

# **UI Toolkit Reference Manual**

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# Preface

## About this manual

This document describes the general philosophy, concepts, and usage of the Synergy/DE™ UI Toolkit. UI Toolkit is designed to help you provide a windows interface for your application. Before you get started, we recommend that you read [chapter 1, “Welcome to UI Toolkit,”](#) carefully. This chapter describes what Toolkit is and where it fits with the windowing system as a whole and the structure of your Synergy™ applications. It also provides hints on getting started with Toolkit. The remaining chapters discuss each Toolkit component in detail and contain examples to help you code your own windows interfaces.

## Manual conventions

Throughout this manual, we use the following conventions:

- ▶ In code syntax, text that you type is in `Courier` typeface. Variables that either represent or should be replaced with specific data are in *italic* type.
- ▶ Optional arguments are enclosed in *[italic square brackets]*. If an argument is omitted and the comma is outside the brackets, a comma must be used as a placeholder, unless the omitted argument is the last argument in a subroutine. If an argument is omitted and the comma is inside the brackets, the comma may also be omitted.
- ▶ Arguments that can be repeated one or more times are followed by an ellipsis...
- ▶ A vertical bar (|) in syntax means to choose between the arguments on each side of the bar.
- ▶ Data types are **boldface**. The data type in parentheses at the end of an argument description (for example, (n)) documents how the argument will be treated within the routine. An **a** represents alpha, a **d** represents decimal or implied-decimal, an **i** represents integer, an **n** represents numeric (which means the type can be **d** or **i**), and **any** represents any data type, including object types.
- ▶ To “enter” data means to type it (or highlight it, in the case of a selection window entry) and then press ENTER. (“ENTER” refers to either the ENTER key or the RETURN key, depending on your keyboard.)

- ▶ This grid indicates on which platforms and in which environments a routine, statement, etc., is supported: in traditional Synergy on Windows (WT), in Synergy .NET on Windows (WN), on UNIX (U), or on OpenVMS (V). By “supported” we mean that the item performs a useful function on that platform or environment. For example, an unsupported routine may cause a compiler error or it may just not do anything.

|    |    |   |   |
|----|----|---|---|
| WT | WN | U | V |
|----|----|---|---|

### WIN

---

- ▶ Items or discussions that pertain only to a specific operating system or environment are called out with the name of the operating system.
- 

## Other resources

- ▶ The UI Toolkit Release Notes (**REL\_DTK.TXT**)
- ▶ *Getting Started with Synergy/DE*
- ▶ *Repository User's Guide*
- ▶ *Synergy DBL Language Reference Manual*
- ▶ *Synergy Tools*
- ▶ *Environment Variables & System Options*
- ▶ *Professional Series Portability Guide*
- ▶ Composer Online Help

## Product support information

If you cannot find the information you need in this manual or in the resources listed above, you can reach the Synergy/DE Developer Support department at the following numbers:

800.366.3472 (in the U.S. and Canada)

916.635.7300 (in all other locations)

To learn about your Developer Support options, contact your Synergy/DE account manager at one of the above numbers.

Before you contact us, make sure you have the following information:

- ▶ The version of the Synergy/DE product(s) you are running.
- ▶ The name and version of the operating system you are running.
- ▶ The hardware platform you are using.
- ▶ The error mnemonic and any associated error text (if you need help with a Synergy/DE error).

- ▶ The statement at which the error occurred.
- ▶ The exact steps that preceded the problem.
- ▶ What changed (for example, code, data, hardware) before this problem occurred.
- ▶ Whether the problem happens every time and whether it is reproducible in a small test program.
- ▶ Whether your program terminates with a traceback, or whether you are trapping and interpreting the error.

## Reporting Synergy .NET issues

If you are having any of the following problems, please send us the complete set of source files to re-create the issue, and send us the information in the **BuildVersion.txt** file, which is in MSBuild\Synergex\VS2010 under the Program Files directory or the Program Files (x86) directory.

- ▶ Visual Studio lock up or crash
- ▶ Compiler crash
- ▶ Unusual MSIL Assembler (**ilasm.exe**) issues
- ▶ “Invalid program” errors
- ▶ “JIT Compiler has encountered an internal limitation” error at runtime

For Visual Studio issues, zip the entire project.

Note that for untrapped errors, you won’t get a traceback, as you would with traditional Synergy. Instead, you’ll get the Windows Dr. Watson box. And if you click Debug, you’ll go into the debugger. If the program was not built with debug information, and you instead click Cancel, you’ll get a traceback.

## Synergex Professional Services Group

If you would like assistance implementing new technology or would like to bring in additional experienced resources to complete a project or customize a solution, Synergex® Professional Services Group (PSG) can help. PSG provides comprehensive technical training and consulting services to help you take advantage of Synergex’s current and emerging technologies. For information and pricing, contact your Synergy/DE account manager at 800.366.3472 (in the U.S. and Canada) or 916.635.7300.

## Comments and suggestions

We welcome your comments and suggestions for improving this manual. Send your comments, suggestions, and queries, as well as any errors or omissions you’ve discovered, to [doc@synergex.com](mailto:doc@synergex.com).





# 1

## Welcome to UI Toolkit

### **Before You Begin Using UI Toolkit 1-2**

Suggests the best way to get “up and running” with UI Toolkit. This section includes information for both new and experienced users.

### **What Is UI Toolkit? 1-3**

Explains what UI Toolkit does, describes its components in general terms, and then describes each “tool” in more detail.

### **UI Toolkit Concepts and Terminology 1-8**

Explains basic concepts and terminology of a windowing system. Describes how we designed the windowing components to work together.

### **Getting Started with UI Toolkit 1-15**

Outlines the steps for creating a windowing application using UI Toolkit.

### **Requirements and Considerations for Synergy Programs 1-17**

Discusses some requirements and considerations to keep in mind when writing your Synergy application.

### **Using UI Toolkit with the .NET Framework 1-22**

Introduces methods for using Toolkit code with Microsoft .NET Framework.

### **Moving Your Application to Other Systems 1-25**

Discusses how to deploy your application to other platforms.

# Before You Begin Using UI Toolkit

If you are a new user of UI Toolkit, we suggest you do the following:

- ▶ Read all of this chapter. This chapter explains how Toolkit works.
- ▶ Scan the [Glossary](#) at the back of this manual to get a better understanding of Toolkit terminology.
- ▶ Read the introductory sections of [chapter 2, “Script,”](#) to get a better understanding of what scripts are and why you use them. Also look at the individual script commands in this chapter, paying special attention to the following commands:

.COLUMN  
.END  
.ENTRY  
.FIELD  
.INPUT  
.SELECT  
.WINDOW

These are the script commands you will use most often.

- ▶ Make some sample scripts and process them using the Script utility, which is explained in [“Script: The Script Compiler” on page 2-135](#). If you want, you can use Proto to look at the columns and windows you have just created. (See [chapter 3, “Proto.”](#))
- ▶ Learn the following basic subroutines. You can’t create a Toolkit application without them:

U\_START  
U\_FINISH  
M\_LDCOL  
M\_PROCESS  
I\_LDINP  
I\_INPUT  
U\_OPEN  
U\_CLOSE

- ▶ Examine the example programs and scripts in this manual. It is our experience that a careful examination of examples will help you as much as the discussions for the various Toolkit subroutines.

These suggestions are intended to be a guide so you can begin using UI Toolkit as quickly as possible.

# What Is UI Toolkit?

## The philosophy of UI Toolkit

In the competitive software market, you need an edge. UI Toolkit gives you this edge in four important ways:

1. Toolkit helps you provide a user interface that is easy to use and includes the following:

- ▶ Color
- ▶ Drop-down menus
- ▶ Cascading menus
- ▶ Pop-up help
- ▶ Ability to run in Windows environments
- ▶ ActiveX controls
- ▶ Tabbed dialogs
- ▶ Composite windows (parent/child windows)

Whether we like it or not, many end-users base their initial impression on an application's appearance rather than its capabilities. Not only will Toolkit enable your product to perform well, it will also look good.

2. Toolkit makes creating this type of user interface fast and easy. To do this, we separated the user interface manipulation from the application itself and designed Toolkit utilities that handle all the user-interface details for you. The UI Toolkit environment establishes and maintains input, prompts, messages, menus, help, and other user interface details—so you don't have to write such code yourself. Now instead of writing menus and help windows, you can concentrate on your area of expertise: your vertical market.
3. You retain all of the programming power of a true third generation language because Synergy DBL is the foundation for Toolkit. Most programming tools that are designed to give you an enhanced interface and speed your development are too limiting for the true programmer. Toolkit is an extremely powerful tool that will meet almost any programming need; however, in those situations where you encounter special requirements, you will always have the full power of Synergy DBL available to you.
4. UI Toolkit gives you consistency within your applications. If you write the accounts payable part of an accounting package and someone else writes the accounts receivable part, both parts will look the same to the user. This is because Toolkit provides you with pre-written code for the user interface portions of your software. No matter who writes the programs, it will all look and feel the same to the user.

## General information

UI Toolkit is a set of subroutines and utility programs that gives you the tools you need to create state-of-the-art user interfaces for your applications.

UI Toolkit is structured to support large applications. Our design assumes that the major functions of your application will be supported by individual subroutines, while the main routine will consist primarily of a small decision apparatus that makes the appropriate calls to these subroutines.

These subroutines and programs interact with window library files that UI Toolkit creates when it processes the script files you have written.

To use UI Toolkit, you first create a user interface window script file with Composer or a text editor. Next, you compile the script file with one of Toolkit's utility programs: Composer, Proto, or Script. These utility programs build the windows and store their definitions in a window library file. In the final step, you write a Synergy program that calls Toolkit subroutines. [Figure 1-1](#) illustrates this basic procedure.

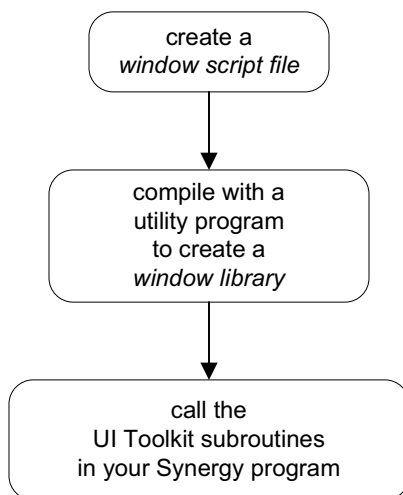


*Figure 1-1. Basic procedure for using UI Toolkit.*

You can use Proto to preview your window script file before testing it in your Synergy program.

## UI Toolkit components

### Window scripts

At the heart of the UI Toolkit windowing system are window script files, which enable you to quickly create general windows, input windows, menu columns, selection windows, and list classes from your own editable text files.

You provide the “script” to build a window, using script commands and arguments. The commands and arguments control the overall window characteristics and the items the window will contain.

You can create your script automatically with the Composer program. Using Composer, you can interactively design your windows, fields, buttons, and so on, in a graphical format. Once your design looks exactly like you want it, you select the “Save script” option. The Composer will translate your graphical design into a script file.

Once your script file is created, you merely run a script processing utility or program (Script or Proto), or select “Compile Script” in Composer to build the window definitions. This processing also saves these definitions in a window library file.

Using UI Toolkit subroutines, your Synergy program can restore windows from the window library when they are needed. (The subroutines and script files do not interact directly. Rather, at runtime, the subroutines open and use the window library that was created when the script file was processed.)

Using window scripts has a distinct advantage. Each window is in a window library file, instead of being hard-coded into your programs. Because these libraries can be maintained outside your programs, you can modify window parameters and text without changing or recompiling your Synergy routines.

### The UI Toolkit utility programs

UI Toolkit contains three utility programs: Composer, Script, and Proto.

#### **Composer (Windows)**

Composer creates and modifies window script files with a WYSIWYG (What You See Is What You Get) interface, enabling you to

- ▶ interactively design windows and input windows.
- ▶ save your design to a script file.
- ▶ read and modify existing script files.
- ▶ compile window scripts, storing the definitions into a window library.

Composer is available on Windows systems only. For more information about Composer, see the [“Designing Your User Interface”](#) chapter of *Getting Started with Synergy/DE*.

#### Script

The Script program processes all forms of window script files, batch-style, to generate windows. In one step, it does the following for you:

- ▶ Reads and interprets the script
- ▶ Converts window and column scripts into window and column definitions
- ▶ Stores the definitions into a window library

See [chapter 2, “Script,”](#) for more information.

#### Proto

Proto performs all the actions that Script does, except that it also enables you to interactively process window scripts. Proto lets you display windows, too. Using it, you can do the following:

- ▶ Load (from a window library file) and view menu columns and windows
- ▶ Test menu columns and windows
- ▶ Create and update window libraries
- ▶ Prototype display renditions
- ▶ Edit key map definitions

See [chapter 3, “Proto,”](#) for more information.

[Figure 1-2](#) illustrates how these utilities work together.

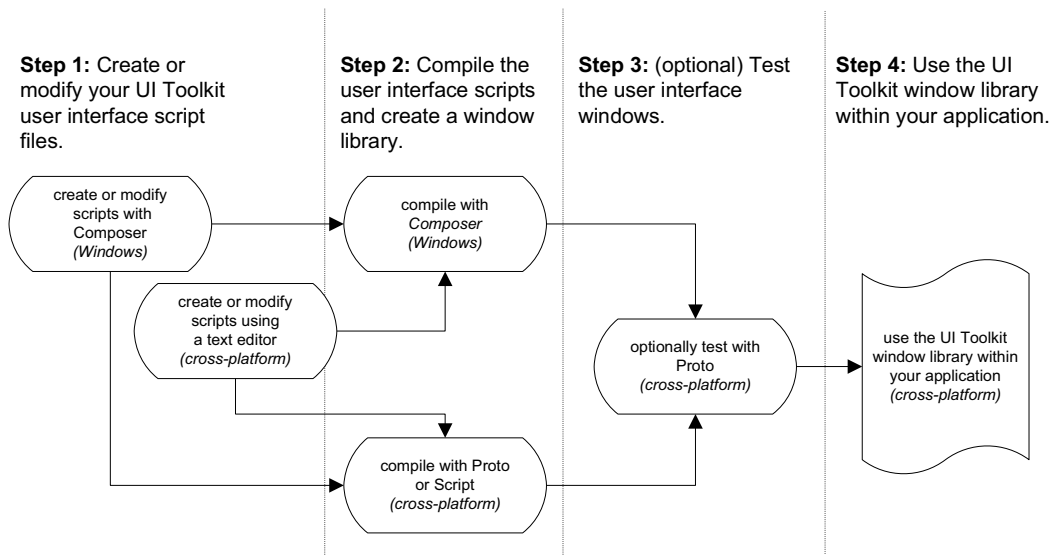


*Figure 1-2. Building user interfaces with UI Toolkit utilities.*

## The UI Toolkit subroutines

The main component of UI Toolkit is a set of subroutines. These subroutines link your application and the windowing system. They handle menu processing, input processing, text processing, selection processing, list processing, toolbar processing, tab set processing, environment maintenance, and more. These subroutines are based on a set of low-level Synergy windowing subroutines (the “W\_” routines) that are part of the Synergy runtime.

The specific attributes of menus, input windows, and other window elements are defined in window script files and stored in window libraries, external to your application. You can also set display renditions, and define control and function key sequences externally.

## Window debugger

The UI Toolkit window debugger gives you information and the current status of the windowing environment. Using the debugger you can view the following:

- ▶ Any loaded window
- ▶ Any environment level
- ▶ General information about loaded windows and open channels
- ▶ List and file-stack information
- ▶ Detailed information about a specific window

See to [chapter 17, “Debugger,”](#) for more information.

# UI Toolkit Concepts and Terminology

This section explains basic concepts, terminology, and how the UI Toolkit utilities and subroutines work and interact.

## Display screen

### Layout

The UI Toolkit subroutines and programs use a display screen divided into the following five horizontal sections as pictured in [figure 1-3](#):

- ▶ Header
- ▶ Menu bar
- ▶ Body
- ▶ Information line
- ▶ Footer

The *header*, at the top of the screen, can have up to four lines. Under the header is a one-line *menu bar*, which contains the titles of various drop-down columns. At the bottom of the screen is the *footer* section which, like the header, can have a maximum of four lines. Immediately above the footer is a single *information line*, which holds information for the user. The header and footer can also be used to display information to your users. The *body* of the screen is the area that remains, between the menu bar and the information line, and is where your windows will be displayed.

These five screen sections are defined by the U\_START subroutine, the subroutine that sets up the UI Toolkit environment. With U\_START, you can change the basic look of your screen display. Since the header and footer are optional, you can specify in U\_START whether you want them, and if you do, how big you want each of them to be. You also can remove and place the information line and menu bar by calling the U\_BAR subroutine.

### Rendition schemes

A *rendition* is the attribute and color combination you select for each item in the UI Toolkit screen display. You can control the rendition of over 40 display items, such as the fields, the window background, the information line, and the footer. A *rendition scheme* is a collective set of chosen renditions.

You define rendition schemes by calling a Toolkit subroutine from your application, or you can use the “Renditions” function in Proto. (Proto calls the same subroutine you would call from your program.) The rendition schemes are stored as records in the rendition file. The default name of the rendition file is **dtkrnd.ism**.

See [“Customizing the Look of Your Application” on page 18-27](#) for more information.



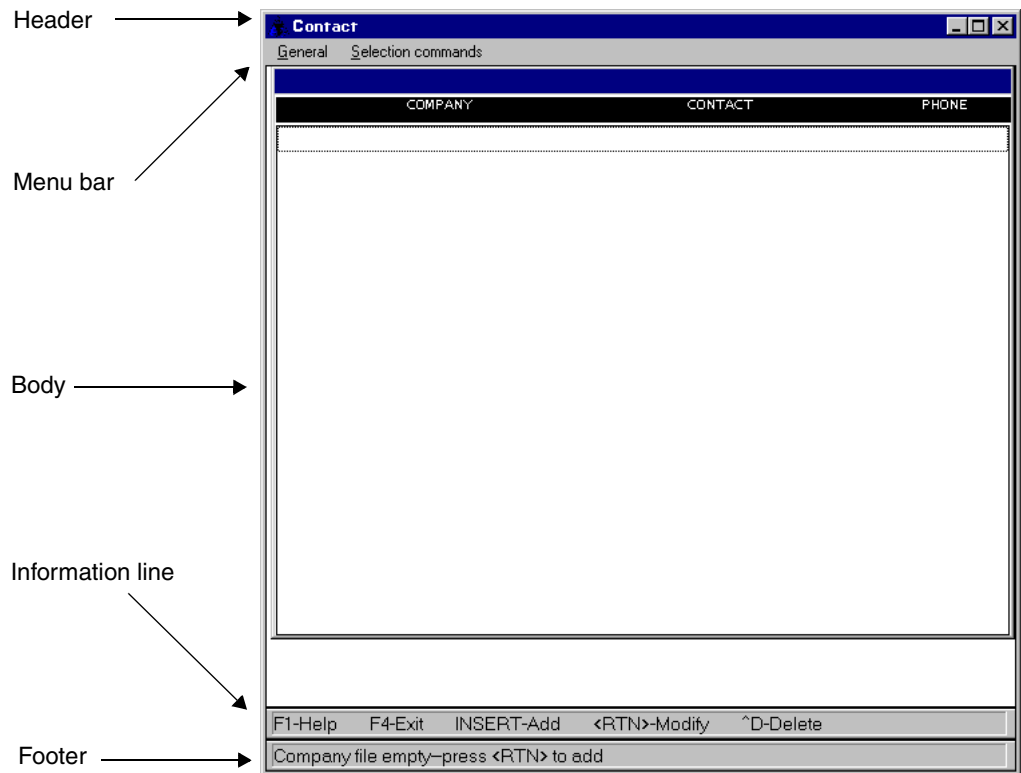


Figure 1-3. Parts of a display screen.

## Menus

UI Toolkit supports drop-down menus using primary menu and submenu columns. A *menu column* is a special window that is generated from a menu column (window) script. Each menu column contains one or more entries. Each menu entry has the following:

- ▶ An internal entry name (used within your program)
- ▶ The entry text that will be displayed on the menu
- ▶ An optional shortcut (key sequence that automatically selects that entry)
- ▶ A quick-select character that enables users to select the menu entry without using arrow keys

The menu column drives the application. All special keys need to be defined on the menu bar in order to be recognized by UI Toolkit (on UNIX and OpenVMS systems).

UI Toolkit provides menu processing subroutines that enable you to load, remove, delete, enable, and disable menu columns; enable and disable menu entries and sets of entries; and process a menu. Also included are routines that enable you to create menu columns at runtime.

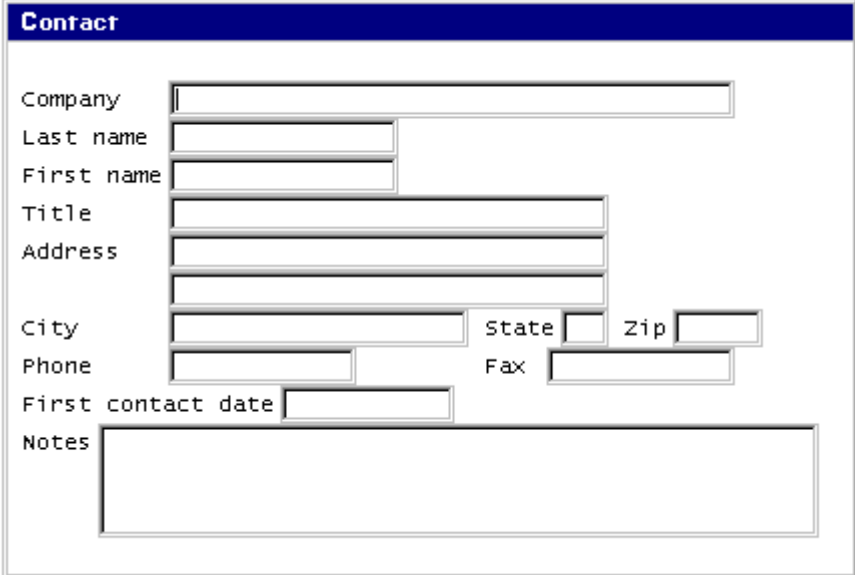
Refer to [chapter 10, “Menu Routines,”](#) for more information about processing menus, and for the syntax and a discussion of each of the menu-related subroutines.

## Input windows

One of the easiest ways to confuse end users and make them dissatisfied with your application is to process input inconsistently. Your users want to know that the same rules and constraints apply, regardless of where they enter input. For this reason, one of the major components of UI Toolkit is input processing. Because Toolkit handles all such processing, you can ensure that input will be processed consistently throughout your entire application.

We address the need to process terminal input through *input windows*. An input window is a window that can contain text, input fields, and buttons. Each input field is assigned a position and length within the window, as well as a set of *qualifiers* that define how the field should be processed (a name for the field, the type and length of the data, any redisplay format, a selection window to use, any valid range or set of values, etc.). Field qualifiers may be specified in window scripts or in S/DE Repository. [Figure 1-4](#) below shows an example of an input window.

Toolkit enables you to load and process input windows, modify attributes of input windows and fields at runtime, access input field data, and specify the next field to be processed. You can also create input windows at runtime. See [chapter 8, “Input Routines,”](#) for information about processing input windows and for information on input-related subroutines.



The image shows a graphical user interface window titled "Contact". The window contains several input fields for user data. The fields are arranged in a form-like layout. The labels for the fields are: Company, Last name, First name, Title, Address, City, State, Zip, Phone, Fax, First contact date, and Notes. The "Notes" field is a larger text area at the bottom. The fields are represented by rectangular boxes with a double-line border, indicating they are active or focusable. The "State" and "Zip" fields are smaller than the others, suggesting they might be dropdown menus or have specific length constraints. The "First contact date" field is also a standard-sized text box. The "Notes" field is a larger rectangular area at the bottom of the form.

Figure 1-4. A sample input window.

## Selection windows

Most applications include fields where the user can choose from a group of predefined selections included in a *selection window*. The UI Toolkit selection processing routines enable you to process a selection window, change the default selection, replace the entries in a selection window, and create a selection window “on-the-fly.”

See [chapter 12, “Selection Routines,”](#) for more information about building and processing selection windows and for the syntax and a discussion of each of the selection window-related subroutines.

## Lists

One of the most powerful tools you can use in your application is *list processing*. The Toolkit list subroutines provide a mechanism whereby static or dynamic lists of information can be easily displayed and traversed.

A list is characterized by its row and column position, number of items visible at one time, optional header and footer lines, optional scroll bars, the rules by which it abides when processed, and whether it is a standard Toolkit list or an ActiveX Toolkit list. The loading of items into the list occurs only as needed (or “on demand”), rather than all at once at the beginning. For this reason Toolkit lists are sometimes referred to as *demand-loaded lists*.

Lists can be placed, removed, enabled, disabled, processed, and deleted. Individual items within the list can be inserted, updated, deleted, and moved.

UI Toolkit handles all the list management functions such as maintaining the data in the list, redisplaying items, scrolling up and down through the list, and tracking which item is being processed. Your program only needs to be concerned with the current item.

Refer to [chapter 9, “List Routines,”](#) for more information about processing lists and for the syntax and a discussion of each of the list-related subroutines.

## Tab set processing

Complex applications developed with Synergy/DE often contain input requirements that won’t fit on a single-screen input window. Historically, this problem has been solved by either several windows, which are navigated using a Page Up/Down equivalent, or a single large window with a screen-sized movable display area.

Among software development platforms for Windows environments, a standard approach to this problem has emerged: tabbed dialogs, where windows are rendered as tabbed file-folders.

The tab set processing functions in UI Toolkit enable you to associate input windows or lists with the “tabs” of a tabbed dialog. Specific input window or list processing is handled using a method that you register with Toolkit.

See [chapter 13, “Tab Set Routines,”](#) for more information about processing a tabbed dialog and for the syntax and a discussion of each of the tab set-related functions.

## Text processing

A central feature of text processing is the *text window*. A text window is a window that is configured with the text set-up subroutine. It defines formatting characteristics such as margins, indentation, the number of lines between paragraphs, and the size and position of the display area. If a text window is larger than the screen, you can define the visible portion of the window, called the *view* and then move that view throughout the window as desired (by scrolling).

A *text entry* is a special entry in a window library that contains lines of text in a compressed form. Text entries give you a convenient, efficient way to store variable-length text.

The text processing subroutines in UI Toolkit enable you to configure a window as a text window, load and retrieve text from a text window, edit text, move a view through a text window, and read and write text entries.

Refer to [chapter 14, “Text Routines,”](#) for more information about processing text windows and for the syntax and a discussion of each of the text-related subroutines.

## Composite window processing

In addition to using tab sets to combine input windows and lists into a single dialog, Toolkit enables you to create composite windows. A composite window is a window that consists of a parent window and child windows and lists, but functions and appears to the user as a single window. For information, see [chapter 6, “Composite Window Routines.”](#)

## Toolbar processing

A key component of most Windows applications is a toolbar. The UI Toolkit’s toolbar functions enable you to create and manipulate an application window toolbar. Selecting a toolbar button can trigger the simulation of one or more characters pressed on the keyboard, or invoke an entire subroutine of application code.

See [chapter 15, “Toolbar Routines,”](#) for more information about processing the toolbar and for the syntax and a discussion of each of the toolbar-related functions.

## Environments

UI Toolkit maintains a *current environment* and a *current display* within your program.

The environment consists of the following:

- ▶ Windows
- ▶ Menu columns
- ▶ Lists
- ▶ Header
- ▶ Information line

- ▶ Footer
- ▶ Channels
- ▶ State flags
- ▶ Toolbars

The display consists of the following:

- ▶ Menu bar
- ▶ Toolbar placement
- ▶ Body of the display screen
- ▶ Menu column placement
- ▶ Window placement
- ▶ List placement

When you enter a new environment, UI Toolkit saves the current state (which includes both the display and environment) and initializes a new state. When you exit an environment, Toolkit closes its current state and resets it to the preceding state.



Toolbars are under environment control only when created with %TB\_TKCREATE or logged with %TB\_TKLOG.

---

Environments make it easier to create and maintain modular programs. If a routine enters a new environment and exits it when it returns to the calling program, the routine is completely modular. Such a self-contained routine is a powerful tool because, while it can be called and used by other routines, it does not depend on the other routines to perform. This also means that the routine looks and works the same way, no matter where your application calls it.

For example, consider an inventory maintenance function in a retail management application as an XCALLED module. Your application can call this routine from the main menu for the user who only wants to review the inventory. It can also call the same function from the inventory receiving routine so that the user automatically updates the inventory when new products come in.

Refer to [chapter 7, “Environment Routines,”](#) for more information about program environments and for the syntax and a discussion of each of the environment-related subroutines.

## Black-box processing

*Black-box processing* is a common term used to describe the type of processing UI Toolkit enables you to do. This means that, from the standpoint of your application, no specific processing code is required for handling menus, input windows, text windows, selection windows, and lists. You simply call the appropriate processing routine (black box), and your program receives a return status that says “this action occurred” or “this option was selected.” Your program doesn’t have to track how the user makes a menu selection or enters data into input fields—it simply takes the

appropriate action. This programming style is known as *event-driven programming*. (Event-driven programming is discussed more later in this chapter.) In object-oriented terminology, this is also called *encapsulation*.

Additionally, menus are “automatically” processed within black-box processing. Each black box has certain reserved menu entries that it recognizes. If any other menu entry is selected, the routine will return to the caller with the selected menu entry.

Menu entry shortcuts are also processed by the black-box routines. If the user presses an assigned shortcut, the black-box routine immediately returns the associated option’s code to your program without going through full menu processing.

Because menu processing is handled automatically by the black-box routines, and because most of your application’s time is spent in some sort of input processing, you rarely need to process the menu yourself.

The various types of black-box processing routines are those for input windows, text windows, selection windows, and lists. Before calling these routines, you can place one or more menu columns on the menu bar to define the available functions. The menu bar will be processed automatically. Any menu entries that the processing routine cannot handle will be returned to your application for processing.

Input window processing is terminated either when the user completes input of all fields, when a menu entry the input processor does not recognize is selected, or when the user processes a field that has been flagged as one that should return control to the caller.

Text window processing is terminated when a menu entry the text processor does not recognize is selected.

Selection window processing is terminated when the user makes a selection (by pressing ENTER), or when a menu entry the selection processor does not recognize is selected.

List processing is terminated when you delete the list or exit the environment in which the list was created.

For information on how to create a Toolkit event loop, see [“The UI Toolkit event loop” on page 1-18](#). This loop takes advantage of UI Toolkit’s black-box processing using event-driven programming.

## Keyboard independence

UI Toolkit supports keyboard or terminal independence, which enables a variety of terminals (each with its own key map) to execute the same application on a single system.

See [“Customizing Key Mapping for Menu Shortcuts” on page 18-11](#) for more information about this feature.

# Getting Started with UI Toolkit

The initial steps you should take to develop applications using UI Toolkit for traditional Synergy are as follows. (For information on using UI Toolkit with Synergy .NET, see [“Using UI Toolkit with the .NET Framework” on page 1-22.](#))

1. Define your windows and menu columns in a window script file. See [chapter 2, “Script,”](#) for more information about writing script files. We suggest you use Composer to create this script interactively. See the [“Designing Your User Interface”](#) chapter of *Getting Started with Synergy/DE* for information on using Composer.
2. Compile the script files with Proto or Script to build the windows and columns and to store them in a window library. (You can also compile the script files from within Composer.)
3. Test and view the windows and columns with Proto.
4. Write a Synergy program that calls the UI Toolkit subroutines. You will need to include the file **WND:tools.def** in your program (with the Synergy DBL `.INCLUDE` statement). Read [“Requirements and Considerations for Synergy Programs” on page 1-17](#) before writing your program.
5. Compile the source code. (See [“Creating and Running Traditional Synergy Applications”](#) in the “Building and Running Traditional Synergy Applications” chapter of *Synergy Tools*.)
6. Link your program with **WND:tklib.elb** (**TKLIB\_SH.EXE** on OpenVMS). See [“Linking Object Modules”](#) in the “Building and Running Traditional Synergy Applications” chapter of *Synergy Tools* for information on commands for linking.

On Windows, you can link against **tklib\_qcheck.elb**, a version of the UI Toolkit library that’s built with more thorough bounds checking (the **-qcheck** compiler option). But note that all code linked against this version of the Toolkit library must be compiled with **-qcheck**. See [“Bounds checking” on page 1-20](#) and [“Compiler options”](#) in the “Building and Running Traditional Synergy Applications” chapter of *Synergy Tools*.

---

## VMS

To link your program, you must replace **SYNRTL.OPT** with **SY\$SHARE:SYNTKLIB.OPT**. (Using **SY\$SHARE:SYNTKLIB.OPT** will link in the Toolkit shared image.)

Additionally, you must use **TKLIB\_SH.EXE** to link into the Toolkit libraries instead of **tklib.elb** (which is for Windows and UNIX only).

---

7. Run your application. It will use the windows and menu columns stored in the window library.

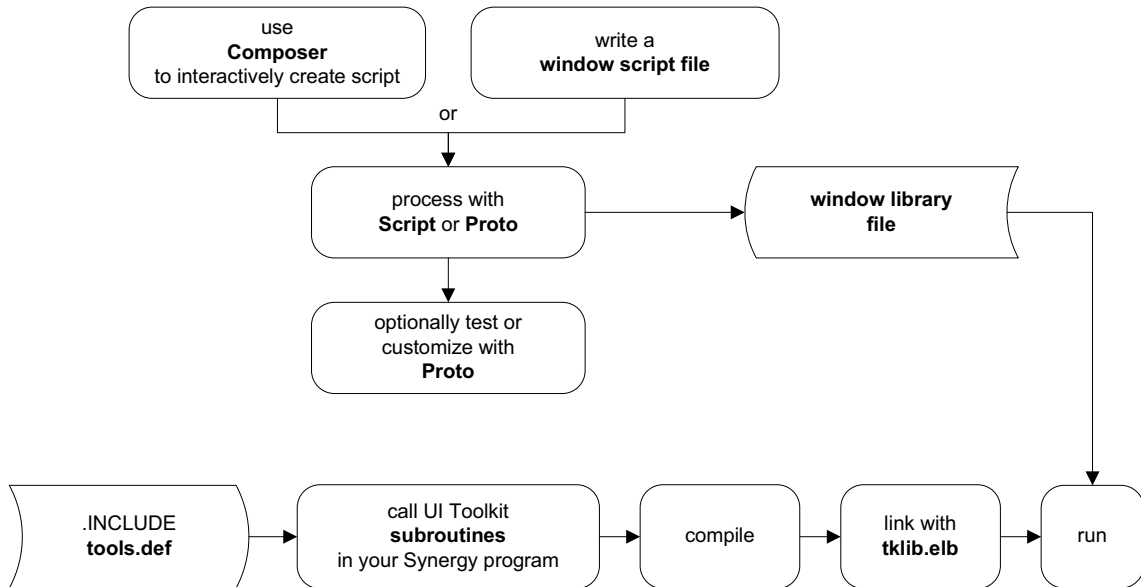


Figure 1-5. Creating a Toolkit application with traditional Synergy.



# Requirements and Considerations for Synergy Programs

When writing your Synergy program, remember

- ▶ to include the **tools.def** file.
- ▶ to avoid using global data section names reserved by UI Toolkit.
- ▶ to use variables for channels.

We also recommend that you use event-style programming when using UI Toolkit. This section discusses these and other issues you should keep in mind when creating UI Toolkit applications.

## The tools.def file

When using UI Toolkit, the only file you must include in your application is the **tools.def** file. It contains definitions of the flags and value-control arguments required by Toolkit. Use the Synergy DBL `.INCLUDE` statement to include this file in your program.

If you want to include only part of the **tools.def** file in your application, you can use `D_DEFINES_ONLY` and `D_NO_GLOBAL_DATA`. Defining `D_DEFINES_ONLY` before including **tools.def** will include only the Toolkit definitions from **tools.def**. Defining `D_NO_GLOBAL_DATA` will include the Toolkit definitions and the function declarations, but not the global data.

For example, you could define `D_DEFINES_ONLY` and include **tools.def** before the first routine in the file, and then you would need to include **tools.def** only in routines that need access to the global data or the function declarations.

`D_NO_GLOBAL_DATA` can be especially helpful when modularizing your code to be used with *x/ServerPlus*. For example, the following code suppresses the inclusion of global data.

```
.define D_NO_GLOBAL_DATA  
.include "WND:tools.def"
```

See [“Customizing Configuration Fields” on page 18-2](#) for information on customizing UI Toolkit with **tools.def**.

## Reserved global data section and common field names

All Toolkit global data section names begin with “DTK\_”. UI Toolkit also uses names that begin with “GLST\_” for common field names. Therefore, to avoid potential conflicts, avoid using names beginning with “DTK\_” or “GLST\_” for common fields or global data sections.

## Channel usage

The UI Toolkit subroutines use variables for all channels. You may not be used to this; most programs in the past “hard-coded” their channel numbers by using decimal literals (1, 15, 32, and so forth). However, hard-coding can get you into trouble. For example, you might inadvertently use a channel that is already in use. Enabling the development environment to manage the I/O channels eliminates this problem since Toolkit assigns the channels and maintains a database so channels don’t get re-used inappropriately.

UI Toolkit uses three types of channels: system channels, global channels, and local channels.

A system channel is reserved from use. That is, you may not manipulate it with `U_OPEN`, `U_CLOSE`, `U_GBLCHN`, and so forth. The terminal channel opened by `U_START` is a system channel, and so are all channels that have been excluded from Toolkit use, such as those before or after the *first\_channel* through *last\_channel* range passed to `U_START`. These channels may be accessed through non-Toolkit calls, but we do not recommend it.

A global channel is a channel that you can open or close. You can either open it as a global channel or promote it to global later. You cannot automatically close a global channel with an `E_EXIT` from the environment in which it was opened; however, you can close it using a `U_CLOSE` at any time.

You can also open a local channel, but it will be closed automatically (with purge) when the environment in which it was opened is exited. Unlike local windows, a local channel may also be closed using `U_CLOSE` at any environment level.

For information about opening and closing channels, see [U\\_OPEN on page 16-109](#) and [U\\_CLOSE on page 16-18](#).

## Event-driven programming

Programming with UI Toolkit is most effective if you use event-driven (or event-style) programming. Toolkit uses black-box processing, and event-driven programming takes full advantage of this feature. For more information, see [“Black-box processing” on page 1-13](#).

In event-driven programming, control of your program is turned over to UI Toolkit by calling a Toolkit subroutine. When the UI Toolkit subroutine completes its processing, it returns control to your program. Your program tests an exit flag for the “event” that caused the routine to exit. Based on the result of this test, your program performs the appropriate function.

### The UI Toolkit event loop

UI Toolkit is designed so this event-driven technique works best in a loop (`REPEAT`, `DO UNTIL`, and so forth). We call this the “Toolkit event loop.” It works for any of the UI Toolkit functions: input processing, menu processing, text editing or viewing, or list processing.

At the top of your loop, you call a Toolkit subroutine. For example, you may call a subroutine to do input processing. UI Toolkit will start input processing, and any input from the user will be processed by Toolkit.

When Toolkit determines that the user has input something that meets its criteria for termination of input processing, a flag (or flags) will be set, the input routine will exit, and control will be returned to your program.

Immediately following the call to the input processing subroutine, your program will perform a test, or series of tests, to determine the reason input processing exited. Using the test results, you can have your program call another subroutine, look up a record in a file, validate data, exit the input processing loop, or anything else that can be done with Synergy DBL.

When your program has done what it needs to do, it returns to the top of the loop and calls the input processing subroutine to get more input.

The complete steps for using event-driven programming are as follows:

1. Remove any unnecessary menu columns from the menu bar.
2. Place necessary menu columns on the menu bar.
3. Set up the following loop:
  - ▶ Get user input with direct menu bar selection, text windows, input windows, selection windows, or lists.
  - ▶ Find out what event occurred. Was a menu entry selected? Is the user done with a text or input window? Do you need to process an input window's break field? Did the user make a selection?
  - ▶ Process the event.
  - ▶ Unless the event is one that terminates processing, return to the first bulleted item under step 3.

Throughout this manual, you will be exposed to the UI Toolkit event loop. We encourage you to study this sample code, and better still, try writing some small programs using this technique. Once you become comfortable with this programming style, you will be well on your way to becoming a productive Toolkit programmer.

## Error processing

Synergy DBL runtime errors (with the exception of most window errors) can be trapped with calls to the FATAL subroutine, with ONERROR statements, and with TRY-CATCH blocks.

When a Toolkit error or a window error is generated, the error is automatically sent to U\_ABORT, unless the error is returned in an argument for a Toolkit routine, such as the *error* argument for L\_CREATE. (If this happens, the error number is returned in the argument, and you can use %U\_GETWNDERR to get the error text.) If an error is sent to U\_ABORT, it will either perform a STOP and display a fatal error message (the default), or it will throw an error that can be trapped by an ONERROR statement. For more information, see [U\\_ABORT on page 16-5](#) and [%U\\_GETWNDERR on page 16-71](#).

For information on Synergy DBL runtime errors, including window errors, see “Runtime errors” in the “Error Messages” chapter of *Synergy Tools*.

## Bounds checking

Bounds checking detects memory access errors (buffer overruns), where a reference exceeds the calling routine's data space, including such failures as data being overwritten and segmentation violations. There are several ways to use bounds checking with Toolkit applications:

- ▶ Set the **g\_dtkbounds** global variable or the DTK\_BOUNDS environment variable to 1 or 2. (DTK\_BOUNDS determines the initial setting of **g\_dtkbounds**.) With these settings, bounds checking is limited to a few input and list routines. Although bounds checking is built into Toolkit libraries on Windows, as discussed below, **g\_dtkbounds**/DTK\_BOUNDS has checks that aren't available with these other bounds checking options. For example, it tells you explicitly when a data area passed to a routine is too small (rather than issuing a generic range error), and on Windows it checks to make sure W\_PROC(WP\_RESIZE) is not used to resize one of the Toolkit's reserved windows (header, footer, or information line) or an input window associated with a list. For more information, see [DTK\\_BOUNDS](#) in the "Environment Variables" chapter of *Environment Variables & System Options* and "[g\\_dtkbounds](#)" on [page 18-3](#).

Note that if **g\_dtkbounds** is set to 2, you can use DTK\_BOUNDS\_LOG to log non-fatal errors to a file. See [DTK\\_BOUNDS\\_LOG](#) in the "Environment Variables" chapter of *Environment Variables & System Options*.

- ▶ Use the **-qstrict** or **-qcheck** Synergy compiler option when you compile your application. These options, which are available in traditional Synergy on Windows and on UNIX and OpenVMS, provide different levels of bounds checking for all routines in your application. See "[Compiler options](#)" in the "Building and Running Traditional Synergy Applications" chapter of *Synergy Tools* for more information.

Note that on Windows in standard Synergy, the default Toolkit library (**tklib.elb**) is built with one of the Synergy compiler options for bounds checking (**-qstrict**) by default. And if you want even more thorough checking, you can use **tklib\_qcheck.elb**, which is a version of the Toolkit library built with the **-qcheck** Synergy compiler option. To use this library, link against it (**WND:tklib\_qcheck.elb**) and build your entire application using **-qcheck**. Note, however, that **-qcheck** is not generally recommended for production builds.

In Synergy .NET, all applications use bounds checking that is automatically provided by the **dblnet** compiler. The **-qstrict** and **-qcheck** compiler options don't apply to Synergy .NET (these are for the standard Synergy compiler), but you can use **g\_dtkbounds**/DTK\_BOUNDS and DTK\_BOUNDS\_LOG. Compiler and runtime checks will generally preclude **g\_dtkbounds**/DTK\_BOUNDS checking, but in some cases this checking may detect additional issues.

## Callbacks

A callback is a call to a Toolkit program from a routine that is not part of the Toolkit program—i.e., a callback routine. On UNIX and OpenVMS, all callbacks are synchronous. On Windows, a callback can be synchronous (e.g., a call to EUTILS\_METHOD) or asynchronous (e.g., a call to click method). Most are asynchronous. Note the following:

- ▶ In method subroutines invoked by asynchronous callbacks, code should be kept to a minimum, and operations that could conflict with concurrent processing should be avoided. If you want to invoke a menu entry from a method subroutine, we recommend using the D\_SIGNAL operation for %M\_SIGNAL.
- ▶ Windows 7 and higher and all 64-bit Windows platforms prevent exceptions from being thrown across the kernel (**user32.dll**) boundary. This means that performing a STOP chain in an asynchronous callback or throwing an exception that could be caught in a routine on the other side of an asynchronous callback will cause random hangs and crashes. The Synergy runtime generates an \$ERR\_NOCHAIN error if a callback attempts to perform a STOP chain, but it does not prevent a callback from throwing an exception that could be caught in a routine on the other side.

## Resizing the application

You can resize a UI Toolkit application on Windows, UNIX, or OpenVMS by using U\_RESIZE to specify the number of rows and columns for the application. See [U\\_RESIZE on page 16-126](#).

With Traditional Synergy on Windows, you can also scale an application. That is, you can increase or decrease the size of the display screen, the windows for the application, and the text in those windows.

- ▶ To set the initial scaling percentage for an application, set the APP\_SCALE environment variable. The default is 100 (no scaling). See [APP\\_SCALE](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.
- ▶ To scale an application programmatically, use the D\_SETSCALE subfunction for %U\_WNDFONT. See [D\\_SETSCALE on page 16-241](#).
- ▶ To scale the application when a user resizes, maximizes, or restores the application, set the SYN\_RESIZE\_SCALE environment variable. See [SYN\\_RESIZE\\_SCALE](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.

You can also instruct Toolkit to perform special processing when an application is resized. See [%EAPPSTATE\\_METHOD on page 7-53](#).

## Using UI Toolkit with the .NET Framework

There are three ways you can use UI Toolkit code with the Microsoft .NET Framework. You can

- ▶ compile Toolkit code with the Synergy .NET compiler (**dblnet**) and run it as a Synergy .NET application with a cell-based appearance. See [“Using UI Toolkit code in Synergy .NET”](#) below.
- ▶ use the Toolkit .NET routines to embed .NET forms in Toolkit windows. With this method, you compile the application with the traditional Synergy compiler and then run the application with the traditional Synergy runtime. See [chapter 11, “.NET Routines,”](#) for information.
- ▶ include Toolkit code in Synergy routines called from *xfNetLink* .NET. For information, see the [“Creating Synergy .NET Assemblies”](#) chapter and [“UI Toolkit Routines”](#) in the [“Preparing Your Synergy Server Code”](#) chapter of the *xfNetLink & xfServerPlus User’s Guide*.

## Using UI Toolkit code in Synergy .NET

You can compile UI Toolkit code with the Synergy .NET compiler (**dblnet**) and then run it as a Synergy .NET application if you use **Synergex.SynergyDE.tklb.dll** (see steps below). Most Toolkit routines and Script commands are fully supported with Synergy .NET, though they result in applications with cell-based rather than Windows-like appearance and functionality. For example, the mouse won’t work in most instances. Note the following:

- ▶ Toolkit routines generally function in Synergy .NET as they do on UNIX—for example, `%U_SAVESETTINGS` always returns false. There are exceptions however. Some of these are listed below; others are documented with the routines they apply to.
- ▶ Code with calls to the following routines won’t compile in Synergy .NET: `%AX_TKCALL`, `AX_TKGET`, `%AX_GETINT`, `AX_TKSET`, `%TB_BUTTON`, `%TB_INFO`, `%TB_TOOLBAR`, and the Script compiler routines (`%SCR_` routines).
- ▶ Native .NET status bars are used for the information line and footer.
- ▶ Native .NET controls are used for menus, but note that automatic menu drop down is not supported, the input string passed to `M_PROCESS` is not used, and the only alignment settings supported for `%M_POPUP` are `D_POPUP_LEFT` and `D_POPUP_RIGHT`.
- ▶ In Synergy .NET, arguments with the “any” type cannot take objects. For example, you cannot pass an object as one of the method data arguments for `C_PROCESS`.
- ▶ In Synergy .NET, Toolkit applications use bounds checking that’s automatically provided by the **dblnet** compiler, but for more complete bounds checking, you can use **g\_dtkbounds** (or `DTK_BOUNDS`) and `DTK_BOUNDS_LOG`. See [“Bounds checking”](#) on page 1-20.
- ▶ If you want the font to be scaled when the application is resized, maximized, or restored, set the `SYN_RESIZE_SCALE` environment variable to 1. See [SYN\\_RESIZE\\_SCALE](#) in the [“Environment Variables”](#) chapter of *Environment Variables & System Options*.

- ▶ By default, Toolkit uses cell-based-style message boxes for `U_MESSAGE`, `%U_MSGBOX`, and `U_WAIT`. However, If `g_netnativmsgbox` is set to true, Toolkit uses native Windows message boxes for these routines. See [“g\\_netnativmsgbox” on page 18-7](#).
- ▶ There are some restrictions on the ways you can use global fields in `tkctl.def` and `tools.def`. See [“Restrictions for global fields”](#) below.

The following is a summary of the process you’ll follow to use Toolkit code with Synergy .NET. See the [“Building and Running Synergy .NET Applications”](#) chapter of *Synergy Tools* for information on creating Synergy .NET programs.

1. Create a Synergy project in Visual Studio. Note that we recommend creating a Synergy project and then building that project rather than compiling from the command line. Build options can be complex and difficult to set correctly from the command line.
2. Add a reference to **Synergex.SynergyDE.tklib.dll** in your project. This is installed in Program Files\Common Files\Synergex\CLR40. (If you compile from the command line, reference this **.dll** in the **dblnet** command. See [step 4](#).)
3. Use Synergy DBL and Toolkit routines that Synergy .NET supports to create the program. You can also define your Toolkit windows in windows script files and then compile the script files with Proto or Script. (See [step 1](#) through [step 3](#) of [“Getting Started with UI Toolkit” on page 1-15](#).) Script and Proto run only in traditional Synergy, but the libraries they create are compatible with Toolkit applications in Synergy .NET.
4. Compile your application in Visual Studio. This creates an **.exe** or a **.dll** assembly. (If you compile from the command line, use the **-ref** option to reference the **tklib.dll** assembly.)
5. Run the **.exe** or call the **.dll**.

## Restrictions for global fields

When using Toolkit code in Synergy .NET, there are some limitations to the ways you can use global fields defined in `tools.def` and `tkctl.def`. The following are not supported:

- ▶ Ranging when assigning a value—for example, `“g_entnam(7:4) = number”`. Instead, you can assign the value of the global field to a temporary field, and then use ranging with that field.
- ▶ Assigning a value from a different type (implicit conversion). Instead, use explicit conversion.
- ▶ Assigning a value and then using the result of the assignment in the same statement—for example, `“if (g_select = value)”`. Instead, separate the assignment and the use of the assignment into two statements:

```
g_select=1
if (g_select) ...
```

- ▶ Modifying through a cast—for example, “clear ^i(g\_entnam)”. Instead, use a temporary field:

```
clear ^i(temp_var)  
g_entnam=temp_var
```

- ▶ Accessing groups or record names.
- ▶ Passing global fields as modifiable parameters to subroutines, functions, or methods. Instead, you can pass a temporary field and then assign its value to a global field.



# Moving Your Application to Other Systems

You can deploy your application on any of the platforms supported by Synergy/DE while maintaining a single set of source code for your entire application. It does not matter on which platform your application was developed or to which platform you want to deploy.

Refer to the *Professional Series Portability Guide* for information about the functions, requirements, and processes that differ on the various platforms.

## Moving customized files to other systems

Most of the following provide two ways to move files, depending on whether or not the destination system has the same endian type as the original system. If you're unsure of your system's endian type, refer to [“Big-endian and little-endian”](#) in the “Synergy/DE on UNIX: The Basics” chapter of the *Professional Series Portability Guide* for a complete list of systems and their endian types.

### Moving key mapping files

Follow the rules in [“Moving Database Files to Other Systems”](#) in the “Synergy DBMS” chapter of *Synergy Tools*.

### Moving text message files

To move Synergy/DE text message files to another system, do one of the following:

- ▶ Copy the files as you would copy any other text file.
- ▶ Use the Synergy UI Toolkit Control Panel to unload and then load the files on the new system. (For more detail, see [“Making major changes: Unloading messages to an ASCII file”](#) in the “General Utilities” chapter of *Synergy Tools*.)

### Moving window library files

To move your window library files to another system, do one of the following:

- ▶ If the systems have the same endian type and the same data file type (RMS or ISAM), copy the window library files as you would copy any other file.
- ▶ If the systems have different endian types, you'll need to copy the customized window script file (which has the extension **.wsc**) to the new system and rescript it there. (UI Toolkit must also be installed on the destination system.)



# 2

## Script

### Window Script Files 2-3

Explains what a script file is and gives an overview of the window building commands and other components you will use to create one.

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| .TRIM – Trim extra blanks from end of window .....                      | 2-128 |
| .USER_DEFINE – Define a user data set.....                              | 2-129 |
| .VERSION – Define the UI Toolkit version.....                           | 2-130 |
| .WFIELD – Define a general window field.....                            | 2-131 |
| .WINDOW – Begin a general window definition.....                        | 2-133 |

### **Examples of Window Scripts 2-134**

Contains examples of window scripts, such as a menu column, an input window, and a selection window.

### **Script: The Script Compiler 2-135**

Describes the utility that compiles script files and builds the windows for your application from the script commands.

### **Accessing the Script Compiler from Your Application 2-138**

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| %SCR_CLOSELIBRARY – Close the currently open window library.....        | 2-139 |
| %SCR_ERRORCOUNT – Return script compilation error information .....     | 2-140 |
| %SCR_OPENLIBRARY – Open a window library.....                           | 2-141 |
| %SCR_PROCESS – Compile a script file into the open window library ..... | 2-143 |

### **Scridl: The Script-to-Repository Conversion Utility 2-144**

Describes **scridl**, a conversion utility that converts field information from an existing script file into a format readable by S/DE Repository.

# Window Script Files

## What is a script file?

A script file is a standard text file that contains special window building commands. The recommended extension for a script file is **.wsc**.

Storing all of the window building information in a script file enables you to maintain your windows external to your program. You can redefine border attributes, change shortcuts, redefine field characteristics, and more, without ever touching your code, which means you don't have to recompile or relink.

You can create your script file with any text editor, using the commands described in [“Script Commands” on page 2-8](#). You can also use Composer to create and modify script files interactively. See the [“Designing Your User Interface”](#) chapter of *Getting Started with Synergy/DE* for more information about Composer.

## Components of a script file

### Commands and arguments

The main components of script files are script commands.

#### Commands

Each script command is a single logical line in the script file. Script commands always begin with a period (.) in the first column. The command identifier is not case sensitive, and can be abbreviated to uniqueness. (For example, “.C” is valid for .COLUMN, but “.ENT” is required to distinguish .ENTRY from .END.) A script command can optionally have one or more arguments.

A script file begins with the .SCRIPT command.

#### Window building commands

Window building commands are script commands that define overall window characteristics, including name, size, screen position, border renditions, and title.

Window definitions within a script file begin with one of the following start commands (depending on what kind of window you are building): .WINDOW, .COLUMN, .INPUT, .SELECT, or .LISTCLASS. The .END command ends a window definition. You can have more than one window definition (window script) in a single script file.

## Arguments

When arguments are present, the first one must be separated from the command by at least one blank space or tab, and any additional arguments must be separated by commas. Separating commas can optionally be preceded or followed by one or more blanks and/or tabs. If you omit optional trailing arguments, you need not specify separating commas.

Like commands, arguments can be abbreviated to uniqueness.

## Continuation lines

The maximum length of a physical line is 255 characters. You can continue many script commands, such as `.BORDER`, `.ENTRY`, `.FIELD`, `.LIST`, `.REPOSITORY_STRUCTURE`, and `.STRUCTURE` on more than one physical line by placing a dash continuation mark (–) at the end of each line that will be continued. If the last logical character on the line is a dash, the command continues to the next line. (The dash can either precede or follow the comma.)

## Blank lines and comments

Script files can contain blank lines (which are ignored) and comment lines.

A comment line is any line whose first non-blank, non-tab character is a semicolon (;). Comment lines that begin with a semicolon can be placed outside or within a window definition.

See [“Special characters” on page 2-123](#) for more information about comment lines within the text of a window.

## Output logging

To send window script output and error messages to the standard output stream, add the `..LOG` command to your script. Note the following:

- ▶ You can add the `..LOG` command at any point in a script, but it must be on a line by itself.
- ▶ Output from all lines that follow the `..LOG` command are sent to the standard output stream.
- ▶ Like all other script commands, the `..LOG` command is case insensitive.

## Types of window definitions

There are five types of windows you can define in a script:

- ▶ General window
- ▶ Menu column
- ▶ Input window
- ▶ Selection window
- ▶ List class

## General window definitions

A general window definition defines a general purpose window and must begin with the `.WINDOW` command.

## Menu column definitions

Menu column definitions define primary menu and submenu column windows, and also column entries, quick-select characters, and shortcuts. A menu column definition must begin with the `.COLUMN` command.

### Menu entry definitions

A menu column definition defines menu entries with the `.ENTRY` command. Menu entries are created according to the order of their definitions in the script file. The first `.ENTRY` command defines the first entry, the second `.ENTRY` command defines the second entry, and so on. The total number of menu entries in the column is equal to the total number of entry specifications.

## Input window definitions

Input window definitions define windows that can contain text, input fields, and buttons. An input window script must begin with the `.INPUT` command.

### Input field definitions

An input window definition defines input fields with the `.FIELD` command. Input fields are created according to the order of their definitions in the script file. The first `.FIELD` command defines the first field, the second `.FIELD` command defines the second field, and so on. The total number of fields in the window is equal to the total number of field specifications.

## Selection window definitions

Selection window definitions define windows that contain one or more selection items. A selection window definition must begin with the `.SELECT` command.

### Selection item definitions

A selection window definition defines selection items with the `.ITEM` command. Selection items are created according to the order of their definitions in the script file. The first `.ITEM` command defines the first item, the second `.ITEM` command defines the second item, and so on. The total number of selection items in the window is equal to the total number of item specifications.

## List class definitions

List class definitions define a set of specific list characteristics with the `.LISTCLASS` command.

List characteristics that are likely to be consistent across multiple lists, such as the number of lines for headers and footers, can be defined in a list class.

## Which window definitions use which commands?

The following table indicates which window building commands you can use in which kind of window definition. The script commands `.LOG`, `.DATE_GENERATED`, `.SCRIPT`, and `.VERSION` are specified outside of a window definition and are therefore omitted from the table.

| Commands for Defining Windows |                |             |              |                  |            |
|-------------------------------|----------------|-------------|--------------|------------------|------------|
| Command                       | General window | Menu column | Input window | Selection window | List class |
| <code>.BLANK</code>           |                | ✓           |              | ✓                |            |
| <code>.BORDER</code>          | ✓              |             | ✓            | ✓                |            |
| <code>.BOX</code>             | ✓              |             | ✓            |                  |            |
| <code>.BUTTON</code>          |                |             | ✓            |                  |            |
| <code>.BUTTON_SET</code>      |                |             | ✓            |                  |            |
| <code>.COLUMN</code>          |                | ✓           |              |                  |            |
| <code>.DATA</code>            | ✓              |             |              |                  |            |
| <code>.DISPLAY_AREA</code>    | ✓              |             | ✓            |                  |            |
| <code>.END</code>             | ✓              | ✓           | ✓            | ✓                | ✓          |
| <code>.ENTRY</code>           |                | ✓           |              |                  |            |
| <code>.FIELD</code>           |                |             | ✓            |                  |            |
| <code>.FILL</code>            | ✓              |             | ✓            |                  |            |
| <code>.FONT</code>            | ✓              |             | ✓            | ✓                |            |
| <code>.INPUT</code>           |                |             | ✓            |                  |            |
| <code>.ITEM</code>            |                |             |              | ✓                |            |
| <code>.LINE</code>            | ✓              | ✓           | ✓            | ✓                |            |
| <code>.LIST</code>            |                | ✓           |              |                  |            |
| <code>.LISTCLASS</code>       |                |             |              |                  | ✓          |
| <code>.LOCAL</code>           |                |             | ✓            |                  |            |
| <code>.PAINT</code>           |                |             | ✓            |                  |            |



| Commands for Defining Windows (Continued) |                |             |              |                  |            |
|-------------------------------------------|----------------|-------------|--------------|------------------|------------|
| Command                                   | General window | Menu column | Input window | Selection window | List class |
| .PLACEMENT                                | ✓              |             | ✓            | ✓                | ✓          |
| .REPOSITORY_STRUCTURE                     |                |             | ✓            |                  |            |
| .SELECT                                   |                |             |              | ✓                |            |
| .SET                                      |                |             | ✓            |                  |            |
| .STRUCTURE                                |                |             | ✓            |                  |            |
| .TEXT                                     | ✓              | ✓           | ✓            | ✓                |            |
| .TITLE                                    | ✓              |             | ✓            | ✓                |            |
| .TRIM                                     | ✓              |             | ✓            |                  |            |
| .USER_DEFINE                              | ✓              |             |              |                  |            |
| .WFIELD                                   | ✓              |             |              |                  |            |
| .WINDOW                                   | ✓              |             |              |                  |            |
| Data control commands                     | ✓              |             | ✓            |                  |            |

## Script Commands

This section documents in detail the Script commands, which are used to create script files.

## .BLANK – Add a blank row

|    |    |   |   |
|----|----|---|---|
| WT | WN | U | V |
|----|----|---|---|

.BLANK

### Discussion

The .BLANK command adds a blank row to a menu or selection window column. This blank row is not a blank menu entry or selection item; it is just a row without text.

If you have a selection window defined by the .SELECT command that has more than one column but does not have corresponding text entries in the same row of each column, left and right movement within the window won't be consistent. We therefore recommend that you make sure each column in a multi-column selection window contains its text entries in the same row.

### WIN

---

Using .BLANK within a selection window script (.SELECT) has no meaning in a Windows environment. Also, note that while blank rows in a menu column are not *selectable*, they may still be highlighted.

---

## .BORDER – Define border renditions



`.BORDER [border_on_off][, rendition, ...][, DRAGBAR[ (dragbar_on_off) ]]`

### Arguments

*border\_on\_off*

(optional) Determines whether or not the window displays a border. Valid options are as follows:

|               |                                                                                         |
|---------------|-----------------------------------------------------------------------------------------|
| <b>ON</b>     | Window displays a border. (default)                                                     |
| <b>OFF</b>    | Window does not display a border.                                                       |
| <b>NOCELL</b> | Window displays a border only if it does not require a full character cell for display. |

*rendition*

(optional) One or more of the following display renditions:

|                                  |                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------|
| <b>BLINK   ITALIC</b>            | Blinking (on UNIX and OpenVMS) or italic (on Windows).                                             |
| <b>NOBLINK   NOITALIC</b>        | Not blinking (on UNIX and OpenVMS) or not italic (on Windows). (default)                           |
| <b>BOLD</b>                      | Highlighted (or boldfaced).                                                                        |
| <b>NOBOLD</b>                    | Not highlighted (or boldfaced). (default)                                                          |
| <b>COLOR</b> ( <i>palette#</i> ) | Assign specified <i>palette#</i> , where <i>palette#</i> is a palette number in the range 1 to 16. |
| <b>HIGHLIGHT</b>                 | Highlighted (or boldfaced).                                                                        |
| <b>NOHIGHLIGHT</b>               | Not highlighted (or boldfaced). (default)                                                          |
| <b>REVERSE</b>                   | Reverse video.                                                                                     |
| <b>NOREVERSE</b>                 | Normal video. (default)                                                                            |
| <b>UNDERLINE</b>                 | Underlined.                                                                                        |
| <b>NOUNDERLINE</b>               | Not underlined. (default)                                                                          |

---

**WIN****DRAGBAR**

(optional) The specification that the window will or will not have a drag bar.

*dragbar\_on\_off*

(optional) The specification that turns on or off a drag bar. Valid options are as follows:

**ON** Window has a drag bar if in a Windows environment. (default)

**OFF** Window doesn't have a drag bar if in a Windows environment.

---

## Discussion

The .BORDER command defines the renditions of the border around the window. *Renditions* can be listed in any order.

The default for *palette#* is 1.

---

**WIN**

In Windows environments, window borders do not take up an entire “cell” as on cell-based environments. Therefore, note the following:

- ▶ If you specify NOCELL, the window will have a border only if the application runs in a Windows environment.
- ▶ If you are depending on one window's border to fully occlude a certain area of another window when your application runs on UNIX or OpenVMS, you won't be able to depend on this same occlusion when your application runs in a Windows environment.

None of the *renditions* available for borders have any effect in a Windows environment.

On Windows, you can optionally specify DRAGBAR and the optional argument *dragbar\_on\_off*. DRAGBAR only affects the window when the border is turned on. If you don't pass DRAGBAR and if the window is more than one row in height, the default is ON. If the window is one row in height, the default is OFF. If you specify DRAGBAR without specifying ON or OFF, DRAGBAR defaults to ON.

---

---

**UNIX, VMS**

Specifying DRAGBAR has no effect in UNIX and OpenVMS environments.

---

## Examples

This example displays a border in reverse video with color palette number 3.

```
.border on, reverse, color(3)
```

### **WIN**

---

The next example displays a border around a window that the user will not be able to drag.

```
.border on, dragbar(off)
```

---

## .BOX – Draw a box



`.BOX name, height, width[, POSITION (row, column) ][, rendition, ...]`

### Arguments

*name*

The name of the box (a maximum of 30 characters).

*height*

The height of the box (number of rows).

*width*

The width of the box (number of columns).

### POSITION

(optional) The position specification for the box.

*row*

The row at which the upper-left corner of the box is positioned.

*column*

The column at which the upper-left corner of the box is positioned.

*rendition*

(optional) One or more of the following display renditions:

**BLINK | ITALIC**                      Blinking (on UNIX and OpenVMS) or italic (on Windows).

**NOBLINK | NOITALIC**                Not blinking (on UNIX and OpenVMS) or not italic (on Windows). (default)

**BOLD**                                 Highlighted (or boldfaced).

**NOBOLD**                               Not highlighted (or boldfaced). (default)

**COLOR**(*palette#*)                    Assign specified *palette#*, where *palette#* is a palette number in the range 1 to 16.

**HIGHLIGHT**                          Highlighted (or boldfaced).

**NOHIGHLIGHT**                        Not highlighted (or boldfaced). (default)

**REVERSE**                             Reverse video.

|                    |                           |
|--------------------|---------------------------|
| <b>NOREVERSE</b>   | Normal video. (default)   |
| <b>UNDERLINE</b>   | Underlined.               |
| <b>NOUNDERLINE</b> | Not underlined. (default) |

## Discussion

The .BOX command draws a box in a general or input window.

If POSITION is not specified, the position of the box defaults to the current screen position.

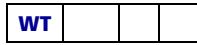
## Examples

This example draws a box with a height of 4 rows, width of 10 columns, at row 3 and column 3 of a window in reverse video.

```
.box box1, 4, 10, pos(3, 3), reverse
```



## .BUTTON – Include Windows-style button in a window



```
.BUTTON name [ , TEXT (button_text) | BITMAP (file) ] –  
                [ , METHOD (method_name[, elb_name]) ] –  
                [ , SELECT (select_char) ]
```

### Arguments

*name*

The name of the button (a maximum of 30 characters).

#### TEXT

(optional) Display text on the button face.

*button\_text*

The text to display on the button face.

#### BITMAP

(optional) Display a graphic on the button face.

*file*

The filename for the graphic to display on the button face.

#### METHOD

(optional) Specifies that the name of the associated method follows.

*method\_name*

The name of the method to invoke.

*elb\_name*

(optional) The name of the library from which *method\_name* will be drawn.

#### SELECT

(optional) Specifies that the quick-select character for the button follows.

*select\_char*

The quick-select character.

## Discussion

You can use the `.BUTTON` command to add Windows-style buttons to a window. The maximum number of buttons allowed in a window is 127.

When a window is being processed, its buttons are automatically enabled by default, and when a window is not being processed, its buttons are automatically disabled by default. However, note the following:

- ▶ Buttons that have been disabled (with `%B_DISABLE`) will not be automatically enabled, and buttons that have been enabled (with `%B_ENABLE`) will not be automatically disabled unless `%B_ENABLE` is used with the *input\_only* argument set to true to restore the default behavior for the button. See [%B\\_ENABLE on page 5-19](#) for more information.
- ▶ To enable buttons on general windows, you must either use `%B_ENABLE` or process the window with `T_VIEW` or `T_EDIT`.
- ▶ For composite windows, `C_PROCESS` enables buttons for the composite container window and all enabled child windows and lists, even those that are not active. Note, however, that this is not the case when `C_PROCESS` is called for a composite window that's part of another composite window. In this case, buttons will have already been enabled by the `C_PROCESS` call for the outer composite window. Additionally, when `C_PROCESS` returns, it disables buttons for the composite window and all child windows and lists—unless the `C_PROCESS` call is for a composite window that's part of another composite window. If it is, buttons will be disabled when `C_PROCESS` returns for the outer composite window.
- ▶ For composite windows, buttons that are explicitly enabled with `%B_ENABLE` (without the *input\_only* flag set true) remain enabled when composite window processing is finished.

The placement of the button is determined by the `.BUTTON_SET` command. If no `.BUTTON_SET` command is specified, the buttons are placed (in their defined order) at the bottom of the window, left-justified.

The order in which buttons are defined determines how they are added to the window tabbing order. `TAB` moves forward and `SHIFT+TAB` moves backward through the buttons as if they were fields in the input window.

Focus (display of the active item) is shown on the buttons as a thin dotted line around the text portion of the button. When focused, the button can be “pressed” using either the spacebar or the `ENTER` key. Whether focused or not, any button can be selected (“pressed”) by clicking on it with the left mouse button.

If neither `TEXT` nor `BITMAP` is specified, the button name will be displayed on the button face.

Use `BITMAP(file)` to specify a graphic to display on the button face. See [“Toolkit button graphics”](#) below for information on supported formats and creating transparent button graphics.

If *method\_name* is specified, it will be invoked when the button is clicked. The arguments passed to the method are the window ID, button name, and the 20 optional method data arguments passed to `I_INPUT`.

If *method\_name* is not specified, the button's name is the menu entry signaled when the button is pressed.

If *select\_char* is specified, pressing ALT+*select\_char* will have the effect of pressing the button. See the Discussion for B\_BUTTON on [page 5-5](#).

If *select\_char* is not passed or is blank, the button will not have a quick-select character.

The window will expand downward or to the right to accommodate the buttons. This expansion may cause your window to extend beyond the bottom or right side of your application window. Also, the button will be a standard size. Therefore, text that exceeds the size of the button will not be visible.

### Toolkit button graphics

UI Toolkit button graphics can have the following formats:

- ▶ BMP—Windows bitmap
- ▶ GIF—Graphics Interchange Format
- ▶ JPEG—Joint Photographic Experts Group (stored in JPEG File Interchange Format, JFIF)
- ▶ Exif—Exchangeable Image File
- ▶ PNG—Portable Network Graphics
- ▶ TIFF—Tag Image File Format

If an image is too large for the button face, the image will be cropped; Toolkit won't scale the image to fit the button. If Toolkit can't find the file, or if it isn't one of the supported file types, Toolkit will leave the button face blank.

Note that you can make button images “transparent.” That is, you can specify a color to be replaced by the button face color (which can vary from user to user). To do this, set the SYN\_TRANSPARENT\_COLOR environment variable and, if necessary, the SYN\_TRANSPARENCY\_THRESHOLD environment variable.

- ▶ SYN\_TRANSPARENT\_COLOR. Set this environment variable to the color you want replaced. Set it to an RGB triplet using hexadecimal values prefixed with 0x. For example, if your button images are yellow figures on a gray (RGB 192, 197, 202) background, setting SYN\_TRANSPARENT\_COLOR=0xC0,0xC5,0xCA (the equivalent of 192, 197, 202) will cause the background of the button images to take on the color of the button face. That gray will never appear in a button image unless it happens to be the button face color. For more information, see [SYN\\_TRANSPARENT\\_COLOR](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.
- ▶ SYN\_TRANSPARENCY\_THRESHOLD. Use this environment variable to specify how much a color can vary from the SYN\_TRANSPARENT\_COLOR setting and still be treated as transparent. Typically, you don't need to set this unless you're using JPEG graphics, which use a lossy compression algorithm that may alter colors in the image—or unless you don't know the exact background color. If you do set this, set it to a hexadecimal value with the prefix 0x.

Toolkit adds this value to and subtracts it from each of the RGB values specified for `SYN_TRANSPARENT_COLOR` to establish upper and lower limits for transparency. For example, if you specify the following, Toolkit will treat any color from RGB B0, B5, BA to RGB D0, D5, DA as transparent.

```
SYN_TRANSPARENT_COLOR=0xC0, 0xC5, 0xCA  
SYN_TRANSPARENCY_THRESHOLD=0x10
```

For more information, see [SYN\\_TRANSPARENCY\\_THRESHOLD](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.

When a button with a graphic is disabled (grayed out), the transparent portions of the graphic remain transparent. In other words, they retain the button face color.

Note that this script command has no effect on applications running on UNIX or OpenVMS. Script does, however, save button information on these platforms, so if the window is loaded on a Windows platform, the button will be displayed (assuming ISAM-compatible platforms).

## See also

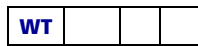
- ▶ [.BUTTON\\_SET](#) on page 2-19 for more information about specifying the placement of button sets.
- ▶ [IB\\_BUTTON](#) on page 8-91 for more information about specifying buttons for an input window built at runtime.
- ▶ [B\\_BUTTON](#) on page 5-5 for more information about specifying buttons in a window or tab set.
- ▶ [L\\_BUTTON](#) on page 9-55 for more information about specifying buttons on a list.
- ▶ [%B\\_DISABLE](#) on page 5-17 and [%B\\_ENABLE](#) on page 5-19 for more information about disabling and enabling buttons.

## Examples

This example displays an OK button that signals “I\_OK,” a Cancel button that signals “O\_ABANDON,” and a Help button that calls `HELP_METHOD` when pressed. The OK button has the quick-select character “K.” When ALT+K is pressed, a click of the OK button is simulated.

```
.button I_OK, text("OK"), select(K)  
.button O_ABANDON, text("Cancel")  
.button help, text("Help"), method("HELP_METHOD")
```

## .BUTTON\_SET – Define the placement of a set of buttons



```
.BUTTON_SET [BOTTOM (buttons_per_row) | RIGHT (buttons_per_column) ] –  
            [, justification][, DEFAULT (button_name)]
```

### Arguments

#### BOTTOM

(optional) Places the buttons at the bottom of the window with the maximum number of buttons per row specified.

*buttons\_per\_row*

The maximum number of buttons to display per row. (default)

#### RIGHT

(optional) Places the buttons at the right of the window with the maximum number of buttons per column specified.

*buttons\_per\_column*

The maximum number of buttons to display per column.

*justification*

(optional) Specifies how the button set is aligned in a row at the bottom of the window or a column.

**BEGINNING**      Justify to the beginning of the row or column. (default)

**CENTER**          Justify to the center of the row or column.

**END**              Justify to the end of the row or column.

#### DEFAULT

(optional) Specifies the default button.

*button\_name*

The name of the default button.

### Discussion

You can use the .BUTTON\_SET command to define the placement of a set of buttons in a window. It can be specified before or after the .BUTTON commands.

The default button set placement is BOTTOM.

If *buttons\_per\_row* or *buttons\_per\_column* is not specified, the maximum number of buttons that will fit on a row or column of the window will be displayed before a new row or column is created.

If the `E_STATE` option `D_RETURNBTN` is set, the default button will be selected if you press `RETURN`, no matter what field you're on in the window. If *button\_name* is not specified and `D_RETURNBTN` is set, the first button in the window is the default.

If a tab set container and its contained window both have buttons, the following rules are used to determine which button is the default:

- ▶ If only one, either the contained window or the tab set container, defines a default button, the specified button is the default button.
- ▶ If neither the contained window nor the tab set container defines a default button, the first button on the contained window is the default button.
- ▶ If both the contained object and the tab set container define a default button, the default button of the contained window is the default button.

The window will expand downward or to the right to accommodate the buttons. This expansion may cause your window to extend beyond the bottom or right side of your application window.

Note that this script command has no effect on applications running on UNIX or OpenVMS. Script does, however, save button information on these platforms, so if the window is loaded on a Windows platform, the button will be displayed (assuming ISAM-compatible platforms).

## See also

- ▶ [.BUTTON on page 2-15](#) for more information about including buttons in a window.
- ▶ [IB\\_BUTTONSET on page 8-93](#) for more information about specifying button placement for an input window built at runtime.
- ▶ [B\\_BUTTONSET on page 5-15](#) for more information about specifying button placement for a window or tab set.
- ▶ [L\\_BUTTONSET on page 9-62](#) for more information about specifying button placement for a list.
- ▶ [DTS\\_BUTTONSET on page 13-19](#) for more information about specifying button placement on a tab set. (`DTS_BUTTONSET` is a subfunction of `%TS_TABSET`.)
- ▶ [E\\_STATE on page 7-45](#) for more information about the `ENTER` key selecting the default button.

## Examples

This example shows OK, Cancel, and Help buttons centered on the right side of an input window.

```
.button I_OK, text("OK")  
.button O_ABANDON, text("Cancel")  
.button O_HELP, text("Help")  
.button_set right, center
```

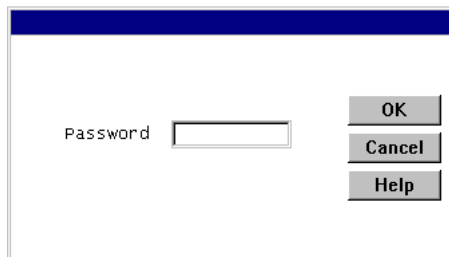


*Figure 2-1. Buttons on an input window.*

## .COLUMN – Begin a menu column definition



```
.COLUMN name, text[, justification][, DISABLE][, SELECT (character) ]
```

### Arguments

*name*

The name of the column (a maximum of 15 characters).

*text*

A quoted or alphanumeric string that contains the text of the column's heading.

*justification*

(optional) Designates how the column is aligned beneath the heading.

**LEFT**                      Align the left sides. (default)

**RIGHT**                    Align the right sides.

**CENTERED**                Center the column and heading.

**DISABLE**

(optional) Specifies that when the column is placed on the menu bar, it will be disabled.

**SELECT**

(optional) Specifies that a quick-select character follows.

*character*

A single, printable quick-select character.

### Discussion

The .COLUMN command marks the beginning of a new menu column definition. This column can be used either as a primary or a submenu column.

*Name* is case insensitive, and must be a unique window name within the window library.

*Text* is the text that will be displayed on the menu bar. Upper and lowercase will appear as entered. *Text* is required for submenu column definitions, but is currently ignored.

*Justification* defaults to LEFT if you do not specify LEFT, RIGHT, or CENTERED. If you specify RIGHT justification, the right sides of the column and heading will be aligned. If you specify CENTERED justification, the column will be centered beneath the heading. (See [figure 2-2.](#)) When the column is being used as a submenu, the *justification* setting will be ignored. On Windows, *justification* has no effect.

Menu column placement is limited by available screen space.



If you specify `DISABLE`, you can later re-enable the column with the `M_ENABLE` subroutine.

If you do not specify `SELECT(character)`, UI Toolkit uses the first non-blank character of text. A column's quick-select character will not work if any menu column is dropped down, which sometimes happens automatically. You can use the `M_DEFCOL(0)` subroutine to disable automatic drop-down.

The width of the column's heading is two spaces larger than the length of text, with the text beginning at the second column. If you want the heading text to have more than one leading or trailing space, you can include spaces in the quoted text string.

To create a submenu column, define the column and the parent column (the menu from which the submenu will cascade) as you would any other, but in the parent menu column's definition, use the `SUB` argument for the menu entry that will cause the submenu to be displayed. And, for the same menu entry, use the submenu column's name (the *name* argument for `.COLUMN`) as the entry name (the *name* argument for `.ENTRY`). See Examples below.

## See also

[.ENTRY on page 2-29](#) for more information about defining column entries.

## Examples

This example generates a new menu column named **util** whose text in the menu bar is "General utilities," with an extra leading space. The column is left-aligned beneath the heading by default.

```
.column util, "General utilities"
```

The column generated by the second example is named **receive**; the text entry in the menu bar is "Receivables." The column is centered beneath the heading.

```
.column receive, Receivables, centered
```

This example creates a menu column **primary** that references a submenu column **submenu**.

```
.column primary, "Primary"
.entry submenu, "Submenu", sub
.end

.column submenu, "Submenu"
.entry subent1, "Sub entry 1"
.entry subent2, "Sub entry 2"
.end
```

## .DATA – Load data into a user data set field



`.DATA field_number, data`

### Arguments

*field\_number*

Either the decimal value of the user data set field or one of the following options:

**FIRST**

**LAST**

**NEXT**

**PREVIOUS**

**CURRENT**

*data*

The data to be loaded into the user data set field.

### Discussion

A user data set is a one-dimensional alpha array that is associated with a window (rather than your program) and is maintained within the window data area by the window system. Its parameters and contents are completely defined by the user.

The `.DATA` command loads data into a user data set field.

Use the Synergy DBL `W_FLDS` subroutine to process user data sets. See [W\\_FLDS](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* for more information.

If *data* is longer than one word, it must be enclosed in quotation marks.

### Examples

This window has a copy of its text in another language. At runtime, the program can use either the English or the Spanish version.

```
.window nofile, 3, 30
.text nofile, pos(2,1)
Cannot find file.
.user_define 1, 30
.data 1, "No puedo encontrar el archivo."
.end
```

## .DATE\_GENERATED – Define the date the script file was generated



```
.DATE_GENERATED "date"
```

### Arguments

*date*

The date that the **scrcnvrt** conversion utility or Composer generated the script.

### Discussion

This command is generated by UI Toolkit and appears immediately following the **.VERSION** command. This command is ignored by Toolkit when reading scripts; therefore, it is not required.

### Examples

This script was generated by Composer on November 25, 2005.

```
.date_generated "25-NOV-2005"
```

## .DISPLAY\_AREA – Define the display area



`.DISPLAY_AREA row, column, height, width`

### Arguments

*row*

The row position of the upper-left corner of the display area (relative to the upper-left corner of the window, not the display screen).

*column*

The column position of the upper-left corner of the display area (relative to the upper-left corner of the window, not the display screen).

*height*

The number of rows deep the display area will be.

*width*

The number of columns wide the display area will be.

### Discussion

The `.DISPLAY_AREA` command defines the dimensions and placement of the display area for a general window (`.WINDOW`) or input window (`.INPUT`). The display area defines the view into a window and defaults to the entire window.

The view is movable if the display area is smaller than the size of the window. If the window is an input window, the input processing system adjusts the location if necessary to include the entire input field being processed.

Row 1, column 1 is the upper-left corner.

### See also

- ▶ [“Input fields” on page 8-3.](#)
- ▶ [.PLACEMENT on page 2-105](#) for considerations of display area size.
- ▶ [“Notes and Tips for ActiveX Toolkit Lists” on page 9-15](#) for information on setting the display area for an input window that is associated with an ActiveX Toolkit list.

## Examples

The following `.DISPLAY_AREA` command defines a movable view for the **realbig** window, which is larger than the screen. The upper-left corner of the display area is at window row 3, column 1, and the area is 16 rows deep by 78 columns wide.

```
.input realbig, 48, 78  
.display_area 3, 1, 16, 78
```

## .END – End a window definition



.END

### Discussion

The .END command terminates the current window definition.

All commands and text between the .WINDOW, .COLUMN, .INPUT, .SELECT, or .LISTCLASS command and the .END command define the window definition. This command must be present, following all other script commands for a window or column. When .END is processed by the Script compiler, the window or column is constructed and stored in a window library.

## .ENTRY – Define a column entry



```
.ENTRY name, text[, justification][, DISABLE][, KEY (shortcut) | SUB][, NORESET] –  
[, SELECT (character) ][, USER (string) ]
```

### Arguments

*name*

The entry name (a maximum of 10 characters).

*text*

An alphanumeric or quoted string that contains the text of the column entry.

*justification*

(optional) Designates how the entry text is aligned within the column.

**LEFT**                      Align the left sides. (default)

**RIGHT**                     Align the right sides.

**CENTERED**                Center the entry text.

**DISABLE**

(optional) Specifies that when the column is placed on the menu bar, the entry will be disabled.

**KEY**

(optional) Specifies that a shortcut key follows.

*shortcut*

The shortcut key or key sequence.

**SUB**

(optional) Specifies that a submenu column is associated with the entry.

**NORESET**

(optional) Keeps the menu from being reset when the entry is selected. (The column and menu stay dropped down.)

**SELECT**

(optional) Specifies that a quick-select character follows.

*character*

A single, printable quick-select character.

## USER

(optional) Specifies that a user text string follows.

*string*

A user-defined text string to be associated with the entry (a maximum of 80 characters).

## Discussion

The `.ENTRY` command generates a new entry within a primary menu or submenu column. You can define up to 20 menu entries per menu column.

*Name* is case insensitive. Don't use names that begin with "U\_" unless you want such entries to access the `EUTILS_METHOD` subroutine. (See [chapter 7, "Environment Routines,"](#) for more information.) Also avoid entries that begin with "E\_", "S\_", "T\_", or "I\_" (other than the reserved entries); some subroutines will generate errors if they encounter unrecognized entries of these types. The name `O_HELP` is also reserved for the `EHELP_METHOD` subroutine. See ["Appendix B: Reserved Menu Entries"](#) for a list of reserved menu entries.

The first character of *text* is loaded at the second character position within the entry's display if the entry is left-justified. You can define additional leading or trailing spaces by explicitly including them in the quoted string. If required, the overall width of the column is increased so that at least one trailing blank follows *text*.

*Justification* defaults to `LEFT` if you do not specify `RIGHT` or `CENTERED`. If you specify `RIGHT` justification, the right side of the column and this entry's text will be aligned. If you specify `CENTERED` justification, this entry will be centered within the column. (See [figure 2-2.](#))

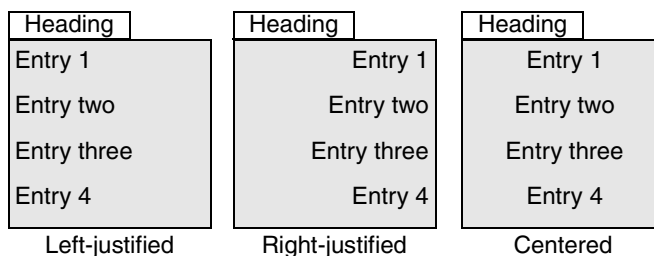


Figure 2-2. Entry justification.

---

## WIN

In Windows environments, you should always use `LEFT` justification for menu entry text. `RIGHT` and `CENTERED` will not operate as expected because Windows uses a proportional font rather than a fixed font for menu column text.

---



If you specify **DISABLE**, you can re-enable the entry with the **M\_ENABLE** subroutine later.

**NORESET** will keep the menu column displayed after a selection has been made. This is useful if you want to do additional processing while the menu is still dropped down. Note, however, that if **NORESET** is specified, it is the responsibility of the application program to reset the menu with the **M\_RESET** subroutine. If you do not specify **NORESET**, the menu will be reset to the disabled menu bar after the user makes a selection. Placement or removal of any menu columns will also automatically reset the menu bar.

---

## WIN

**NORESET** has no effect in a Windows environment.

---

**KEY**(*shortcut*) defines the entry's shortcut. If *shortcut* is defined in the key mapping script file (**keymap.ctl** by default), it must have the form used there. For example, if the key mapping script file has an entry **f42=alt\_s("Alt-S")**, you can pass only **KEY(alt\_s)** for function 42. If it isn't defined in the key mapping script file, you can use the following forms for *shortcut*:

|              |                                                                                                                                                                                                                                                                                                                                               |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fnn</b>   | where <i>nn</i> is a numeric value from 1 through 63. This form assigns the specified function key as the shortcut for the entry.                                                                                                                                                                                                             |
| <b>^x</b>    | where <i>x</i> is an alphabetic value. This form specifies that a control character is the shortcut for the entry (^A for CTRL+A, ^T for CTRL+T, and so forth). ^M is not valid as a shortcut because it is a carriage return. (There are other keys you should avoid using. See <a href="#">“Customizing reserved keys” on page 18-25.</a> ) |
| <b>LEFT</b>  | specifies the LEFT arrow key as the shortcut for the entry.                                                                                                                                                                                                                                                                                   |
| <b>RIGHT</b> | specifies the RIGHT arrow key as the shortcut for the entry.                                                                                                                                                                                                                                                                                  |
| <b>UP</b>    | specifies the UP arrow key as the shortcut for the entry.                                                                                                                                                                                                                                                                                     |
| <b>DOWN</b>  | specifies the DOWN arrow key as the shortcut for the entry.                                                                                                                                                                                                                                                                                   |

Note the following:

- ▶ None of the qualifiers are case sensitive (^e is the same as ^E, f3 is the same as F3, and “left” is the same as “LEFT”). If **KEY**(*shortcut*) is not present, no shortcut is assigned.
- ▶ If you use **KEY**(*shortcut*) for an entry in a menu column, the width of the column is a combination of the width of the longest text for a menu shortcut and the width of the longest menu entry in the column.
- ▶ The arrow qualifiers (**LEFT**, **RIGHT**, **UP**, and **DOWN**) can be abbreviated to a single character: L, R, U, or D.

- ▶ You can use the *Fnn* form only if the **keymap.ctl** file doesn't have a corresponding entry. (On Windows, every function from F11 to F63 is already defined in **keymap.ctl** as distributed.)
- ▶ You can add, change, and delete definitions in **keymap.ctl** to make **KEY(*shortcut*)** definitions more easily understood. For example, if you want to use the CTRL+P key combination as a shortcut on Windows for a menu entry, you'll need to pass **KEY(alt\_p)** if you're using the distributed version of **keymap.ctl**. (This is because for historical reasons the **keymap.ctl** file includes the definition **^p=alt\_p**.) If you want to instead pass **KEY(^p)**, which will make your code more readable, you'll need to delete the **^p=alt\_p** definition from **keymap.ctl**. And if you want to pass an identifier for *shortcut* that isn't one of the forms listed above for *shortcut*, you'll need to create a definition in **keymap.ctl** for this identifier. For example, if you want to pass **KEY(print)** to specify the CTRL+P key combination, you'll need to create the following definition in **keymap.ctl**: **^p=print**. See [“Modifying shortcut identifiers for menu entries defined in a script” on page 18-21](#) for information.

By passing **SUB**, you can cause the menu entry to display a submenu column. (Note that you must also pass the submenu column's name as the entry's name. See the Discussion for **.COLUMN** on [page 2-22](#) for more information.) If you specify **SUB**, the **KEY(*shortcut*)** argument is ignored.

If you do not specify **SELECT(*character*)**, the quick-select character defaults to the first non-blank character of text.

---

## WIN

In Windows environments, quick-select characters are always designated by an underscore (“\_”).

---

Quick-select characters, shortcuts, and disabling/enabling are discussed further in the “Introduction to Menus” section of the “Menu Subroutines” chapter.

**USER(*string*)** enables you to specify a user-defined text string. If you pass it, you can

- ▶ use the **M\_USER** subroutine to retrieve the user string specified by any **.ENTRY** on a primary menu column.
- ▶ test the **g\_entuser** field to find out the last **.ENTRY** the user selected on a primary menu column.

UI Toolkit includes several reserved menu entries that perform scrolling and editing functions (see [“Appendix B: Reserved Menu Entries”](#)). You must specify these entries in your script file (with **.ENTRY**) to include them on a menu column.

## See also

[M\\_USER on page 10-62](#) for more information on retrieving the **USER(*string*)** for a primary menu entry.

## Examples

The first example generates a new entry named **o\_help**. The text that appears in the menu column for this entry is HELP, F1 is the shortcut, and “H” is the quick-select character by default.

```
.entry o_help, Help, key(F1)
```

The new entry generated by the second example is named **gl**. The text “General Ledger” is centered beneath the heading, and when the column is placed on the menu bar, the entry will be disabled. The quick-select character for this entry is the letter “G” by default.

```
.entry gl, "General Ledger", centered, disable
```

The third example generates an entry named **ap**, whose entry text is “Accounts Payable.” The quick-select character is the letter “P”. The column stays on the screen when the **ap** entry is selected and a submenu named **ap** is displayed. (For example, the submenu might contain the choices “Maintenance,” “Processing,” and “Reports”.)

```
.entry ap, "Accounts Payable", select(p), sub
```

## .FIELD – Define an input window field



```
.FIELD field_spec, [type] –
    [, ALLOW (valid[, ...]) ][, NOALLOW][, ARRIVE_METHOD (arrive_method) ] –
    [, NOARRIVE_METHOD][, AUTOMATIC][, NOAUTOMATIC] –
    [, BLANK_IFZERO | BZRO | BLANK_IF_ZERO] –
    [, NOBLANK_IFZERO | NOBZRO | NOBLANK_IF_ZERO][, BLINK][, NOBLINK] –
    [, BOLD][, NOBOLD][, BREAK (option) ][, NOBREAK] –
    [, CHANGE_METHOD (change_method) ][, NOCHANGE_METHOD][, CHECKBOX] –
    [, NOCHECKBOX][, COLOR (palette#) ][, NOCOLOR][, COPY] –
    [, DATE ([TODAY][, PERIOD][, SHORT]) ][, NODATE][, DECREMENT] –
    [, DEFAULT (default) ][, NODEFAULT][, DISABLED][, NODISABLED | ENABLED] –
    [, DSP_LENGTH (display_length) ][, NODSP_LENGTH] –
    [, DISPLAY_METHOD (display_method) ][, NODISPLAY_METHOD] –
    [, DRILL_METHOD (drill_method) ][, NODRILL_METHOD] –
    [, EDITFMT_METHOD (editfmt_method) ][, NOEDITFMT_METHOD] –
    [, ENUMERATED(display_length[, base][, step)]][, NOENUMERATED] –
    [, FIELD_POSITION ([change, row, column] | FPOS ([change, row, column]) ] –
    [, NOFIELD_POSITION | NOFPOS][, FONT (palette_name) ][, NOFONT] –
    [, FORMAT (fmt_string) | FMT (fmt_string) ][, NOFORMAT | NOFMT] –
    [, HELP (help_id) ][, NOHELP][, HIGHLIGHT][, NOHIGHLIGHT] –
    [, HYPERLINK_METHOD (hyperlink_method) ][, NOHYPERLINK_METHOD] –
    [, INCREMENT][, INFORMATION (info_string) ][, NOINFORMATION] –
    [, INPUT_LENGTH (input_length) ][, NOINPUT_LENGTH][, ITALIC][, NOITALIC] –
    [, JUSTIFY (alignment) ][, NOJUSTIFY][, LEAVE_METHOD (leave_method) ] –
    [, NOLEAVE_METHOD][, MATCH (option[, option]) ][, NEGATIVE (option) ] –
    [, NONEGATIVE][, NODECIMAL | NODECIMAL_REQUIRED] –
    [, DECIMAL_REQUIRED][, NOECHO ([display_character]) ][, ECHO][, NOTERM] –
    [, TERM][, PAINT (character) ][, NOPAINT][, POSITION ([CHANGE, row, column]) ] –
    [, NOPOSITION][, PROMPT (prompt) ][, NOPROMPT][, NOPROMPTFONT] –
    [, RADIO][, NORADIO][, RANGE (minimum, maximum) ][, NORANGE][, READONLY] –
    [, NOREADONLY][, REQUIRED][, NOREQUIRED][, RETAIN_POSITION] –
    [, NORETAIN_POSITION][, REVERSE][, NOREVERSE] –
    [, SELECT (srow, scolumn, [height], entry[, ...]) ][, NOSELECT] –
    [, SELWND (srow, scolumn, window) ][, NOSELWND][, TIME ([AMPM][, NOW]) ] –
    [, NOTIME][, TIMESTAMP ([AMPM][, SHORT]) ][, NOTIMESTAMP] –
    [, UNDERLINE][, NOUNDERLINE][, UPPER_CASE_ONLY | UC] –
    [, NOUPPER_CASE_ONLY | NOUC | LOWER_CASE_ALLOWED] –
    [, USER ([user_text][, user_type]) ][, NOUSER][, VIEW_LENGTH (view_length) ] –
    [, NOVIEWS_LENGTH][, WAIT (wait_time) ]
```

## Arguments

### *field\_spec*

The field specification for the input window field. See “Field specifications” on page 2-47 for information.

### *type*

The data type and size, specified *only* for local fields, which must have one of the following formats:

|                                       |                                                                 |
|---------------------------------------|-----------------------------------------------------------------|
| <b>A</b> <i>size</i>                  | Alpha type of <i>size</i> .                                     |
| <i>dimension</i> <b>A</b> <i>size</i> | Alpha array of <i>dimension</i> elements of <i>size</i> .       |
| <b>D</b> <i>size</i>                  | Decimal type of <i>size</i> .                                   |
| <b>D</b> <i>size.decimal</i>          | Implied-decimal type of <i>size</i> with <i>decimal</i> places. |
| <b>I</b> <i>size</i>                  | Integer type of <i>size</i> .                                   |

Where *size* is the size of the input field, *dimension* is the number of dimensions for the array (only single-dimension alpha arrays are supported), and *decimal* is the number of digits after the decimal point. (See the Discussion on page 2-44 for information on maximums.)

### **ALLOW**(*valid[, ...]*)

(optional) Specifies which entries are valid for the field (see page 2-48 for more information).

### **NOALLOW**

(optional) Cancels any allow list for the field (see page 2-48 for more information). (default)

### **ARRIVE\_METHOD**(*arrive\_method*)

(optional) Specifies a pre-input subroutine (see page 2-49 for more information).

### **NOARRIVE\_METHOD**

(optional) Cancels any arrive method for the field (see page 2-49 for more information). (default)

### **AUTOMATIC**

(optional) Specifies that when an empty field is processed, a return with no input is automatically assumed (see page 2-49 for more information).

### **NOAUTOMATIC**

(optional) Cancels automatic entry of data in the field (see page 2-49 for more information). (default)

### **BLANK\_IFZERO or BZRO or BLANK\_IF\_ZERO**

(optional) Indicates that a numeric (**d** or **i**) field will be left blank if the user enters a value of 0 (see page 2-50 for more information).

**NOBLANK\_IFZERO or NOBZRO or NOBLANK\_IF\_ZERO**

(optional) Indicates that a 0 will be displayed if the user enters a value of 0 (see [page 2-50](#) for more information). (default)

**BLINK**

(optional) Specifies italicized text on Windows and blinking text on UNIX and OpenVMS (see [page 2-50](#) for more information).

**NOBLINK**

(optional) Cancels italicized or blinking text (see [page 2-50](#) for more information). (default)

**BOLD**

(optional) Specifies bold text on Windows and highlighted text on UNIX and OpenVMS (see [page 2-50](#) for more information).

**NOBOLD**

(optional) Cancels bold or italicized text (see [page 2-50](#) for more information). (default)

**BREAK(*option*)**

(optional) Triggers a break in input set processing on a field (see [page 2-51](#) for more information).

**NOBREAK**

(optional) Cancels break processing on the field (see [page 2-51](#) for more information). (default)

**CHANGE\_METHOD(*change\_method*)**

(optional) Defines a change method for the field (see [page 2-52](#) for more information).

**NOCHANGE\_METHOD**

(optional) Cancels any change method for the field (see [page 2-52](#) for more information). (default)

**CHECKBOX**

(optional) Indicates that this field is to be displayed as a check box on Windows (see [page 2-52](#) for more information).

**NOCHECKBOX**

(optional) Indicates that the field will not be displayed as a check box (see [page 2-52](#) for more information). (default)

**COPY**

(optional) Copies the value from the data area that corresponds to this field (as defined by the structure) if the field is empty (see [page 2-53](#) for more information).

**COLOR(*palette#*)**

(optional) Specifies the color palette entry to use for foreground and background colors for the text (see [page 2-53](#) for more information). (default)

**NOCOLOR**

(optional) Cancels any overridden foreground and background colors for the text (see [page 2-53](#) for more information). (default)

**DATE(*/TODAY//*, *PERIOD//*, *SHORT*)**

(optional) Enables you to process dates (see [page 2-54](#) for more information).

**NODATE**

(optional) Resets a date field to a normal decimal field (see [page 2-54](#) for more information). (default)

**DECREMENT**

(optional) Designates that if the user does not enter a value the first time a numeric (**d** or **i**) field is processed, the last value in the field minus one will be used (see [page 2-56](#) for more information).

**DEFAULT(*default*)**

(optional) Defines a default value for the field (see [page 2-56](#) for more information).

**NODEFAULT**

(optional) Cancels any default value specified for the field (see [page 2-56](#) for more information). (default)

**DISABLED**

(optional) Disables the field (see [page 2-57](#) for more information).

**NODISABLED or ENABLED**

(optional) Enables the field (see [page 2-57](#) for more information). (default)

**DSP\_LENGTH(*display\_length*)**

(optional) Specifies the maximum number of characters that can be displayed in a field (see [page 2-57](#) for more information).

**NODSP\_LENGTH**

(optional) Cancels display length settings for the field, which causes the default display length to be used (see [page 2-57](#) for more information). (default)

**DISPLAY\_METHOD(*display\_method*)**

(optional) Defines a display method for the field (see [page 2-58](#) for more information).

### **NODISPLAY\_METHOD**

(optional) Cancels any display method for the field (see [page 2-58](#) for more information).  
(default)

### **DRILL\_METHOD(*drill\_method*)**

(optional) Defines a drill method for the field (see [page 2-58](#) for more information).

### **NODRILL\_METHOD**

(optional) Cancels any drill method for the field (see [page 2-58](#) for more information).  
(default)

### **EDITFMT\_METHOD(*editfmt\_method*)**

(optional) Defines an edit format method for the field (see [page 2-59](#) for more information).

### **NOEDITFMT\_METHOD**

(optional) Cancels any edit format method for the field (see [page 2-59](#) for more information).  
(default)

### **ENUMERATED(*display\_length*[, *base*][, *step*])**

(optional) Specifies an enumerated data field, which returns a decimal value for the corresponding displayed text entry (see [page 2-60](#) for more information).

### **NOENUMERATED**

(optional) Resets the field to a non-enumerated field (see [page 2-60](#) for more information).  
(default)

### **FIELD\_POSITION([CHANGE, *row*, *column*]) or FPOS([CHANGE, *row*, *column*])**

(optional) Specifies the position of a field, independent of its prompt (see [page 2-61](#) for more information).

### **NOFIELD\_POSITION or NOFPOS**

(optional) Resets the position of the field to the default next character after the prompt (see [page 2-61](#) for more information). (default)

### **FONT(*palette\_name*)**

(optional) Specifies a font for the field (see [page 2-62](#) for more information).

### **NOFONT**

(optional) Cancels any font for the field and resets the field to use the default font (see [page 2-72](#) for more information). (default)

### **FORMAT(*fmt\_string*) or FMT(*fmt\_string*)**

(optional) Designates a redisplay format for the field (see [page 2-63](#) for more information).



**NOFORMAT or NOFMT**

(optional) Cancels any redisplay format for the field (see [page 2-63](#) for more information).  
(default)

**HELP(*help\_id*)**

(optional) Specifies a help identifier (see [page 2-64](#) for more information).

**NOHELP**

(optional) Cancels any help identifier for the field (see [page 2-64](#) for more information).  
(default)

**HIGHLIGHT**

(optional) Specifies highlighted (or bold) text (see [page 2-64](#) for more information).

**NOHIGHLIGHT**

(optional) Cancels highlighted (or bold) text (see [page 2-64](#) for more information). (default)

**HYPERLINK\_METHOD(*hyperlink\_method*)**

(optional) Specifies a hyperlink method for the field (see [page 2-64](#) for more information).

**NOHYPERLINK\_METHOD**

(optional) Cancels any hyperlink method for the field (see [page 2-65](#) for more information).  
(default)

**INCREMENT**

(optional) Designates that if the user does not enter a value the first time a numeric (**d** or **i**) field is processed, the last value in the field plus one will be used (see [page 2-65](#) for more information).

**INFORMATION(*info\_string*)**

(optional) Specifies a text string that is displayed on the information line when input is being processed for that field (see [page 2-65](#) for more information).

**NOINFORMATION**

(optional) Cancels any information line string (see [page 2-65](#) for more information). (default)

**INPUT\_LENGTH(*input\_length*)**

(optional) Specifies the maximum number of characters the user can enter into an input field (see [page 2-66](#) for more information).

**NOINPUT\_LENGTH**

(optional) Cancels input length settings for the field, which causes the default input length to be used (see [page 2-66](#) for more information). (default)

### **ITALIC**

(optional) Specifies italicized text on Windows or blinking text on UNIX and OpenVMS (see [page 2-67](#) for more information).

### **NOITALIC**

(optional) Cancels italicized or blinking text (see [page 2-67](#) for more information). (default)

### **JUSTIFY**(*alignment*)

(optional) Determines whether the text in the field will be displayed left-justified, right-justified, or centered (see [page 2-67](#) for more information).

### **NOJUSTIFY**

(optional) Resets the field justification to the default for its type (see [page 2-67](#) for more information). (default)

### **LEAVE\_METHOD**(*leave\_method*)

(optional) Specifies a post-input subroutine for the field (see [page 2-68](#) for more information).

### **NOLEAVE\_METHOD**

(optional) Cancels any leave method for the field (see [page 2-68](#) for more information). (default)

### **MATCH**(*option*[, *option*])

(optional) Specifies whether the alpha field input must match the case of a specified allowable entry and/or match all characters in the entry (see [page 2-68](#) for more information).

### **NEGATIVE**(*option*)

(optional) Allows negative values on numeric type (**d** or **i**) fields (see [page 2-69](#) for more information).

### **NONEGATIVE**

(optional) Indicates that negative values cannot be entered as input in the field (see [page 2-69](#) for more information). (default)

### **DECIMAL\_REQUIRED**

(optional) Aligns the numeric value based on an entered decimal point only (see [page 2-69](#) for more information). (default)

### **NODECIMAL or NODECIMAL\_REQUIRED**

(optional) Indicates that the user does not need to type a decimal point when placing input in a **d** type field (see [page 2-69](#) for more information).

### **ECHO**

(optional) Leaves echo on for field input (see [page 2-70](#) for more information). (default)

**NOECHO(*[display\_character]*)**

(optional) Prevents the text entered by the user from being displayed in the field (see [page 2-70](#) for more information).

**TERM**

(optional) Indicates that the user must press ENTER to terminate field input (see [page 2-70](#) for more information). (default)

**NOTERM**

(optional) Terminates the field automatically when the field is full so the user doesn't have to press ENTER (see [page 2-70](#) for more information).

**PAINT(*character*)**

(optional) Specifies a character that “paints” the empty field to indicate where the user types input (see [page 2-71](#) for more information).

**NOPAINT**

(optional) Cancels any paint character for the field and resets the field to use the default paint character (see [page 2-71](#) for more information). (default)

**POSITION(*[CHANGE, ]row, column*)**

(optional) Specifies either a specific position or the number of rows and columns that the current position will change (see [page 2-71](#) for more information).

**NOPOSITION**

(optional) Resets the position of the prompt to the default next character available (see [page 2-71](#) for more information). (default)

**PROMPT(*prompt*)**

(optional) Provides a fixed (static) or variable (dynamic) prompt to the user for input (see [page 2-72](#) for more information).

**NOPROMPT**

(optional) Cancels any prompt for the field (see [page 2-72](#) for more information). (default)

**PROMPTFONT(*palette\_name*)**

(optional) Specifies a font for the prompt (see [page 2-72](#) for more information).

**NOPROMPTFONT**

(optional) Cancels any font for the prompt and resets the prompt to use the default font (see [page 2-72](#) for more information). (default)

**RADIO**

(optional) Indicates that this field is to be displayed as a set of radio buttons on Windows (see [page 2-73](#) for more information).

**NORADIO**

(optional) Indicates that the field will not be displayed as a set of radio buttons (see [page 2-73](#) for more information). (default)

**RANGE(*minimum, maximum*)**

(optional) Defines the minimum and maximum values for a numeric (**d** or **i**) field (see [page 2-74](#) for more information).

**NORANGE**

(optional) Cancels range checking for the field (see [page 2-74](#) for more information). (default)

**READONLY**

(optional) Renders the field read-only (see [page 2-75](#) for more information).

**NOREADONLY**

(optional) Cancels the field from being read-only (see [page 2-75](#) for more information). (default)

**REQUIRED**

(optional) Specifies that a non-blank alpha or non-zero numeric entry is required in the field (see [page 2-75](#) for more information).

**NOREQUIRED**

(optional) Makes input to the field optional (see [page 2-75](#) for more information). (default)

**RETAIN\_POSITION**

(optional) Allowed only for text fields. Enables the user to leave and then return to the text field, retaining the current position until the field is re-initialized or redisplayed (see [page 2-75](#) for more information).

**NORETAIN\_POSITION**

(optional) Cancels position retention in the text field (see [page 2-75](#) for more information). (default)

**REVERSE**

(optional) Specifies reversed text (see [page 2-76](#) for more information).

**NOREVERSE**

(optional) Cancels reversed text (see [page 2-76](#) for more information). (default)

**SELECT(*srow, scolumn, [height], entry[, ...]*)**

(optional) Specifies a selection window to be placed on the screen (see [page 2-76](#) for more information).

**NOSELECT**

(optional) Cancels any selection list associated with the field (see [page 2-76](#) for more information). (default)

**SELWND(*srow*, *scolumn*, *window*)**

(optional) Similar to select, except the selection window already exists (see [page 2-78](#) for more information).

**NOSELWND**

(optional) Cancels any selection window associated with the field (see [page 2-78](#) for more information). (default)

**TIME([*AMPM*]/, *NOW*)**

(optional) Enables you to process times (see [page 2-79](#) for more information).

**NOTIME**

(optional) Resets a time field to a normal decimal field (see [page 2-79](#) for more information). (default)

**TIMESTAMP([*AMPM*]/, *SHORT*)**

(optional) Enables you to create a field that corresponds to a timestamp key in an ISAM file (see [page 2-80](#) for more information).

**NOTIMESTAMP**

(optional) Creates a standard 8-byte integer field from an imported repository autotime field (see [page 2-80](#) for more information).

**UNDERLINE**

(optional) Specifies underlined text (see [page 2-81](#) for more information).

**NOUNDERLINE**

(optional) Cancels underlined text (see [page 2-81](#) for more information). (default)

**UPPER\_CASE\_ONLY or UC**

(optional) Converts lowercase input characters to uppercase on alpha fields (see [page 2-82](#) for more information).

**NOUPPER\_CASE\_ONLY or NOUC or LOWER\_CASE\_ALLOWED**

(optional) Allows lowercase input for the field (see [page 2-82](#) for more information). (default)

**USER([*user\_text*]/, *user\_type*)**

(optional) Enables you to associate a user-defined text string with input fields and/or validate a data type that you've defined (see [page 2-82](#) for more information).

## **NOUSER**

(optional) Indicates that the field is not a user-defined type (see [page 2-82](#) for more information). (default)

## **VIEW\_LENGTH(*view\_length*)**

(optional) Determines the width of the field (see [page 2-83](#) for more information).

## **NOVIEW\_LENGTH**

(optional) Cancels view length settings for the field, which causes the longer of the display length or input length to determine the field width (see [page 2-83](#) for more information).

(default)

## **WAIT(*wait\_time*)**

(optional) An input time-out for the field, overriding the value in the **g\_wait\_time** field (see [page 2-84](#) for more information).

## **Discussion**

The **.FIELD** command defines a field to be included in the window's input set. The maximum number of input fields in an input window or input set is 253.

Fields can be placed anywhere in the input window. On exit, the current window position is updated to the next horizontal character following the input field, including the display width.

Default values will be used for all options that are not specified.

A field with the form *dimension***A***size* (a single-dimension alpha array) is displayed as a multi-line text field. *Dimension* determines the number of lines in the field and *size* determines the width of the field. For example, **4a50** designates a four-line, 50-column text field, which is technically four 50-column alpha fields stacked vertically. (Note, however, that on Windows, these stacked fields are enclosed in a single frame and are a single Windows control.) Wrap mode is set automatically for input, and a text field can be edited with any editing function. Note that *dimension***A***size* is an array declaration (unlike an *index* specification, which merely references an element in an existing array defined in a repository).

On a decimal or implied-decimal field, the decimal point can either be explicitly entered or implied during input. If you specify that a field is of type **d** and has a decimal value of 2 (the number of decimal places), an input of 55 will yield "55.00", while an input of 8.7 will yield "8.70". If you specify the **NODECIMAL** qualifier, which means the user doesn't need to type the decimal point (see "**NODECIMAL** or **NODECIMAL\_REQUIRED**" on [page 2-69](#)), the entry of 55 will yield ".55". (The entry 8.7 will still yield "8.70".) Note that whether a decimal field is defined in Repository, with **.FIELD**, or with **IB\_FIELD**, the field can have no more than nine digits after the decimal point.

Implied-decimal fields will always display their full precision unless the field is formatted otherwise. Any explicit spacing may be overwritten if the field needs it to display the full precision. (See the **FORMAT** option for information about formatting the field's display.)

Alpha fields and single-dimension alpha array fields can have a *size* of up to 65,535 characters. If you specify a *size* greater than 65,535, Toolkit will generate an error. Decimal fields (including implied decimal fields) have a maximum size of 28, and for implied-decimal fields, up to 28 digits can follow the decimal point. On any operating system, integer fields can have 1, 2, 4, or 8 digits, depending on the size of the integer field. Integer fields support all qualifiers that are valid for decimal fields without precision.

For all qualifiers, except ALLOW and SELECT, you can break a line only between qualifiers, not in the middle of a qualifier and its arguments.

If you specify a repository structure (using .REPOSITORY\_STRUCTURE), note the following:

- ▶ You must call .REPOSITORY\_STRUCTURE prior to the .FIELD commands so that fields can be drawn from that repository structure.
- ▶ All fields defined after a .REPOSITORY\_STRUCTURE command must exist in that repository.
- ▶ Repository fields that have the “Excluded by Toolkit” flag set, will not be accessible by Script (or Composer or the IB\_FIELD subroutine). By default, this flag is not set.
- ▶ You cannot specify *type*, *size*, *dimension*, or *decimal* places for fields drawn from a repository.
- ▶ For field qualifiers that not explicitly specified, UI Toolkit uses the default values defined in the repository. If neither option from an option pair has been specified in the repository, the Toolkit default applies.
- ▶ If you wish to override the default values (whether they are repository defaults or Toolkit defaults), see the sections below for the .FIELD arguments ([“ARRIVE\\_METHOD\(arrive\\_method\)” on page 2-49](#), [“AUTOMATIC” on page 2-49](#), etc.).
- ▶ When you include time and date fields from the repository, you must specify any desired time and date formats in your script files. UI Toolkit does not import repository formatting for time and date fields. For timestamp fields, however, there is a default display format, which you can change or override,
- ▶ If you are drawing an input field’s allow list or selection list from a repository, any quoted entries (single or double quotes) will be unquoted, unless you have enclosed the entry and the quotes in the opposite type of quotes—for example, for “Allow” use ““Allow”” (double quotes enclosing an entry with single quotes) in your repository definition, and for ‘Allow’ use “‘Allow’” (single quotes enclosing an entry with double quotes).
- ▶ Multiple repository structures can be combined together enabling access as one structure by using the implicit group feature of Repository. For more information, see [“Basic field information”](#) in the “Working with Fields” chapter of the *Repository User’s Guide*.
- ▶ For repository arrayed fields, use the *index* argument to access individual elements. See [“Field specifications”](#) below.

- ▶ For fields that are group members, you must use the group prefix unless the field name is unique within the structure. See [“Field specifications”](#) below.
- ▶ For fields that are members of a structfield, the field name must be unique within the repository structure.

## Renditions

Specifying the BLINK, BOLD, HIGHLIGHT, ITALIC, REVERSE, UNDERLINE, or COLOR qualifier for a field overrides the corresponding rendition set with .FILL for the window. Specifying NOBLINK, NOBOLD, NOHIGHLIGHT, NOITALIC, NOREVERSE, NOUNDERLINE, or NOCOLOR causes the corresponding window rendition that’s been set by .FILL to be used. (See [.FILL on page 2-86](#) for information on specifying these renditions for a window.)

Renditions specified with .FIELD override user-controlled renditions for the field (renditions set with Synergy UI Toolkit Control Panel or Windows Control Panel). If a rendition is overridden for a field, the default Toolkit behavior is no longer used for the field. This means that no rendition is applied when the field is being processed, displayed, or cleared, unless done so programmatically with I\_FLDMOD, %IDISPLAY\_METHOD, or %IEDIT\_FMTMETHOD.

Note the following:

- ▶ For all edit controls, renditions set with .FIELD affect only text within the field’s frame.
- ▶ For check box fields on UNIX or OpenVMS, only the check box area is affected. On Windows, no area of a check box field is affected.
- ▶ For combo boxes on Windows, text within the field’s frame is affected. The actual list is affected only by UNDERLINE, ITALIC, and BOLD.
- ▶ For radio buttons on Windows, the area occupied by the entries’ text is affected. The buttons themselves are not.
- ▶ Disabled fields on Windows always have gray text. Specifying a foreground color for a disabled field has no effect.
- ▶ Modifying a rendition for a field affects only that rendition. Other renditions, including color, remain the same.
- ▶ For ActiveX® Toolkit lists, field attributes and color have precedence over any specified alternating background colors for the list.
- ▶ When using Toolkit lists (non-ActiveX lists) on Windows, the field’s rendition isn’t updated until the field is focused.
- ▶ It may be best to use different renditions for different platforms or when using different fonts.

See [“Customizing the Look of Your Application” on page 18-27](#) for more rendition information.



## Field specifications

Field specifications have the following form and cannot exceed 30 characters:

*[struct\_alias.]field\_name[ [index, ...] ]*

where *struct\_alias* is the alias for a structure (used only after the input window has been created), *field\_name* is the name of the field (which may include a group prefix), and *index* is an index for a dimension of a repository array field. Note that

- ▶ *struct\_alias*, *index*, and group prefixes are valid only for fields defined in a repository.
- ▶ *struct\_alias* is necessary only after the input window has been created and must be followed by a period. (When using .FIELD, .SET, IB\_FIELD, or IB\_SET, the .REPOSITORY\_STRUCTURE specification or the IB\_RPS\_STRUCTURE call determines the structure used for the field.)
- ▶ *index* specifications must be enclosed in a set of square brackets.

*Index* specifications enable you to access individual elements of a repository array field. For multi-dimensional arrays, pass the same number of *index* specifications as there are dimensions, and pass them in the same order as the corresponding dimensions. For example, for a two-dimensional array named **total**, specify the following to use the seventh field (second dimension) of the third element (in the first dimension):

```
.FIELD total[3,7]
```

The name of the resulting input field will include brackets, indices, and separating commas, but not spaces, tabs, or leading zeros. For the field definition above, for example, this would be total[3,7], so to use I\_DISABLE for this field, you could pass something like the following:

```
xcall i_disable(wndid, "total[3,7]")
```

For single-dimension alpha arrays, you can use *index* to specify a particular field in the array, or you can omit *index* and the square brackets. (If you omit *index*, you must also omit the square brackets.) Omitting *index* instructs Toolkit to display the entire array as a text field. The number of elements determines the number of lines in the text field, and the field size for the array becomes the length of the text field. Wrap mode is set automatically during input, and a text field can be edited with any editing function.

Note that Script will generate an error

- ▶ if an *index* value is less than 1 or greater than the number of elements specified for that dimension.
- ▶ if the number of *index* specifications does not match the number of dimensions. (The exception is single-dimension alpha arrays. For these, *index* is optional.)

For fields that are group members in a repository, use the group prefix (if one has been specified for the group) to make the field name unique—for example, if the group prefix is **gr2** and the field name is **lastname**, you can use **gr2lastname**. (You can omit the group prefix only if the name is unique within the entire structure.) For example, the following *field\_spec* references the second element in **address**, a single-dimension array which is a member of a group with the prefix **gr1**:

```
.REPOSITORY_STRUCTURE customer
.FIELD gr1address[2]
.SET custset, customer, gr1address[2]
```

If the **customer** structure in the above example has the alias **cust**, you could use the following to disable the field after the input window had been created:

```
xcall i_disable(wndid, "cust.gr1address[2]")
```

Note that for arrayed groups, you can use a field name (with or without a group prefix) only to access a member from the first element in the array. You can use *index* specifications to access an arrayed group element as a whole, but you cannot use *index* to access individual members within an arrayed group element.

### **ALLOW**(*valid[, ...]*)

### **NOALLOW** (default)

ALLOW specifies which entries are valid for the field. You can specify up to 100 entries.

*valid*

A valid entry.

For example, if “yes” and “no” were the only possible entries, the syntax for the .FIELD command would be as follows:

```
.field yesno, a3, allow("yes", "no")
```

If you don't specify the MATCH qualifier and the allowable entry is alpha, the input system will only look for a match for the shortest entry, and there will be no case sensitivity. You can change these match characteristics by specifying the MATCH qualifier. (See [page 2-68](#) for more information on the MATCH qualifier.)

NOALLOW is the default state if neither ALLOW nor NOALLOW is specified in the script or in the repository. If ALLOW has been specified in the repository, NOALLOW will cancel the allow list associated with the field.

**ARRIVE\_METHOD**(*arrive\_method*)**NOARRIVE\_METHOD** (default)

ARRIVE\_METHOD specifies a pre-input subroutine.

*arrive\_method*

The name of the subroutine to invoke.

If you specify ARRIVE\_METHOD, the *arrive\_method* subroutine will be called before the field is processed by I\_INPUT. Up to 20 optional data arguments can be passed to I\_INPUT. These optional data arguments are then, in turn, passed to the *arrive\_method* subroutine.

*Arrive\_method* is case insensitive and is acceptable with or without quotation marks.

You can specify the ARRIVE\_METHOD qualifier as follows:

```
.field field, ..., arrive_method("mymethod")
```

The routine specified in *arrive\_method* must be callable as a subroutine and must reside either in the program image itself or in an open ELB. In the latter case, on some systems a call to the OPENELB routine is required. See [page 8-118](#) for more information on writing the *arrive\_method* subroutine.

NOARRIVE\_METHOD is the default state if neither ARRIVE\_METHOD nor NOARRIVE\_METHOD is specified in the script or in the repository. If ARRIVE\_METHOD has been specified in the repository, specifying NOARRIVE\_METHOD will override this setting and the arrive method will not be invoked.

**AUTOMATIC****NOAUTOMATIC** (default)

AUTOMATIC specifies that when an empty field is processed, a return with no input is automatically assumed (i.e., the specified default action—DEFAULT, COPY, INCREMENT, or DECREMENT—will occur automatically). In the following example, the **ordnum** field automatically contains the default value (which happens to be 1).

```
.field ordnum, d4, automatic, default(1)
```

NOAUTOMATIC is the default state if neither AUTOMATIC nor NOAUTOMATIC is specified in the script or in the repository. If AUTOMATIC has been specified in the repository, NOAUTOMATIC cancels automatic entry of the field.

**BLANK\_IFZERO or BZRO or BLANK\_IF\_ZERO**

**NOBLANK\_IFZERO or NOBZRO or NOBLANK\_IF\_ZERO (default)**

BLANK\_IFZERO indicates that a numeric (**d** or **i**) field will be left blank if the user enters a value of 0. For example, the **amount** field below will be left blank if the user enters a 0 value.

```
.field amount, d5, bzro
```

NOBLANK\_IFZERO is the default state if neither BLANK\_IFZERO, BZRO, nor NOBLANK\_IFZERO is specified in the script or in the repository. If BLANK\_IFZERO has been specified in the repository, specifying NOBLANK\_IFZERO will override this setting and will display a zero on zero input.

**BLINK**

**NOBLINK (default)**

BLINK specifies italicized text on Windows and blinking text on UNIX and OpenVMS. It is synonymous with ITALIC.

For detailed information on BLINK and other input field renditions, see [“Renditions” on page 2-46](#).

In the following example, the contents of the field are italicized on Windows and blinking on UNIX and OpenVMS.

```
.field date_due, d8, blink
```

NOBLINK is the default state if neither BLINK nor NOBLINK is specified in the script or repository. If BLINK has been specified in the repository, NOBLINK cancels the blinking. NOBLINK is synonymous with NOITALIC.

**BOLD**

**NOBOLD (default)**

BOLD specifies bold (or highlighted) text. It is synonymous with HIGHLIGHT.

For detailed information on BOLD and other input field renditions, see [“Renditions” on page 2-46](#).

In the following example, the contents of the field are bold.

```
.field balance, d18.2, bold
```

NOBOLD is the default state if neither BOLD nor NOBOLD is specified in the script or repository. If BOLD has been specified in the repository, NOBOLD cancels this attribute. NOBOLD is synonymous with NOHIGHLIGHT.

**BREAK([option])**

**NOBREAK (default)**

BREAK triggers a break in input set processing on a field.

*option*

(optional) One of the following:

|               |                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------|
| <b>CHANGE</b> | Causes break processing to occur when the field is changed. (default)                                                |
| <b>ALWAYS</b> | Causes break processing to occur on the specified field every time the user leaves the field.                        |
| <b>RETURN</b> | Causes break processing to occur on the specified field only when the field is changed or RETURN (ENTER) is pressed. |

Sometimes you'll want to interrupt input set processing on a field, perform external operations, and then continue with the input set. The BREAK qualifier without an argument or with the CHANGE argument specifies that a break will occur after input to this field has been processed (that is, whenever the field's data is changed). If the ALWAYS argument is present, a break will occur regardless of whether or not input has been processed (for instance, even if the user merely leaves the field with the I\_NEXT or I\_PREV menu entry). If the RETURN argument is present, a break will occur when RETURN (ENTER) is pressed, but not when the field has been accessed with the I\_NEXT or I\_PREV menu entry (assuming the field was not modified).

The global variable **g\_fldnam** specified in **tools.def** will contain the name of the field with the break specification.

The BREAK qualifier might be useful in specifying an inventory item in a sales transaction. You could break on the specification field, search for the item in inventory, display any pertinent information, and then continue with the rest of the input set.

In the following example, a break will occur after the **custno** field's input has been processed.

```
.field custno, d6, break
```

NOBREAK is the default state if neither BREAK nor NOBREAK is specified in the script or in the repository. If BREAK has been specified in the repository, NOBREAK will cancel break processing for the field. To change to another form of break processing (ALWAYS, RETURN, or the default, CHANGE), specify BREAK with the desired optional qualifier.

**WIN**

---

When used in conjunction with CHECKBOX, SELECT, SELWND, or RADIO, the BREAK qualifier will not trigger a return to the calling routine, until you leave that field. For example, clearing a check box will not return from I\_INPUT until another field is accessed. If, however, the E\_STATE (D\_VALSTCHG) option has been set, then a break occurs immediately on a change of state, and does not occur when leaving the field (unless the two are simultaneous).

---

## **CHANGE\_METHOD(*change\_method*)**

### **NOCHANGE\_METHOD (default)**

CHANGE\_METHOD specifies a post-validation routine.

*change\_method*

The name of the routine to invoke.

If you specify CHANGE\_METHOD, the *change\_method* routine will be called after the field is validated by I\_INPUT, L\_INPUT, I\_INPFLD, or L\_INPFLD. (By default, validation will not occur until focus on the field is lost. Immediate validation can be specified for check boxes, radio buttons, and combo boxes by using the D\_VALSTCHG option in E\_STATE.) Up to 20 optional data arguments can be passed to I\_INPUT and L\_INPUT. These optional data arguments are then, in turn, passed to the *change\_method* routine.

*Change\_method* is case sensitive and is acceptable with or without quotation marks.

You can specify the CHANGE\_METHOD qualifier as follows:

```
.field name, ..., change_method("mymethod")
```

The routine specified in *change\_method* must be callable as a function and must reside either in the program image itself or in an open ELB. In the latter case, on some systems a call to the OPENELB routine is required. See [page 8-122](#) for more information on writing the *change\_method* routine.

NOCHANGE\_METHOD is the default state if neither CHANGE\_METHOD nor NOCHANGE\_METHOD is specified in the script or in the repository. If CHANGE\_METHOD has been specified in the repository, specifying NOCHANGE\_METHOD will override this setting and the change method will not be invoked.

## **CHECKBOX**

### **NOCHECKBOX (default)**

On Windows, a check box is a small square that is either empty or has a check in it. Every check box displays one of these states, and the state is represented in the data area of input as a 1 or 0 for checked or unchecked, respectively.

On UNIX and OpenVMS, check boxes are one-character fields ("X" if non-zero, or space if zero).

At runtime, the space bar can be used to toggle the state.

A numeric input window field can be designated a check box field by adding the script option "checkbox" to the .FIELD command. When this is done, a check box is created at the location of the field. Prompt text becomes the text associated with the check box and is always placed adjacent and to the right of the check box, regardless of any specified prompt position. You can use IB\_FIELD with the D\_FLD\_CHECKBOX qualifier to create a check box field when creating windows at runtime, or you can create a check box using Composer. See the ["Designing Your User Interface"](#) chapter of *Getting Started with Synergy/DE* for more information on Composer.

A check box is implicitly an enumerated field, and therefore *cannot* be defined with the ENUMERATED qualifier.

Toggling a check box does not, by default, cause the field to be immediately validated. Until the field loses focus, no Toolkit validation tests or change method occurs. Likewise, no leave and arrive methods will be invoked until focus is lost. In order for a field to be immediately validated, the D\_VALSTCHG option of E\_STATE needs to be set. See [page 7-45](#) for more information on the E\_STATE environment subroutine and the D\_VALSTCHG option.

---

## WIN

If a check box has no prompt, there is no visual change when the check box gains focus. Focus is denoted by a dotted rectangle around the prompt and changes to the renditions for the prompt (if needed E\_STATE options are set).

---

NOCHECKBOX is the default state if neither CHECKBOX nor NOCHECKBOX is specified in the script or in the repository. If CHECKBOX has been specified in the repository, specifying NOCHECKBOX will override this setting and the field will not be displayed as a check box.

## COLOR(*palette#*)

### NOCOLOR (default)

COLOR specifies the color to use for the field.

*palette#*

A palette number in the range of 1 to 16.

For detailed information on COLOR and other input field renditions, see “[Renditions](#)” on [page 2-46](#).

In the following example, the contents of the field are displayed using color palette number 5.

```
.field amount_due, d10.2, color(5)
```

NOCOLOR is the default state if neither COLOR nor NOCOLOR is specified in the script or in the repository. If a color has been specified in the repository, NOCOLOR specifies that the window's color be used, or color palette number 1 if not specified.

## COPY

COPY copies the value from the data area that corresponds to this field (as defined by the structure) if the field is empty. In the following example, if the **cusnam** field is empty, UI Toolkit copies the contents of the data area that corresponds to the field.

```
.field cusnam, a30, copy
```

If you use COPY, you should *not* use DECREMENT, INCREMENT, or DEFAULT. These four qualifiers are mutually exclusive.

If COPY has been specified in the repository, specifying NODEFAULT will cancel it. (See [page 2-56](#) for more information on NODEFAULT.)

**DATE(/(TODAY//[, PERIOD//[, SHORT/)**  
**NODATE (default)**

DATE enables you to process dates.

**TODAY**

(optional) Defaults the date to the current date if the user presses ENTER without entering a date.

**PERIOD**

(optional) Specifies that the date is a period.

**SHORT**

(optional) Shortens the display of the date from the normal 11 characters.

You can use this qualifier only on **d4** through **d8** fields, or on **i2** or **i4** fields; fields of any other type or size will generate an error. The input for a date is either numeric or delimited.

The size of the field defines the way the date is stored, as shown in the table below.

| Date Formats for Field Sizes |                        |                                                             |
|------------------------------|------------------------|-------------------------------------------------------------|
| Size                         | Date format            | Meaning                                                     |
| <b>d4</b> field              | YYPP                   | Two-digit year, period                                      |
| <b>d5</b> field              | YYJJJ                  | Two-digit year, Julian day                                  |
| <b>d6</b> field              | YYMMDD<br>or<br>YYYYPP | Two-digit year, month, day<br>or<br>Four-digit year, period |
| <b>d7</b> field              | YYYYJJJ                | Four-digit year, Julian day                                 |
| <b>d8</b> field              | YYYYMMDD               | Four-digit year, month, day                                 |
| <b>i2</b> field              | YYPP                   | Two-digit year, period                                      |
| <b>i4</b> field              | YYYYMMDD               | Four-digit year, month, day                                 |

Users don't have to type just digits—they can type a three-letter abbreviation for the month, and UI Toolkit will convert what was typed to one of the storage formats shown in the table above. (The `U_MONTHS` subroutine determines the abbreviation for each month. The default is the first three letters of the month in English.)

Using the DATE qualifier, any value that is not specified defaults to the current date. If the user specifies */day/year*, the month will default to the current month, and if the user enters a single value, it will be used as the day. For example, if the user specifies **5**, the date will default to the fifth day of



the current month and year. If the user enters a single value followed by the date separator, it will be used as the month. For example, the user can specify **10/**, and the date will default to October and the current day and year.

If **TODAY** is present and the user presses **ENTER** on a blank date field, it will default to the system date.

If **PERIOD** is present, the date is considered to be a period. A period is a user-defined unit within the range 1 to 99, typically representing an accounting period.

If **SHORT** is present, the date will be displayed in fewer than 11 characters. A short period date (one with both the **SHORT** and **PERIOD** arguments) will have a display length of 5 characters. All other short dates will have a display length of 8 characters.

Several global fields in **tkctl.def** affect date processing. The **g\_date\_order** global field affects date input and display as follows:

| If <b>g_date_order</b> is... | Input and display will have this order...                                         |
|------------------------------|-----------------------------------------------------------------------------------|
| 0                            | <i>month day year</i><br>or<br><i>period year</i> (if <b>PERIOD</b> is specified) |
| 1                            | <i>day month year</i><br>or<br><i>period year</i> (if <b>PERIOD</b> is specified) |
| 2                            | <i>year month day</i><br>or<br><i>year period</i> (if <b>PERIOD</b> is specified) |

Additionally, the **g\_date\_sep** global field specifies the character that will separate parts of the date on redisplay. This is initialized to a slash (/). And the **g\_periods** global field defines the maximum number of periods that are allowed on input. This is initialized to **12** if you don't specify a value.

The following example defaults the date in the **invdat** field to today's date if the user presses **ENTER** without entering anything into the field. The date is stored in the format **YYMMDD**.

```
.field invdat, d6, date(today)
```

In the next example, if the user enters **Dec 7, 12071994, 1207, 12/7, or 12/7/94** (assuming the current year is 1994), the date will be displayed as "12/07/94" and stored as 19941207.

```
.field birthdat, d8, date(short)
```

NODATE is the default state if neither DATE nor NODATE is specified in the script or in the repository. If DATE has been specified in the repository, NODATE will reset the field to a normal decimal field. To override any of the other date qualifiers (TODAY, PERIOD, SHORT), specify DATE without one or more of these qualifiers.

## DECREMENT

DECREMENT designates that if the user does not enter a value the first time a numeric (**d** or **i**) field (any numeric field) is processed, the last value in the field minus one will be used. For example, the following script will decrement the last value in the **quantity** field by one (if the user doesn't enter a value).

```
.field quantity, d4, decrement
```

If you use DECREMENT, you should *not* use COPY, INCREMENT, or DEFAULT. These four qualifiers are mutually exclusive.

If DECREMENT has been specified in the repository, NODEFAULT will cancel it.

## DEFAULT(*default*)

### NODEFAULT (**default**)

DEFAULT defines a default value for the field. This value can be up to 80 characters long.

*default*

The default value.

The default value is automatically displayed in the field if the user has not previously entered anything in the field. The user can accept the default by pressing ENTER, edit the default, or type a new value. In the following example, the default value is 1.

```
.field quantity, d4, default(1)
```

If a selection window is associated with this field, the entry in the selection window that matches the default value will be the first highlighted entry, if found. Note that a default value specified here takes precedence over any default value specified in the .ITEM selection window building command or any call to the S\_SELDFLT subroutine.

For date and time fields, the default value must be specified in field storage form, rather than field input or display form. For example, the default value for a six-digit period date should be specified in the form "199813." If the field is a date field, the default value must match the date field's storage format. For example, the default value for a six-digit period date should be specified as "199813."

If you use DEFAULT, you should *not* use the COPY, INCREMENT, or DECREMENT qualifiers. These four qualifiers are mutually exclusive.

If you use DEFAULT with ENUMERATED, DEFAULT must be specified after ENUMERATED.

NODEFAULT is the default state if there is no specification for this qualifier in the script or in the repository. However, if DEFAULT has been specified in the repository, NODEFAULT cancels any default data specified. It also cancels any COPY, INCREMENT, or DECREMENT qualifier that has been specified for the field.

## DISABLED

### NODISABLED or ENABLED (default)

DISABLED disables the field.

A disabled field is unable to receive keyboard focus either by mouse click or by pressing one of the following: TAB, ARROW, or ENTER. On Windows, except within ActiveX Toolkit lists, the disabled fields will be grayed. On UNIX and OpenVMS, the disabled fields will use the “disabled field display” rendition. This rendition can be modified using U\_REND but cannot be modified using U\_MODREND. See [U\\_REND on page 16-121](#) for more information on the U\_REND subroutine and processing display renditions.

Disabled fields within an ActiveX Toolkit list are rendered the same as enabled fields.

```
.field state, a2, disabled
```

## DSP\_LENGTH(*display\_length*)

### NODSP\_LENGTH (default)

DSP\_LENGTH overrides Toolkit’s default display length, which determines the maximum number of characters that can be displayed in a field.

*display\_length*

The maximum number of characters that can be displayed in the field. This value can be from 0 through 65,535. (Unless an explicit view length is set for the field, however, *display\_length* cannot be set to a value that extends the field beyond the window border.) If you set this to 0, Toolkit uses the default.

This maximum includes any formatting characters, and it includes the negative sign if a negative value is allowed for the field. Display lengths cannot be specified for check box fields, radio buttons, selection fields (including fields with selection windows), or text fields (multi-dimensional alpha fields).

If you don’t specify *display\_length*, or if you set it to 0, it defaults to one of the following:

- ▶ For a field that’s an enumerated list, display length defaults to the display length set for the enumeration setting (for example, the *display\_length* argument for the ENUMERATED qualifier).
- ▶ For a field with a format string, display length defaults to the length of the format string. (This does not apply to fields that are enumerated lists.)
- ▶ For a field that’s unformatted, display length defaults to the input length. (This does not apply to fields that are enumerated lists.)

For information on how display length works with other length settings for input fields, see “Understanding display, input, and view lengths” on page 8-6.

NODSP\_LENGTH is the default state if neither DSP\_LENGTH nor NODSP\_LENGTH is specified in the script or in the repository. If DSP\_LENGTH has been specified in the repository, NODSP\_LENGTH cancels the display length setting.

**DISPLAY\_METHOD(*display\_method*)****NODISPLAY\_METHOD (default)**

DISPLAY\_METHOD defines a display method for the field.

*display\_method*

The name of the subroutine to invoke.

If you specify DISPLAY\_METHOD, the *display\_method* subroutine will be called whenever the field is about to be displayed, after the Toolkit has formatted the display according to its rules. Up to 20 optional data arguments can be passed to I\_INPUT. These optional data arguments are then, in turn, passed to the *display\_method* subroutine.

*Display\_method* is case insensitive and is acceptable with or without quotation marks. You can specify the DISPLAY\_METHOD qualifier as follows:

```
.field field,..., display_method("mymethod")
```

Any field with a user-defined data type will not invoke the *display\_method* subroutine. Instead, use the EDSPFLD\_METHOD routine.



Display methods are not allowed for check box, selection list, selection window, or radio button fields.

---

NODISPLAY\_METHOD is the default state if neither DISPLAY\_METHOD nor NODISPLAY\_METHOD is specified in the script or in the repository. If DISPLAY\_METHOD has been specified in the repository, specifying NODISPLAY\_METHOD will override this setting and the display method will not be invoked.

**DRILL\_METHOD(*drill\_method*)****NODRILL\_METHOD (default)***drill\_method*

The name of the subroutine to invoke.

DRILL\_METHOD defines a drill method for the field. A drill method is generally used for some form of lookup or additional information. On Windows, if an input field has a drill method, and is a member of an input set being processed by I\_INPUT, a drilldown button (a small button with “...” on the face) is placed immediately to the right of the field. If you click this button, the drill method is invoked. In UNIX and OpenVMS environments, there is no drilldown button, but instead an

I\_DRILL menu entry will trigger UI Toolkit to invoke the appropriate drill method. Up to 20 optional data arguments can be passed to I\_INPUT. These optional data arguments are then, in turn, passed to the *drill\_method* subroutine.

*Drill\_method* is case insensitive and is acceptable with or without quotation marks. You can specify the DRILL\_METHOD qualifier as follows:

```
.field field,..., drill_method("mymethod")
```

NODRILL\_METHOD is the default state if neither DRILL\_METHOD nor NODRILL\_METHOD is specified in the script or in the repository. If DRILL\_METHOD has been specified in the repository, specifying NODRILL\_METHOD will override this setting and the drill method will not be invoked.

### **EDITFMT\_METHOD(*editfmt\_method*)**

#### **NOEDITFMT\_METHOD (default)**

EDITFMT\_METHOD defines an edit format method for the field.

*editfmt\_method*

The name of the subroutine to invoke.

If you specify EDITFMT\_METHOD, the *editfmt\_method* subroutine will be called whenever data in a field is about to be edited, after the Toolkit has formatted the display according to its rules. Up to 20 optional data arguments can be passed to I\_INPUT. These optional data arguments are then, in turn, passed to the *editfmt\_method* subroutine.

*Editfmt\_method* is case insensitive and is acceptable with or without quotation marks. You can specify the EDITFMT\_METHOD qualifier as follows:

```
.field field,..., editfmt_method("mymethod")
```

For fields with a user-defined data type, any EEDTDSP\_METHOD subroutine is called prior to the *editfmt\_method* subroutine.



Edit format methods are not allowed for check box, selection list, selection window, or radio button fields.

---

NOEDITFMT\_METHOD is the default state if neither EDITFMT\_METHOD nor NOEDITFMT\_METHOD is specified in the script or in the repository. If EDITFMT\_METHOD has been specified in the repository, specifying NOEDITFMT\_METHOD will override this setting and the edit format method will not be invoked.

**ENUMERATED**(*display\_length*[, *base*][, *step*])

**NOENUMERATED** (default)

ENUMERATED specifies an enumerated data field, which is a field that returns a decimal or integer value for the corresponding displayed text entry. Note that this corresponds to the Repository “enumerated” field attribute used in conjunction with an allow list, selection list, or selection window. It does not correspond to the Synergy DBL or Repository enumeration data type.

*display\_length*

The number of characters (from 0 to 65535) that can be displayed for each select or allow list item.

*base*

(optional) The return value of the first entry. If you don’t specify a base value, the default value is 1.

*step*

(optional) The value added to each successive entry. If you don’t specify a step value, the default value is 1.

For example, the following lines define two enumerated input fields:

```
.input inp, 20, 70
.field fld1, d2, enum(6, 1, 1), sel(1, 2, 3, red, orange, yellow)
.field fld2, d2, enum(6, 1, 2), sel(1, 2, 3, red, yellow, blue)
```

- ▶ The first field defined above is named **fld1**, is two digits in size, and has three selection items: **red**, **orange**, and **yellow**. This field has a base value of **1**, a step value of **1**, and a displayed field that is six characters long. It will return the value **1** for **red**, **2** for **orange**, and **3** for **yellow**.
- ▶ The second input field is named **fld2**, is also two digits in size, and has three selection items: **red**, **yellow**, and **blue**. This field has a base value of **1**, a step value of **2**, and a displayed field that is six characters long. It returns the value **1** for **red**, **3** for **yellow**, and **5** for **blue**.

Note that the ENUMERATED qualifier must be used in conjunction with SELECT, ALLOW, SELWND, or with a selection window built “on-the-fly” using S\_SELBLD. If used with SELECT or ALLOW, it must precede them. An enumerated data field must have a decimal (**d**) or integer (**i**) data type, and its size must be able to handle the largest number expected to be returned.

When UI Toolkit processes an enumerated data field at runtime, the data area contains the enumerated field calculated as follows:

$$(entry\_number-1) * step + base$$

where *entry\_number* is the number of the entry specified by the SELECT, ALLOW, or SELWND qualifier for each field.

If there’s a field-level display length (set with the DSP\_LENGTH qualifier, for example), this setting overrides the *display\_length* setting for ENUMERATED.

For more information on display length, including default settings, and for information on how display length, input length, and view length interact, see [“Understanding display, input, and view lengths” on page 8-6](#).



This setting may be used as the view length if no view length or field-level display length (specified with `DSP_LENGTH`, for example) is specified for the field. In this case, `display_length` is used to calculate the width of the field and must not be set to a value that causes the field to extend beyond the window's borders. (See [page 2-83](#) for more information on the field width calculation.)

---

If you use `ENUMERATED` with `DEFAULT`, `ENUMERATED` must precede `DEFAULT`.

`NOENUMERATED` is the default state if this category is not specified in the script or in the repository. If `ENUMERATED` has been specified in the repository, `NOENUMERATED` overrides this setting and resets the field to a non-enumerated field. If you only wish to override the field parameters for `ENUMERATED`, use `ENUMERATED` with the new parameters.



A check box is implicitly an enumerated field and therefore cannot be defined with the enumerated qualifier.

---

### **FIELD\_POSITION([CHANGE, *row*, *column*)] or FPOS([CHANGE, *row*, *column*]) NOFIELD\_POSITION or NOFPOS (default)**

`FIELD_POSITION` (or `FPOS`) specifies the position of a field, independent of its prompt.

#### **CHANGE**

(optional) Designates that `FIELD_POSITION` is a degree of movement rather than an actual position. A `CHANGE` value can be negative or positive.

*row*

Either a row position or the number of rows that the current position will move.

*column*

Either a column position or the number of columns that the current position will move.

If you don't specify the `FIELD_POSITION` qualifier on a `.FIELD` statement, the position of the field defaults to the current screen position if there isn't a prompt, or immediately following the prompt if one exists. (See the documentation for the `POSITION` qualifier on [page 2-71](#) for more information.)

If the position of a field specified by `FIELD_POSITION` falls on or before any part of the prompt, a warning occurs but the command is still processed.

Any `POSITION` or `PROMPT` qualifier is processed first, and `FIELD_POSITION` will be relative to the next position after the prompt (or `POSITION`, if `PROMPT` is not specified).

If the **CHANGE** qualifier is absent, the specified *row* and *column* will be the absolute coordinates for the field relative to the input window.

The following example positions the “Name” prompt at the tenth row and first column (10,1) and the input field at the tenth row and tenth column (10,10). Thus, five spaces are between the end of the “Name” prompt and the beginning of the input field.

```
.field fld1, a10, position(10,1), prompt("Name"), fpos(10,10)
```

This second example has the same result as the previous example except that it specifies a change in position from the end of the prompt rather than specifying an absolute position for the input field.

```
.field fld1, a10, position(10,1), prompt("Name"), fpos(change, 0, 5)
```

**NOFIELD\_POSITION** is the default state if this category has not been specified in the script or in the repository. If **FIELD\_POSITION** has been specified in the repository, **NOFIELD\_POSITION** resets the position of the input field to default to the next character after the prompt rather than the position specified in the repository.

### **FONT**(*palette\_name*)

### **NOFONT** (default)

**FONT** specifies the font for the field.

*palette\_name*

The name of a font palette entry.

*Palette\_name* must be known at runtime or a default font will be used. See [“Using Fonts on Windows” on page 18-46](#) for more information on font palettes.

Although the **FONT** qualifier has no visual effect on UNIX and OpenVMS systems, it is preserved with the window definition so that the same window library can be used for both non-Windows and Windows systems.

Specifying a field font with the **FONT** qualifier overrides any default font that would have been used for the field. **NOFONT** indicates that the window’s font should be used. See also [.FONT on page 2-88](#) for more information about specifying a window’s font, and see the documentation for the **PROMPTFONT** qualifier on [page 2-72](#) for more information about specifying a prompt’s font.

The following example specifies “my\_field\_font” for the field **inpfld**.

```
.field inpfld, a30, font(my_field_font)
```

**NOFONT** is the default state if neither **FONT** nor **NOFONT** is specified in the script or in the repository. If **FONT** has been specified in the repository, **NOFONT** cancels the field’s font and uses the window’s font instead.



**FORMAT(*fmt\_string*) or FMT(*fmt\_string*)**  
**NOFORMAT or NOFMT (default)**

FORMAT designates a redisplay format for the field.

*fmt\_string*

A quoted format string that determines the format in which the field input will be displayed.

On numeric fields, *format\_string* follows the rules for Synergy DBL formatting. If you don't specify the FORMAT qualifier, numeric input is redisplayed, right-justified over blanks. When a redisplay format is defined and justification is not specified, the resulting format string is right-justified within the display field.

On alphanumeric fields, the FORMAT qualifier permits a special form, in which every "@" character is replaced by another character. This replacement is processed from left to right. For example, if the user enters **ab** and you have the format string

```
"The first two are @@"
```

you would get

**The first two are ab**

The system only looks at the leftmost characters and substitutes blanks. For example, if your field has a data type of **a3**, the fourth @ will be blank.

On both numeric and alpha fields, the size of the display field is the width of the input field or the maximum number of characters the format can generate, whichever is greater.

In the following example, the contents of the field will be displayed in the form \$XX,XXX.

```
.field amount, d5, fmt("$XX,XXX")
```

Thus, if the user enters **1234**, the resulting display would be "\$01,234".

If you specify any justification for the field, UI Toolkit will justify only within the display length.

See also ["JUSTIFY\(alignment\)" on page 2-67](#).

UI Toolkit supports the Repository format justification specification. Format justification defines how a format is truncated before being applied to a field. See ["Defining Field Formats"](#) in the "Working with Fields" chapter of the *Repository User's Guide* for more information.

NOFORMAT is the default state if neither FORMAT nor NOFORMAT is specified in the script or in the repository. If FORMAT has been specified in the repository, NOFORMAT cancels the field's format string. If you only wish to specify a different format string, use FORMAT with the new string.

### **HELP**(*help\_id*)

#### **NOHELP** (default)

HELP specifies a help identifier.

*help\_id*

The help identifier or argument.

*Help\_id* is used as an argument to the EHELP\_METHOD subroutine. If no EHELP\_METHOD subroutine is registered, *help\_id* will be passed to the UI Toolkit default help subroutine. (See [page 7-78](#) for more information on the EHELP\_METHOD subroutine and help processing.)

In the following example, **h\_name** is passed as an argument to the EHELP\_METHOD subroutine, if registered; otherwise, it's passed to UI Toolkit's default help routine.

```
.field name, a30, help(h_name)
```

NOHELP is the default state if neither of these qualifiers is specified in the script or in the repository. If HELP has been specified in the repository, NOHELP cancels the help identifier. If you only wish to specify a different help identifier, use HELP with the new identifier.

### **HIGHLIGHT**

#### **NOHIGHLIGHT** (default)

HIGHLIGHT specifies highlighted (or bolded) text. It is synonymous with BOLD.

For detailed information on HIGHLIGHT and other input field renditions, see [“Renditions” on page 2-46](#).

In the following example, the contents of the field are highlighted.

```
.field balance, d18.2, highlight
```

NOHIGHLIGHT is the default state if neither HIGHLIGHT not NOHIGHLIGHT is specified in the script or the repository. IF HIGHLIGHT has been specified in the repository, NOHIGHLIGHT cancels the highlighting. NOHIGHLIGHT is synonymous with NOBOLD.

### **HYPERLINK\_METHOD**(*hyperlink\_method*)

#### **NOHYPERLINK\_METHOD** (default)

HYPERLINK\_METHOD specifies a hyperlink method for the field. HYPERLINK\_METHOD is the name of the subroutine to invoke. On Windows, if an input field has a hyperlink method, when it is a member of an input set being processed by I\_INPUT, any prompt text associated with the field is highlighted. If you click the mouse button with the cursor on the highlighted text, the hyperlink prompt text method is invoked. In UNIX and OpenVMS environments, there is no hyperlink text, but instead an I\_HYPER menu entry triggers UI Toolkit to invoke the appropriate HYPERLINK\_METHOD.

```
.field field,...,hyperlink_method("mymethod")
```

NOHYPERLINK\_METHOD is the default state if neither HYPERLINK\_METHOD nor NOHYPERLINK\_METHOD is specified in the script or in the repository. If HYPERLINK\_METHOD has been specified in the repository, specifying NOHYPERLINK\_METHOD will override this setting and the hyperlink method will not be invoked.

## INCREMENT

INCREMENT designates that if the user does not enter a value the first time a numeric (**d** or **i**) field is processed, the last value in the field plus one will be used.

The following example increments the last value in the **ordnum** field by one (if the user doesn't enter a value).

```
.field ordnum, d5, increment
```

If you use INCREMENT, you should *not* use COPY, DECREMENT, or DEFAULT. These four qualifiers are mutually exclusive.

If INCREMENT has been specified in the repository, specifying NODEFAULT will cancel it. (See [page 2-56](#) for more information on NODEFAULT.)

## INFORMATION(*info\_string*)

### NOINFORMATION (default)

INFORMATION specifies a text string that is displayed on the information line when input is being processed for that field.

*info\_string*

The text string that will be displayed on the information line.

If *info\_string* is absent, the information line will not be modified. If you specify an *info\_string*, it will be displayed on the information line and then revert to the text it contained previously once input to the field is terminated.

In the following example, "Please enter your name" is displayed on the information line while the name field is processed.

```
.field name, a30, information("Please enter your name")
```

NOINFORMATION is the default state if neither INFORMATION nor NOINFORMATION is specified in the script or in the repository. If INFORMATION has been specified in the repository, NOINFORMATION cancels the information string. If you only wish to specify a different information string, use INFORMATION with the new string.

## **INPUT\_LENGTH(*input\_length*)**

### **NOINPUT\_LENGTH (default)**

INPUT\_LENGTH overrides Toolkit's default input length, which determines the maximum number of characters the user can enter in an input field. If there is a change method for the field, the input length determines how many characters will be passed to the change method.

#### *input\_length*

The maximum number of characters a user can enter in the field. This value can be from 0 to 65,535. If you set this to 0, the default input length is used.

Note the following:

- ▶ Input length cannot be specified for check box fields, radio buttons, selection fields (including fields with selection windows), or text fields (multi-dimensional alpha fields).
- ▶ If the input length is longer than the storage size, the additional characters may be ignored if there is no change method.

If you don't specify *input\_length*, it defaults to one of the following:

- ▶ For an alphanumeric or user-defined field, the default input length is the storage size of the field.
- ▶ For a decimal field, the default input length is the storage size plus 1 if a decimal point is allowed. If a negative value is allowed, another character is added.
- ▶ For an integer field, the default input length is 3 for an **i1**, 5 for an **i2**, 10 for an **i4**, or 20 for an **i8**. If a negative value is allowed, the length is increased by 1.
- ▶ For a date field, the default input length is determined by the date format. Period dates are 8. Short period dates are 5. Calendar (non-period) dates are 11. Short calendar dates are 8.
- ▶ For a time field, the default input length is determined by the time format. HHMM is 5. HHMM AMIPM is 8. HHMMSS is 8. HHMMSS AMIPM is 11.

NOINPUT\_LENGTH is the default state if neither INPUT\_LENGTH nor NOINPUT\_LENGTH is specified in the script or in the repository. If INPUT\_LENGTH has been specified in the repository, NOINPUT\_LENGTH cancels the input length setting.

For information on how input length works with other length settings for input fields, see [“Understanding display, input, and view lengths” on page 8-6](#).

**ITALIC****NOITALIC (default)**

ITALIC specifies italicized text on Windows and blinking text on UNIX and OpenVMS. It is synonymous with BLINK.

For detailed information on ITALIC and other input field renditions, see [“Renditions” on page 2-46](#).

In the following example, the contents of the field are italicized on Windows and blinking on UNIX or OpenVMS.

```
.field date_due, d8, italic
```

NOITALIC is the default state if neither ITALIC nor NOITALIC is specified in the script or repository. If ITALIC has been specified in the repository, NOITALIC cancels the italics. NOITALIC is synonymous with NOBLINK.

**JUSTIFY(*alignment*)****NOJUSTIFY (default)**

JUSTIFY determines whether the text in the field will be displayed left-justified, right-justified, or centered.

*alignment*

One of the following:

**LEFT**

**RIGHT**

**CENTER**

Restrictions and defaults for *alignment* depend on your field type:

- ▶ Numeric fields accept only RIGHT (default) or LEFT alignment.
- ▶ Text fields accept only LEFT alignment.
- ▶ Alpha fields accept all three types. LEFT is the default. (Note that leading spaces are not stripped from the data.)

The field defined in the following example will display left-justified text.

```
.field custno, d5, justify(left)
```

If you have formatted the display of the field (using the FORMAT qualifier), the justification is performed only within the length of the formatted display.

NOJUSTIFY is the default state if this category has not been specified in the script or in the repository. If JUSTIFY has been specified in the repository, NOJUSTIFY resets the justification to the field type default. If you only wish to change the justification alignment, use JUSTIFY with the new alignment.

### LEAVE\_METHOD(*leave\_method*)

#### NOLEAVE\_METHOD (default)

LEAVE\_METHOD specifies a post-input subroutine for the field. *Leave\_method* is the name of the subroutine to invoke. A leave method provides a much more reusable and encapsulated mechanism than break processing, which must be at each usage of a field.

```
.field field_spec, field_qualifiers, leave_method("mymethod")
```

NOLEAVE\_METHOD is the default state if neither LEAVE\_METHOD nor NOLEAVE\_METHOD is specified in the script or in the repository. If LEAVE\_METHOD has been specified in the repository, specifying NOLEAVE\_METHOD will override this setting and the LEAVE\_METHOD will not be invoked.

### MATCH(*option*[, *option*])

MATCH specifies whether the alpha field input must match the case of a specified allowable entry and/or match all characters in the entry (see the ALLOW qualifier).

#### *option*

One or both of the following:

|                 |                                                                                   |
|-----------------|-----------------------------------------------------------------------------------|
| <b>CASE</b> or  | Match case as well as characters.                                                 |
| <b>NOCASE</b>   | Do not match case as well as characters. (default)                                |
| <b>EXACT</b> or | Match the characters in the entry exactly for the number of characters specified. |
| <b>NOEXACT</b>  | Do not match the characters exactly. (default)                                    |

If CASE is set, the match will be case sensitive. The entry **no** will match with “no”, but will not match with “NO” or “No”. If the UPPER\_CASE\_ONLY or UC qualifier is specified, MATCH(CASE) is ignored.

If EXACT is not set, UI Toolkit will look for a match based on the shortest string. For example, if you are looking for a match with the entry **Ann**, a match will be acknowledged with “A”, “An” and “Ann”. However, if the entry is longer than **Ann** (for example, “Anne”), it will *not* be recognized as a match. EXACT mode means that input must match the allowed qualifier exactly for the full length of the input. If MATCH(EXACT) mode is set, **Ann** will only match with “Ann”.

CASE and EXACT are not mutually exclusive; you can use them together in any combination. For example, if MATCH(CASE, EXACT) mode is set, the entry **no** will only match with “no”, but if MATCH(CASE, NOEXACT) mode is set, “NO”, “n”, and “no way” will all match the entry **no**.

NOCASE is the default if neither CASE nor NOCASE is specified in the script or repository. If CASE has been specified in the repository, NOCASE cancels case sensitive matching for the field.

NOEXACT is the default state if neither EXACT nor NOEXACT is specified in the script or in the repository. If EXACT has been specified in the repository, NOEXACT cancels full-length matching for the field.

**NEGATIVE**(*/option*)**NONEGATIVE** (default)

NEGATIVE allows negative values on numeric type (**d** or **i**) fields.

*option*

(optional) One of the following:

**ALLOWED** Allows negative entries. (default)

**ONLY** Allows negative entries only.

**ORZERO** Allows negative or zero entries only.

If you specify the NEGATIVE qualifier, a negative or minus sign (–) can be placed either before or after the numeric value. This qualifier causes the size of the input field to be one character larger than the size of the data field. For example, if negative were specified on a **d8** field, nine input characters would be allowed.

In the following example, the **credit** field can contain a negative value and allows a total of eight input characters (seven digits and a minus sign):

```
.field credit, d7, negative
```

NONEGATIVE is the default state if neither NEGATIVE nor NONEGATIVE is specified in the script or in the repository. However, if NEGATIVE has been specified in the repository, NONEGATIVE will override it and enable the input of non-negative values only.

**NODECIMAL or NODECIMAL\_REQUIRED****DECIMAL\_REQUIRED** (default)

NODECIMAL indicates that the user does not need to type a decimal point when placing input in a **d** type field. The input is stored right-justified, with the number of decimal places inferred from the storage format. In the following example, an entry of **55** will be interpreted as “.55”:

```
.field amount, d7.2, nodecimal
```

Note that an entry of **55** in the following example (which does not specify the NODECIMAL qualifier) will be interpreted as “55.00”:

```
.field amount, d7.2
```

An explicit decimal point overrides the NODECIMAL qualifier. For example, an entry of **12.34** always yields a result of “12.34”, even if the NODECIMAL qualifier is present.

DECIMAL\_REQUIRED is the default state if neither DECIMAL\_REQUIRED nor NODECIMAL is specified in the script or in the repository. If NODECIMAL has been specified in the repository, specifying DECIMAL\_REQUIRED cancels it and aligns the numeric value based on an entered decimal point only.

## **NOECHO**(*[display\_character]*)

### **ECHO** (default)

NOECHO prevents the text entered by the user from being displayed in the field.

*display\_character*

(optional) A character to be displayed for every character typed.

The *display\_character* also fills in any remaining spaces at the end of the input after the user presses ENTER, so others can't see how many characters were entered. The default is no character and no cursor movement.

NOECHO has the following restrictions:

- ▶ It can only be used for alpha fields.
- ▶ You cannot use “E\_” entries (field editing menu entries) on fields that have NOECHO.
- ▶ REQUIRED is the only validation allowed. (See [page 2-75](#) for more information on the REQUIRED qualifier.)

The following example defines a password field in which an asterisk (\*) is displayed for every character the user types. The typed characters themselves are not echoed in the input field.

```
.field password, a10, noecho(*), pos(1,1), prompt("Password:")
```

ECHO is the default state if neither NOECHO nor ECHO has been specified in the script or in the repository. If NOECHO has been specified in the repository, ECHO will cancel it and leave echo on for field input. To cancel or override the character specified with NOECHO, use the NOECHO qualifier with another character or no character specified.

## **NOTERM**

### **TERM** (default)

NOTERM automatically terminates the field when the field is full so the user doesn't have to press ENTER. For example, if you type **555-1079** into the **acctnum** field defined below, it would be equivalent to typing **555-1079** and pressing ENTER without NOTERM. (You can still terminate a NOTERM field by pressing ENTER before it is full.)

```
.field acctnum, a8, noterm
```

TERM requires the user to press ENTER to terminate field input. If a field is full and the user tries to enter more characters, the terminal bell is rung for each extra character typed.

TERM is the default state if neither one of these qualifiers is specified in the script or in the repository. If NOTERM is specified in the repository, specifying TERM will override it, requiring the user to press ENTER to end input.

## **WIN**

---

NOTERM is *not* supported on Windows.

---



**PAINT(*character*)****NOPAINT (default)**

PAINT specifies a character that “paints” the empty field to indicate where the user types input.

*character*

The paint character for the field.

This character overrides any paint character designated by the .PAINT command.

With the following example, when the field is empty, it will be painted with the “#” character to indicate where the user should type input. (When input processing begins, the field is blanked.)

```
.field amount, d7, paint(#)
```

NOPAINT is the default state if neither of these qualifiers is specified in the script or in the repository. If PAINT has been specified in the repository, NOPAINT resets the field to the default paint character (which is a space).

---

**WIN**

Paint characters specified by .FIELD PAINT or .PAINT have no meaning in a Windows environment.

---

**POSITION(/CHANGE, *row*, *column*)****NOPOSITION (default)**

POSITION specifies either a specific position or the number of rows and columns that the current position will change.

**CHANGE**

(optional) Designates that POSITION is a degree of movement rather than an actual position. A CHANGE value can be positive or negative.

*row*

Either a row position or the number of rows that the current position will move.

*column*

Either a column position or the number of columns that the current position will move.

If explicit positioning is not specified, UI Toolkit will automatically update the position to follow any field or text that was specified immediately before this command.

If there is no prompt defined (see the PROMPT qualifier section), the input field begins at the specified position. If a prompt is defined, the prompt begins at the specified position.

In the following example, the prompt begins at row 12, column 10, and the **name** field immediately follows the prompt (at row 12, column 15).

```
.field name, a30, position(12, 10), prompt("Name ")
```

In the next example, the **name** field will move 2 rows down from its current position but will stay in its current column.

```
.field name, a30, position(change, 2, 0)
```

NOPOSITION is the default state if neither POSITION nor NOPOSITION is specified in the script or in the repository. However if POSITION has been specified in the repository, NOPOSITION resets the position of the prompt to default to the next character available rather than the position specified in the repository.

### **PROMPT(prompt)**

#### **NOPROMPT (default)**

PROMPT provides a fixed (static) or variable (dynamic) prompt to the user for input.

*prompt*

The prompt for input.

With a fixed prompt, *prompt* is a quoted string that must include any desired spacing between the prompt and the input. Fixed prompts may be modified at runtime using I\_PROMPT. With a variable prompt, *prompt* is a number that specifies the length of the variable prompt. The I\_PROMPT subroutine uses this length to set the variable prompt.

If you do not use the FIELD\_POSITION qualifier, field input will immediately follow the prompt. Your prompt must include any desired spacing between the prompt and the input.

The following example defines a fixed prompt that prompts the user for a name:

```
.field name, a30, prompt("Name  ")
```

The following example defines a variable prompt that can be up to 20 characters long:

```
.field name, a30, prompt(20)
```

NOPROMPT is the default state if this category is not specified in the script or in the repository. If PROMPT has been specified in the repository, NOPROMPT will cancel it. If you only wish to specify a new input prompt, use PROMPT with the desired parameter.

### **PROMPTFONT(palette\_name)**

#### **NOPROMPTFONT (default)**

PROMPTFONT specifies a font for a prompt.

*palette\_name*

The name of a font palette entry.

*Palette\_name* must be known at runtime or a default font will be used. See [“Using Fonts on Windows” on page 18-46](#) for more information on font palettes.

Although the PROMPTFONT qualifier has no visual effect on UNIX and OpenVMS systems, it is preserved with the window definition so that the same window library can be used for both non-Windows and Windows systems.

Specifying a prompt font with the PROMPTFONT qualifier overrides any default font that would have been used for the prompt. Specifying NOPROMPTFONT indicates that the default font for the prompt is to be used.

If a prompt is not specified for the field, any prompt font specified will be ignored.

See also [.FONT on page 2-88](#) for more information about specifying a window's font, and see the documentation for the FONT qualifier on [page 2-62](#) for more information about specifying a prompt's font.

The following example specifies "my\_prompt\_font" for field **inpfld**.

```
.field inpfld, a30, prompt("Name"), promptfont(my_prompt_font)
```

NOPROMPTFONT is the default state if neither PROMPTFONT nor NOPROMPTFONT is specified in the script or in the repository. If PROMPTFONT has been specified in the repository, NOPROMPTFONT cancels the field's font and the uses window's font instead.

## RADIO

### NORADIO (default)

If you use the RADIO qualifier with either SELWND or SELECT on Windows, the field will be a group of radio buttons. Radio buttons are a form of selection window, where each entry becomes a radio button, and the text for each entry is displayed to the right of the radio button. Note the following:

- ▶ All radio buttons for a field receive focus as a single field. Pressing TAB, SHIFT+TAB, or RETURN, or clicking on another field advances focus to the next field.
- ▶ If you use the SELECT qualifier with RADIO, radio buttons are placed vertically in a single column unless you pass the *height* argument for SELECT. If you pass *height*, this argument determines how many radio buttons a column can hold. For example, if you pass *height* as 3 and there are eight radio buttons, there will be three columns: the first and second columns will have three radio buttons, and the third column will have two radio buttons.
- ▶ If you use the SELWND qualifier with RADIO, the height of the associated selection window determines how many radio buttons can fit in a column. For example, if the selection window is only one row high, the buttons will be placed horizontally; there will be only one button per column. If the selection window is three rows high and there are five radio buttons, the first column will have three radio buttons, and the second will have two.
- ▶ If a font is not specified for the field, the default prompt font will be used for the radio button's selection entry text.
- ▶ NORADIO is the default state if neither RADIO nor NORADIO is specified in the script or in the repository. If RADIO has been specified in the repository, specifying NORADIO will override this setting and the field will not be displayed as a set of radio buttons.

- ▶ Make sure radio buttons do not overlap other controls or extend beyond the limits of the containing window. Toolkit does not limit radio button placement.
- ▶ Specifying RADIO in a UNIX or OpenVMS environment has no effect.

For information on creating an input window with radio buttons at runtime, see the Discussion for IB\_FIELD on [page 8-104](#).

Composer can also be used to create radio buttons. Refer to the “[Designing Your User Interface](#)” chapter of *Getting Started with Synergy/DE* for more information on Composer.

For information on how radio button fields are validated, see the documentation for the SELECT qualifier on [page 2-76](#).

You can use the selection subroutines with radio buttons to load new selections, get or set a default, and so forth. For example, to make a change to a radio button set (add a button, remove a button, etc.), use S\_SELLD to reload the associated selection window with a different set of selections. See [S\\_SELLD on page 12-18](#) for information.

You can retrieve the selection window ID with I\_FLDINF. See [I\\_FLDINF on page 8-24](#).

### **RANGE(minimum, maximum)**

#### **NORANGE (default)**

RANGE defines the minimum and maximum values for a numeric (**d** or **i**) field.

*minimum*

The minimum input value.

*maximum*

The maximum input value.

For date and time fields, the minimum and maximum values must be specified in field storage format, rather than the field input or display format. Also note that the minimum and maximum values will not be validated for date and time fields; they will only be compared with the resulting value from the user’s input.

The following example defines a minimum value of 1 and a maximum value of 100.

```
.field amount, d3, range(1, 100)
```

NORANGE is the default state if neither of these qualifiers is specified in the script or in the repository. If RANGE has been specified in the repository, NORANGE cancels range checking for the field. If you only wish to specify new range parameters, use RANGE with the new parameters.

**READONLY****NOREADONLY (default)**

READONLY renders the field read-only.

Only edit controls can be rendered read-only. Selection window, radio button, and check box fields that specify the READONLY qualifier will generate an error when compiled by script or when read into Composer.

Like disabled fields, the contents of a read-only field cannot be modified. Unlike a disabled field, a read-only field is able to receive focus. On Windows, the field's contents can be highlighted for the purpose of copying it to the clipboard. On Windows, the field will use the "3D face" color for its background, and "window text" color for the text. Typically, this is black on dark gray. This rendition can be modified by using U\_REND but cannot be modified using U\_MODREND. See [page 16-121](#) for more information on the U\_REND subroutine and processing display renditions.

Read-only fields within an ActiveX Toolkit list are rendered the same as disabled fields.

```
.field description, 3a50, readonly
```

**REQUIRED****NOREQUIRED (default)**

REQUIRED specifies that a non-blank alpha or non-zero numeric entry is required in the field. For example, **custno** doesn't enable an entry of 0.

```
.field custno, d6, required
```

You can enable the user to temporarily exit from a required field. If the first keystroke in the field is a menu entry that causes an exit from the field, no validation will be done by the input processor.

However, the user will still be required to enter data into all required fields before completing the input set.

NOREQUIRED is the default state if neither REQUIRED nor NOREQUIRED is specified in the script or in the repository. However if REQUIRED has been specified in the repository, specifying NOREQUIRED overrides it and enables the user to skip this field or enter a zero.

**RETAIN\_POSITION****NORETAIN\_POSITION (default)**

RETAIN\_POSITION is allowed only for text fields. It enables the user to leave and then return to the text field, retaining the current position until the field is re-initialized or redisplayed.

NORETAIN\_POSITION is the default state if neither RETAIN\_POSITION nor NORETAIN\_POSITION is specified in the script or in the repository. However if RETAIN\_POSITION has been specified in the repository, specifying NORETAIN\_POSITION overrides it.

## **REVERSE**

### **NOREVERSE (default)**

REVERSE specifies reversed text.

For detailed information on REVERSE and other input field renditions, see [“Renditions” on page 2-46](#).

In the following example, the contents of the field are in reverse video.

```
.field description, 4a60, reverse
```

NOREVERSE is the default state if neither REVERSE nor NOREVERSE is specified in the script or in the repository. If REVERSE has been specified in the repository, NOREVERSE cancels the reversing.

## **SELECT(*srow*, *scolumn*, [*height*], *entry*[, ...])**

### **NOSELECT (default)**

SELECT defines a selection window by specifying the position where the window is placed on the screen and designating one or more text entries. Up to 100 text entries may be specified.

*srow*

The row at which the upper-left corner of the selection window will be placed, relative to the beginning of the field.

*scolumn*

The column at which the upper-left corner of the selection window will be placed, relative to the beginning of the field.

*height*

(optional) The maximum number of rows in the selection window (or the maximum number of radio buttons placed in a column if you also use the RADIO qualifier). Specifying a *height* of zero is the same as omitting *height*.

*entry*

A text entry in the selection window.

Data on UNIX and OpenVMS and radio buttons on Windows are organized first by column, top to bottom, and then left to right. For example, if *height* is **3** and there are eight entries or radio buttons, the window will contain three columns with three entries or radio buttons in the first, three in the second, and two in the third. If *height* is not specified, the height of the window is the number of entries or radio buttons in a column.

---

**WIN**

*Srow* and *scolumn* have no meaning on Windows and are ignored.

On Windows, fields associated with selection windows use native Windows combo boxes (unless you specify the RADIO qualifier). Combo boxes combine the field edit control with an arrow box. Clicking on the arrow or anywhere within the field will drop down the combo box. The combo box arrow is only displayed when the input set containing the field is active. If the *height* of the selection window is less than the number of entries it contains, the drop-down list will display *height* number of entries and a scroll bar.

If you specify the RADIO qualifier with SELECT, the field will be a group of radio buttons. These buttons are placed vertically in a single column unless you pass the *height* argument for SELECT. If you pass *height*, this argument determines how many radio buttons can fit in a single column. For example, if there are three radio buttons and *height* is passed as 1, there will be three columns with one radio button in each. (In other words, the buttons are placed horizontally.) If, however, there are eight radio buttons and *height* is passed as 3, there will be three radio buttons in the first column, three in the second, and two in the third. For more information on radio buttons, see the documentation for the RADIO/NORADIO qualifier on [page 2-73](#).

Highlighting an entry in a combo box or selecting a radio button does not, by default, cause the field to be immediately validated. Until the field loses focus, no Toolkit validation tests or change method occurs. Likewise, no leave or arrive methods will be invoked until focus is lost. In order for a field to be immediately validated, the D\_VALSTCHG option of E\_STATE needs to be set. See [page 7-45](#) for more information on the E\_STATE environment subroutine and the D\_VALSTCHG option.

If the user selects an entry by dropping down the combo box's list, focus moves to the next field by default. If the user selects an entry without dropping down the combo box's list, focus will remain on the combo box. To always maintain focus on the combo box set after a selection is made, turn off the D\_CBADVANCE option of E\_STATE.

---

The following example defines a selection window with a maximum height of two rows and the text entries "yes" and "no." The upper-left corner of the selection window will be placed at row 1 and column 2, relative to the beginning of the field.

```
.field yesno, a3, select(1, 2, 2, yes, no)
```

NOSELECT is the default state if neither SELECT nor NOSELECT has been specified in the script or in the repository. If SELECT has been specified in the repository, NOSELECT cancels the selection window associated with the field. If you only wish to specify different parameters for the selection window, use SELECT with the new parameters.

You can use the selection subroutine to load new selections, get or set a default, and so forth. See [chapter 12, "Selection Routines,"](#) for details.

**SELWND**(*srow*, *scolumn*, *window*)

**NOSELWND** (default)

SELWND specifies a selection window to be placed on the screen.

*srow*

The screen row at which the upper-left corner of the selection window will be placed, relative to the beginning of the field.

*scolumn*

The screen column at which the upper-left corner of the selection window will be placed, relative to the beginning of the field.

*window*

The name of a selection window.

SELWND is similar to SELECT, except the selection window already exists. The window must either reside in the same window library or be created during runtime (using the S\_SELBLD subroutine) before the input window is loaded.

---

## WIN

If you use the SELWND qualifier on Windows, the field will be either a native Windows combo box or, if you also specify RADIO, a group of radio buttons. If you use SELWND and RADIO, the height of the selection window determines the maximum number of radio buttons that can fit in a column. For example, if the window is two rows high and there are five radio buttons, the first column will have two radio buttons, the second column will have two, and the third column will have one. You can control spacing between radio button columns by changing the column width for the selection window. This spacing is calculated by adding the width of the radio button to the width of a column in the selection window (which is equal to the number of characters times the character width for the font).

See the Windows-specific information for the SELECT/NOSELECT qualifier on [page 2-76](#) for more information on native Windows combo boxes and radio buttons.

---

The following example specifies that the **yesno** selection window's upper-left corner will be placed at row 1, column 2, relative to the beginning of the field.

```
.field yesno, a3, selwnd(1, 2, yesno)
```

NOSELWND is the default state if neither SELWND nor NOSELWND is specified in the script or in the repository. However, if SELWND has been specified in the repository, NOSELWND cancels the association between the pre-built selection window and the field. If you only want to specify different parameters for this category, use SELWND with the new parameters.



**TIME([AMPM]/, NOW)**

**NOTIME (default)**

TIME enables you to process times.

**AMPM**

(optional) Specifies that the display form will be 12-hour time, followed by an AM or PM indicator.

**NOW**

(optional) Defaults the time to the current system time if the user presses ENTER without entering a time.

You can use this qualifier only on **d4**, **d6** (or greater), **i2**, or **i4** fields; fields of any other size will generate an error. The input for a time is either numeric or delimited.

The size of the field defines the way the time is stored as the following table indicates:

| Time Formats for Field Sizes |             |                      |
|------------------------------|-------------|----------------------|
| Size                         | Time format | Meaning              |
| <b>d4</b> field              | HHMM        | Hour and minute      |
| <b>d6</b> field              | HHMMSS      | Hour, minute, second |
| <b>i2</b> field              | HHMM        | Hour and minute      |
| <b>i4</b> field              | HHMMSS      | Hour, minute, second |

The size used for the hour will be extended if a field larger than **d6** is used.

For numeric input

- ▶ if one or two digits are entered, it is considered to be the hour.
- ▶ if three or four digits are entered, it is considered to be the hour and minute. The rightmost two digits will be the minute, and the leftmost one or two digits will be the hour.
- ▶ if five or more digits are entered, it is considered to be the hour, minute, and second. The rightmost two digits will be the second, the next two digits are the minute, and the leftmost one or two digits are the hour.

When the input string is delimited, if any component of the time is missing that part will be assumed to be zero. If one of the non-numeric components is the post-meridian indicator, twelve hours will be added to the time specified.

If NOW is present and the user presses ENTER on a blank time field, it will default to the current system time.

If AMPM is present, the display form will be 12-hour time, followed by the AM or PM meridian indicator. The meridian indicators are defined in the UI Toolkit text message file as DTK\_AM and DTK\_PM and can therefore be modified. The meridian indicators are not case sensitive and may be abbreviated. Defaults for the meridian indicators are “AM” and “PM.”

The global field **g\_time\_sep** in **tkctl.def** specifies the character that will separate parts of the time on redisplay. It is initialized to a colon (:) by U\_START.

In the following example, if the user enters **1545**, the time will be displayed as “3:45 PM”, and stored as **154500**.

```
.field shiptime, d6, time(ampm)
```

The next example defaults the time in the **ordtime** field to the current system time if the user presses ENTER without entering anything into the field. The time is stored in the form *HHMMSS*.

```
.field ordtime, d6, time(now)
```

NOTIME is the default state if neither TIME nor NOTIME is specified in the script or in the repository. However, if TIME has been specified in the repository, NOTIME resets the repository field to a normal decimal field. To override either of the time qualifiers (NOW, AMPM), specify TIME without the qualifier(s) you want to override.

## **TIMESTAMP(/AMPM//, SHORT/)**

### **NOTIMESTAMP**

TIMESTAMP creates a read-only 8-byte integer field that corresponds to a timestamp key in an ISAM file. (See “[Keys in ISAM files](#)” in the “Synergy DBMS” chapter of *Synergy Tools*.)

### **AMPM**

(optional) Sets the display format to use 12-hour notation with an AM/PM designation preceded by a space. (AM and PM designators are set by DTK facility entries in **syntxt.ism**.)

### **SHORT**

(optional) Sets the display format to a short form that omits the following: the century portion of the year, the seconds value and its separator, and the milliseconds value and the period (.) that precedes it.

By default, fields drawn from repository autotime fields become timestamp fields in the window library. You can, however, use

- ▶ NOTIMESTAMP to create a standard integer field from a repository autotime field.
- ▶ TIMESTAMP to create a timestamp field without drawing it from a repository autotime field.
- ▶ AMPM and SHORT with TIMESTAMP to change the display format for a timestamp field drawn from a repository autotime field.

Note that an error will occur if you use TIMESTAMP with a field that is set to anything but a read-only 8-byte integer, or if the field is set to be a selection field, a radio button set, or a check box.

The default display format for a timestamp field consists of a date and a time separated by a space. For example:

12/31/2013 23:59:59.999999

The date portion consists of two-digit numbers for month and day and a four-digit number for year. (Two digits are used for the year if SHORT is specified.) The **g\_date\_order** setting defines the order of date components (month, day, year), and **g\_date\_sep** defines the separator for date components (see “[tkctl.def](#)” on page 18-2).

The time consists of an hour value (1 to 24, unless AMPM is specified), a minute value, a seconds value, and a six-digit microseconds value. The separator for hour, minutes, and seconds is defined by **g\_time\_sep** (see “[tkctl.def](#)” on page 18-2), and a period (.) precedes the microseconds value.

| Qualifier(s)<br>in effect | Default display length<br>and view length <sup>a</sup> | Example                       |
|---------------------------|--------------------------------------------------------|-------------------------------|
| <i>none</i>               | 26                                                     | 12/31/2013 23:59:59.999999    |
| AMPM                      | 29                                                     | 12/31/2013 11:59:59.999999 PM |
| SHORT                     | 14                                                     | 12/31/13 23:59                |
| AMPM and SHORT            | 17                                                     | 12/31/13 11:59 PM             |

a. Lengths are based on two-character AM and PM designators.

Timestamp fields are right-justified by default, though justification has an effect only if the month or hour requires one digit, or if the display length has been changed from the default.

You can change the display format by setting the view length, display length, or justification for the field, and you can use an IDISPLAY\_METHOD method to set up a different display format.

**UNDERLINE**  
**NOUNDERLINE (default)**

UNDERLINE specifies underlined text.

For detailed information on UNDERLINE and other input field renditions, see “[Renditions](#)” on [page 2-46](#).

In the following example, the contents of the field are underlined.

.field contact, a30, underline

NOUNDERLINE is the default state if neither UNDERLINE nor NOUNDERLINE is specified in the script or in the repository. If UNDERLINE has been specified in the repository, NOUNDERLINE cancels the underlining.

### **UPPER\_CASE\_ONLY or UC**

#### **NOUPPER\_CASE\_ONLY or NOUC or LOWER\_CASE\_ALLOWED (default)**

UPPER\_CASE\_ONLY converts lowercase input characters to uppercase on alpha fields. All input will be displayed in uppercase. In the following example, all entries in the **state** field will be displayed in uppercase.

```
.field state, a2, uc
```

Note that only input is uppercased. If your program loads data directly into this field, you must uppercase that data.

NOUPPER\_CASE\_ONLY is the default state if neither of these qualifiers is specified in the script or in the repository. If UPPER\_CASE\_ONLY has been specified in the repository, NOUPPER\_CASE\_ONLY will cancel it and enable lowercase input.

### **USER({*user\_text*}[*, user\_type*])**

#### **NOUSER (default)**

USER enables you to associate a user-defined text string with input fields and/or validate a data type that you've defined.

*user\_text*

(optional if *user\_type* is specified) The text to be stored.

*user\_type*

(optional if *user\_text* is specified) A string that represents the user-defined data type.

Either *user\_text* or *user\_type* (or both) must be specified.

You can access *user\_text* at runtime with the I\_USER subroutine.

The size of the *user\_text* is fixed by the size of the string used during the window's compilation; writing data out to the string won't change the size of the string. The maximum size of *user\_text* is 80 characters.

The *user\_type* argument is available only on alpha fields. It flags the runtime input processor to call the ECHKFLD\_METHOD (for extra input validation), EDSPFLD\_METHOD (for display), and EEDTDSP\_METHOD (for editing) subroutines. *User\_type* is passed to EDSPFLD\_METHOD, ECHKFLD\_METHOD, and EEDTDSP\_METHOD to be used as a control code. The maximum size of *user\_type* is 30 characters.

For example, you might want to define a zip code data type and a phone number data type. If the zip code type is "**ZIP\_TYPE**", then a *user\_type* specified as "**ZIP\_TYPE**" will indicate that you want to check the zip code. To check your user-defined data type, you must write the ECHKFLD\_METHOD and EDSPFLD\_METHOD subroutines. (If you choose to use the EEDTDSP\_METHOD or %IEDITFMT\_METHOD routines, you will need to write them as well.) If ECHKFLD\_METHOD is not specified, your code will still run but UI Toolkit will bypass user-defined data type checking. (See "[Environment Routines](#)" on page 7-1 for more information about ECHKFLD\_METHOD, EDSPFLD\_METHOD, and EEDTDSP\_METHOD.)

In the following example, the string “This can contain whatever you want” is associated with the **name** field.

```
.field name, a30, user("This can contain whatever you want")
```

The following sample window script includes a user-defined zip code data type. It assumes that the subroutines ECHKFLD\_METHOD and EDSPFLD\_METHOD will control the zip code input validation and display format.

```
.input mail, 1, 17
.placement 5, 29
.title " Zip Test "
.field zip, a9, pos(1,2), prompt("Zip"), user(, "ZIP_TYPE"), uc
.end
```

NOUSER is the default state if neither USER nor NOUSER is specified in the script or in the repository. If USER has been specified in the repository, NOUSER cancels both the user-text and user-defined data type specified in the repository. To cancel only one, you must specify USER with the correct parameters.

### **VIEW\_LENGTH**(*view\_length*)

#### **NOVIEW\_LENGTH** (default)

VIEW\_LENGTH overrides Toolkit’s default view length. View length determines the width of the field—i.e., the width of the area on the screen that will display data for the field. Note that view lengths cannot be specified for check box fields or radio buttons.

#### *view\_length*

The number of characters used to determine the width of the field. This number can be any value from 0 through 9,999, as long as it doesn’t extend the field beyond the window border. If you set this to 0, the default view length is used.

On Windows, if the view length is less than the field’s display length, the field is scrollable. For text fields (multi-dimensional alpha fields), this doesn’t affect the number of lines, just the width of each line. You can scroll through all displayed characters and delete any displayed character, no matter what the input length. (However, you can enter a character only when there are fewer characters than the limit imposed by the input length.)



On UNIX and OpenVMS, if the view length is less than the field’s display length, the contents of a field will be truncated to the view length if you move the cursor in the field or modify the contents of the field.

---

If you specify an explicit view length on Windows, the width of the field is computed by multiplying the view length value by the width of the sizing character for the font used by the field. (If the font is changed, the field’s width is adjusted.) On UNIX and OpenVMS, the width is set to the number of characters specified by *view\_length*.

If you specify an explicit view length for a field in an ActiveX list, this setting overrides input and display lengths, but may be extended by the length of a header, a footer, or another field that occupies the same column in a multi-line item. A view length may also be overridden by dragging column borders or by a call to `SetColumnWidth`, a published method for ActiveX Toolkit lists.

If you don't set an explicit view length, the default is the greater of display length or input length.



If no explicit view length is in effect, a value of 0 is returned in **gs\_viewlen**. This is unlike **gs\_dsplen** and **gs\_inplen**, which always return display length and input length settings, whether you set them or the defaults are in effect. (**Gs\_viewlen**, **gs\_dsplen**, and **gs\_inplen** are members of the **gs\_inpfld** record returned by `I_FLDINF`.)

---

For information on how view length works with other length settings for input fields, see [“Understanding display, input, and view lengths” on page 8-6](#).

`NOVIEW_LENGTH` is the default state if neither `VIEW_LENGTH` nor `NOVIEW_LENGTH` is specified in the script or in the repository. If `VIEW_LENGTH` has been specified in the repository, `NOVIEW_LENGTH` cancels the view length setting.

### **WAIT**(*wait\_time*)

`WAIT` specifies an input time-out. Unless you specify a different time-out setting, Toolkit uses the **g\_wait\_time** setting, which by default instructs Toolkit to wait until I/O processing is complete (i.e., no time-out) before returning to the calling routine. (See [“g\\_wait\\_time” on page 18-6](#).) If a time-out is set and the user doesn't complete input within the specified time, **g\_select** is set to true, and **g\_entnam** is set to the entry name set with **g\_time\_entry**, which is defined in `tkctl.def`. The default value for **g\_time\_entry** is “O\_TIMEOUT” (see [“g\\_time\\_entry” on page 18-5](#)).

*wait\_time*

One of the following:

|                  |                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------|
| <b>IMMEDIATE</b> | Time out immediately. With this setting the user will be unable to enter data in the field.         |
| <b>FOREVER</b>   | Wait until I/O processing is completed.                                                             |
| <b>GLOBAL</b>    | Use the globally specified time-out ( <b>g_wait_time</b> ).                                         |
| <i>n</i>         | Wait up to <i>n</i> seconds (where <i>n</i> is a positive value) for I/O processing to be complete. |

Note the following:

- ▶ On UNIX and OpenVMS, the time-out is reset after the user presses the first keystroke in an input field. For instance, if you have a 60 second time-out on a field, and after 30 seconds the user presses a key, the user has an additional 60 seconds to complete input. Subsequent keystrokes, however, do not reset the time-out.
- ▶ On Windows, the time-out is not reset by keystrokes. Additionally, no time-out will occur while a menu is dropped down or when the application is otherwise suspended (as when a message window is open). When the application continues, the time-out occurs as soon as the application can process the message from the system.

## .FILL – Define the fill character



`.FILL string [, rendition, ...]`

### Arguments

*string*

A quoted string that will fill the window.

*rendition*

(optional) One or more of the following display renditions:

|                               |                                                                                                                                      |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>BLINK   ITALIC</b>         | Blinking (on UNIX and OpenVMS) or italic (on Windows).                                                                               |
| <b>NOBLINK   NOITALIC</b>     | Not blinking (on UNIX and OpenVMS) or not italic (on Windows). (default)                                                             |
| <b>BOLD</b>                   | Highlighted (or boldfaced).                                                                                                          |
| <b>NOBOLD</b>                 | Not highlighted (or boldfaced). (default)                                                                                            |
| <b>COLOR(<i>palette#</i>)</b> | Assign specified <i>palette#</i> , where <i>palette#</i> is a palette number in the range 1 to 16. The default <i>palette#</i> is 1. |
| <b>HIGHLIGHT</b>              | Highlighted (or boldfaced).                                                                                                          |
| <b>NOHIGHLIGHT</b>            | Not highlighted (or boldfaced). (default)                                                                                            |
| <b>REVERSE</b>                | Reverse video.                                                                                                                       |
| <b>NOREVERSE</b>              | Normal video. (default)                                                                                                              |
| <b>UNDERLINE</b>              | Underlined.                                                                                                                          |
| <b>NOUNDERLINE</b>            | Not underlined. (default)                                                                                                            |

### Discussion

The `.FILL` command defines a string to fill the entire window as well as default renditions for the window and every object on the window. Because you will normally want any input to be placed over the filled background, you should use this command at the beginning of your window definition before any other text is loaded. If you process input before filling the window, the fill string will overwrite the entire window.

---

#### WIN

When used within an input window that contains buttons, *string* and *rendition* (with the exception of `COLOR`) will not extend into the area added onto the window to accommodate the buttons.

---



## See also

[“Renditions” on page 2-46](#) for information on how field-level renditions override window-level renditions.

## Examples

The following example fills the window with blanks and sets the default attribute to reverse.

```
.fill " ", reverse
```

## .FONT – Specify the font for a window



`.FONT palette_name`

### Arguments

*palette\_name*

The name of a font palette entry.

### Discussion

The `.FONT` command allows a font to be specified for a general window, input window, or selection window.

Specifying a proportional font for a window causes the window to be sized according to the metrics of that font. Objects are positioned according to rows and columns based upon the metrics of that font, taking into consideration the sizing character — for example, a capital “W” represents a wider cell size than a lowercase “a” — and the existing leading calculations.

If a proportional font is specified, objects in the window that do not support proportional fonts may not display as expected. See [“Using Fonts on Windows” on page 18-46](#) for more information.

Although the `.FONT` command has no visual effect on UNIX and OpenVMS systems, it is preserved with the window definition so that the same window library can be used for both non-Windows and Windows systems.

### See also

- ▶ [D\\_SETWNDFONT on page 16-242](#) and [D\\_GETWNDFONT on page 16-237](#) for more information on modifying and retrieving a window’s font at runtime. (`D_SETWNDFONT` and `D_GETWNDFONT` are subfunctions of `%U_WNDFONT`.)
- ▶ The documentation for the `FONT` qualifier on [page 2-62](#) and for the `PROMPTFONT` qualifier on [page 2-72](#) if you need to specify a field or prompt font, respectively. (`FONT` and `PROMPTFONT` are qualifiers for `.FIELD`.)

### Examples

This example uses “`my_input_font`” for the window **inpwnd**.

```
.input inpwnd  
.font my_input_font
```

## .INPUT – Begin an input window definition



`.INPUT` *name, rows, columns*

### Arguments

*name*

The name of the input window (a maximum of 15 characters).

*rows*

The number of rows in the window.

*columns*

The number of columns in the window.

### Discussion

The `.INPUT` command defines the name and size of an input window and marks the beginning of the input window definition.

*Name* must be a unique window name within the window library.

If you use `.PLACEMENT`, *rows* and *columns* must be set to values that enable the input window to fit in the application window, unless you first use `.DISPLAY_AREA`. (You can use `.DISPLAY_AREA` to make a display area that fits in the application window, even if the input window doesn't. See [.DISPLAY\\_AREA on page 2-26](#).) The `.PLACEMENT` command causes Script to logically place the input window, which in turn causes Script to determine whether the input window will fit in the application window. (See [.PLACEMENT on page 2-105](#).)

### Examples

The following examples show the beginning of two input window definitions: **cusinf** and **realbig**. **Cusinf** is 12 rows by 40 columns, while **realbig** is 48 rows by 78 columns.

```
.input cusinf, 12, 40  
.input realbig, 48, 78
```

## .ITEM – Define a selection window entry



```
.ITEM text [, justification][, DEFAULT][, SELECT (character) ]
```

### Arguments

*text*

An alphanumeric or quoted string that contains the text of the selectable entry.

*justification*

(optional) Designates how the entry text is aligned within the selection window column.

**LEFT**                      Align the left side. (default)

**RIGHT**                    Align the right side.

**CENTERED**                Center the entry text.

**DEFAULT**

(optional) Specifies that this entry will be the default entry for the selection window.

**SELECT**

(optional) Specifies that the quick-select character follows.

*character*

A single, printable quick-select character.

### Discussion

The .ITEM command creates an entry in a selection window.

Entries are loaded into a selection window in the order specified, along with any intervening .TEXT, .BLANK, and .LINE entries.

The specified *text* is returned if the entry is selected either during input processing or through S\_SELECT. UI Toolkit also adds leading and trailing blanks to the display but doesn't consider those blanks part of the entry.

You can use the S\_SELECTCB and S\_UPDATECB subroutines to process “check box” type selection windows. See [“Creating a check box selection window” on page 12-4](#) for information on designing check box selection windows. If you want your selection window to show a check mark to the left of the item selected, make sure the first character of *text* is a blank space. This space will be used for the check mark.

The default justification for entries is LEFT. When you select an entry that is right-justified or centered, any leading blanks are included in the returned entry.

---

**WIN**

In Windows environments, you should always use LEFT justification for selection items. RIGHT and CENTERED will not operate as expected because Windows uses a proportional font, rather than a fixed font, for selection window text.

---

You can specify the DEFAULT option for only one entry. The default entry can be changed or overridden by

- ▶ the .FIELD DEFAULT qualifier (which takes precedence over all other specifications for a default entry).
- ▶ subsequent calls to S\_SELDFLT.
- ▶ the optional parameters to S\_SELECT.

If you don't specify DEFAULT, UI Toolkit uses the first entry in the selection window as the default.

If you do not specify SELECT(*character*), UI Toolkit defaults to the first non-blank character in the entry.

---

**WIN**

Quick-select characters specified by .ITEM are ignored in a Windows environment. The first non-blank character of the item's text is always used as the quick-select character. Also, quick-select characters are never highlighted and if a user presses an invalid quick-select character, no beep is generated.

---

## Examples

---

**UNIX, VMS**

This script defines the following selection window:

```
.select teams, 5, 8
.text "Team 1"
.line
.item Jim
.item Kim
.item Tim
.text "Team 2"
.line
.item Bill
.item Jill
.item Phil
.text "Team 3"
```

```
.line  
.item Jan  
.item Dan  
.item Fran  
.end
```

| Team 1 | Team 2 | Team 3 |
|--------|--------|--------|
| Jim    | Bill   | Jan    |
| Kim    | Jill   | Dan    |
| Tim    | Phil   | Fran   |

---

## .LINE – Draw a line



`.LINE name, length[, POSITION (row, column) ][, direction][, rendition, ...]`

or

`.LINE`

### Arguments

*name*

The name of the line (a maximum of 30 characters).

*length*

The length of the line.

#### POSITION

(optional) The position specification for the line.

*row*

The row at which the upper-left end of the line is positioned.

*column*

The column at which the upper-left end of the line is positioned.

*direction*

(optional) One of the following:

**HORIZONTAL** Draw a horizontal line. (default)

**VERTICAL** Draw a vertical line.

*rendition*

(optional) One or more of the following display renditions:

**BLINK | ITALIC** Blinking (on UNIX and OpenVMS) or italic (on Windows).

**NOBLINK | NOITALIC** Not blinking (on UNIX and OpenVMS) or not italic (on Windows). (default)

**BOLD** Highlighted (or boldfaced).

**NOBOLD** Not highlighted (or boldfaced). (default)

**COLOR**(*palette#*) Assign specified *palette#*, where *palette#* is a palette number in the range 1 to 16.

**HIGHLIGHT** Highlighted (or boldfaced).

|                    |                                           |
|--------------------|-------------------------------------------|
| <b>NOHIGHLIGHT</b> | Not highlighted (or boldfaced). (default) |
| <b>REVERSE</b>     | Reverse video.                            |
| <b>NOREVERSE</b>   | Normal video. (default)                   |
| <b>UNDERLINE</b>   | Underlined.                               |
| <b>NOUNDERLINE</b> | Not underlined. (default)                 |

## Discussion

The first form of the .LINE command above is used to draw a line within a general or input window definition.

If *position* is not specified, the position of the line defaults to the current screen position.

The second form of the .LINE command adds a row with a horizontal line to a menu column or selection window definition. These horizontal lines do not contain leading or trailing blanks, and will not connect with the menu column or selection window border.

On Windows, .LINE in a selection window definition (.SELECT) has no effect.

## Examples

This example draws a vertical line 8 rows long in reverse video positioned at row 2 and column 1 of a window.

```
.line line1, 8, pos(2, 1), vertical, reverse
```

This example separates the “Exit” menu entry from the “About” menu entry with a horizontal line.

```
.column c_general, "General"
.entry o_help, "Help", key(F1)
.entry o_exit, "Exit", key(F4)
.line
.entry u_about, "About"
.end
```



## .LIST – Create a set of menu entries



```
.LIST list_name=entry_name[, ...]
```

### Arguments

*list\_name*

The name of the list set (a maximum of 10 characters).

*entry\_name*

The identifier for a previously defined entry in the menu column.

### Discussion

The .LIST command enables you to group specific menu entries together so that you can enable or disable them as a set.

You use the *list\_name* with the M\_ENABLE and M\_DISABLE subroutines, which can enable or disable lists of entries. An entry must be defined with .ENTRY before you can include it in a list.

### Examples

This example groups the **jobcost**, **salesman**, **smgr**, and **sched** entries into a list named **sysmgr**.

```
.list sysmgr=jobcost, salesman, smgr, sched
```

The second example groups the entries **po**, **inven**, and **bom** into a list named **retail**.

```
.list retail=po, inven, bom
```

## .LISTCLASS – Begin a list class definition



```
.LISTCLASS name [, ARRIVE_METHOD (arrive_method) ] –  
                [, DOUBLE_CLICK_METHOD (double_click_method) ] –  
                [, FOOTERS ([fline_count [, STATIC]]) ] –  
                [, HEADERS ([hline_count [, STATIC]]) ] –  
                [, INPUT_SNAPSHOT][, ITEMS (item_count) ] –  
                [, LEAVE_METHOD (leave_method) ][, LOAD_METHOD (load_method) ] –  
                [, NONULL][, OPTIONS (option_string) ]
```

### Arguments

*name*

(optional) The name of the list class (a maximum of 15 characters). It must be a unique name in the window library.

#### ARRIVE\_METHOD

(optional) Specifies that the name of the arrive method subroutine follows (see [page 2-99](#) for more information).

*arrive\_method*

The name of the list arrive method subroutine you have written.

#### DOUBLE\_CLICK\_METHOD

(optional) Specifies that the name of the double-click method subroutine follows (see [page 2-99](#) for more information).

*double\_click\_method*

The name of the double-click method subroutine you have written.

#### FOOTERS

(optional) Specifies that the number of footer lines for the list follows (see [page 2-99](#) for more information).

*fline\_count*

The number of footer lines for the list.

#### STATIC

(optional) Indicates that the horizontal display area of the footer/header is static.

**HEADERS**

(optional) Specifies that the number of header lines for the list follows (see [page 2-100](#) for more information).

*hline\_count*

The number of header lines for the list.

**INPUT\_SNAPSHOT**

(optional) Specifies that the list will maintain input window control information using `I_SNAPSHOT` (see [page 2-100](#) for more information).

**ITEMS**

(optional) Specifies that the number of items to be displayed at one time in the list follows (see [page 2-100](#) for more information).

*item\_count*

The number of list items to be displayed at one time.

**LEAVE\_METHOD**

(optional) Specifies that the name of the leave method subroutine follows (see [page 2-100](#) for more information).

*leave\_method*

The name of the list leave method subroutine you have written.

**LOAD\_METHOD**

(optional) Specifies that the name of the load method subroutine follows (see [page 2-101](#) for more information).

*load\_method*

The name of the list load method subroutine you have written.

**NONULL**

(optional) Specifies that the list is not allowed to remain empty (see [page 2-101](#) for more information).

**OPTIONS**

(optional) Defines an option string containing implementation-specific creation options (see [page 2-101](#) for more information).

*option\_string*

One or more of the following creation options separated by commas:

|                                                               |                                                                                               |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>ACTIVEX</b>                                                | Specify that the ActiveX implementation of a Toolkit list will be used.                       |
| <b>GRIDCOLOR</b> ( <i>[odd_color]</i> , <i>[even_color]</i> ) | Specify background colors for alternating ActiveX Toolkit list items.                         |
| <b>NOACTIVEX</b>                                              | Specify that a Toolkit list (non-ActiveX) will be used.                                       |
| <b>NOAUTOSIZE</b>                                             | Suppress automatic sizing of the list when the container is resized.                          |
| <b>NOBAR</b>                                                  | Suppress the list's vertical and horizontal scroll bars.                                      |
| <b>NOCELLHBAR</b>                                             | Suppress the list's horizontal scroll bar only when running in a UNIX or OpenVMS environment. |
| <b>NOCELLVBAR</b>                                             | Suppress the list's vertical scroll bar only when running in a UNIX or OpenVMS environment.   |
| <b>NOHBAR</b>                                                 | Suppress the list's horizontal scroll bar.                                                    |
| <b>NOVBAR</b>                                                 | Suppress the list's vertical scroll bar.                                                      |

## Discussion

The **.LISTCLASS** command enables you to define a list class. A list class defines a set of list characteristics. When a list is created in a Toolkit application, its characteristics can be drawn from a given list class.

A list class defines features of lists that are likely to be common across multiple lists. When you define these features in classes, global changes in presentation style are simple. Because you define classes in scripts, global customization of distributed list classes is possible.

The placement of a list can be specified as a list class characteristic using the **.PLACEMENT** command. The placement coordinates can be overridden when a list is created with the **L\_CREATE** subroutine; or the list can be created without being placed. If so, these coordinates will be retained and used when the list is placed.

If placement is not specified, the default placement is inherited from the associated input window specified in the **L\_CREATE** subroutine.

---

## WIN

When using the **L\_INPUT** subroutine, be aware that the user can change the current list item without control returning to your program first. This means that the state of the input fields and the input set context can be propagated across list items. For example, if your program uses **I\_INIT** to initialize fields in the input set, and the user moves to a different item in the list, the fields are still

considered empty. This results in a different redisplay of the data, and validation occurs unexpectedly. There are two ways to solve this problem. Use the INPUT\_SNAPSHOT option to preserve input context and field states. If, however, you don't want the context preserved for each item, you can use a list item arrive method to either initialize or display the data in the associated input window (depending on the content of the list item), and then use I\_NEXT to establish the correct context.

---

### **ARRIVE\_METHOD(*arrive\_method*)**

ARRIVE\_METHOD specifies that you want the list processor to call an arrive method subroutine whenever an item is accessed ("arrived at"). You can overload this method at runtime with the L\_METHOD subroutine. See [page 9-107](#) for more information on the L\_METHOD routine. You may want to use ARRIVE\_METHOD when you want additional setup performed when the item is accessed. If ARRIVE\_METHOD is not specified, no special action is taken when a new item is accessed.

For *arrive\_method*, use the name of the (list) arrive method subroutine you have written. See [LARRIVE\\_METHOD/LLEAVE\\_METHOD on page 9-152](#) for more information on the LARRIVE\_METHOD subroutine.

### **DOUBLE\_CLICK\_METHOD(*double\_click\_method*)**

DOUBLE\_CLICK\_METHOD specifies that you want the list processor to call a double-click method subroutine whenever the user double-clicks within the list. You can overload this method at runtime with the L\_METHOD subroutine. See [page 9-107](#) for more information on the L\_METHOD subroutine. If DOUBLE\_CLICK\_METHOD is not specified and the user double-clicks on the current item, the list processor will assume that the item is being selected.

For *double\_click\_method*, use the name of a double-click method subroutine you have written. See [page 9-155](#) for more information on the LDBLCLICK\_METHOD subroutine.

### **FOOTERS(*fline\_count*[, STATIC])**

If FOOTERS isn't specified, the default is 0.

If the FOOTERS qualifier is present but *fline\_count* is not specified, the default line count is 1.

STATIC indicates that the horizontal display area of the footer will not be adjusted by the L\_VIEW subroutine, or by a D\_LRIGHT or D\_LLEFT request to L\_PROCESS, or when the input window display is adjusted to encompass the current input field. The default is not static.

---

### **WIN**

For ActiveX Toolkit lists, text is centered in each column by default. If you specify STATIC, however, text will be left-justified in each column.

---

### **HEADERS([*hline\_count*], **STATIC**)]**

If HEADERS isn't specified, the default is 0.

If the HEADERS qualifier is present but *hline\_count* is not specified, the default line count is 1.

STATIC indicates that the horizontal display area of the header will not be adjusted by the L\_VIEW subroutine, or by a D\_LRIGHT or D\_LLEFT request to L\_PROCESS, or when the input window display is adjusted to encompass the current input field. The default is not static.

---

### **WIN**

For ActiveX Toolkit lists, text is centered in each column by default. If you specify STATIC, however, text will be left-justified in each column.

---

### **INPUT\_SNAPSHOT**

INPUT\_SNAPSHOT specifies that the list will maintain input window control information for each item in the list, by using the I\_SNAPSHOT subroutine. (See [I\\_SNAPSHOT](#) on page 8-85 for more information.) This option is useful when using input sets in a list but creates unnecessary overhead in other cases (such as selection processing).

If INPUT\_SNAPSHOT is not specified, the default action is not to maintain item-specific input window control information.

### **ITEMS(*item\_count*)**

If ITEMS is not defined, the default number depends on the available screen-body space between the placement row (inclusive) and the information bar (exclusive). Display items such as borders, headers, and footers are made to fit within this area.

If *item\_count* is too large for the screen, the default number (as defined above) will be used.

### **LEAVE\_METHOD(*leave\_method*)**

LEAVE\_METHOD specifies that you want the list processor to call a leave method subroutine whenever the user leaves a list item. You can overload this method at runtime with the L\_METHOD subroutine. (See [L\\_METHOD](#) on page 9-107 for more information.) You can use LEAVE\_METHOD when you want the item to perform additional processing (such as validating the input) when the user leaves it. If LEAVE\_METHOD is not specified, no special action is taken when the user leaves the item.

For *leave\_method*, use the name of the (list) leave method subroutine you have written. See [page 9-152](#) for more information on the LLEAVE\_METHOD subroutine.

**LOAD\_METHOD(*load\_method*)**

LOAD\_METHOD specifies that you want the list processor to call a load method subroutine whenever it loads existing items (on demand) into the list. You can overload this method at runtime with the L\_METHOD subroutine. See [page 9-107](#) for more information on the L\_METHOD subroutine. If LOAD\_METHOD is not specified, load requests are returned to the calling routine. See [page 9-114](#) for more information on L\_PROCESS.

For *load\_method*, use the name of the load method subroutine you have written. See [page 9-158](#) for more information on the LLOAD\_METHOD subroutine.

On Windows, you must write and use a *load\_method* subroutine to enable scrolling of the list.

**NONULL**

NONULL specifies that the list is not allowed to remain empty. A list is null if no items are loaded into it, or if the last list item is deleted.

If NONULL is specified, an empty list will cause the L\_PROCESS subroutine to return a D\_ABORT request, which asks the calling routine to immediately delete the list.

The default is to enable a null list.

**OPTIONS(*option\_string*)**

OPTIONS defines an option string to be used by L\_CREATE when instances of this class are created.

Specifying the ACTIVEX option creates an ActiveX implementation of a Toolkit list when displaying and processing the list in a Windows environment. On UNIX and OpenVMS systems, ACTIVEX has no effect; you get a standard Toolkit list. (For information on the differences between Toolkit lists and ActiveX Toolkit lists, and for tips on using ActiveX lists, see [“Using Lists in Toolkit Applications” on page 9-4.](#))

**WIN** 

---

For ActiveX Toolkit lists, the GRIDCOLOR *odd\_color* and *even\_color* options are numbers between 0 and 511 that correspond to Synergy color definitions. *Odd\_color* is used for the background color for odd numbered items in the list, and *even\_color* for even numbered items. Both default to white. If an item spans multiple rows, all rows for that item use the same background color.

Additionally, note the following:

- ▶ You must use different colors for *odd\_color* and *even\_color*. (If you want to set the entire background to one color, use the BackColor property. For information, see “[Published Properties for ActiveX Toolkit Lists](#)” on page 9-17.)
- ▶ Field attribute settings have precedence over GRIDCOLOR settings and the DarkItemColor and LightItemColor published properties for ActiveX lists.
- ▶ GRIDCOLOR settings are used only when a list is created. So changes to the Synergy colors used for *odd\_color* and *even\_color* won’t affect lists that exist when the changes are made.

For information on Synergy colors, see “[Colors and the color palette](#)” in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.

---

If the NOAUTOSIZE option is set on a Windows system, the size of the list is not affected by the size of its container and can only be resized using L\_RESIZE. NOAUTOSIZE is ignored on UNIX and OpenVMS systems. See the Discussion on [page 13-16](#) for an explanation of how this feature can be used.

---

## **WIN**

Note that mouse wheel scrolling works even if you suppress scroll bars with NOBAR, HOHBAR, or NOVBAR.

---

## **Examples**

This example defines a list class named **my\_list** which enables 14 items to be displayed at once. A load method subroutine called **my\_load\_method** has been written, which will be called by the Toolkit list processor to load entries into the list.

```
.listclass my_list, items(14), load_method("my_load_method")
.placement 3, 1
.end
```

This example defines a list class with one header named **my\_activex\_list** which enables 14 items to be displayed at once. A double click method subroutine called **my\_dclick\_method** has been written, which will be called by the list processor whenever the user double clicks within the list. This list will use an ActiveX Toolkit list when run on Windows.

```
.listclass my_activex_list, items(14), -
double_click_method("my_dclick_method"), -
options(activex), headers
.placement 3, 1
.end
```



## .LOCAL – Define subsequent fields as local

|    |    |   |   |
|----|----|---|---|
| WT | WN | U | V |
|----|----|---|---|

.LOCAL

### Discussion

The .LOCAL command specifies that subsequent fields in the current input window definitions are to be created, instead of drawn from the repository. This is the default state when an .INPUT command is issued. This command is used after you have specified .REPOSITORY\_STRUCTURE to draw one or more fields from the repository, and you now want to create local fields.

An input window can contain local fields and fields from one or more repository structures.

### Examples

This example defines an input window containing four fields. The first two fields, **empnam** and **empid**, are to be drawn from the repository. The last two fields, **start\_time** and **end\_time**, are local and will therefore be created.

```
.input emprec, 5, 35
.repository_structure empmas
.field empnam
.field empid
.local
.field start_time, d4, time, prompt("Enter starting time ")
.field end_time, d4, time(now), prompt("Enter quitting time ")
.structure time, start_time, end_time
.set wktime, time
.end
```

## .PAINT – Define the paint character



*.PAINT character*

### Arguments

*character*

A single, printable paint character.

### Discussion

The .PAINT command determines which character “paints” an empty field to indicate where the user types input.

Initially the paint character is a blank. The .PAINT command resets the default paint character. Note that the PAINT qualifier of .FIELD will override the input window’s .PAINT character currently in effect for that field. Fields drawn from a repository always override .PAINT.

Paint characters specified by .FIELD PAINT or .PAINT have no effect in a Windows environment.

### See also

The documentation for the PAINT qualifier on [page 2-41](#) for information about an alternative way to specify the paint character for an empty field. (PAINT is a qualifier for the .FIELD command.)

### Examples

In the following example, the underscore character indicates where the user should type input.

```
.paint _
```

## .PLACEMENT – Define the placement of a window



`. PLACEMENT row, column[, UNBOUNDED]`

### Arguments

*row*

The screen row at which the upper-left corner of the window is placed (relative to the upper-left corner of the screen body, not the entire screen).

*column*

The screen column at which the upper-left corner of the window is placed.

### UNBOUNDED

(optional) The specification that you want absolute window placement that is not bounded by UI Toolkit's screen. UNBOUNDED must be omitted for a list class.

### Discussion

The .PLACEMENT command defines the location of an input, selection, or general window on the screen. You can also use it to specify the default placement for a list class.

The default position is row 1, column 1. Any border goes around the window's placement area.

When a selection window defined by the .SELECT command is processed, the position specified by the SELWND input field qualifier will override the position specified by .PLACEMENT. Therefore, with selection windows, .PLACEMENT is most useful when processing a selection window directly through U\_LDWND and either S\_SELECT or S\_SELECTCB.

If .PLACEMENT is specified for a list class, you can override the placement when a list is created with the L\_CREATE subroutine. If .PLACEMENT is not defined for a list class, the default placement is inherited from the associated input window specified in the L\_CREATE subroutine.

Any window with a display area of up to 50 x 255 can be placed with the .PLACEMENT command. If you use a .PLACEMENT command for a window that Script considers to be larger than the application window, it will generate a non-fatal "Could not place window" error. Script will then continue processing. (Proto will generate the same error for windows larger than 24 x 80 that have a .PLACEMENT command.) Script determines if a window will fit in the application window

- ▶ on UNIX and OpenVMS by assuming that the application window is 132 columns by 50 rows.
- ▶ on Windows by assuming that the application window height and width are equal to the APP\_HEIGHT and APP\_WIDTH settings from **synergy.ini** or **synuser.ini**. (The default for APP\_HEIGHT is 25, and the default for APP\_WIDTH is 80.)

## See also

[.DISPLAY\\_AREA](#) on [page 2-26](#) for more information on defining a movable display area (a view) for general windows (.WINDOW) and input windows (.INPUT).

## Examples

The following .INPUT command in the example defines an input window named **cusinf** whose dimensions are 12 rows by 40 columns. The .PLACEMENT command places the upper-left corner of that window at screen row 4, column 21.

```
.input cusinf, 12, 40  
.placement 4, 21
```

The list class defined in the following example is placed at row 3, and column 1.

```
.listclass my_list, items(14), load_method("my_load_method")  
.placement 3,1  
.end
```

## .REPOSITORY\_STRUCTURE – Establish the current repository structure



```
.REPOSITORY_STRUCTURE structure_name[=alias_name], ["main_file" ][, "text_file" ]
```

### Arguments

*structure\_name*

The name of the repository structure to access.

*alias\_name*

(optional) The name by which *structure\_name* will be referenced within this input window (a maximum of 30 characters).

*main\_file*

(optional) The name of the main repository file to use.

*text\_file*

(optional) The name of the repository text file to use.

### Discussion

The .REPOSITORY\_STRUCTURE command specifies that subsequent fields in the current input window definition are to be drawn from the given repository structure when you are compiling your script. If no fields exist in the structure, an error will be generated. The specified repository structure is in effect until a .LOCAL, .END, or another .REPOSITORY\_STRUCTURE.

Field qualifiers on subsequent .FIELD commands will override repository specifications.

Additional requirements for drawing field definitions from a repository are discussed in the Discussion for .FIELD on [page 2-44](#).

The .REPOSITORY\_STRUCTURE command automatically creates a .STRUCTURE in the window library with the specified structure name, containing all of the referenced fields in the appropriate positions.

If you make changes to your repository structure after compiling your script, you will need to re-compile.

Use the *alias\_name* argument in the following situations:

- ▶ When you include the same repository structure more than once within an input window.
- ▶ When you include two or more fields that have the same name although they are referenced from different repository structures.

In either of the preceding situations, you must rename the second and succeeding “same” structures using the *alias\_name* argument. Note that there are no spaces between the equal sign (=) and the names.

After you have assigned an *alias\_name* to a structure, any following references to the structure (for example, in a .SET) must use the alias name instead. If you have given the structure an *alias\_name* and are referencing a field at runtime (for example, with I\_NEXT, I\_DSPFLD, or I\_INPFLD), the reference to the field must have the following syntax:

```
alias_name.field_name
```

This syntax can be used only for fields that are in a renamed structure. The first 30 characters of the full reference above must be unique within the input window. Thus, we recommend that you use short alias names.

You can combine multiple repository structures, enabling their access as one structure, by using the implicit group feature of Repository. See “[Basic field information](#)” in the “Working with Fields” chapter of the *Repository User’s Guide* for more information.

If *main\_file* and *text\_file* are not passed or are blank, the repository main and text file specified by the environment variables RPSMFIL and RPSTFIL, respectively, will be used. If these environment variables are not set, UI Toolkit will use the default repository files (**rpmain.ism** and **rpstext.ism**) found in the directory specified by the RPSDAT environment variable.

If specified, *main\_file* and *text\_file* must be enclosed in quotation marks, and if you use an environment variable, it must be followed by a colon. For example:

```
.repository_structure s1, "D:\test\rpmain.ism", "D:\test\rpstext.ism"
.repository_structure s2, "MAINFILE:", "TEXTFILE:"
```

## See also

- ▶ The Discussion for .FIELD on [page 2-44](#) for more information on repository fields.
- ▶ “[Basic field information](#)” in the “Working with Fields” chapter of the *Repository User’s Guide* for more information on using implicit groups to combine repository structures.

## Examples

The following example defines an input window that contains four fields from the repository structure **cusmas**. A default set **cusinf** will be created that references the structure **cusmas**.

```
.input cusinf, 4, 45
.repository_structure cusmas, "RPS1:rpmain.ism", "RPS1:rpstext.ism"
.field name
.field address
.field city
.field state
.end
```

The next example defines an input window that contains two fields from the repository structure **cusmas**, and one field from the repository structure **cushis**. The position specified for the field **prev\_address** in the repository is overridden here. This example creates only one input set, **cusinf**, which references the first defined structure (**cusmas**). **Cushis** is a structure without a set here, and note that **cushis** is from the default repository (the **rpsmain.ism** and **rpstext.ism** files in the directory specified by the RPSDAT environment variable).

```
.input cusinf, 4, 45
.repository_structure cusmas, "RPS1:rpsmain.ism", "RPS1:rpstext.ism"
.field name
.field address
.repository_structure cushis
.field prev_address, pos(3,2)
.end
```

This example creates two input sets, **old** and **new**, which reference two identical structures, both of which are defined by the repository structure **cusmas**. In the program that uses this window, if you want to use **old** set, you would reference the **name** field. If you want to use **new** set, you would reference **new.name**.

```
.input cusinf, 4, 45
.repository_structure cusmas, "RPS1:rpsmain.ism", "RPS1:rpstext.ism"
.field name
.field address
.repository_structure cusmas=new
.field name
.field address
.set old, cusmas, name, address
.set new, new, name, address
.end
```

## .SCRIPT – Define a version 6 or higher script file



.SCRIPT

### Discussion

The .SCRIPT command defines the beginning of a version 6 or higher script file. It must be the first command in the file, and may only be preceded by comments.



## .SELECT – Begin a selection window definition



```
.SELECT name, [rows], [column_width][, NOPAD]
```

### Arguments

*name*

The name of the selection window (a maximum of 15 characters).

*rows*

(optional) The number of rows for the selection window.

*column\_width*

(optional) The width of each column of the selection window.

### NOPAD

(optional) The specification to suppress the blank columns that occur to the left and right of each entry in the selection window.

### Discussion

The .SELECT command defines the name and size of a selection window, and marks the beginning of a selection window definition.

*Name* must be unique within the set of windows in the library. You can use *name* in the SELWND qualifier of the .FIELD command to attach the selection window to an input field. You can also pass *name* to the U\_LDWND subroutine to load the window directly.

If *rows* is not specified or is zero (0), UI Toolkit uses the total number of entries. However, if the window contains more than 20 entries, the entries are evenly divided into as many columns as are required to use 20 rows or less.

If *column\_width* is not specified, UI Toolkit uses the width of the widest entry. Note that this width does not include the leading and trailing blanks, which are always added to each entry (unless NOPAD is specified).

If either *rows* or *column\_width* is not specified and you are using the NOPAD qualifier, you must use the appropriate comma placeholder for the missing qualifier.

A selection window must contain at least one item and may not contain more than 32767. (Note, however, that because Synergy cannot place windows that do not fit on the screen, the practical maximum number of entries will be much lower. For instance, if the size of the Toolkit's virtual screen is 25 rows by 80 columns, a selection window cannot be placed if it has more than 2000 entries—and 2000 would only be possible if there is no padding between the columns and each entry is a single character.)

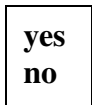
## See also

[.ITEM on page 2-90](#) for more information about defining selection window items.

## Examples

This example creates a two-item selection window with a vertical format, as follows:

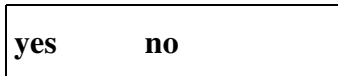
```
.select yesorno  
.item "yes"  
.item "no"  
.end
```



Changing the `.SELECT` command to

```
.select yesorno, 1, 10
```

creates the same selection window with a horizontal layout, as follows:



Each selection item in this example occupies 10 spaces and is displayed in its own column.

## .SET – Define an input set



`.SET set_name, [structure_name][, field_spec, ...]`

### Arguments

*set\_name*

The name of the input set (a maximum of 30 characters).

*structure\_name*

(optional) The name of the structure to associate with the set.

*field\_spec*

(optional) The field specification for one or more fields in the set. (See “Field specifications” on page 2-47 for information.)

### Discussion

The .SET command specifies a set of fields to be associated with one another and their order of reference. If you don’t issue a .SET command, a default set will be created that comprises all fields defined in the first structure in the order they are defined. The default set will have the name of the input window.

List fields in the order that you want them processed at runtime. An input set can contain up to 253 input fields. (See [L\\_INPUT](#) on page 8-57, [L\\_DISPLAY](#) on page 8-14, and [L\\_NEXT](#) on page 8-67 for more information about the purpose and use of input sets.)

If no structure has been defined (with .REPOSITORY\_STRUCTURE or .STRUCTURE), when a .SET command is issued, you must pass the default structure name as *structure\_name* if you want the input set to have any fields. The default structure has the same name as the input window, and will include all of the fields defined for the input window.

If you omit *structure\_name* and *field\_spec*, Toolkit creates an empty input set. (If you omit *structure\_name*, you must also omit *field\_spec*.) This is useful if you want a set of buttons that can be placed anywhere in a composite window. See “Buttons in composite windows” on page 6-6 for more information.

If you include *structure\_name* and omit *field\_spec*, all of the fields within the specified structure will be used in the order of their definition within that structure. Note the following:

- ▶ All *field\_specs* in the set must be members of the same structure. (See [.STRUCTURE](#) on page 2-115 and [.REPOSITORY\\_STRUCTURE](#) on page 2-107.)
- ▶ You don’t have to put all fields in sets. You can process fields individually as well.

## Examples

All fields specified in the following example are members of the same structure. All sets are associated with the structure **cusinf**: **setone** consists of **cusnum** and **name**; **settwo** consists of **cusnum** and **state**; and **cusinf** consists of **cusnum**, **name**, **addr1**, **addr2**, **city**, **state**, and **zip**. When a *set\_name* is used, its fields will be processed in the order they appear in the set specification.

```
.structure cusinf, cusnum, name, addr1, addr2, city, state, zip
.set setone, cusinf, cusnum, name
.set settwo, cusinf, cusnum, state
.set cusinf, cusinf, cusnum, name, addr1, addr2, city, state, zip
```

All fields in the next example are also members of the same structure, but this structure is defined in a repository (and includes the arrays **addresses**, **city**, and **state**). In this example, the first input set will enable users to modify **address[1]**, **city[1]**, and **state[1]** but not **address[2]**, **city[2]**, or **state[2]**, which belong to the second input set.

```
.repository_structure cusmas
.field name
.field address[1]
.field address[2]
.field city[1]
.field city[2]
.field state[1]
.field state[2]
.set shipping, cusmas, name, address[1], city[1], state[1]
.set billing, cusmas, name, address[2], city[2], state[2]
```

## .STRUCTURE – Define the structure of a data area



```
.STRUCTURE data_area[, field_def | value][, ...]
```

### Arguments

*data\_area*

The name of the data area (a maximum of 30 characters).

*field\_def*

(optional) A field definition has one of the following forms:

*field*

*field@character\_pos*

*field@field\_name*

*field@field\_name+offset*

where *character\_pos* is a base-one character position within the structure, *field\_name* is a field previously specified within the structure, and *field\_name+offset* is an offset from a field previously specified within the structure.

*value*

(optional) The number of pad characters, enclosed in angle brackets. You can use *value* to skip space in your data area between fields.

### Discussion

The .STRUCTURE command defines field membership and position within a data area (usually a record).

.STRUCTURE creates a local structure within the current input window. A structure definition is used to verify that no input set contains fields from different structures; a field can be a member of only one structure. Note, however, that a field does not have to be a member of any structure.

At runtime, structure definitions are used to transfer data to and from the field's data position within its record buffer.

Although a given field can be a member of only one structure, you can specify up to 25 structures in an input window.

You cannot use .STRUCTURE for a repository structure (.REPOSITORY\_STRUCTURE).  
.STRUCTURE is only needed for local fields.

If there are no repository structures and you do not include a `.STRUCTURE` statement for local fields, a default structure is defined. Its name is the name of the input window, and it comprises all fields in the order that their `.FIELD` commands are specified. (If the input window has no fields, the default structure will have no fields.)

Thus, if you need only one record containing all fields in the order defined, you don't need to define the record with `.STRUCTURE` because it will be created by default.

You can specify up to 507 *field\_def* or *values*. If you do not specify either, all of the fields will be used in the order they are defined. A field name can have a maximum of 30 characters. The maximum size of a structure is 9999 characters (**d4**). Text fields take up space that equals *size x dimension*.

In the first form of *field\_def*, the position of *field* within the structure follows the previous field (or filler) definition. In the second form, *field* starts at position *character\_pos* within the structure. The third and fourth forms position *field* relative to *field\_name* within the structure. Note that if the field is specifically positioned by one of the latter three forms, the default position for the next field definition is after this field, regardless of this field's position within the structure. (Specifically, the next field will not default to the end of the structure.)

## Examples

The following example defines a data area named **cusinf** that has the following fields: **cusnum**, **name**, **addr1**, **addr2**, **city**, **state**, **zip**.

```
.structure cusinf, cusnum, name, addr1, addr2, city, state, zip
```

The next example is very similar to the first, but it designates that 60 pad characters should be placed in the data area between the fields **name** and **city**.

```
.structure cusinf, cusnum, name, <60>, city, state, zip
```

The following example specifies **city** to be positioned 30 characters after the beginning of **address**. If **address** began at 60, **city** would begin at 90.

```
.structure cusinf, cusnam, name, address, city@address+30, state, zip
```

## .TEXT – Add text to a window or menu column



`.TEXT name [, POSITION (row, column) ][, MARGIN (left, right) ]`

*text*

or

`.TEXT text [, justification]`

### Arguments

*name*

The name of the text (a maximum of 30 characters).

#### POSITION

(optional) The position specification for the text. The position doesn't have to be in the display area, but it must be within the window.

*row*

The row at which the upper-left corner of the text is positioned.

*column*

The column at which the upper-left corner of the text is positioned.

#### MARGIN

(optional) The margin specification for the text. Margins are the number of spaces from the left and right edge of the window.

*left*

The number of columns specified for the left margin. (If *left* is less than or equal to *column*, this setting applies to all but the first line, whose indent in this case is controlled by the *column* argument for POSITION.)

*right*

The number of columns specified for the right margin.

*text*

One or more rows of text in general or input windows; a text string in menu columns or selection windows.

### *justification*

Designates how the text is aligned within the entry-text area, as opposed to the entire width of the menu or selection column. It must be one of the following:

|                 |                                         |
|-----------------|-----------------------------------------|
| <b>LEFT</b>     | Left-justify the column text. (default) |
| <b>RIGHT</b>    | Right-justify the column text.          |
| <b>CENTERED</b> | Center the column text.                 |

## Discussion

The first form of the .TEXT command above is used to add text to a general or input window. *Text* can contain data control commands that control the renditions of the text. See [“Data Control Commands and Text”](#) below.

When justified text is needed on the same line as an input field, make sure that the .FIELD command occurs after the .TEXT command.

The second form of the .TEXT command adds the contents of *text* to a column or selection window. This text is not a selection. The required width of this entry is two spaces longer than the length of text, and the text is loaded starting at the second character position (when left-justified). The width of the selection column is increased, if necessary, to accommodate the width of the entry.

If you don’t specify LEFT, RIGHT, or CENTERED, the text will be left-justified by default.

If you have a selection window defined by .SELECT that has more than one column but does not have corresponding text entries in the same row of each column, left and right movement within the window won’t be consistent. We therefore recommend that you make sure each column in a multi-column selection window contains its text entries in the same row.

---

### **WIN**

.TEXT in a selection window definition (.SELECT) has no meaning in a Windows environment.

---

Note that .TEXT is optional (unless you use the script in S/DE Composer, which requires it). If you include a line of text that is not preceded by a .TEXT command, Script adds the text to the window, using margin and rendition settings that match the previous line of text processed by Script, and positioning the text to follow the previous line of text. If Script has not previously processed a line of text, Script uses the following settings: a position of 1,1; no margins; no attributes; and color 1.



## Data Control Commands and Text

This section describes the commands that affect the position and display of text within general and input windows. These are called *data control commands*.

The script compiler initially loads text into the window starting at window row 1, column 1, unless a data control command changes the position. Each time the script compiler loads text into the window, it updates the position. (The `.FIELD` command also will update the position.)

The maximum length of a text line in a script file is 255 characters. If there are too many text lines for the windows, all overflow lines are ignored. Tabs are converted into a space.

If a word starts with a backslash (`\`), it is considered a data control command. Data control commands can be anywhere on a text line, even embedded in text. A dash (`-`) after the backslash resets the command, but only commands that can be reset process the dash; all others ignore it. Data control commands are one character long, and any arguments must be enclosed in parentheses.

### Rendition commands

You can turn five window renditions on and off in the script file:

- ▶ Blink (on UNIX and OpenVMS) or italic (on Windows)
- ▶ Color
- ▶ Highlight (bold)
- ▶ Reverse video
- ▶ Underline

The lines in the script file are processed sequentially, so any text after a rendition change is displayed with the new renditions until you change renditions again.

In each window definition, attributes are initially clear. Once set, they remain set until explicitly cleared.

The commands for setting and resetting the renditions are shown in the following table.

| Rendition Commands         |                                                         |
|----------------------------|---------------------------------------------------------|
| Command                    | Meaning                                                 |
| <code>\b   \i</code>       | Blinking on (UNIX and OpenVMS) or italic (Windows)      |
| <code>\-b   \-i</code>     | Blinking off (UNIX and OpenVMS) or italic off (Windows) |
| <code>\c (palette#)</code> | Color palette number (default value is 1)               |
| <code>\h</code>            | Highlighting (bolding) on                               |
| <code>\-h</code>           | Highlighting off                                        |

| Rendition Commands (Continued) |                   |
|--------------------------------|-------------------|
| Command                        | Meaning           |
| \r                             | Reverse video on  |
| \-r                            | Reverse video off |
| \u                             | Underlining on    |
| \-u                            | Underlining off   |

For example:

```
.window renditions, 20, 45
.place 3, 18
.title "Renditions"
.border rev
.text mytext, position(2,2), margin(2,2)
\bThis blinks.\-b\n
\hThis is bold.\-h\n
\rThis is in reverse video.\-r\n
\uThis is underlined.\-u\n
This isn't.\n
.trim
.end
```

### Miscellaneous commands

The remaining data control commands are described below:

#### \j (*option*)

Justifies the text that follows over blanks within the margins. Justification doesn't take effect until you have a new line or word wrap. If you've done a fill on the line, no justification will occur.

*Option* can be one of the following:

- l** Left. (default)
- r** Right.
- c** Center.
- f** Fill line (right- and left-justify text).

Lines are left-justified by default. The next new line is either the next line after a **\n** or the next line of overflow text.

When the **f** option is set, spacing between words on a line will be adjusted so the line fits exactly between the margins. Line filling is only done when an implicit new line (because of word wrap) occurs. An explicit new line (because of a **\n**) will not cause the previous line to be filled.

If the last specified renditions (such as `\b`, `\h`, `\r`) were specified on a previous line, the renditions will apply not only to the justified text, but to the entire line (except the margins). If you specify renditions on the same line as the justified text, the renditions will apply only to the justified text (blanks on either side of the text will receive any previously-specified renditions).

If you need to center text that's enclosed in a box, draw the box at the end of the window definition.

For example:

```
.window justify, 10, 45
.title "Justifying"
.border rev
.text mytext, position(1,2), margin(2,2)
\n
\j(l)This text is left-justified.\n
\n
\j(r)This text is right-justified.\n
\n
This
text
\j(c)
is
centered.
\n
\n
\j(f)This text left- and right-justified.
.end
```

**\n**

Moves the window display position to the next line's left margin. It also forces justification after a justify (`\j`) command.

For example:

```
.window newline, 20, 45
.place 3, 18
.title "New Lines"
.border rev
.text mytext, position(2,2), margin(2,2)
```

The `\n` command moves the text display to the next line. If a script contains two new line commands in a row (`\n\n`), it will skip two lines.

```
\nLike that.\n\n
```

This command is sometimes necessary when you want to justify text with the `\j` command. Justification occurs at the next new line, so you may need to use a `\n` command after the text you want justified.

```
.trim
.end
```

**\s (default)****\-s**

The **\s** command (default) adds a space to the end of a text line in the script file so that when words wrap across lines in the window, they are properly delimited by a space. This spacing occurs only if wrap mode is active and the last word on the line in the script file is not already followed by a space.

The **\-s** command resets this feature.

For example:

```
.window spacing, 3,10
.title "Spacing"
.border rev
.text mytext
word
wrap
\-s
word
wrap
.end
```

This script first uses the default settings of **\s** and **\w** (see description of **\w** later in this section), which means that the first line of the resulting window is as follows:

**word wrap**

When we turn off the default spacing, however, “wrap” will still be displayed on the same line as “word” because of the automatic word wrap, but the space will not be inserted automatically. The second line of text in the resulting window is therefore:

**wordwrap****\w (default)****\-w**

The **\w** command (default) turns word wrap on. If a word overflows the current display line, the entire word is moved to the left margin on the next line, and trailing blanks on the previous line are trimmed. If the text overflows the last line of the window, it is ignored. If wrap is not set, any overflow at the end of a line is ignored.

The **\-w** command turns word wrap off.

For example:

```
.window wrap, 20, 25
.title "Wrap"
.border rev
.text mytext, margin(2,2)
\n\n
```

Wrap mode is the default in the script compiler, which makes it easy to load different blocks of text into the same window. You may, however, want to turn off the wrap mode with `\\-w`.

```
\\-w
\\n\\n
Now wrap mode\\n
is turned off.\\n
If text goes past\\n
the window's edge,\\n
it simply will not appear.
.end
```

## Special characters

`\\.`

Puts a single period in the text. This command is especially useful if you want to have a leading period in a line of text. This command is unnecessary if the period is within or at the end of text.

`\\\\`

Places a backslash into the text. (See the example under `\\;` below.)

`\\;`

Treats the text line as a comment. The end of the text line is the end of the comment. The comment line must be within a window definition and on its own line.

For example:

```
.window comments, 20, 45
.place 3, 18
.title "Comments"
.border rev
.text mytext, position(2, 2), margin(2, 2)
When you are developing with UI Toolkit, you may find it useful or
necessary to include comments within scripts that you do not want to
display. To do this, begin a comment with \\\n\n
\\;For example, this sentence will not be displayed.
\\;To continue a comment on another line, you must begin the
\\;next line with another \\\n\n
.trim
.end
```

Comment lines can exist outside of a text definition if preceded by a semicolon (;). See [“Window Script Files” on page 2-3](#) for information about comment lines.

## Examples

This example displays text at row 2 and column 2 of a general or input window—2 spaces in front of the left and right margins.

```
.text mytext, position (2,2), margin (2,2)  
This is some text in my window.
```

The following example adds the text “System Manager Functions” to the menu column. This text is aligned with the left side of the column entries.

```
.text "System Manager Functions"
```

## .TITLE – Define a window title



`.TITLE title[, on/off][, rendition, ...][, border][, position]`

### Arguments

*title*

The title for a window.

*on/off*

(optional) One of the following options:

|            |                                    |
|------------|------------------------------------|
| <b>ON</b>  | Window displays a title. (default) |
| <b>OFF</b> | Window does not display a title.   |

*rendition*

(optional) One or more of the following display renditions:

|                                  |                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------|
| <b>BLINK   ITALIC</b>            | Blinking (on UNIX and OpenVMS) or italic (on Windows).                                             |
| <b>NOBLINK   NOITALIC</b>        | Not blinking (on UNIX and OpenVMS) or not italic (on Windows). (default)                           |
| <b>BOLD</b>                      | Highlighted (or boldfaced).                                                                        |
| <b>NOBOLD</b>                    | Not highlighted (or boldfaced). (default)                                                          |
| <b>COLOR</b> ( <i>palette#</i> ) | Assign specified <i>palette#</i> , where <i>palette#</i> is a palette number in the range 1 to 16. |
| <b>HIGHLIGHT</b>                 | Highlighted (or boldfaced).                                                                        |
| <b>NOHIGHLIGHT</b>               | Not highlighted (or boldfaced). (default)                                                          |
| <b>REVERSE</b>                   | Reverse video.                                                                                     |
| <b>NOREVERSE</b>                 | Normal video. (default)                                                                            |
| <b>UNDERLINE</b>                 | Underlined.                                                                                        |
| <b>NOUNDERLINE</b>               | Not underlined. (default)                                                                          |

*border*

(optional) Designates which border holds the title. *Border* must be one of the following:

|               |                       |
|---------------|-----------------------|
| <b>TOP</b>    | Top border. (default) |
| <b>BOTTOM</b> | Bottom border.        |
| <b>LEFT</b>   | Left border.          |
| <b>RIGHT</b>  | Right border.         |

*position*

(optional) Determines the position of the title within the border. *Position* must be one of the following:

|                  |                                                 |
|------------------|-------------------------------------------------|
| <b>BEGINNING</b> | Position at the beginning of the border.        |
| <b>CENTER</b>    | Position at the center of the border. (default) |
| <b>END</b>       | Position at the end of the border.              |
| <b>VALUE</b>     | An absolute column position within a border.    |

## Discussion

The .TITLE command defines a window title name, its renditions, and its border position.

The title is displayed only if both the border and title are on. You can list the *renditions*, *border*, and *position* in any order, but *title* must always be first. If the title is longer than one word, it must be enclosed in quotation marks.

The window must be as wide as the title for the title to be displayed.

The default for *palette#* is **1**.

Any repeated options override previous ones.

On Windows, the Windows theme in use determines the location of the title; Toolkit settings have no effect.

## Examples

The following example defines a highlighted border in color palette number 3, and then defines the title “My To Do List” in color palette number 3.

Your window will resemble [figure 2-3](#) (below) on UNIX and OpenVMS and [figure 2-4](#) (below) on Windows.

```
.border on, highlight, color(3)
.title " My To Do List ", color(3)
```



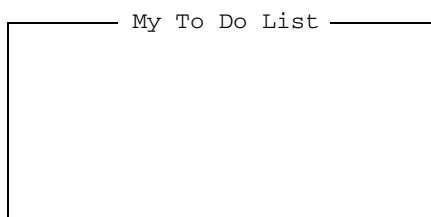


*Figure 2-3. Example of a window title in a UNIX or OpenVMS environment.*

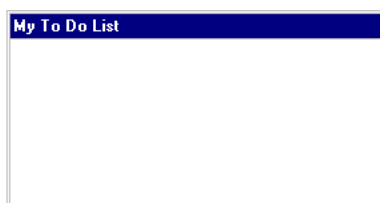


*Figure 2-4. Example of a window title in a Windows environment.*

The second example defines the title “New Customer,” which will be placed in the center of the left border. The border must be ON and the window must be at least 12 columns wide for the title to be displayed.

```
.title "New Customer", left, center
```

## .TRIM – Trim extra blanks from end of window



```
.TRIM [#lines_to_leave]
```

### Arguments

*#lines\_to\_leave*

(optional) The number of blank lines to leave at the bottom of the window after it is trimmed.

### Discussion

The .TRIM command tells the script compiler to trim extra blank lines from the end of the window and redefine the window height given in the .WINDOW or .INPUT command. If *#lines\_to\_leave* is omitted, all blank lines will be trimmed.

If you have an empty window and either omit *#lines\_to\_leave* or specify a value of 1, UI Toolkit will create a one-line window.

The displayed height cannot be less than one line, so .TRIM cannot reduce a window to 0 lines.

### Examples

This example trims all blank lines but one from the bottom of the window.

```
.window h_general, 5, 40
.placement 1,1
.text mytext, position(1,1)
This window is trimmed to three lines, with the last line blank
.trim 1
.end
```

## .USER\_DEFINE – Define a user data set



```
.USER_DEFINE #fields, field_size
```

### Arguments

*#fields*

The number of fields to be in the user data set.

*field\_size*

The size of each data set field.

### Discussion

The .USER\_DEFINE command defines the number of fields and the size of each field in a user data set.

If you have previously defined a user data set for the window (by a previous .USER\_DEFINE command), that data set and any data that has been placed in the set is replaced. The specified user data set is initialized to blanks.

Use the Synergy DBL W\_FLDS subroutine to process user data sets. For more information, see [W\\_FLDS](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following example defines a user data set that has 5 fields of 10 characters each.

```
.user_define 5, 10
```

This window has a copy of its text in another language. At runtime, the program can use either the English or the Spanish version.

```
.window nofile, 3, 30
.text nofile, position(2,1)
Cannot find file.
.user_define 1, 30
.data 1, "No puedo encontrar el archivo."
.end
```

## .VERSION – Define the UI Toolkit version



```
.VERSION "version"
```

### Arguments

*version*

The version of the UI Toolkit from which the script was generated.

### Discussion

This command is generated by UI Toolkit and appears immediately following the .SCRIPT command. This command is ignored by Toolkit when reading scripts, therefore it is not required.

### Examples

This script was generated by version 8.3 of Composer.

```
.version "8.3"
```

## .WFIELD – Define a general window field



`.WFIELD name, LENGTH(length) | TEXT(text) [, POSITION(row, column) ] –  
[, rendition, ...]`

### Arguments

*name*

The name of the window field (a maximum of 30 characters).

#### LENGTH

Specifies that the length of the field follows.

*length*

The length of the field.

#### TEXT

Specifies that the text of the field follows.

*text*

The text in the window field.

#### POSITION

(optional) The position specification for the window field.

*row*

The row at which to position the field.

*column*

The column at which to position the field.

*rendition*

(optional) Used only with TEXT. One or more of the following display renditions:

**BLINK | ITALIC**

Blinking (on UNIX or OpenVMS) or italic (on Windows).

**NOBLINK | NOITALIC**

Not blinking (on UNIX or OpenVMS) or not italic (on Windows). (default)

**BOLD**

Highlighted (or boldfaced).

**NOBOLD**

Not highlighted (or boldfaced). (default)

**COLOR**(*palette#*)

Assign specified *palette#*, where *palette#* is a palette number in the range 1 to 16.

|                    |                                           |
|--------------------|-------------------------------------------|
| <b>HIGHLIGHT</b>   | Highlighted (or boldfaced).               |
| <b>NOHIGHLIGHT</b> | Not highlighted (or boldfaced). (default) |
| <b>REVERSE</b>     | Reverse video.                            |
| <b>NOREVERSE</b>   | Normal video. (default)                   |
| <b>UNDERLINE</b>   | Underlined.                               |
| <b>NOUNDERLINE</b> | Not underlined. (default)                 |

## Discussion

Defines a window field (which is different from an input field). The *row* and *column* values set the field's beginning position within a window. The field's length is defined either by the value of *length* or by the length of the text. Fields cannot be redefined and are numbered sequentially by the script compiler. The window display position is updated to the end of the field. If you do not specify *row* or *column*, the script compiler uses the current row and column position.

Use the `W_FLDS` subroutine to process window fields, not `I_INPUT`. For more information, see [W\\_FLDS](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.

## Examples

```
.window functions, 15, 20
.title "Function Fields"
.wfield add, position(6,5), text("Add")
.wfield sub, position(8,5), text("Subtract")
.wfield mult, position(10,5), text("Multiply")
.wfield div, position(12,5), text("Divide")
.wfield mod, position(14,5), text("Modulo")
.end
```

## .WINDOW – Begin a general window definition



`.WINDOW` *name*, *height*, *width*

### Arguments

*name*

The name of the window (a maximum of 15 characters).

*height*

The height of the window in rows.

*width*

The width of the window in columns.

### Discussion

The `.WINDOW` command defines the name and size of a general window and marks the beginning of the general window definition.

The window defined by `.WINDOW` is a general or display-type window that contains only text. You might use this type of window to display such items as messages, errors, or help information.

The window *name* must be unique within the set of windows in the library.

If you use `.PLACEMENT`, *height* and *width* must be set to values that enable the general window to fit in the application window, unless you first use `.DISPLAY_AREA`. (You can use `.DISPLAY_AREA` to define a display area that fits in the application window, even if the general window you are defining doesn't. See [.DISPLAY\\_AREA on page 2-26](#).) The `.PLACEMENT` command causes Script to logically place the general window, which in turn causes Script to determine whether the window will fit in the application window. (See [.PLACEMENT on page 2-105](#).)

### See also

- ▶ [.INPUT on page 2-89](#) for more information about defining input windows.
- ▶ [.SELECT on page 2-111](#) for more information about defining selection windows.
- ▶ [.DISPLAY\\_AREA on page 2-26](#) for more information about defining a view into the window.
- ▶ [“Text processing” on page 1-12](#) for more information on processing.

### Examples

The following example defines a window named **win**, which is 9 rows by 12 columns.

```
.window win, 9, 12
```

## Examples of Window Scripts

The following are examples of window scripts. If you want, you can type these examples into a script file and then run Proto or Composer to see what the windows look like.

The following example defines a menu column with the name “Utilities” on the menu bar. The internal name is **util**. It contains three entries and defines a shortcut for each.

```
.column util, "Utilities"
.entry abort, Abort, key(^A)
.entry exit, "Exit function", key(F4)
.entry o_help, Help, key(Help)
.end
```

The next example defines an input window with the title “Address Book.” It contains seven fields, which are painted with the dot character to indicate where the user types input. The border is in reverse video. The first field, **lastnm**, is required—the user can’t skip it. Input to the **state** field is displayed in uppercase.

The **phone** field is left blank if the user enters a value of 0; input is redisplayed in the format (XXX) XXX-XXXX.

```
.input address, 14, 60
.place 2, 10
.border reverse
.title " Address Book "
.paint '.'
.field lastnm, a15, required, position(2,2), prompt("Last name ")
.field firstnm, a15, position(3,2), prompt("First name ")
.field addr, a30, position(4,2), prompt("Address ")
.field city, a20, position(5,2), prompt("City ")
.field state, a2, uc, position(5,35), prompt("State ")
.field zip, d5, position(5,45), prompt("Zip code ")
.field phone, d10, fmt("(XXX) XXX-XXXX"), position(6,2), bzro, -
    prompt("Phone ")
.end
```

The following example defines a selection window called **prod** that has four entries, whose quick-select characters are **F**, **R**, **S**, and **U**. The entries in the window are “Full System,” “Runtime(s),” “Support,” and “Update,” respectively.

```
.select prod, 5, 13
.item "Full System"
.item "Runtime(s)"
.item "Support"
.item "Update"
.end
```



# Script: The Script Compiler

Once you have created a script file, it must be processed for use by UI Toolkit. The Script compiler converts window and column scripts into window and column definitions. These definitions are then loaded into a window library (ISAM file) created by Script. (Proto and Composer can also compile a script file.)

## Running Script

To compile your script files,

1. Start Script with your system's execute command.

| On...           | Do this...                                                |
|-----------------|-----------------------------------------------------------|
| Windows or UNIX | At a command prompt, enter<br><code>dbr WND:script</code> |
| OpenVMS         | At a command prompt, enter<br><code>run WND:script</code> |

Script will display this prompt:

### Window Libr:

2. Enter the name of the window library that will contain the compiled window and column definitions. Script will search for an existing library and modify it by loading the specified script files. If you append /c (or /C) to the library name, Script either creates a new library file, if it doesn't already exist, or completely overwrites the existing library.

You are then prompted with the following:

### Script File:

3. Enter the name of the file that contains the window script(s) that you want to compile. The default extension of the script filename is **.wsc**.
  - ▶ If Script cannot find or create the library file, it displays an error message then waits for valid input.
  - ▶ If Script cannot save because of locked window library records, Script waits two seconds and tries again to save to it. Script attempts this ten times before displaying a message and prompting you again for a filename.
  - ▶ Script cannot process a line that is longer than 255 characters.

After Script creates the window library, it prompts for another script file, letting you compile multiple files at one sitting. Typing an end-of-file character or pressing ENTER at the **Script File** prompt ends the utility.



When Script ends, it will exit with a status of D\_EXIT\_FAILURE if it encountered any errors (0 on OpenVMS, 1 on all other systems). Otherwise, it will exit with a status of D\_EXIT\_SUCCESS (1 on OpenVMS, 0 on all other systems). Most operating systems have commands that enable you to test for the exit status. See the documentation for your operating system for more information.

You can use Script in command files once you have final versions of script files and want to build windows quickly and automatically.

Command-line syntax

You can also compile a script from the command line as follows.

| On...            | Do this...                                                                                                               |
|------------------|--------------------------------------------------------------------------------------------------------------------------|
| Windows and UNIX | At a command prompt, enter<br>dbr WND:script [option, ...]                                                               |
| OpenVMS          | Define the following symbol:<br>script==\$WND:script.exe<br><br>Then, at a command prompt, enter<br>script [option, ...] |

Arguments

*option*

One or more of the following command line options:

- l *library\_name* Specifies an existing library.
- c *library\_name* Creates a new library.
- i *script\_file* [, ...] Specifies one or more script files.
- o *error\_file* Specifies an error log file.

## Discussion

An error will occur if more than one library file is specified, or both “-l” and “-c” are specified. If no library is specified, *library\_name* will default to the same base name as the first script file specified, but with the extension **.ism**. If no script file or library is specified, then Script will prompt the user for the filenames. The default extension for a library is **.ism**.

The command line option “-i” specifies up to 255 script files. They are processed in the order specified. If no script is specified, then a single script will be processed which has the same name as the library file specified, but with a **.wsc** extension. The default extension for a script is **.wsc**.

If “-o” is specified, all error output will be sent to this file. If no errors occur, this file will not exist (it will be deleted). The default extension is **.err**. If “-o” is not specified, all error output is directed to standard output (the terminal).

## Accessing the Script Compiler from Your Application

You can compile scripts in the following ways:

- ▶ Run the Script compiler, providing the necessary information when prompted
- ▶ Run the Script compiler, using the command-line syntax
- ▶ Use the external routine interface

### Accessing the Script compiler using the external routine interface

The following routines enable you to call the Script compiler directly from your application:

- ▶ `%SCR_CLOSELIBRARY`
- ▶ `%SCR_ERRORCOUNT`
- ▶ `%SCR_OPENLIBRARY`
- ▶ `%SCR_PROCESS`

These routines are contained in **WND:script.elb** (or **script.sh.exe** on OpenVMS). Their syntax is documented on the following pages. To call these routines, you must either link **WND:script.elb** with your program or open it using the `OPENELB` subroutine.

### Sample program

A sample program (**scremp.dbl**) is included in the `toolkit\examples\script` directory.

## %SCR\_CLOSELIBRARY – Close the currently open window library



```
status = %SCR_CLOSELIBRARY
```

or

```
xcall SCR_CLOSELIBRARY
```

### Return value

*status*

This function returns true if successful, false if not. (^VAL)

### Arguments

This function has no arguments.

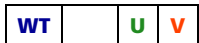
### Discussion

The %SCR\_CLOSELIBRARY function closes the window library that was opened by %SCR\_OPENLIBRARY. If an error occurs, the error information is sent to the ESCRIPTERR\_METHOD routine before this function returns.

### See also

- ▶ [E\\_METHOD on page 7-38](#) for more information on registering environment methods.
- ▶ [EScripterr\\_METHOD on page 7-86](#) more information on registering and writing a routine for handling script compilation errors.

## %SCR\_ERRORCOUNT – Return script compilation error information



```
num_error = %SCR_ERRORCOUNT ([type][, scope])
```

### Return value

*num\_error*

This function returns the number of script compilation errors and/or warnings. (^VAL)

### Arguments

*type*

(optional) One of the following: (**n**)

|                |                                  |
|----------------|----------------------------------|
| <b>D_ERROR</b> | Report errors only. (default)    |
| <b>D_ALERT</b> | Report warnings only.            |
| <b>D_ALL</b>   | Report both errors and warnings. |

*scope*

(optional) One of the following: (**n**)

|                  |                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------|
| <b>D_LIBRARY</b> | Report the count for all scripts compiled in the window library that was opened by %SCR_OPENLIBRARY. (default) |
| <b>D_SCRIPT</b>  | Report only the count for the most recently compiled script.                                                   |

### Discussion

The %SCR\_ERRORCOUNT function returns the number of script compilation errors and/or warnings for all scripts compiled in the currently open window library (opened by %SCR\_OPENLIBRARY) or for the most recently compiled script.

The actual script compilation errors themselves are sent to the ESCRIPTERR\_METHOD routine.

### See also

- ▶ [E\\_METHOD on page 7-38](#) for more information on registering environment methods.
- ▶ [ESCRIPTERR\\_METHOD on page 7-86](#) more information on registering and writing a routine for handling script compilation errors.

## %SCR\_OPENLIBRARY – Open a window library



```
channel = %SCR_OPENLIBRARY(library[, create])
```

or

```
xcall SCR_OPENLIBRARY(library[, create])
```

### Return value

*channel*

This function returns the channel of the opened library if successful, otherwise 0. (^VAL)

## Arguments

*library*

The name of the window library file to open. **(a)**

*create*

(optional) A true/false flag that indicates whether to create the library file. **(n)**

|                       |                          |
|-----------------------|--------------------------|
| <b>D_CREATE_NEVER</b> | Do not create. (default) |
|-----------------------|--------------------------|

**D CREATE IFNEEDED** Create if it doesn't exist.

**D CREATE ALWAYS**      Create even if it exists.

## Discussion

The %SCR\_OPENLIBRARY function opens the specified window library file.

If *library* does not specify an extension, it defaults to **.ism**.

If the library is already open, it is closed first and then reopened. If the open is successful, the channel is opened in the current environment. To promote it to global, use the U\_GBLCHN subroutine.

If an error occurs, the error information is sent to the `ESCRIPTErr_METHOD` routine before this function returns.

A macro is provided in **WND:tools.def** to simplify creating a library:

```
.define SCR_CREATELIBRARY(library) SCR_OPENLIBRARY(library,
&                                D CREATE ALWAYS)
```

## Script

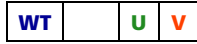
%SCR\_OPENLIBRARY

### See also

- ▶ [E\\_METHOD on page 7-38](#) for more information on registering environment methods.
- ▶ [ESCRPTERR\\_METHOD on page 7-86](#) more information on registering and writing a routine for handling script compilation errors.



## %SCR\_PROCESS – Compile a script file into the open window library



```
status = %SCR_PROCESS (script)
```

or

```
xcall SCR_PROCESS (script)
```

### Return value

*status*

This function returns true if successful, false if not. (^VAL)

### Arguments

*script*

The name of the window script file to compile. (a)

### Discussion

The %SCR\_PROCESS function compiles the specified script file into the window library that was opened by %SCR\_OPENLIBRARY.

If *script* does not specify an extension, it defaults to .wsc.

If any errors occur (including no open library file, errors opening the script file, or syntax errors in the script), the error information is sent to the ESCRIPTERR\_METHOD before this routine returns. (If Script cannot save to the window library, Script waits two seconds and tries again to save. Script attempts this ten times before displaying a message and prompting you again for a filename.)

### See also

- ▶ [E\\_METHOD on page 7-38](#) for more information on registering environment methods.
- ▶ [EScriptERR\\_METHOD on page 7-86](#) for more information on registering and writing a routine for handling script compilation errors.

# Scridl: The Script-to-Repository Conversion Utility

To help move field information from existing script files into a repository, you can use the **scridl** conversion utility.

Complete conversion is a two-step process:

1. Run the **scridl** utility.
2. Update the existing repository.

## Step 1: Running scridl

If your .INPUT window scripts do not contain .STRUCTURE statements, you must add them so that **scridl** knows which structure to add/update in the repository.

Run **scridl** on your script file, refer to the table below.

| On...           | Do this...                                                |
|-----------------|-----------------------------------------------------------|
| Windows or UNIX | At a command prompt, enter<br><code>dbr WND:scridl</code> |
| OpenVMS         | At a command prompt, enter<br><code>run WND:scridl</code> |

This creates a Synergy Data Language file containing input field information extracted from the script file. (Non-input windows, such as .WINDOW and .COLUMN, are ignored.)

When you run **scridl**, an input window is displayed on the screen. (See [figure 2-5](#).) Complete the fields as described below.

1. Specify the repository main and text files. (A repository consists of two parts: a main file and a text file.)
  - ▶ In the **Repository main file** field, enter the name of the target repository main file.
  - ▶ In the **Repository text file** field, enter the name of the target repository text file.
2. In the **Script file** field, specify the name of the existing script file.

A new script file is generated with a **.new** extension. This file references the structures in the repository above. (Repository filenames are added only if they override the default filename.)

A Synergy Data Language file is generated with an **.sdl** extension. If errors occur during the conversion, an error log file is created with an **.err** extension. (See [“Errors during conversion” on page 2-146](#).) All of these files inherit the name of the original script file but with different extensions.

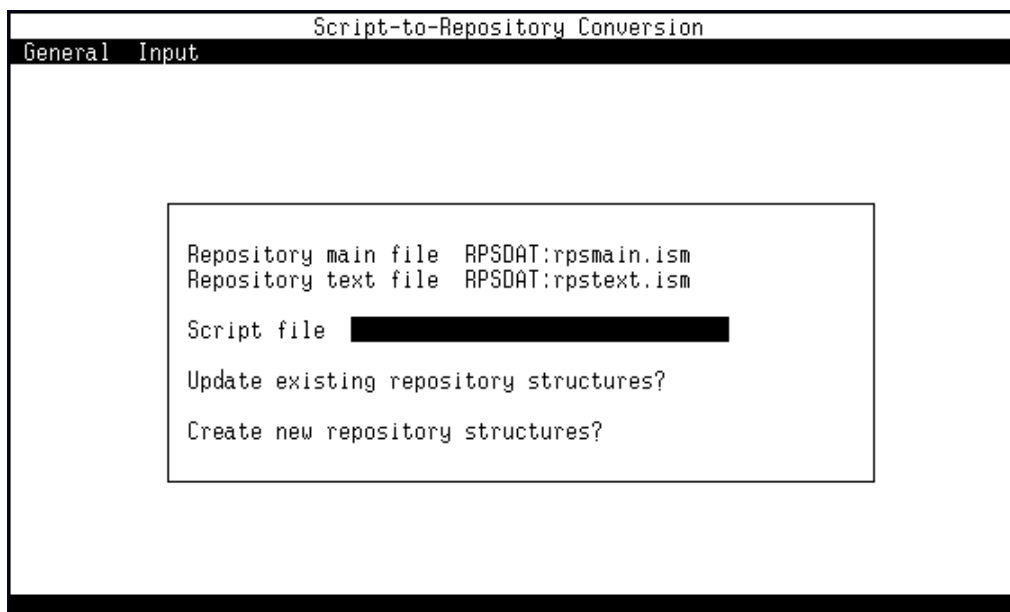


Figure 2-5. Scridl input window.

3. Specify whether you want to update the existing repository structures.

Select **Yes** if you want **scridl** to update any existing repository structures that have the same names as structures in your script file. (Note that **scridl** is not casesensitive.) For each matching structure, **scridl** will do the following:

- ▶ Add appropriate `.REPOSITORY_STRUCTURE` statements to the output script file. (The contents of the repository file override the defaults.)
- ▶ Remove `.STRUCTURE` statements.
- ▶ Add `.LOCAL` statements for fields not contained in repository structures.
- ▶ Generate errors if fields within an existing structure are not found in the corresponding repository structure or if the type, size, dimension, or position in the structure of those fields do not match the repository specification.

If all of these tests pass, all of the other script qualifiers for this field will be copied to the Synergy Data Language repository field specification and removed from the output script specification. (Exceptions to this rule are the formats for date- and time-type fields.)

Select **No** if you want **scridl** to ignore structure names that already exist in the repository. The output script remains unchanged for these structures.

#### 4. Specify whether you want to create new repository structures.

Select **Yes** if you want **scridl** to do the following when it encounters structure names that are not in the repository:

- ▶ Create the structure names in the Synergy Data Language output file.
- ▶ Add the appropriate `.REPOSITORY_STRUCTURE` and `.LOCAL` statements to the output script file. (Repository filenames are added only if the contents of the file override the defaults.)
- ▶ Remove the `.STRUCTURE` statements.
- ▶ Use `.FIELD` statements for fields contained in those structures to create Synergy Data Language output in order to generate those fields.
- ▶ Remove output script qualifiers (except for date- and time-type fields, which remain in the script).

Select **No** if you want **scridl** to ignore any new structure names not already in the repository. The output script remains unchanged for these structures, even if it refers to these new names.

## Errors during conversion

If any errors occur during conversion, they are logged in the error log file (*filename.err*), and a message is displayed on the screen indicating the number of errors found.

The same message is also written to the end of the Synergy Data Language output file (*filename.sdl*) and the script output file (*filename.new*), to prevent compiling of these files from occurring without modification. We recommend that you review scripts before converting and review the output Synergy Data Language and script files before using them.

## Step 2: Updating the repository

The second step consists of using the Synergy Data Language file (*filename.sdl*) to update an existing repository. Refer to the “[Utility Functions](#)” chapter in the *Repository User’s Guide* for information on using the Load Repository Schema utility.

When the Load Repository Schema utility prompts you to merge the schema, select **Yes**. You then will be prompted for how to handle new and existing definitions found in the Synergy Data Language file. Select **Yes** at the “Add new?” prompt, and select **Overlay** at the “Change existing?” prompt.

# 3

## Proto

### **What is Proto? 3-2**

Gives a description and overview of the Proto program.

### **Starting Proto 3-3**

Gives instructions for starting the Proto program.

### **Using Proto 3-4**

Covers the basic rules of using Proto, describes the General and Main menus, and then discusses each entry associated with those menus.

### **Customizing Proto 3-10**

Briefly covers the ways you can customize the Proto program.

## What is Proto?

Proto is a menu-driven, prototyping tool that

- ▶ builds windows and columns from a script file.
- ▶ displays the windows and columns on the screen.
- ▶ places the windows and columns in a window library.

Proto provides a quick and easy way to view and test the UI Toolkit screen functions. It enables you to load and place menu columns, input windows, and other windows on your screen so you can see what they look like.

# Starting Proto

Start Proto by entering your system’s execute command as follows:

| On...   | Do this...                                               |
|---------|----------------------------------------------------------|
| UNIX    | At a command prompt, enter<br><code>dbr WND:proto</code> |
| OpenVMS | At a command prompt, enter<br><code>run WND:proto</code> |

On Windows, we recommend you use Composer.

## Using Proto

Proto was written using UI Toolkit; thus it follows the same “rules” as any other Toolkit application.

If the menu bar is disabled, press CTRL+P to enable it.

An entry in a menu or list is always highlighted. To select an item, use the arrow keys to move the highlighted area until the item you want is highlighted and then press ENTER.

You can also select a menu entry using the quick-select character (when the menu bar is active) or shortcut for that entry. The shortcuts (which in this case are all function keys) are listed on the information line at the bottom of your screen.

After you enter Proto, you will see the menu bar, which contains two headings: General and Main.

## The General menu

The General menu contains the following entries:

- Help
- Exit
- About
- View
- Directory
- Renditions
- Key mapping
- App keypad

The View, Directory, Renditions, Key mapping, and App keypad entries are hot-entries, meaning they are available at all times while you are running Proto.

## Getting help

The Help entry displays information about the current screen. Use the Help shortcut if you are not sure what a menu entry means.

## Exiting the current entry

Selecting Exit takes you out of the current menu entry and returns you to the previous entry. You can use the Exit shortcut to stop doing almost anything. If you are at the Main menu, Exit will exit from Proto altogether.



## Viewing a window without obstruction

The View command is only enabled when you are loading windows. View removes all prompts and selection windows to enable you to view any windows you have placed. (Note that View is meaningless when you are loading columns, because the columns are not placed on the screen and you therefore will not be able to see them.)

View is a toggle; to replace the prompt and selection window so you can continue loading windows, press the View command key again. You can also press ENTER to continue.

## Getting a directory listing

When you press the hot-entry key for the Directory, a text window that lists the current contents of the window library is placed on the screen. A Scroll commands menu is added to enable you to page through the directory. The left and right arrow keys are the shortcuts for page down and page up, respectively.

If no window library is currently open, this entry is disabled and your terminal will beep if you try to access it by pressing its shortcut.

## Renditions

Select Renditions from the General menu if you want to define your own rendition schemes for the various screen areas. You can edit the display renditions for such items as menu entries, input fields, and windows. (You can add this same rendition editing capability to your own programs by calling the UI Toolkit's U\_EDITREND subroutine, which is what Proto does.) See [“Using the Renditions window \(Windows\)” on page 18-41](#) for information.

## Key mapping

Key mapping is the internal processing that associates a key on a keyboard with a Toolkit menu entry. The key mapping utility enables you to add or modify the key mapping for one or more terminal types.

You can start the key mapping utility from Proto or the Synergy UI Toolkit Control Panel. You can also start it from your own programs by calling UI Toolkit's U\_EDITKEYS subroutine (which is what Proto and Synergy UI Toolkit Control Panel do).

See [“Customizing Key Mapping for Menu Shortcuts” on page 18-11](#) for information.

## Setting application keypad mode

Selecting App keypad toggles the keypad mode on and off and generates a message stating if keypad mode is set or reset.

If you have a VT100 keyboard, you can set your keypad to application mode using an escape sequence. If your menu column uses the keypad but your terminal is not set in application keypad mode, you can use the “App keypad” hot-entry to set it. (The “App keypad” menu entry has no effect on terminals that are not VT100-compatible.)

Proto does not automatically reset the application keypad mode when it exits.

## The Main menu

The Main menu contains the following entries:

- Create library
- Process script
- View/Test
- Open library

The entries in this menu are highlighted according to the logical order of choices you are likely to make.

The first selection highlighted is Create library. Since Proto uses a window library file for all user-defined windows and columns (those you are prototyping), you may need to create a library into which Proto can load columns and windows when a script file is compiled. After the library is created and you are once again at the Main menu, the Process script entry is highlighted, followed by the View/Test entry.

If you are testing windows in an existing window library, you can select the “Open library” entry first. When Proto returns to the Main menu, the View/Test entry will be highlighted.

The information line contains the name of the current window library.

## Creating a library

When you select Create library from the menu, an input window prompts you for the name of the library to create. Type the name of a library file.

If Proto cannot create the library because a library of that name already exists, it displays an error message and waits for valid input.

The default extension for a library file is **.ism**.

## Processing a script file

The “Process script” option is available only when a window library is open. When you select “Process script,” an input window prompts you for the name of the script file you want to compile.

Type the name of the script file (the default extension is **.wsc**). If Proto cannot find the script file, it displays an error message and waits for valid input. If Proto is unable to save because of locked window library records, it retries up to 10 times with two-second delays between retries.

Proto can process physical lines containing up to 255 characters.

As each window is processed, it is placed in the current window library. When processing is complete, Proto displays a directory that lists all windows or columns in the script file that was just compiled.

Select “Exit” to leave this directory.

## Viewing and testing your windows

When you select View/Test, the Main menu is replaced with a Functions menu. This menu contains the following entries:

- Load column
- Load input window
- Load selection window
- Load window
- Process an input window
- Process a selection window
- Exercise columns
- Remove column
- Remove all columns
- Remove window
- Remove all windows

### Loading a column

When you select Load column from the menu, Proto displays a selection window that contains a list of the columns that can be loaded. A Selection functions menu is added to the menu bar; it contains the following entries:

- Next selection
- Prior selection
- Next page
- Prior page
- Manual entry

You can use these entries to scroll through the selection window.

When you select a column, Proto loads that column in memory but does not place it on the screen. You will get a message telling you the column was loaded; press ENTER to continue.

You can load up to seven columns at one time. If you want to manually enter the name of a column, press the Manual entry shortcut (CTRL+E). The list of columns is removed from the screen, and you can type the name of the column you want to load.

When you are finished loading columns, press the Exit shortcut. To place your column, select Exercise columns from the menu. See [“Exercising \(placing\) columns” on page 3-9](#).

### **Loading an input, selection, or general window**

To load an input, selection, or general window, select Load input window, Load selection window, or Load window from the menu.

Proto displays a selection window that contains a list of the available windows. The Selection functions menu (described on [page 3-7](#)) is added to the menu bar.

When you select a window, Proto loads that window and places it on the screen. You can place up to 10 windows at one time. (No more than five input windows and five selection windows are allowed.)

If you want to manually enter the name of a window, press the Manual entry shortcut (CTRL+E). The list of windows is removed from the screen, and you can type the name of the window you want to load.

The View shortcut is enabled while you are loading windows. View removes the window selection list from the screen so you can view your placed windows without obstruction. Press ENTER or the View shortcut again to continue.

When you are finished loading and placing windows, press the Exit shortcut.

### **Processing an input window**

To process an input window, select Process input window from the menu. Proto displays a list of placed input windows on the screen.

When you select the input window you want to process, input processing begins. You are responsible for having previously loaded any columns required by the input window. When the input routine reaches a break field, it displays a message that tells you which break field it has reached.

Remember, you can only submit input to visible fields. If you try to process an occluded field, a fatal Toolkit error occurs. Proto always displays the input termination message when testing input windows. Proto always uses the default input set.

## Processing a selection window

To process a selection window, select Process a selection window from the menu. Proto displays a list of placed selection windows on the screen.

When you choose the selection window you want to process, selection processing begins. You are responsible for having previously loaded any columns required by the selection window. When you select an item by pressing ENTER, Proto displays a message that tells you which selection item was chosen.

## Exercising (placing) columns

When you load a menu column, it is not automatically placed on the screen. You must select Exercise columns to actually place all loaded columns on the menu bar.

The menu bar is enabled after selecting Exercise columns, and the first column that you loaded is dropped down by default. You can move through the menu column entries using quick-select characters and the up and down arrow keys, and drop down other columns using the left and right arrow keys. If you select a menu entry that Proto does not recognize, Proto generates a message that tells you which entry was selected.

The General menu is still present on the menu bar. To end the column exerciser, press the Exit shortcut.

## Removing a column or window

You can either remove one column or window at a time, or you can remove all columns or all windows.

When you select “Remove column” or “Remove window” from the menu, Proto displays a selection window that contains a list of the placed columns or windows. Select the item you want to remove, and Proto removes it from the screen. Press the “Exit” shortcut when you are finished removing columns or windows.

When you select “Remove all columns” or “Remove all windows” from the menu, Proto removes all columns or windows from the screen and deletes them from memory. The columns and windows are not deleted from the window library.

## Opening an existing library

When you select “Open library” from the menu, an input window prompts you for the name of the library you want to open. Type the name of the library. If Proto can’t find the library file, it displays an error message and waits for valid input. If the library filename is valid, the specified library is opened and Proto returns to the Main menu.

Once a library is opened, the “Directory” shortcut is enabled.

## Customizing Proto

Your UI Toolkit distribution includes the script file (**proto.wsc**) for the menus and windows in the Proto program. If you need to translate the menu items or the help windows into another language, edit this script file and rebuild the windows. The menus and help windows are saved in a window library named **proto.ism**.

You can modify the text messages displayed in Proto by using the Synergy UI Toolkit Control Panel. These messages are stored in **syntxt.ism** under the facility PRO.

See [“The Synergy UI Toolkit Control Panel”](#) in the “General Utilities” chapter of *Synergy Tools*.

# 4

## ActiveX Routines

UI Toolkit ActiveX routines are not available in Synergy .NET.

### Options for ActiveX 4-3

Lists and discusses methods you can use to add ActiveX controls to your Toolkit application.

### Routines for ActiveX Controls in Toolkit Containers 4-7

Discusses and provides the syntax for routines that enable you to use ActiveX controls with Toolkit container windows.

|                                                                                   |      |
|-----------------------------------------------------------------------------------|------|
| AX_INPUT – Perform input to an ActiveX control.....                               | 4-8  |
| AX_REGISTER – Register an ActiveX control .....                                   | 4-11 |
| AX_TIMEOUT – Set the time-out value for an ActiveX control .....                  | 4-12 |
| %AX_TKCALL – Call a method for an ActiveX control.....                            | 4-13 |
| %AX_TKCID – Get the ID for an ActiveX container .....                             | 4-16 |
| %AX_TKCTLID – Get an ActiveX control ID .....                                     | 4-17 |
| AX_TKGET – Get a property for an ActiveX control.....                             | 4-18 |
| %AX_TKGETINT – Get an ActiveX control property as an integer .....                | 4-20 |
| AX_TKSET – Set a property for an ActiveX control .....                            | 4-22 |
| %AX_TKSINGLE – Create a Toolkit container and load a single ActiveX control ..... | 4-24 |
| %AX_TKWIN – Create a Toolkit container window .....                               | 4-27 |
| AX_WANTSKEY – Register keys to an ActiveX control.....                            | 4-29 |

### Routine for the Spread Control 4-32

Discusses and provides the syntax for a routine that makes it easier to create a container for and load the Spread™ control.

|                                                                       |      |
|-----------------------------------------------------------------------|------|
| %GRID_CREATE – Create a Toolkit container for the Spread control..... | 4-33 |
|-----------------------------------------------------------------------|------|

**Supplied Methods 4-36**

Discusses %UWNDEVENTS\_METHOD methods that are loaded by %AX\_TKSINGLE and %GRID\_CREATE. These methods automatically call developer-supplied methods if you pass the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE.

|                                                                                |      |
|--------------------------------------------------------------------------------|------|
| %AX_TKEVENT_CLOSE – Call extension for close event .....                       | 4-37 |
| %AX_TKEVENT_LEFT_CLICK – Call extension for left click event .....             | 4-38 |
| %AX_TKEVENT_LEFT_DBLCLK – Call extension for left double-click event .....     | 4-40 |
| %AX_TKEVENT_MAXIMIZE – Call extension for maximize event.....                  | 4-42 |
| %AX_TKEVENT_MIDDLE_CLICK – Call extension for middle click event .....         | 4-44 |
| %AX_TKEVENT_MIDDLE_DBLCLK – Call extension for middle double-click event ..... | 4-46 |
| %AX_TKEVENT_MINIMIZE – Call extension routine for minimize event .....         | 4-48 |
| %AX_TKEVENT_MOVE – Call extension routine for move event.....                  | 4-49 |
| %AX_TKEVENT_RESTORE – Call extension routine for restore event.....            | 4-51 |
| %AX_TKEVENT_RIGHT_CLICK – Call extension routine for right click event.....    | 4-52 |
| %AX_TKEVENT_RIGHT_DBLCLK – Call extension for right double-click event .....   | 4-54 |
| %AX_TKEVENT_SCROLL – Call extension routine for scroll event .....             | 4-56 |
| %AX_TKEVENT_SIZE – Size the Toolkit container window .....                     | 4-58 |



# Options for ActiveX

UI Toolkit enables you to add ActiveX controls to Toolkit windows, including composite windows. Toolkit includes a routine (%GRID\_CREATE) that is specially designed for the FarPoint™ Spread control, but the other ActiveX routines can be used for any ActiveX control. For general information on developing with ActiveX controls, see the *Migrating Your Application to Windows* guide, available in the [Synergex website](#).

Note the following:

- ▶ Before an application can use an ActiveX control, the control must be registered with the Windows operating system. You can register an ActiveX control manually (see the *Migrating Your Application to Windows* guide, available in the [Synergex website](#)), or you can use AX\_REGISTER, %AX\_TKSINGLE, or %GRID\_CREATE to register it programmatically.
- ▶ You cannot use any 64-bit ActiveX control with the 32-bit Synergy Runtime, and you cannot use any 32-bit ActiveX control with the 64-bit Runtime. (Consequently, %GRID\_CREATE, which creates an instance of the 32-bit Spread ActiveX control, works only with the 32-bit Synergy Runtime.)

Also note that Toolkit automatically uses an ActiveX control (based on the Spread control) when you choose to include ActiveX Toolkit lists in your application.

The following are the methods you can use to add ActiveX controls:

- ▶ *Use the ActiveX API.* The ActiveX API is a group of routines included in Synergy DBL. These routines enable you to use an ActiveX control in a Synergy application. You don't need UI Toolkit to use the ActiveX API, but some of these routines are useful if you do use Toolkit. For information, see the “[Synergy ActiveX API](#)” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ *Use a single control with a Toolkit container.* The most common way to handle ActiveX controls is to use a single ActiveX control with a Toolkit container. UI Toolkit includes routines that simplify this scenario. For information, see “[Using a single control with a Toolkit container](#)” on page 4-4.
- ▶ *Use multiple controls with a single Toolkit container.* UI Toolkit enables you to use multiple controls with a single container. For information, see “[Using multiple controls with a single container](#)” on page 4-5.
- ▶ *Add the Spread control.* UI Toolkit includes a routine specifically designed to make it easy to add the Spread control, a spreadsheet encapsulated in an ActiveX control. For information, see “[Creating a container for the Spread control](#)” on page 4-5.
- ▶ *Add an ActiveX Toolkit list.* UI Toolkit includes an ActiveX implementation of the Toolkit list. This implementation enables Toolkit list routines to control an ActiveX list. For information, see “[Using an ActiveX Toolkit list](#)” on page 4-6.

## Containers for ActiveX controls

To use an ActiveX control with a UI Toolkit application, you'll need two types of container for the control: a *Toolkit container window* and an *ActiveX container*. Toolkit includes routines that create these containers, load ActiveX controls, and retrieve the IDs for ActiveX containers.

The Toolkit container window is a Toolkit window that you can manipulate as you would any other Toolkit window (environment control, place/remove, and so forth). The ActiveX container is placed within the Toolkit window and is exactly the same size as the Toolkit window. This container is “slaved” to the Toolkit container window, so you won't manipulate it directly. The `%AX_TKCID` routine does enable you to get the ActiveX container ID, and you can get this ID by passing the optional `ax_container_id` argument to `%AX_TKWIN`. You will need this ID if you want to bind to the ActiveX container's events or if you want to manipulate the ActiveX container's properties. (See “[Extended properties](#),” “[Ambient properties](#),” and “[Local properties](#)” in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.)

## Using a single control with a Toolkit container

The most common way to use ActiveX controls with a Toolkit application is to use a single ActiveX control with a single Toolkit container window (and a single ActiveX container). To do this, use the following routines, which are designed for this scenario and are easier to use than ActiveX API counterparts. These routines are documented in “[Routines for ActiveX Controls in Toolkit Containers](#)” on page 4-7 unless otherwise noted.

- ▶ To create a Toolkit container and an ActiveX container and load the ActiveX control, use `%AX_TKSINGLE`. This routine returns an ID for the Toolkit container window, registers a method set for the window, and enables you to extend the method set with your own routines.
- ▶ To retrieve the ActiveX control ID, pass the Toolkit container ID to `%AX_TKCTLID`.
- ▶ To retrieve the ActiveX container ID, pass the Toolkit container ID to `%AX_TKCID`.
- ▶ To trigger an event for the Toolkit container window, use the `D_SIGNAL` subfunction of `%U_WNDEVENTS`. (See `%U_WNDEVENTS` on page 16-214 for information.)
- ▶ To use the Toolkit container window ID to access the properties and methods for the ActiveX control, use `%AX_TKCALL`, `AX_TKGET`, `%AX_TKGETINT`, or `AX_TKSET`.
- ▶ To use the ActiveX container ID to access the properties and methods for the ActiveX container, use `%AX_CALL`, `AX_GET`, `%AX_GETINT`, or `AX_SET`. (For information on these routines, see the “[Synergy ActiveX API](#)” chapter of the *Synergy DBL Language Reference Manual*.)
- ▶ To control how keystrokes are passed to the ActiveX control, use `AX_WANTSKEY`.
- ▶ To wait for user input for the ActiveX control, use `AX_INPUT`.

You can also use the method documented in “[Using multiple controls with a single container](#)” below, and load only one control into the container. However, we recommend using `%AX_TKSINGLE` when working with a single control because it minimizes the number of separate IDs that need to be maintained.

## Using multiple controls with a single container

You can use multiple controls with a single Toolkit container window (and a single ActiveX container). Note, however, that with this method, you can't use the Toolkit container window ID to access properties and methods for an ActiveX control (i.e., you can't use %AX\_TKCALL, AX\_TKGET, %AX\_TKGETINT, or AX\_TKSET). Unless otherwise noted, the following routines are documented in [“Routines for ActiveX Controls in Toolkit Containers” on page 4-7](#)

To use multiple controls with a single container, use the following routines.

- ▶ To create a Toolkit container and an ActiveX container, use %AX\_TKWIN. This routine returns an ID for the Toolkit container window.
- ▶ To load the ActiveX controls, use %AX\_LOAD. The ActiveX control IDs are the return value of this function. (For information on this function, see [%AX\\_LOAD](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.)
- ▶ To retrieve the ActiveX container ID, pass the Toolkit container ID to %AX\_TKCID or pass the optional *ax\_container\_id* argument to %AX\_TKWIN.
- ▶ To trigger an event for the Toolkit container window, use the D\_SIGNAL subfunction of %U\_WNDEVENTS. (See [%U\\_WNDEVENTS on page 16-214](#) for information.)
- ▶ To use the ActiveX control ID or the ActiveX container ID to access the properties and methods for the ActiveX control, use %AX\_CALL, AX\_GET, %AX\_GETINT, or AX\_SET. (For information on these routines, see the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.)
- ▶ To control how keystrokes are passed to an ActiveX control, use AX\_WANTSKEY.
- ▶ To wait for user input for an ActiveX control, use AX\_INPUT.

## Creating a container for the Spread control

Professional Series includes the FarPoint Spread control, which is a full-featured spreadsheet encapsulated in an ActiveX control. To use the Spread control, you'll treat it as a single control in a Toolkit window as discussed in [“Using a single control with a Toolkit container” on page 4-4](#). However, instead of using %AX\_TKSINGLE to create the containers and load the control, you'll use %GRID\_CREATE. (Unless otherwise noted, the following routines are documented in [“Routines for ActiveX Controls in Toolkit Containers” on page 4-7](#).)

- ▶ To create a Toolkit container and an ActiveX container and load the Spread control, use %GRID\_CREATE. This function returns an ID for the Toolkit container window, registers a method set for the window, and enables you to extend the method set with your own routines. For information, see [%GRID\\_CREATE on page 4-33](#).
- ▶ To retrieve the ActiveX control ID, pass the Toolkit container ID to %AX\_TKCTLID.
- ▶ To retrieve the ActiveX container ID, pass the Toolkit container ID to %AX\_TKCID.
- ▶ To trigger an event for the Toolkit container window, use the D\_SIGNAL subfunction of %U\_WNDEVENTS. For information, see [%U\\_WNDEVENTS on page 16-214](#).

- ▶ To use the Toolkit container window ID to access the properties and methods for the ActiveX control, use `%AX_TKCALL`, `AX_TKGET`, `%AX_TKGETINT`, or `AX_TKSET`.
- ▶ To use the ActiveX control ID to access the properties and methods for the ActiveX control, use `%AX_CALL`, `AX_GET`, `%AX_GETINT`, or `AX_SET`. (For information on these routines, see the “[Synergy ActiveX API](#)” chapter of the *Synergy DBL Language Reference Manual*.)
- ▶ To control how keystrokes are passed to the ActiveX control, use `AX_WANTSKEY`.
- ▶ To wait for user input for the ActiveX control, use `%AX_INPUT`.

For information on obtaining the Spread control, visit <http://www.componentone.com>. For definitions of the methods, properties, and events of the Spread control, see the Spread documentation.

## Using an ActiveX Toolkit list

UI Toolkit includes an ActiveX implementation of the Toolkit list. This implementation wraps some of the functionality of the Spread control, providing an ActiveX list that you can control with Toolkit list routines. Your code creates an ActiveX Toolkit list on Windows platforms and a standard Toolkit list on UNIX and OpenVMS. For information, see “[Defining Lists](#)” on page 9-5.

In addition to the Toolkit list routines, you can also access published properties and methods for the ActiveX list. For information, see “[Using Lists in Toolkit Applications](#)” on page 9-4.

## Error handling for ActiveX control exceptions

You can trap exceptions generated by ActiveX controls as you load them or use them in your Toolkit application. We use the EXITE mechanism to generate errors from these exceptions. These errors can be trapped by ONERROR statements if they are in effect when the ActiveX subroutine that loads or uses the control is called. When an error is trapped, control is transferred to the code for the error if the error is in the error list for the ONERROR statement (or there’s a catch-all label). If the error isn’t trapped by the ONERROR statement, or if no ONERROR statement is in effect, any exception generated by the ActiveX control will cause a fatal runtime error at the line where the ActiveX subroutine was called.

- ▶ See the “[Error Messages](#)” chapter of *Synergy Tools* for a list of possible errors.
- ▶ See **ONERROR** in the “Synergy DBL Statements” chapter of the *Synergy DBL Language Reference Manual* for information on the ONERROR statement.
- ▶ See **EXITE** in the “System-Supplied Subroutines and Functions” chapter of the *Synergy DBL Language Reference Manual* for information on trapping errors generated by EXITE.

## Routines for ActiveX Controls in Toolkit Containers

In addition to the ActiveX API routines (documented in the “[Synergy ActiveX API](#)” chapter of the *Synergy DBL Language Reference Manual*), you can use the following routines to load and use ActiveX controls with Toolkit containers. Note the following:

- ▶ There are three routines that create Toolkit containers and load ActiveX controls: %AX\_TKSINGLE, AX\_TKWIN, and %GRID\_CREATE. See “[Options for ActiveX](#)” on [page 4-3](#) for information on their differences.
- ▶ You do not need to link against **axlib.elb** to use these routines. UI Toolkit automatically links to this library when you use these AX\_ routines.

## AX\_INPUT – Perform input to an ActiveX control



```
xcall AX_INPUT (tk_container_id, [help_id], [wait_time][, menu_flag])
```

### Arguments

*tk\_container\_id*

The ID of the Toolkit ActiveX container window. **(n)**

*help\_id*

(optional) A help identifier that will be passed if the menu entry “O\_HELP” is signaled or selected. **(a)**

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. This setting overrides any AX\_TIMEOUT setting. **(n)**

**D\_FOREVER** or **-1**

Never time out.

**D\_GLOBAL** or **-2**

Use the global value (see “[g\\_wait\\_time](#)” on page 18-6).  
(default)

**D\_IMMEDIATE** or **0**

Time out immediately.

*n*

Wait up to *n* seconds (where *n* is a positive value) for the user to press a key.

*menu\_flag*

(optional) If passed and true, a flag that causes AX\_INPUT to return utility menu entries (U\_ and O\_HELP) instead of processing them. **(n)**

### Discussion

The AX\_INPUT routine should be used instead of UI Toolkit’s I\_INPUT routine whenever you want to do input to an ActiveX control while Toolkit is running. AX\_INPUT enables you to focus the component and allow the user to perform input on it, while at the same time allowing menu entries to be selected and returned from the Toolkit. (On UNIX, this routine calls M\_PROCESS. On OpenVMS, it is ignored.)

The specified Toolkit ActiveX container window is activated and used to determine which keys get passed through to ActiveX controls. Before calling AX\_INPUT, the client routine should establish focus on the correct control by setting the “Ext\_Focus” property of the desired control.

AX\_INPUT recognizes the following reserved menu entries, which are documented in [“Appendix B: Reserved Menu Entries”](#):

```
E_CLEAR
E_COPY
E_CUT
E_MARK
E_PASTE
```

Unless *menu\_flag* is passed as true, the help method for the current environment will be invoked if the “O\_HELP” menu entry is signaled or selected, and if a “U\_” menu entry is signaled or selected, EUTILS\_METHOD for the current environment will be invoked. If *menu\_flag* is passed as true, AX\_INPUT returns these menu entries instead of processing them.

Note that when an ActiveX control is part of a composite window, TAB and SHIFT+TAB may not move focus to the next or previous child if the ActiveX control consumes these as accelerators. If this is the case, you can work around this by signaling “C\_NEXT” or “C\_PREV”. For information, see [“Controlling tabbing, focus, and input context”](#) on page 6-4.

When AX\_INPUT returns, **g\_select** will be true and **g\_entnam** will contain the selected menu entry. Note that an ActiveX event handler routine can use %M\_SIGNAL to force a break from AX\_INPUT.

If the operation times out, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See [“g\\_time\\_entry”](#) on page 18-5.

## See also

- ▶ [“Error handling for ActiveX control exceptions”](#) on page 4-6.
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## Examples

The following example uses this script file:

```
.script

.column c_general, "General"
.entry o_help, "Help", key(f1)
.entry o_exit, "Exit", key(esc), select(x)
.end
```

This example performs input to an ActiveX control.

```
main ToolkitActiveX                ;Toolkit ActiveX example

.include "DBLDIR:activex.def"      ;ActiveX definitions
.include "WND:tools.def"           ;Toolkit definitions
.include "WND:inpctl.def"          ;Toolkit input controls
```

```
.align
stack record
    colid      ,i4                ;Column ID
    axwin      ,i4                ;ActiveX Toolkit window ID
    axcntr     ,i4                ;ActiveX Container ID
    axctrl     ,i4                ;ActiveX Control ID

proc
    xcall u_start("ToolkitActiveX")
                                ;Start Toolkit and open our window lib
    xcall m_ldcol(colid,, "c_general") ;Load our general column
    axwin = %ax_tkwin("", 10, 40, axcntr)
                                ;Create Toolkit ActiveX window and
                                ; container
    axctrl = %ax_load(axcntr, "MSMask.MaskedTextBox.1", 15, 15, 100, 20)
                                ;Create a masked edit control at 15,15
                                ; (pixels) within the container, sized
                                ; at 100x20 (pixels)
    xcall u_window(D_PLACE, axwin, 5, 21) ;Place the window
    xcall ax_wantskey(axwin, D_KEY_ALL, D_MAP_CONTROL, D_KEY_MENU,
&                                D_MAP_MENU)
                                ;Tell the window that we want any key
                                ; that is not a menu shortcut to be
                                ; passed to the ActiveX controls
    xcall ax_set(axctrl, "Ext_Focus", TRUE)
                                ;Focus the masked edit control
    repeat
        begin
            xcall ax_input(axwin) ;Allow input to anything available
            if (g_select)         ;Menu entry or shortcut?
                begin
                    using g_entnam select ;Which one?
                        ("O_EXIT "), exitloop
                    endusing
                end
            end
        xcall u_finish                ;Close Toolkit
    endmain
```



## AX\_REGISTER – Register an ActiveX control



```
xcall AX_REGISTER(ocx_file)
```

### Arguments

*ocx\_file*

The name of the **.ocx** file for an ActiveX control. **(a)**

### Discussion

The AX\_REGISTER routine attempts to register the specified **.ocx** file as an ActiveX control. If it is unable to find or register the control, it resignals the error trapped for the load failure.

### See also

The *Migrating Your Application to Windows* guide, available in the [Synergex website](#).

## AX\_TIMEOUT – Set the time-out value for an ActiveX control



```
xcall AX_TIMEOUT(wait_time)
```

### Arguments

*wait\_time*

The input time-out (or “wait”) in seconds for I/O processing to be completed before returning to the calling routine. (**n**)

**D\_IMMEDIATE** or **0**                      Time out immediately.

**D\_FOREVER** or **-1**                      Never time out.

**D\_GLOBAL** or **-2**                      Use the global value. (default)

*#seconds*                                  Wait up to *#seconds* for I/O processing to be complete.

### Discussion

The AX\_TIMEOUT routine changes the time-out setting for AX\_INPUT. A call to this routine overrides the **g\_wait\_time** setting (the default time-out setting), but will be overridden by a time-out value set with AX\_INPUT.

Note that Toolkit does not time out while an application is suspended. For example, Toolkit does not time out while a menu is dropped down or a message window is open on Windows.

### See also

- ▶ [g\\_wait\\_time](#) on page 18-6.
- ▶ [AX\\_INPUT](#) on page 4-8 .
- ▶ **WAIT** in the “Synergy DBL Statements” chapter of the *Synergy DBL Language Reference Manual*.

## %AX\_TKCALL – Call a method for an ActiveX control

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

*value* = %AX\_TKCALL (*tk\_container\_id*, *method\_name*[, *arguments*, ...])

or

xcall AX\_TKCALL (*tk\_container\_id*, *method\_name*[, *arguments*, ...])

### Return value

*value*

The value returned by the method on Windows in traditional Synergy. If the method returns a value that isn't meaningful when expressed as an integer, *value* is returned as zero, and the value returned by the method is ignored. On UNIX, a call to this routine will cause an error. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*tk\_container\_id*

The window ID for the ActiveX control's Toolkit container. (n)

*method\_name*

The name of the method to call. (a)

*arguments*

(optional) Up to nine arguments to be passed to the method. (See the Discussion below for information on passing more than nine.)

### Discussion

This routine enables you to access an ActiveX control's methods by passing the Toolkit container ID. (If you use %AX\_CALL, you must pass the control ID.) Note the following:

- ▶ You can use %AX\_TKCALL only if you used %AX\_TKSINGLE or %GRID\_CREATE to create the container and load the control.
- ▶ If you used %AX\_TKWIN to create the container, you're limited to %AX\_CALL. See [%AX\\_CALL](#) in the "Synergy ActiveX API" chapter of the *Synergy DBL Language Reference Manual*.

Because %AX\_TKCALL is a macro, you can pass more than nine arguments by grouping arguments together using angle brackets (< >). If you enclose all optional arguments in a single set of angle brackets, the macro expansion will treat the enclosed text as a single unit.

%AX\_TKCALL will attempt to convert all optional arguments into the type of data that the method expects. You must ensure that the type of data passed has meaning within the context of the targeted conversion. Failure to do so will yield undefined results. For more information, see [“ActiveX data types”](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.



If you make multiple method calls to the same control, use %AX\_TKCTLID to get the ActiveX control ID, and then use AX\_CALL to call the methods. %AX\_TKCALL is convenient (because you don't need the control ID), but it calls AX\_CALL, so it's not as efficient.

---

## See also

- ▶ [“Error handling for ActiveX control exceptions” on page 4-6.](#)
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## Examples

The following example uses %AX\_TKCALL to display the About window for the control when the O\_ABOUT menu entry is selected. It also displays two messages when the O\_DBLCLK menu entry is signaled.

```
proc
  xcall u_start

  xcall mb_column(cntrl, "Col", "General")
  xcall mb_entry(cntrl, "o_about", "About")
  xcall mb_line(cntrl)
  xcall mb_entry(cntrl, "o_exit", "Exit", F4_KEY)
  xcall mb_end(cntrl, col_id)

  wndid = %grid_create(10, 40, D_SPREAD_LICENSE, "tgrid_")
  xcall u_window(D_PLACE, wndid, 10, 21)
  xcall ax_tkset(wndid, "VirtualMode", TRUE)
  xcall ax_tkset(wndid, "VirtualRows", 100)
  xcall ax_tkset(wndid, "MaxCols", 5)
  repeat
    begin
      xcall ax_input(wndid)
      if (g_select)
        begin
          using g_entnam select
("O_DBLCLK "),      xcall u_message("Double-clicked row " +
&                    %string(%ax_tkgetint(wndid, "ActiveRow"))+
&                    ", column " +
&                    %string(%ax_tkgetint(wndid, "ActiveCol"))+
&                    "\n\n  using %ax_tkgetint call")
```

```
("O_ABOUT "),      xcall ax_tkcall(wndid, "AboutBox")
("O_EXIT "),       exitloop
(),                exitloop
    endusing
    end
end
```

## %AX\_TKCID – Get the ID for an ActiveX container



*container\_id* = %AX\_TKCID(*tk\_container\_id*)

### Return value

*container\_id*

On Windows, %AX\_TKCID returns the associated ActiveX container ID. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*tk\_container\_id*

The ID of the Toolkit container window. (n)

### Discussion

Each UI Toolkit container window has an ActiveX container associated with it. This function enables you to obtain the ID for the ActiveX container by passing the ID for the Toolkit container window. (%AX\_TKWIN, %AX\_TKSINGLE, and %GRID\_CREATE return the ID for the Toolkit container window.)

### See also

- ▶ [“Error handling for ActiveX control exceptions” on page 4-6.](#)
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## %AX\_TKCTLID – Get an ActiveX control ID



```
control_id = %AX_TKCTLID(tk_container_id)
```

or

```
xcall AX_TKCTLID(tk_container_id)
```

### Return value

*control\_id*

The ID of the ActiveX control on Windows. On UNIX, a call to this routine will cause an error. On OpenVMS, this routine always returns true. (^**VAL**)

### Arguments

*tk\_container\_id*

The window ID for the ActiveX control's Toolkit container. (**n**)

### Discussion

This routine enables you to retrieve the ID for an ActiveX control associated with a given Toolkit container window. You can use this routine only if you used %AX\_TKSINGLE or %GRID\_CREATE to create the containers and load the control.

### See also

- ▶ [“Error handling for ActiveX control exceptions” on page 4-6.](#)
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

### Examples

See Examples on [page 4-35](#).

## AX\_TKGET – Get a property for an ActiveX control



```
xcall AX_TKGET (tk_container_id, property, current_value[, parameters])
```

### Arguments

*tk\_container\_id*

The window ID for the ActiveX control's Toolkit container. **(n)**

*property*

The name of the property to access. For information on supported properties, see “[Published Properties for ActiveX Toolkit Lists](#)” on page 9-17 and “[Properties](#)” in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*. **(a)**

*current\_value*

A field that will be loaded with the current value for the property. **(a)**

*parameters*

(optional) Up to eight additional parameters required by a property. **(a or n)**

### Discussion

This routine enables you to retrieve an ActiveX control's properties. However, you can use AX\_TKGET only if you used %AX\_TKSINGLE or %GRID\_CREATE to create the container and load the control. Note the following:

- ▶ If you used %AX\_TKWIN to create the container, you must use %AX\_GET. See [%AX\\_GET](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ To retrieve a property for an ActiveX control as an integer, use %AX\_TKGETINT. See [%AX\\_TKGETINT](#) on page 4-20.



Rather than making multiple calls to AX\_TKGET to get properties for the same control, use %AX\_TKCTLID to get the ActiveX control ID and then use AX\_GET to get the properties. AX\_TKGET is convenient (because you don't need the control ID), but it calls AX\_GET, so it's not as efficient.

Make sure the data type of *current\_value* has meaning within the context of the specified property. If it does not, the results are undefined.

The *parameters* argument can pass only integer values. It cannot be used to pass additional parameters for a property that expects alpha parameters.

It is the caller's responsibility to ensure that the data type of *current\_value* has meaning within the context of the specified property. If it does not, the results are undefined.



Some controls support indexed properties, which are stored as arrays in a control and have one or more indices. If the property is an indexed property, *parameters* must be the index values of the array element to reference. The user documentation for a given control should specify when a property is indexed.

On UNIX, a call to this routine will cause an error. On OpenVMS, this routine is ignored.

## See also

- ▶ [“Error handling for ActiveX control exceptions” on page 4-6.](#)
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## Examples

See Examples on [page 4-14](#).

## %AX\_TKGETINT – Get an ActiveX control property as an integer

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

*value* = %AX\_TKGETINT (*tk\_container\_id*, *property* [, *parameters*])

### Return value

*value*

On Windows, %AX\_TKGETINT returns the current value for the property. On UNIX a call to this routine will cause an error. On OpenVMS this routine always returns true. (^VAL)

### Arguments

*tk\_container\_id*

The window ID for the ActiveX control's Toolkit container. (n)

*property*

The name of the property to access. For information on supported properties, see “[Published Properties for ActiveX Toolkit Lists](#)” on page 9-17 and “[Properties](#)” in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*. (a)

*parameters*

(optional) Up to eight additional parameters required by a property. (n)

### Discussion

This routine enables you to retrieve an integer value for an ActiveX control. You can use %AX\_TKGETINT only if you used %AX\_TKSINGLE or %GRID\_CREATE to create the container and load the control. Note the following:

- ▶ If you used %AX\_TKWIN to create the container, you're limited to %AX\_GETINT. See [%AX\\_GETINT](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ To retrieve an ActiveX control property with a non-integer value, use AX\_TKGET. See [AX\\_TKGET](#) on page 4-18.

If *property* does not reference a property whose value has an integer representation, *value* will be undefined.

Some controls support indexed properties, which are stored as arrays in a control and have one or more indices. If the property is an indexed property, *parameters* must be the index values of the array element to reference. The user documentation for a given control should specify when a property is indexed.

The *parameters* argument can pass only integer parameters. It cannot be used to pass additional parameters for a property that expects alpha parameters.



Rather than making multiple calls to AX\_TKGETINT to get properties for the same control, use %AX\_TKCTLID to get the ActiveX control ID, and then use AX\_GETINT to get the properties. AX\_TKGETINT is convenient (because you don't need the control ID), but it calls AX\_GETINT, so it's not as efficient.

---

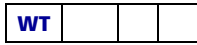
## See also

- ▶ [“Error handling for ActiveX control exceptions” on page 4-6.](#)
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## Examples

See Examples on [page 4-26](#).

## AX\_TKSET – Set a property for an ActiveX control



```
xcall AX_TKSET (tk_container_id, property, new_value)
```

### Arguments

*tk\_container\_id*

The window ID for the ActiveX control's Toolkit container. (**n**)

*property*

The name of the property to access. For information on supported properties, see “[Published Properties for ActiveX Toolkit Lists](#)” on page 9-17 and “[Properties](#)” in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*. (**a**)

*new\_value*

The new value for the property. (**a** or **n**)

### Discussion

This routine enables you to set an ActiveX control's properties by passing the Toolkit container ID. However, you can use AX\_TKSET only if you used %AX\_TKSINGLE or %GRID\_CREATE to create the container and load the control. (If you used %AX\_TKWIN to create the container, you must use %AX\_SET. See %AX\_SET in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.)

Make sure the data type of *new\_value* has meaning within the context of the specified property. If it doesn't (for example, if you specify an alpha string for a numeric property), the results are undefined.

We recommend that you use XCALL AX\_TKSET instead of accessing it as a function.



Rather than making multiple calls to AX\_TKSET to set properties for the same control, use %AX\_TKCTLID to get the ActiveX control ID, and then use AX\_GET to get the properties. AX\_TKSET is convenient (because you don't need the control ID), but it calls AX\_SET, so it's not as efficient.

On UNIX, a call to this routine will cause an error. On OpenVMS, this routine is ignored.

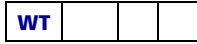
## See also

- ▶ [“Error handling for ActiveX control exceptions”](#) on page 4-6.
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## Examples

See Examples on [page 4-14](#).

## %AX\_TKSINGLE – Create a Toolkit container and load a single ActiveX control



```

window_id = %AX_TKSINGLE (tk_container_name, rows, columns, control_name, [ocx_file],
&                               [license_string][, prefix])

```

### Return value

*window\_id*

On Windows, %AX\_TKSINGLE returns the ID of the created Toolkit container window. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*tk\_container\_name*

The name of the Toolkit container window to create. (a)

*rows*

The number of rows to initially size the window. (n)

*columns*

The number of columns to initially size the window. (n)

*control\_name*

The name of the ActiveX control you want to load. (a)

*ocx\_file*

(optional) The name of the OCX file that contains the control. (a)

*license\_string*

(optional) The optional license string for the control. (a)

*prefix*

(optional) The optional prefix for binding extension routines to the automatically registered %UWNDEVENTS\_METHOD set and for auto-binding control events. (See the documentation for the *autobind\_prefix* argument for [AX\\_LOAD](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.) If you pass *prefix* to %AX\_TKSINGLE, it is used in two places: for the %UWNDEVENTS\_METHOD set that is registered for the Toolkit container window and for binding (AX\_BIND) routines to each of the control events. (a)

## Discussion

The %AX\_TKSINGLE routine

- ▶ creates a Toolkit container window.
- ▶ creates an ActiveX container window.
- ▶ loads the ActiveX control.
- ▶ registers a %UWNDEVENTS\_METHOD set. (This includes a routine for each event.)
- ▶ optionally saves the addresses of extension routines so they can be used later within the registered method set. (Use the *prefix* argument to do this.)

%AX\_TKSINGLE loads only one ActiveX control per Toolkit container. (To use more than one ActiveX control in a single Toolkit container, you must use %AX\_TKWIN.) You maintain only one ID: the window ID returned by %AX\_TKSINGLE. The resulting Toolkit container window is part of the current environment, but can be promoted to global.

%AX\_TKSINGLE automatically registers a default method set that includes an entry for each event. For example, for D\_EVENT\_LEFT\_CLICK, there's an %AX\_TKEVENT\_LEFT\_CLICK entry. (The names for these routines all begin with AX\_TKEVENT\_.) This method set also includes %AX\_TKEVENT\_SIZE (for the D\_EVENT\_SIZE event), which automatically resizes the ActiveX control when the user or the program resizes the Toolkit container window.

If you want to create your own routines for these events, there are three ways to replace these methods: by creating extensions, by creating your own routines with the same name and linking them in at runtime, or by registering your own method set. We recommend extensions, which are routines you write whose names have a common prefix, but otherwise are modeled after the event names for the AX\_TKEVENT\_\* supplied methods (documented in [“Supplied Methods” on page 4-36](#)). For example, if the common prefix is GRID\_ and you create an extension for the left click event, your extension would need to be named GRID\_TKEVENT\_LEFT\_CLICK. You then pass the prefix (“GRID\_”, in this case) as the *prefix* argument to %AX\_TKSINGLE.

Note the following:

- ▶ Only %AX\_TKEVENT\_SIZE contains code that affects the ActiveX control. The other automatically registered methods do nothing unless you pass *prefix* or you have created your own routines with the same names as the automatically registered set.
- ▶ Only those routines available at runtime with the correct naming convention are registered as extensions.
- ▶ You don't have to supply an extension for every event.

If you pass a null string (“”) for *tk\_container\_name*, Toolkit assigns a unique window name in the form \_W\_nnn, where *nnn* is the window ID.

If the ActiveX control cannot be loaded and the *ocx\_file* argument

- ▶ is passed and non-blank, %AX\_TKSINGLE attempts to automatically register the OCX file specified by *ocx\_file* and then attempts to load the control a second time. If either fails, %AX\_TKSINGLE resignals the error trapped on the load failure.
- ▶ is *not* passed or is blank, %AX\_TKSINGLE resignals the error trapped on the load failure.

### See also

- ▶ [“Error handling for ActiveX control exceptions” on page 4-6.](#)
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

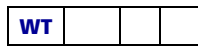
### Examples

The following example creates a Toolkit container window, creates an ActiveX container, and loads the **MSCAL.Calendar** ActiveX control. When the CAL\_SELECT menu entry is signaled, a message box is displayed indicating the currently selected date in the calendar control.

```
proc
  xcall u_start
  wndid = %ax_tksingle("", 10, 40, "MSCAL.Calendar", "mscal.ocx", ,
    & "calendar_")
  xcall b_button(wndid, "CAL_SELECT", DSB_TEXT, "OK")
  xcall b_button(wndid, "O_EXIT", DSB_TEXT, "Cancel")
  xcall u_window(D_PLACE, wndid, 5, 21)
  repeat
    begin
      xcall ax_input(wndid)
      if (g_select)
        using g_entnam select
          ("CAL_SELECT"), begin
            xcall u_message("Selected date (MM/DD/YYYY): " +
              & %string(%ax_tkgetint(wndid, "Month")) + "/" +
              & %string(%ax_tkgetint(wndid, "Day"), "XX") + "/" +
              & %string(%ax_tkgetint(wndid, "Year"), "XXXX"))
          end
        end
      exitloop
    endusing
  end
  xcall u_finish
.end
```



## %AX\_TKWIN – Create a Toolkit container window



```
window_id = %AX_TKWIN(tk_container_name, rows, columns[, ax_container_id][, font_id])
```

### Return value

*window\_id*

On Windows, %AX\_TKWIN returns the Toolkit window ID. On UNIX and OpenVMS, this routine returns false. (^VAL)

### Arguments

*tk\_container\_name*

A string that contains the name of the Toolkit container window. This can be up to 15 characters. (a)

*rows*

The height of the window in character rows. (n)

*columns*

The width of the window in character columns. (n)

*ax\_container\_id*

(optional) Returned with the ActiveX container ID. (n)

*font\_id*

(optional) The name of a font palette entry, a font handle, or one of the following: (a or n)

**DF\_CURRENT**      Current font.

**DF\_DEFAULT**      Global font.

**DF\_ALTERNATE**    Alternate font.

**DF\_DEBUGGER**     Debugger font.

### Discussion

%AX\_TKWIN creates two windows: a standard UI Toolkit window and an ActiveX container that is “slaved” to it. The ActiveX container is placed within the Toolkit window with an initial size that’s exactly the same size as the Toolkit window.

%AX\_TKWIN also sets up the necessary control structures to use the window with AX\_INPUT and then to control the mapping of keys as either accelerators or characters destined for the control or the Synergy application (via AX\_WANTSKEY).

Because the outer container is a Toolkit window, you can perform all of the Toolkit's standard window-related functions (place, remove, delete, resize, and so forth, including border and title manipulation) by referencing the Toolkit window ID returned by %AX\_TKWIN. Similarly, you can perform all of the ActiveX-related functions (load a control, get a property value, set a property value, and so on) by referencing *ax\_container\_id*.

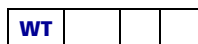
If you pass a null string ("" ) for *tk\_container\_name*, Toolkit assigns a unique window name in the form *\_W\_nnn*, where *nnn* is the window ID.

*Font\_id* enables you to specify a font for the container window as you create it. Changing the font later, after %AX\_TKWIN has returned, may change the size of the container window. Therefore the size of the ActiveX control may need to be changed as well.

### See also

- ▶ [“Error handling for ActiveX control exceptions” on page 4-6.](#)
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## AX\_WANTSKEY – Register keys to an ActiveX control



```
xcall AX_WANTSKEY (tk_container_id, key_code, mapping_flag[, key_code,
& mapping_flag, ...])
```

### Arguments

*tk\_container\_id*

The ID of the UI Toolkit ActiveX container window. (n)

*key\_code*

The Toolkit key code for the desired key (defined in **inpctl.def**). *Key\_code* can also be one of the following special values: (n)

**D\_KEY\_ALL** All key codes (CTRL\_A\_KEY through CTL\_SHFTTAB)

**D\_KEY\_MENU** All keys that are currently mapped to shortcuts

*mapping\_flag*

One of the following values (defined in **tools.def**): (n)

**D\_MAP\_DEFAULT** Map as a control accelerator, then menu accelerator, then keystroke. (default)

**D\_MAP\_KEY** Map only as a keystroke.

**D\_MAP\_CONTROL** Map as a control accelerator, then keystroke.

**D\_MAP\_MENU** Map only as a menu accelerator (shortcut).

### Discussion

This routine allows function and control keys to be passed to the ActiveX control instead of being interpreted by Toolkit. (On UNIX and OpenVMS, this routine is ignored.)

The special *key\_code* values enable you to allow only certain keys to be processed as shortcuts.

When a function or control key is pressed while in AX\_INPUT, the default processing of that keystroke is as follows:

- ▶ If the key is mapped as an accelerator by the focused control or any of its containers, the key will be mapped accordingly.
- ▶ Otherwise, if the key is available to Toolkit as a shortcut, it will be mapped accordingly, whether or not that shortcut is currently active.
- ▶ Finally, if the key is neither an accelerator for the control nor an available Toolkit shortcut key, it is translated as a keystroke and passed to the focused control.

AX\_WANTSKEY allows this behavior to be overridden in one of three ways for any control or function key when processing a specific ActiveX container window. (The mapping flag D\_MAP\_DEFAULT specifies the default processing and is only needed to reset a previously specified mapping flag for that key.)

- ▶ If a key is designated with a D\_MAP\_KEY mapping flag, neither the control's accelerators nor UI Toolkit's shortcuts will be mapped from this key. Rather, the key will immediately be interpreted as a keystroke and passed to the focused control. This option is useful with Delphi controls that typically respond to keystrokes using an OnKeyDown or OnKeyPress event.
- ▶ If a key is designated with a D\_MAP\_CONTROL mapping flag, the processing is the same as D\_MAP\_DEFAULT except that UI Toolkit's shortcut mapping is skipped. The key will only be used by the control as either an accelerator (if the control defines it as such) or as a keystroke. This option is useful when you know that the control needs to see the key, but you do not know whether it defines it as an accelerator or a keystroke. Visual Basic controls often fall into this category.
- ▶ If a key is designated with a D\_MAP\_MENU mapping flag, the control will not see the keystroke at all, and the key will be mapped as a UI Toolkit shortcut. This option is useful if you want to override a key that is used by the control to signal a menu entry instead.

The following table illustrates the types of key mapping that may occur for each option. Where more than one type of mapping is shown, the leftmost marked column has priority.

| Option        | Control accelerator | UI Toolkit shortcut | Keystroke to control |
|---------------|---------------------|---------------------|----------------------|
| D_MAP_DEFAULT | ✓                   | ✓                   |                      |
| D_MAP_KEY     |                     |                     | ✓                    |
| D_MAP_CONTROL | ✓                   |                     | ✓                    |
| D_MAP_MENU    |                     | ✓                   |                      |

Because all key codes that can be passed to AX\_WANTSKEY are available to Toolkit as shortcuts, a key will never be seen as a keystroke to the control when shortcut mapping is enabled for the key.



The application used to create the ActiveX control can affect whether or not you need to use AX\_WANTSKEY. For instance, controls written using Visual Basic rarely need to use AX\_WANTSKEY, because keystrokes like TAB, SHIFT+TAB, and ESC are already mapped as accelerators. However, controls written using Delphi usually require you to use AX\_WANTSKEY, because Delphi doesn't automatically translate keystrokes. Unless you developed the control, you won't know if it is handling the keystrokes or not. Therefore, we recommend that at first you try not using AX\_WANTSKEY. If a keystroke doesn't get through to the control, you can add the key using AX\_WANTSKEY.

## See also

- ▶ [“Error handling for ActiveX control exceptions”](#) on page 4-6.
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## Examples

The default mapping works for most controls, but a more robust setting can be established by calling the following statement after you have placed and enabled all desired menu shortcuts:

```
xcall ax_wantskey(tk_container_id, D_KEY_ALL, D_MAP_CONTROL, D_KEY_MENU,
&
D_MAP_MENU)
```

This statement first designates that all keys belong to the control (either as an accelerator or as a keystroke), and then it maps all enabled menu shortcuts to Toolkit. Therefore, if the key corresponds to an enabled menu shortcut it will be interpreted as such. Otherwise, it is left to the control to interpret.

Also see the example that begins on [page 4-9](#).

# Routine for the Spread Control

To use the full functionality of the FarPoint Spread control, use %GRID\_CREATE to create the Toolkit container window, create the ActiveX container, and load the Spread control. See [“Creating a container for the Spread control” on page 4-5](#) for information on other routines you can use.

## %GRID\_CREATE – Create a Toolkit container for the Spread control



```

window_id = %GRID_CREATE (rows, columns, license_string, [prefix], [control_name]
&                        [, ocx_file])

```

### Return value

*window\_id*

On Windows, %GRID\_CREATE returns the ID of the created Toolkit container window. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*rows*

The number of rows for the initial container window size. (n)

*columns*

The number of columns for the initial container window size. (n)

*license\_string*

Your developer license string for the Spread control. (a)

*prefix*

(optional) The optional prefix for binding extension routines to the automatically registered %UWNDEVENTS\_METHOD set and for auto-binding control events. (See the documentation for the *autobind\_prefix* argument for [AX\\_LOAD](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.) If you pass *prefix* to %GRID\_CREATE, it is used in two places: for the %UWNDEVENTS\_METHOD set that is registered for the Toolkit container window and for binding (AX\_BIND) routines to each of the control events. (a)

*control\_name*

(optional) The name of the control you want to load. (a)

*ocx\_file*

(optional) The filename of the OCX file that contains the control. (a)

## Discussion

%GRID\_CREATE makes it easy to add the FarPoint Spread control to a Toolkit application. You maintain only one ID: the window ID returned by %GRID\_CREATE. The %GRID\_CREATE routine

- ▶ creates a Toolkit container window.
- ▶ creates an ActiveX container window.
- ▶ loads the Spread control.
- ▶ registers a %UWNDEVENTS\_METHOD set. (This includes a routine for each element.)
- ▶ optionally saves the address of extension routines so they can be used later within the registered method set. (Use the *prefix* argument to do this.)

The resulting Toolkit container window is part of the current environment, but can be promoted to global.



Spread is a 32-bit ActiveX control, so %GRID\_CREATE works only with the 32-bit Synergy Runtime. It does not work with the 64-bit Synergy Runtime.

---

To obtain your developer license string for the *license\_string* argument, use the ActiveX Diagnostic Utility (**axutl.exe**). You must have installed a licensed copy of the Spread control (purchased from GrapeCity, Inc.) to get this string.

For information on the *prefix* argument and on causing the routines in the automatically registered method set to call routines (extensions) you've created, see the Discussion for %AX\_TKSINGLE on [page 4-25](#).

By default %GRID\_CREATE loads the Spread control distributed with Toolkit. If you want to use a different version of the Spread control, you can use the *control\_name* argument to pass a different control name, and you can use the *ocx\_file* argument to pass the name (and path, if necessary) of a different OCX file and automatically register it.

If the Spread control cannot be loaded and the *ocx\_file* argument

- ▶ is passed and non-blank, %GRID\_CREATE attempts to automatically register the OCX file specified by *ocx\_file* and then attempts to load the control a second time. If either of these attempts fails, %GRID\_CREATE resignals the error trapped on the load failure.
- ▶ is not passed or is blank, %GRID\_CREATE resignals the error trapped on the load failure.

The UI Toolkit distribution includes **grid.def**, a file that provides definitions for constants used by the Spread control. See Examples below.

See the Spread control documentation for information on the methods, properties, and events supported by the Spread control.



## See also

- ▶ [“Error handling for ActiveX control exceptions”](#) on page 4-6.
- ▶ The [“Synergy ActiveX API”](#) chapter of the *Synergy DBL Language Reference Manual*.

## Examples

The following example creates a Toolkit container, creates an ActiveX container, and loads the Spread control.

```
.include "WND:tools.def"
.include "DBLDIR:activex.def"
.include "WND:grid.def"
.define  D_SPREAD_LICENSE, 1234567

proc
    xcall u_start
    wndid = %grid_create(10, 40, D_SPREAD_LICENSE, "tgrid_")
    xcall u_window(D_PLACE, wndid, 10, 21)
    ctlid = %ax_tkctlid(wndid)
    xcall ax_set(ctlid, "Col", 1)
    xcall ax_set(ctlid, "Col2", 5)
    xcall ax_set(ctlid, "Row", 10)
    xcall ax_set(ctlid, "Row2", 10)
    xcall ax_set(ctlid, "BlockMode", TRUE)
    xcall ax_set(ctlid, "BackColor", RGB_VALUE(0,0,255))
    xcall ax_set(ctlid, "BlockMode", FALSE)
    xcall ax_set(ctlid, "Row", 2)
    xcall ax_set(ctlid, "Col", 3)
    xcall ax_set(ctlid, "ForeColor", RGB_VALUE(255,0,0))
    xcall ax_set(ctlid, "Text", "Hello world!")
    xcall ax_set(ctlid, "Action", SS_ACTION_ACTIVE_CELL)
    repeat
        begin
            xcall ax_input(wndid)
            if (g_select)
                exitloop
            end
        xcall u_finish
    .end
```

## Supplied Methods

The following are %UWNDEVENTS\_METHOD methods that are loaded by %AX\_TKSINGLE and %GRID\_CREATE. These methods automatically call developer-supplied methods if you pass the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE. For more information, see the Discussion for %AX\_TKSINGLE on [page 4-25](#).

## %AX\_TKEVENT\_CLOSE – Call extension for close event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

*value* = %AX\_TKEVENT\_CLOSE(*resv1*, *resv2*, ^VAL(*container\_id*), ^VAL(*event*))

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(*container\_id*). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_CLOSE, and it must be passed by value: ^VAL(D\_EVENT\_CLOSE). (i)

### Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_CLOSE* was available when the container was created, %AX\_TKEVENT\_CLOSE calls your extension routine for the D\_EVENT\_CLOSE event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_CLOSE does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

### See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ “Appendix D: Methods”.

**%AX\_TKEVENT\_LEFT\_CLICK – Call extension for left click event**

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_LEFT_CLICK (resv1, resv2, ^VAL(container_id), ^VAL(event),
&                                ^VAL(col_cell), ^VAL(row_cell), ^VAL(col_pix),
&                                ^VAL(row_pix), ^VAL(add_info) )
```

**Return value***value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

**Arguments***resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(container\_id). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_LEFT\_CLICK, and it must be passed by value: ^VAL(D\_EVENT\_LEFT\_CLICK). (i)

*col\_cell*

The horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(col\_cell). (i)

*row\_cell*

The vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(row\_cell). (i)

*col\_pix*

The horizontal position (x axis) as a pixel column number. This must be passed by value: ^VAL(col\_pix). (i)

*row\_pix*

The vertical position (y axis) as a pixel row number. This must be passed by value:  
^VAL(*row\_pix*). (i)

*add\_info*

Additional mouse click information. This must be passed by value: ^VAL(*add\_info*). (i)

|                         |                                            |
|-------------------------|--------------------------------------------|
| <b>D_AREA_CLIENT</b>    | Click was in client area.                  |
| <b>D_AREA_NONCLIENT</b> | Click was in non-client area.              |
| <b>D_BUTTON_LEFT</b>    | Left mouse button was down during click.   |
| <b>D_BUTTON_MIDDLE</b>  | Middle mouse button was down during click. |
| <b>D_BUTTON_RIGHT</b>   | Right mouse button was down during click.  |
| <b>D_KEY_CONTROL</b>    | Control key was down during click.         |
| <b>D_KEY_SHIFT</b>      | Shift key was down during click.           |
| <b>D_LSTCLK_FOOTER</b>  | Click was in footer section.               |
| <b>D_LSTCLK_HEADER</b>  | Click was in header section.               |
| <b>D_LSTCLK_ONLINE</b>  | Click was on a line.                       |

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_LEFT\_CLICK* was available when the container was created, %AX\_TKEVENT\_LEFT\_CLICK calls your extension routine for the D\_EVENT\_LEFT\_CLICK event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_LEFT\_CLICK does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ “Appendix D: Methods”.

## %AX\_TKEVENT\_LEFT\_DBLCLK – Call extension for left double-click event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_LEFT_DBLCLK (resv1, resv2, ^VAL (container_id),
&                                     ^VAL (event), ^VAL (col_cell), ^VAL (row_cell),
&                                     ^VAL (col_pix), ^VAL (row_pix),
&                                     ^VAL (add_info) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(*container\_id*). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_LEFT\_DBLCLK, and it must be passed by value: ^VAL(D\_EVENT\_LEFT\_DBLCLK). (i)

*control\_id*

The ID of the ActiveX control. This must be passed by value: ^VAL(*control\_id*). (i)

*col\_cell*

The horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(*col\_cell*). (i)

*row\_cell*

The vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(*row\_cell*). (i)

*col\_pix*

The horizontal position (x axis) as a pixel column number. This must be passed by value:  
^VAL(*col\_pix*). (i)

*row\_pix*

The vertical position (y axis) as a pixel row number. This must be passed by value:  
^VAL(*row\_pix*). (i)

*add\_info*

Additional mouse click information. This must be passed by value: ^VAL(*add\_info*). (i)

|                         |                                            |
|-------------------------|--------------------------------------------|
| <b>D_AREA_CLIENT</b>    | Click was in client area.                  |
| <b>D_AREA_NONCLIENT</b> | Click was in non-client area.              |
| <b>D_BUTTON_LEFT</b>    | Left mouse button was down during click.   |
| <b>D_BUTTON_MIDDLE</b>  | Middle mouse button was down during click. |
| <b>D_BUTTON_RIGHT</b>   | Right mouse button was down during click.  |
| <b>D_KEY_CONTROL</b>    | Control key was down during click.         |
| <b>D_KEY_SHIFT</b>      | Shift key was down during click.           |
| <b>D_LSTCLK_FOOTER</b>  | Click was in footer section.               |
| <b>D_LSTCLK_HEADER</b>  | Click was in header section.               |
| <b>D_LSTCLK_ONLINE</b>  | Click was on a line.                       |

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_LEFT\_DBLCLK* was available when the container was created, %AX\_TKEVENT\_LEFT\_DBLCLK calls your extension routine for the D\_EVENT\_LEFT\_DBLCLK event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_LEFT\_DBLCLK does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ "Appendix D: Methods".

## %AX\_TKEVENT\_MAXIMIZE – Call extension for maximize event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

*value* = %AX\_TKEVENT\_MAXIMIZE(*resv1*, *resv2*, ^VAL(*container\_id*), ^VAL(*event*))

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(*container\_id*). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_MAXIMIZE, and it must be passed by value: ^VAL(D\_EVENT\_MAXIMIZE). (i)

### Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_MAXIMIZE* was available when the container was created, %AX\_TKEVENT\_MAXIMIZE calls your extension routine for the D\_EVENT\_MAXIMIZE event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_MAXIMIZE does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.



## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ “Appendix D: Methods”.

## %AX\_TKEVENT\_MIDDLE\_CLICK – Call extension for middle click event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_MIDDLE_CLICK (resv1, resv2, ^VAL (container_id),
&                                     ^VAL (event), ^VAL (col_cell), ^VAL (row_cell),
&                                     ^VAL (col_pix), ^VAL (row_pix),
&                                     ^VAL (add_info) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(container\_id). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_MIDDLE\_CLICK, and it must be passed by value: ^VAL(D\_EVENT\_MIDDLE\_CLICK). (i)

*col\_cell*

The horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(col\_cell). (i)

*row\_cell*

The vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(row\_cell). (i)

*col\_pix*

The horizontal position (x axis) as a pixel column number. This must be passed by value: ^VAL(col\_pix). (i)

*row\_pix*

The vertical position (y axis) as a pixel row number. This must be passed by value:  
^VAL(*row\_pix*). (i)

*add\_info*

Additional mouse click information. This must be passed by value: ^VAL(*add\_info*). (i)

|                         |                                            |
|-------------------------|--------------------------------------------|
| <b>D_AREA_CLIENT</b>    | Click was in client area.                  |
| <b>D_AREA_NONCLIENT</b> | Click was in non-client area.              |
| <b>D_BUTTON_LEFT</b>    | Left mouse button was down during click.   |
| <b>D_BUTTON_MIDDLE</b>  | Middle mouse button was down during click. |
| <b>D_BUTTON_RIGHT</b>   | Right mouse button was down during click.  |
| <b>D_KEY_CONTROL</b>    | Control key was down during click.         |
| <b>D_KEY_SHIFT</b>      | Shift key was down during click.           |
| <b>D_LSTCLK_FOOTER</b>  | Click was in footer section.               |
| <b>D_LSTCLK_HEADER</b>  | Click was in header section.               |
| <b>D_LSTCLK_ONLINE</b>  | Click was on a line.                       |

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_MIDDLE\_CLICK* was available when the container was created, %AX\_TKEVENT\_MIDDLE\_CLICK calls your extension routine for the D\_EVENT\_MIDDLE\_CLICK event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_MIDDLE\_CLICK does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ [“Appendix D: Methods”](#).

## %AX\_TKEVENT\_MIDDLE\_DBLCLK – Call extension for middle double-click event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_MIDDLE_DBLCLK (resv1, resv2, ^VAL (container_id),
&                                     ^VAL (event), ^VAL (col_cell),
&                                     ^VAL (row_cell), ^VAL (col_pix),
&                                     ^VAL (row_pix), ^VAL (add_info) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(container\_id). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_MIDDLE\_DBLCLK, and it must be passed by value: ^VAL(D\_EVENT\_MIDDLE\_DBLCLK). (i)

*col\_cell*

The horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(col\_cell). (i)

*row\_cell*

The vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(row\_cell). (i)

*col\_pix*

The horizontal position (x axis) as a pixel column number. This must be passed by value: ^VAL(col\_pix). (i)

*row\_pix*

The vertical position (y axis) as a pixel row number. This must be passed by value:  
^VAL(*row\_pix*). (i)

*add\_info*

Additional mouse click information. This must be passed by value: ^VAL(*add\_info*). (i)

|                         |                                            |
|-------------------------|--------------------------------------------|
| <b>D_AREA_CLIENT</b>    | Click was in client area.                  |
| <b>D_AREA_NONCLIENT</b> | Click was in non-client area.              |
| <b>D_BUTTON_LEFT</b>    | Left mouse button was down during click.   |
| <b>D_BUTTON_MIDDLE</b>  | Middle mouse button was down during click. |
| <b>D_BUTTON_RIGHT</b>   | Right mouse button was down during click.  |
| <b>D_KEY_CONTROL</b>    | Control key was down during click.         |
| <b>D_KEY_SHIFT</b>      | Shift key was down during click.           |
| <b>D_LSTCLK_FOOTER</b>  | Click was in footer section.               |
| <b>D_LSTCLK_HEADER</b>  | Click was in header section.               |
| <b>D_LSTCLK_ONLINE</b>  | Click was on a line.                       |

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_MIDDLE\_DBLCLK* was available when the container was created, %AX\_TKEVENT\_MIDDLE\_DBLCLK calls your extension routine for the D\_EVENT\_MIDDLE\_DBLCLK event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_MIDDLE\_DBLCLK does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ [“Appendix D: Methods”](#).

## %AX\_TKEVENT\_MINIMIZE – Call extension routine for minimize event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

*value* = %AX\_TKEVENT\_MINIMIZE(*resv1*, *resv2*, ^VAL(*container\_id*), ^VAL(*event*))

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(*container\_id*). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_MINIMIZE, and it must be passed by value: ^VAL(D\_EVENT\_MINIMIZE). (i)

### Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_MINIMIZE* was available when the container was created, %AX\_TKEVENT\_MINIMIZE calls your extension routine for the D\_EVENT\_MINIMIZE event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_MINIMIZE does nothing.

This routine is part of the method set that's registered for %AX\_TKSINGLE or %GRID\_CREATE.

### See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ "Appendix D: Methods".

## %AX\_TKEVENT\_MOVE – Call extension routine for move event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_MOVE (resv1, resv2, ^VAL(container_id), ^VAL(event),
&                                ^VAL(col_cell), ^VAL(row_cell), ^VAL(col_pix),
&                                ^VAL(row_pix) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(container\_id). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_MOVE, and it must be passed by value: ^VAL(D\_EVENT\_MOVE). (i)

*col\_cell*

The horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(col\_cell). (i)

*row\_cell*

The vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(row\_cell). (i)

*col\_pix*

The horizontal position (x axis) as a pixel column number. This must be passed by value: ^VAL(col\_pix). (i)

*row\_pix*

The vertical position (y axis) as a pixel row number. This must be passed by value: ^VAL(row\_pix). (i)

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_MOVE* was available when the container was created, %AX\_TKEVENT\_MOVE calls your extension routine for the D\_EVENT\_MOVE event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_MOVE does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD on page 16-249.](#)
- ▶ [%AX\\_TKSINGLE on page 4-24.](#)
- ▶ [%GRID\\_CREATE on page 4-33.](#)
- ▶ [“Appendix D: Methods”.](#)



## %AX\_TKEVENT\_RESTORE – Call extension routine for restore event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

*value* = %AX\_TKEVENT\_RESTORE(*resv1*, *resv2*, ^VAL(*container\_id*), ^VAL(*event*))

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(*container\_id*). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_RESTORE, and it must be passed by value: ^VAL(D\_EVENT\_RESTORE). (i)

### Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_RESTORE* was available when the container was created, %AX\_TKEVENT\_RESTORE calls your extension routine for the D\_EVENT\_RESTORE event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_RESTORE does nothing.

This routine is part of the method set that's registered for %AX\_TKSINGLE or %GRID\_CREATE.

### See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ "Appendix D: Methods".

## %AX\_TKEVENT\_RIGHT\_CLICK – Call extension routine for right click event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_RIGHT_CLICK (resv1, resv2, ^VAL (container_id),
&                                     ^VAL (event), ^VAL (col_cell), ^VAL (row_cell),
&                                     ^VAL (col_pix),
&                                     ^VAL (row_pix), ^VAL (add_info) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(container\_id). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_RIGHT\_CLICK, and it must be passed by value: ^VAL(D\_EVENT\_RIGHT\_CLICK). (i)

*col\_cell*

The horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(col\_cell). (i)

*row\_cell*

The vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(row\_cell). (i)

*col\_pix*

The horizontal position (x axis) as a pixel column number. This must be passed by value: ^VAL(col\_pix). (i)

*row\_pix*

The vertical position (y axis) as a pixel row number. This must be passed by value:  
^VAL(*row\_pix*). (i)

*add\_info*

Additional mouse click information. This must be passed by value: ^VAL(*add\_info*). (i)

|                         |                                            |
|-------------------------|--------------------------------------------|
| <b>D_AREA_CLIENT</b>    | Click was in client area.                  |
| <b>D_AREA_NONCLIENT</b> | Click was in non-client area.              |
| <b>D_BUTTON_LEFT</b>    | Left mouse button was down during click.   |
| <b>D_BUTTON_MIDDLE</b>  | Middle mouse button was down during click. |
| <b>D_BUTTON_RIGHT</b>   | Right mouse button was down during click.  |
| <b>D_KEY_CONTROL</b>    | Control key was down during click.         |
| <b>D_KEY_SHIFT</b>      | Shift key was down during click.           |
| <b>D_LSTCLK_FOOTER</b>  | Click was in footer section.               |
| <b>D_LSTCLK_HEADER</b>  | Click was in header section.               |
| <b>D_LSTCLK_ONLINE</b>  | Click was on a line.                       |

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_RIGHT\_CLICK* was available when the container was created, %AX\_TKEVENT\_RIGHT\_CLICK calls your extension routine for the D\_EVENT\_RIGHT\_CLICK event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_RIGHT\_CLICK does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ [“Appendix D: Methods”](#).

## %AX\_TKEVENT\_RIGHT\_DBLCLK – Call extension for right double-click event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_RIGHT_DBLCLK (resv1, resv2, ^VAL (container_id),
&                                     ^VAL (event), ^VAL (col_cell), ^VAL (row_cell),
&                                     ^VAL (col_pix), ^VAL (row_pix),
&                                     ^VAL (add_info) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(container\_id). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_RIGHT\_DBLCLK, and it must be passed by value: ^VAL(D\_EVENT\_RIGHT\_DBLCLK). (i)

*col\_cell*

The horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(col\_cell). (i)

*row\_cell*

The vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(row\_cell). (i)

*col\_pix*

The horizontal position (x axis) as a pixel column number. This must be passed by value: ^VAL(col\_pix). (i)

*row\_pix*

The vertical position (y axis) as a pixel row number. This must be passed by value:  
^VAL(*row\_pix*). (i)

*add\_info*

Additional mouse click information. This must be passed by value: ^VAL(*add\_info*). (i)

|                         |                                            |
|-------------------------|--------------------------------------------|
| <b>D_AREA_CLIENT</b>    | Click was in client area.                  |
| <b>D_AREA_NONCLIENT</b> | Click was in non-client area.              |
| <b>D_BUTTON_LEFT</b>    | Left mouse button was down during click.   |
| <b>D_BUTTON_MIDDLE</b>  | Middle mouse button was down during click. |
| <b>D_BUTTON_RIGHT</b>   | Right mouse button was down during click.  |
| <b>D_KEY_CONTROL</b>    | Control key was down during click.         |
| <b>D_KEY_SHIFT</b>      | Shift key was down during click.           |
| <b>D_LSTCLK_FOOTER</b>  | Click was in footer section.               |
| <b>D_LSTCLK_HEADER</b>  | Click was in header section.               |
| <b>D_LSTCLK_ONLINE</b>  | Click was on a line.                       |

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix*\_TKEVENT\_RIGHT\_DBLCLK was available when the container was created, %AX\_TKEVENT\_RIGHT\_DBLCLK calls your extension routine for the D\_EVENT\_RIGHT\_DBLCLK event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_RIGHT\_DBLCLK does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ [“Appendix D: Methods”](#).

## %AX\_TKEVENT\_SCROLL – Call extension routine for scroll event

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_SCROLL (resv1, resv2, ^VAL(container_id), ^VAL(event),  
& ^VAL(col_cell), ^VAL(row_cell), ^VAL(col_offset),  
& ^VAL(row_offset) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (**^VAL**)

### Arguments

*resv1*

Reserved for internal use. (**a**)

*resv2*

Reserved for internal use. (**a**)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(*container\_id*). (**i**)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_SCROLL, and it must be passed by value: ^VAL(D\_EVENT\_SCROLL). (**i**)

*col\_cell*

The display area's horizontal position (x axis) as a cell column number. This must be passed by value: ^VAL(*col\_cell*). (**i**)

*row\_cell*

The display area's vertical position (y axis) as a cell row number. This must be passed by value: ^VAL(*row\_cell*). (**i**)

*col\_offset*

The offset (number of pixels) between the window's horizontal (x axis) position and the display area's horizontal position. This must be passed by value: ^VAL(*col\_offset*). (i)

*row\_offset*

The offset (number of pixels) between the window's vertical (y axis) position and the display area's vertical position. This must be passed by value: ^VAL(*row\_offset*). (i)

## Discussion

If you passed the *prefix* argument to %AX\_TKSINGLE or %GRID\_CREATE, and a routine with the name *prefix\_TKEVENT\_SCROLL* was available when the container was created, %AX\_TKEVENT\_SCROLL calls your extension routine for the D\_EVENT\_SCROLL event. If you didn't pass the *prefix* argument, %AX\_TKEVENT\_SCROLL does nothing.

This routine is part of the method set that's registered when you use %AX\_TKSINGLE or %GRID\_CREATE.

## See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ [%AX\\_TKSINGLE](#) on page 4-24.
- ▶ [%GRID\\_CREATE](#) on page 4-33.
- ▶ [“Appendix D: Methods”](#).

## %AX\_TKEVENT\_SIZE – Size the Toolkit container window

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
value = %AX_TKEVENT_SIZE (resv1, resv2, ^VAL (container_id), ^VAL (event),
&                                ^VAL (win_width), ^VAL (win_height), ^VAL (client_width),
&                                ^VAL (client_height) )
```

### Return value

*value*

The return value for the method. On Windows, this function always returns true unless the extension returns false. On UNIX, this function will cause an error if invoked. On OpenVMS, it returns true. (^VAL)

### Arguments

*resv1*

Reserved for internal use. (a)

*resv2*

Reserved for internal use. (a)

*container\_id*

The ID of the Toolkit container window for the ActiveX control. This must be passed by value: ^VAL(container\_id). (i)

*event*

The event code for the event that invoke the extension. This must always be D\_EVENT\_SIZE, and it must be passed by value: ^VAL(D\_EVENT\_SIZE). (i)

*win\_width*

Width of the logical window (number of columns). This must be passed by value: ^VAL(win\_width). (i)

*win\_height*

Height of the logical window (number of rows). This must be passed by value: ^VAL(win\_height). (i)



*client\_width*

Width of the client area (number of pixels). This must be passed by value:

^VAL(*client\_width*). (i)

*client\_height*

Height of the client area (number of pixels). This must be passed by value:

^VAL(*client\_height*). (i)

## Discussion

%AX\_TKSINGLE and %GRID\_CREATE automatically register a %UWNDEVENTS\_METHOD set that includes %AX\_TKEVENT\_SIZE as the routine for the D\_EVENT\_SIZE event. When the D\_EVENT\_SIZE event is triggered (programmatically or by the user), %UWNDEVENTS calls this routine. If *prefix* (an argument for %AX\_TKSINGLE and %GRID\_CREATE) was passed and

- ▶ there's an extension for the D\_EVENT\_SIZE event, %AX\_TKEVENT\_SIZE calls the extension. If the extension routine returns FALSE, %AX\_TKEVENT\_SIZE returns true without performing any other function. If the extension returns true, %AX\_TKEVENT\_SIZE resizes the ActiveX container and control by setting their "Ext\_Rect" properties to match the client area of the Toolkit container window.
- ▶ there is no extension for D\_EVENT\_SIZE, %AX\_TKEVENT\_SIZE resizes the ActiveX container and control by setting their "Ext\_Rect" properties to match the client area of the Toolkit container window and returns true.

(For information on "Ext\_Rect", see ["Extended properties"](#) in the "Synergy ActiveX API" chapter of the *Synergy DBL Language Reference Manual*.)

If you assign your own method set to the window, you can call %AX\_TKEVENT\_SIZE from the routine you've supplied for the D\_EVENT\_SIZE event.

## See also

The ["Synergy ActiveX API"](#) chapter of the *Synergy DBL Language Reference Manual*.



# 5

## Button Routines

### Using the Button Subroutines 5-2

Discusses general button appearance and behavior and provides an overview of the routines you'll use to create, modify, and delete buttons in Windows environments.

### The Button Subroutines and Functions 5-4

|                                                                                    |      |
|------------------------------------------------------------------------------------|------|
| B_BUTTON – Add, delete, or modify a button on a window or tab set.....             | 5-5  |
| B_BUTTONSET – Define the placement of a set of buttons on a window or tab set..... | 5-15 |
| %B_DISABLE – Disable a button in a window or tab set.....                          | 5-17 |
| %B_ENABLE – Enable a button in a window or tab set.....                            | 5-19 |
| %B_INFO – Return information about the buttons in a window.....                    | 5-21 |

## Using the Button Subroutines

On Windows systems, you can add buttons to a window, list, or tab set. Buttons are a standard way of enabling users to terminate input (OK and Cancel buttons are typical examples) or signify that any action should take place. Note the following:

- ▶ Every button must be part of a button set, and there can be only one button set per window, list, or tab set.
- ▶ A button can display either text or a graphic on its face. (See “[Toolkit button graphics](#)” on [page 2-17](#) for supported graphic formats and for information on transparent button graphics.)
- ▶ When a button has focus, a thin dotted line is drawn around the text portion of the button, and the button can be “pressed” using either the spacebar or the ENTER key. Whether or not a button has focus, the button can be clicked with the left mouse button.
- ▶ When a button is pressed or clicked, a method subroutine is invoked or a menu entry is signaled. If a menu entry is signaled, **g\_select** is set to true, and **g\_entnam** is set to the name of the button. (**G\_select** and **g\_entnam**, global variables defined in **tools.def**, are automatically set by Toolkit when a menu entry is signaled.)
- ▶ When in **I\_INPUT** for a window or tab set, buttons are included in the container’s tabbing order. (This is not true of buttons in a list.) **TAB** moves forward and **SHIFT+TAB** moves backward through the buttons.
- ▶ The maximum number of buttons allowed in a container is 127. A fatal error occurs if this maximum is exceeded.
- ▶ You can use **I\_NEXT** to move focus to a button.

Except for **%B\_INFO**, the routines documented in this chapter can be used only for buttons on a window or tab set. For routines for buttons on a list, see [chapter 9](#), “[List Routines](#).”

## Creating buttons

To create buttons, use the **.BUTTON** script command or, to create them at runtime, use **B\_BUTTON**, **IB\_BUTTON**, or **L\_BUTTON**.

- ▶ The **.BUTTON** script command creates buttons on windows. See [.BUTTON on page 2-15](#) for information.
- ▶ **B\_BUTTON** creates buttons on windows and tab sets at runtime. For information, see [B\\_BUTTON on page 5-5](#). (You can use **IB\_BUTTON** to create buttons on input windows at runtime, and you can use the **DTS\_BUTTON** subfunction to **%TS\_TABSET** to create buttons on tab sets at runtime, but **B\_BUTTON** works for tab sets and all windows.)
- ▶ **L\_BUTTON** creates buttons on lists. For information, see [L\\_BUTTON on page 9-55](#).

## Defining button placement and the default button

You can define a button set's location within a window (bottom or right), its justification, the maximum number of buttons per row or column, and the default button. To do this, use the `.BUTTON_SET` script command or, at runtime, use `B_BUTTONSET`, `IB_BUTTONSET`, or `L_BUTTONSET`. (To define a button's location in the button set, use `B_BUTTON`.)

- ▶ Use the `.BUTTON_SET` script command for button sets on windows. For more information, see [.BUTTON\\_SET on page 2-19](#).
- ▶ Use `B_BUTTONSET` for button sets on windows and tab sets. For information, see [B\\_BUTTONSET on page 5-15](#). (You can use `IB_BUTTONSET` for button sets on input windows and the `DTS_BUTTONSET` subfunction to `%TS_TABSET` for button sets on tab sets, but `B_BUTTONSET` can be used in both of these situations.)
- ▶ Use `L_BUTTONSET` for button sets on lists. See [L\\_BUTTONSET on page 9-62](#).

Note that you can use these to specify a default button, but this default won't be applied unless you also pass `E_STATE` with the `D_ON` and `D_RETURNBTN` options. See the Discussion for `E_STATE` on [page 7-45](#) for more information.

## Enabling and disabling buttons

In general, the buttons for a window are enabled when the window is being processed, and they are disabled when the window is not being processed. (For details and exceptions, see the Discussion for `.BUTTON` [page 2-16](#).)

To enable or disable a button, use `%B_ENABLE` and `%B_DISABLE` for buttons on windows and tab sets. Use `%L_BUTTONSTATE` for buttons on lists. For information on how buttons can be automatically enabled and disabled, see the Discussion for `.BUTTON` on [page 2-16](#).

## Deleting buttons

To delete a button on a window or tab set, use the `DSB_DELETE` subfunction of `%B_BUTTON`. For buttons on lists, use the `DSB_DELETE` subfunction of `%L_BUTTON`.

## Modifying buttons

To modify a button on a window or tab set, use the `DSB_MODIFY` subfunction of `%B_BUTTON` routine. For buttons on lists, use the `DSB_MODIFY` subfunction of `%L_BUTTON`.

## Getting information on buttons

You can also get information on buttons and button sets for a window, tab set, or list by using `%B_INFO`. This function has subfunctions that return the number of buttons, the index for the default button, the enabled state of a button, method information, and so forth. See [%B\\_INFO on page 5-21](#).

# The Button Subroutines and Functions

This section discusses the syntax and arguments for each of the button subroutines and functions.

## B\_BUTTON – Add, delete, or modify a button on a window or tab set



```
xcall B_BUTTON(container_id, [subfunction,] args)
```

### Arguments

*container\_id*

The ID of the window or tab set that contains or will contain the button. (n)

*subfunction*

(optional) One of the following: (n)

**DSB\_ADD**                      Add a button to the window or tab set. See [page 5-6](#). (default)

**DSB\_DELETE**                  Delete a button from the window or tab set. See [page 5-10](#).

**DSB\_MODIFY**                 Modify a button in the window or tab set. See [page 5-11](#).

*args*

One or more arguments, depending on *subfunction*.

### Discussion

The B\_BUTTON subroutine creates, deletes, or modifies a Windows-style button on a window or tab set.

This routine has no effect on applications running on UNIX or OpenVMS or in Synergy .NET. It does, however, save button information on these platforms, so if the window is saved to a window library (by using U\_SAVE) and later loaded from that library on a Windows platform in traditional Synergy, the button will be on the window (assuming ISAM-compatible platforms).

### See also

“Using the Button Subroutines” on [page 5-2](#) for general information on buttons and button sets on windows, tab sets, and lists.

## B\_BUTTON (continued)

### DSB\_ADD

```
xcall B_BUTTON(container_id, [DSB_ADD,] name, [type], [type_data], [method], [elb],
& [select_char], [position][, tooltip])
```

### Arguments

*container\_id*

The ID of the window or tab set you want to add the button to. **(n)**

*name*

The name of the button to add (a maximum of 30 characters). **(a)**

*type*

(optional) The button face type: **(n)**

**DSB\_TEXT**           Text. (default)

**DSB\_BITMAP**       Graphic.

*type\_data*

(optional) Text for the button face if *type* is DSB\_TEXT. A filename if *type* is DSB\_BITMAP. **(a)**

*method*

(optional) The name of the method subroutine to invoke. **(a)**

*elb*

(optional) The name of the executable library (**.elb**) that contains *method*. **(a)**

*select\_char*

(optional) The quick-select character. **(a)**

*position*

(optional) The position the button will be inserted in the button set. **(a or n)**

*tooltip*

(optional) The text of a ToolTip to be displayed when the mouse pointer rests over the button. **(a)**



## Discussion

The DSB\_ADD subfunction of B\_BUTTON enables you to add a button to a window or tab set. If there are no existing buttons, a default button set is created. By default, button sets are placed at the bottom of the window or tab set, are left-justified, and can have as many buttons on a row as will fit before the row wraps. (You can change these defaults with B\_BUTTONSET.)

The window or tab set will expand downward or to the right to accommodate the buttons, which may cause your window to extend beyond the bottom or right side of the application window. Also note that buttons are a standard size; text that exceeds that size will not be visible.

The *type* and *type\_data* arguments enable you to specify text or a graphic for the button face.

- ▶ If you pass *type* as DSB\_TEXT, use *type\_data* to specify the text to display on the button face.
- ▶ If you pass *type* as DSB\_BITMAP, use *type\_data* to specify the name of a graphic file to display on the button face. See [“Toolkit button graphics” on page 2-17](#) for information on supported graphic formats and for information on creating transparent button graphics.

If you don’t pass *type\_data*, the button’s name will be displayed on the button’s face.

If you pass *method*, the method subroutine you pass will be invoked when the button is pressed. The arguments passed to the method are the window ID, button name, and the 20 optional method data arguments passed to I\_INPUT, L\_INPUT, or any of the other input routines that allow method data arguments (L\_SELECT, for example). If you don’t pass *method*, the first ten characters of the button’s name are used to signal a menu entry when the button is pressed.

If you want Toolkit to look in a specific ELB (executable library) for the method specified by *method*, pass the filename of the ELB as the *elb* argument. You can pass the *elb* argument only if you pass the *method* argument.

If *select\_char* is specified in a call to B\_BUTTON, when the window is being processed by C\_PROCESS, I\_INPUT, TS\_PROCESS, T\_VIEW, T\_EDIT, AX\_INPUT, L\_INPUT, or L\_SELECT, in many cases pressing ALT+*select\_char* will have the effect of pressing the button. Note the following:

- ▶ This works only for enabled buttons on the currently active window or tab set, which means that a button can be activated only when the application is processing the window or tab set that contains the button. (For information on how ALT+*select\_char* works with composite windows, see [“ALT+key button activation” on page 6-7](#).)
- ▶ *Select\_char* is case insensitive.
- ▶ The character specified by *select\_char* does not have to exist in the button’s text.
- ▶ If *select\_char* does exist in the button’s text, the first occurrence of *select\_char* will be underlined.
- ▶ If *select\_char* is not passed or is blank, the button will not have a quick-select character.

To avoid confusing the user, we recommend that no two buttons have the same quick-select character. However, if they do, the following rules apply:

- ▶ If the buttons with the conflicting quick-select character are on the same window, the quick-select character is assigned to the last button defined. The other buttons will not have a quick-select character.
- ▶ Within a tab set, if the tab set container and a contained window define buttons with the same quick-select character, the contained window's button is assigned the quick-select character, and the button on the tab set will have its quick-select character removed. When a different tab is active, one that does not contain a button with a conflicting quick-select character, the quick-select character will be re-enabled on the tab set button.
- ▶ In the case of nested windows, where an input routine is called for a second window within a method for the first window, the quick-select characters for buttons in the first window will still work as long as they are enabled and do not conflict with buttons on the second window. If there is a conflict, the buttons on the second window get the quick-select character until the input process on the second window is exited, at which point any overridden quick-select characters for the first window will be restored.

In the case where the `ALT+select_char` combination for a button matches that for a menu column, the button gets the quick-select character. Note, however, that pressing ALT and releasing it, followed by the quick-select character, activates the menu column.

The *position* argument enables you to insert the button at a given point in the button set:

- ▶ To add the button above or to the left of an existing button (depending on the button set's orientation), pass the name of the existing button. The *position* argument is not case sensitive.
- ▶ To specify a numeric position among existing buttons, pass a position number, which is an index (base 1) that specifies the numeric position (left-to-right or top-to-bottom) among existing buttons. For example, if you pass 1, the button is added as the left-most or top button. If you pass 2, the button will be added as the second button to the left or the second button from the top.
- ▶ To add the button to the end of the existing buttons (to the far right or bottom of the button set), pass *position* as a zero-length or blank alphanumeric value.

Toolkit generates a fatal error if you pass a name for *position* that doesn't match any of the existing button names or if you pass a number that's less than 1 or greater than the number of buttons on the window plus 1.

To add a ToolTip to the button, pass a non-blank value with a length that is greater than zero for *tooltip*. Note that a ToolTip's length can be no longer than the operating system's maximum length for an alphanumeric field. (See [DSB\\_TOOLTIP on page 5-37](#) for information on retrieving ToolTip text.)

## Examples

The following example adds an OK button named I\_OK with a quick-select character K. When ALT+K is pressed, a click of the OK button is simulated. If there are other buttons on the window, this button will be added to the end of the button set. Note that we didn't include "DSB\_ADD". You can omit DSB\_ADD when you add a button because DSB\_ADD is the default.

```
xcall b_button(wndid, "I_OK", DSB_TEXT, "OK",,, "K")
```

The next example creates a button named **lookup** with a graphic (**lookup.bmp**) on its face. Clicking this button will invoke the **lookup** subroutine located in the **button.elb** library, and moving the mouse pointer over this button will display the ToolTip "Enter a customer name." This button will be added to the beginning of the button set because the value 1 is passed as the *position* argument.

```
xcall b_button(wndid, DSB_ADD, "lookup", DSB_BITMAP, "lookup.bmp",  
& "lookup", "button.elb",, 1, "Enter a customer name")
```

## B\_BUTTON (continued)

### DSB\_DELETE

```
xcall B_BUTTON(container_id, DSB_DELETE, name)
```

### Arguments

*container\_id*

The ID of the window or tab set that contains the button you want to delete. **(n)**

*name*

The name of the button to delete. **(a)**

### Discussion

The DSB\_DELETE subfunction of B\_BUTTON deletes a button from a window or tab set. Remaining buttons are repositioned as if the deleted button had never existed. For example, if the button is the second button of three in a button set, the third button will be moved to the second button position.

Note that *name* is not case sensitive and that if no button with that name exists, Toolkit generates a fatal error.

### Examples

The following example deletes a button named **lookup**.

```
xcall b_button(wndid, DSB_DELETE, "lookup")
```

## B\_BUTTON (continued)

### DSB\_MODIFY

```
xcall B_BUTTON(container_id, DSB_MODIFY, name, [type], [type_data], [method], [elb],
&                [select_char], [position][, tooltip])
```

### Arguments

*container\_id*

The ID of the window or tab set that contains the button you want to modify. **(n)**

*name*

The name of the button to modify. **(a)**

*type*

(optional) The new type of button face. (If you don't pass this argument, the previous value is the default.) **(n)**

**DSB\_TEXT**           Text.

**DSB\_BITMAP**       Graphic.

*type\_data*

(optional) New text for the button if *type* is DSB\_TEXT. If *type* is DSB\_BITMAP, this is the filename for the graphic. **(a)**

*method*

(optional) The name of a new method subroutine to invoke. **(a)**

*elb*

(optional) The name of the executable library (**.elb**) that contains *method*. **(a)**

*select\_char*

(optional) A new quick-select character. **(a)**

*position*

(optional) A position you want the button moved to in the button set. **(a or n)**

*tooltip*

(optional) The text of a ToolTip to be displayed when the mouse pointer rests over the button. **(a)**

## Discussion

The `DSB_MODIFY` subfunction of `B_BUTTON` modifies a button in a window or tab set. Use the *name* argument to specify the name (case-insensitive) of an existing button. (If *name* isn't the name of an existing button, Toolkit will generate a fatal error.)

If a button has no method, you can use the *method* argument to add a method. If a button does have a method, you can use the *method* argument to change the method (by passing the new method name) or remove the method (by passing *method* as blank or zero-length), which causes Toolkit to signal the button name as a menu entry. Note that if you change the method for a button and an ELB has been specified for the previous method, Toolkit will look for the new method in the same ELB unless you also pass the *elb* argument.

The *elb* argument enables you to specify a new ELB for a button's method or instruct Toolkit not to use a previous *elb* specification. If you pass a new library name as the *elb* argument, Toolkit will look only in this library (and any libraries linked to it) to find the method specified by *method*. If you pass *elb* as blank or zero-length, Toolkit will look in any available module or open ELB (rather than the ELB specified in a previous *elb* specification). So results depend on the application's context (which libraries are open). For the `DSB_MODIFY` subfunction, you can pass *elb* without passing *method* and vice versa.

The *type* and *type\_data* arguments enable you to change what appears on the button's face. The *type\_data* argument can be passed without also passing *type*, and *type* can be passed without *type\_data*. But if you pass *type*, you may need to pass *type\_data* to prevent a caption from being interpreted as the filename for a graphic or vice versa. For information on supported graphic formats and creating transparent graphics, see [“Toolkit button graphics” on page 2-17](#).

The *select\_char* argument enables you to specify a new quick-select character for a button or remove a quick-select character from a button. To specify a new quick-select character, pass the character as *select\_char*. To remove a quick-select character from a button, pass *select\_char* as blank or zero-length. See the Discussion for `DSB_ADD` on [page 5-7](#) for more information on quick-select characters.

The *position* argument enables you to move the button to a new position in the button set.

- ▶ To move the button above or to the left of an existing button (depending on the button set's orientation), pass the name of the existing button. The *position* argument is not case sensitive.
- ▶ To specify a numeric position among existing buttons, pass a position number, which is an index (base 1) that specifies the new numeric position (left to right or top to bottom) among existing buttons. For example, if you pass 1, the button will be moved to the left-most or top position in the button set. If you pass 2, the button will be moved to the second position to the left or the second position from the top in the button set.
- ▶ To move the button to the end of existing buttons (to the far right or bottom of the button set), pass *position* as a zero-length or blank alphanumeric value.

Note that Toolkit generates a fatal error if you pass a name for *position* that doesn't match any of the existing button names or if you pass a number that's less than 1 or greater than the number of buttons on the window plus 1.

To modify the ToolTip for a button, pass a non-blank value with a length that is greater than zero for *tooltip*. Note that a ToolTip's length can be no longer than the operating system's maximum length for an alphanumeric field. (See [DSB\\_TOOLTIP on page 5-37](#) for information on retrieving ToolTip text.)

## Examples

The following example changes the button face for the lookup button. It will display a new graphic named **lookup2.png**. (We're assuming that the button previously had a graphic displayed on the button face. If it instead had text on the button face, this example would need to pass DSB\_BITMAP as the *type* argument to prevent Toolkit from interpreting "lookup2.png" as a text string rather than a filename.)

```
xcall b_button(wndid, DSB_MODIFY, "lookup",, "lookup2.png")
```

The following example changes the button face for the **lookup** button to the text "Search All".

```
xcall b_button(wndid, DSB_MODIFY, "lookup", DSB_TEXT, "Search All")
```

The next example changes the method name and the ELB for the **lookup** button.

```
xcall b_button(wndid, DSB_MODIFY, "lookup",, "search_all",  
& "button2.elb")
```

The next example changes the button so that it no longer calls a method when clicked. Instead, Toolkit will use the first ten characters of the button name to signal a menu entry.

```
xcall b_button(wndid, DSB_MODIFY, "lookup",, " ")
```

The next example changes the button so that Toolkit no longer looks in a specific ELB for the method.

```
xcall b_button(wndid, DSB_MODIFY, "lookup",,,, " ")
```

The next example changes the quick-select character for the button to "s". When the user presses ALT+S, the button will be activated.

```
xcall b_button(wndid, DSB_MODIFY, "lookup",,,,, "s")
```

The next example moves the **lookup** button to the beginning of the button set. (This will be the far left or top depending the orientation of the button set.)

```
xcall b_button(wndid, DSB_MODIFY, "lookup",,,,,, 1)
```

The next example moves the **lookup** button to the position that precedes the I\_CANCEL button. Depending on the button set orientation, it will be above or to the left of the I\_CANCEL button.

```
xcall b_button(wndid, DSB_MODIFY, "lookup",,,,,, "I_CANCEL")
```

The next example moves the **lookup** button to the third position in the button set. Depending on the orientation of the button set, it will be either the third button from the top or the third button from the left.

```
xcall b_button(wndid, DSB_MODIFY, "lookup",,,,,, 3)
```

The next example moves the **lookup** button to the end of the button set. Depending on the orientation of the button set, it will either be at the far right or the bottom of the button set.

```
xcall b_button(wndid, DSB_MODIFY, "lookup",,,,,, "")
```

The next example sets the ToolTip text to “Enter a vendor number”:

```
xcall b_button(wndid, DSB_MODIFY, "lookup",,,,,, "Enter a vendor number")
```



## B\_BUTTONSET – Define the placement of a set of buttons on a window or tab set



```
xcall B_BUTTONSET (container_id, [placement], [per_row_col], [justification]
&
                    [, button_name])
```

### Arguments

*container\_id*

The ID of the window or tab set. **(n)**

*placement*

(optional) One of the following: **(n)**

**DSB\_BOTTOM** The set of buttons will be placed horizontally along the bottom of the container with a maximum of *per\_row\_col* buttons per row. (default)

**DSB\_RIGHT** The set of buttons will be placed vertically along the right side of the container with a maximum of *per\_row\_col* buttons per column.

*per\_row\_col*

(optional) The maximum number of buttons to place on a row if DSB\_BOTTOM is specified, or on a column if DSB\_RIGHT is specified. The default behavior is to display as many buttons as will fit and wrap to the next row or column. **(n)**

*justification*

(optional) One of the following: **(n)**

**DSB\_BEGIN** The buttons will be left-justified if DSB\_BOTTOM is specified, or positioned towards the top if DSB\_RIGHT is specified. (default)

**DSB\_CENTER** The buttons will be centered along the designated side.

**DSB\_END** The buttons will be right-justified if DSB\_BOTTOM is specified, or positioned towards the bottom if DSB\_RIGHT is specified.

*button\_name*

(optional) The name of the default button or the following. Note that if you use the following, it must be in capital letters and enclosed in quotation marks. **(a)**

**\*NONE\*** Clear any explicitly set button default for the window.

## Discussion

B\_BUTTONSET defines the placement of a set of buttons within a window or tab set. (Use the L\_BUTTONSET subroutine to define a button set on a list.)

If button set information is specified for a container that already has a button set, any new information will supersede the previous information, but unspecified arguments will not be modified.

Every button is contained within a set, and only one button set is allowed per window or tab set. Because of this, a call to B\_BUTTONSET affects all buttons within a container.

If the E\_STATE option D\_RETURNBTN is set, the default button will be selected if you press RETURN, no matter what field you're on in the window. If *button\_name* is not specified, the first button in the window is the default.

This routine has no effect on applications running on UNIX or OpenVMS or in Synergy .NET. It does, however, save button information on these platforms, so if the window is saved to a window library (by using U\_SAVE) and later loaded from that library on a Windows platform in traditional Synergy, the button will be on the window (assuming ISAM-compatible platforms).

## See also

- ▶ [“Using the Button Subroutines” on page 5-2](#) for general information on buttons and button sets on windows, tab sets, and lists.
- ▶ [.BUTTON\\_SET on page 2-19](#) for more information on defining the placement of a window's button set in a script file.
- ▶ [L\\_BUTTONSET on page 9-62](#) for more information on defining a button set within a list.
- ▶ [IB\\_BUTTONSET on page 8-93](#) for more information on defining a button set when building a new input window at runtime.
- ▶ [DTS\\_BUTTONSET on page 13-19](#) for more information about specifying button placement on a tab set. (DTS\_BUTTONSET is a subfunction of %TS\_TABSET.)
- ▶ [E\\_STATE on page 7-45](#) for more information about the ENTER key selecting the default button.

## Examples

The following example places the window's buttons on the right side of the window, centered, with at most three buttons per column.

```
xcall b_buttonset(wndid, DSB_RIGHT, 3, DSB_CENTER)
```

## %B\_DISABLE – Disable a button in a window or tab set



```
state = %B_DISABLE (container_id, button_name)
```

or

```
xcall B_DISABLE (container_id, button_name)
```

### Return value

*state*

On Windows, this function returns the previous state of the button: (^VAL)

**D\_DISABLED**      Disabled.

**D\_ENABLED**      Enabled.

**D\_INPUTONLY**    Enabled only within input (the default state; see below).

On UNIX and OpenVMS, this function always returns false.

### Arguments

*container\_id*

The ID of the window or tab set that contains the button to disable. (n)

*button\_name*

The name of the button to disable. (a)

### Discussion

The %B\_DISABLE function prevents a button from being enabled and, if the button is enabled, disables the button (which prevents the button from receiving focus). Note the following:

- ▶ By default, a button is enabled only when its window is being processed. (See [.BUTTON on page 2-15](#) for details and exceptions.) To restore this default behavior (which %B\_DISABLE prevents), call %B\_ENABLE with the *input\_only* argument set to true.
- ▶ Use the %L\_BUTTONSTATE function to disable a button on a list.

If *container\_id* is invalid or the window does not contain the specified button, an error occurs.

This routine has no effect on applications running on UNIX or OpenVMS or in Synergy .NET. It does, however, save button information on these platforms, so if the window is saved to a window library (by using U\_SAVE) and later loaded from that library on a Windows platform in traditional Synergy, the button will be on the window (assuming ISAM-compatible platforms).

## Button Routines

%B\_DISABLE

### Examples

The following example disables the OK button in window **wndid**.

```
prev_state = %b_disable(wndid, "OK")
```

## %B\_ENABLE – Enable a button in a window or tab set



```
prev_state = %B_ENABLE(container_id, button_name[, input_only])
```

or

```
xcall B_ENABLE(container_id, button_name[, input_only])
```

### Return value

*prev\_state*

On Windows, this function returns the previous state of the button: (^VAL)

**D\_DISABLED** Disabled.

**D\_ENABLED** Enabled.

**D\_INPUTONLY** Enabled only within input (the default state; see below).

On UNIX and OpenVMS, this function always returns false.

### Arguments

*container\_id*

The ID of the window or tab set that contains the button to enable. (**n**)

*button\_name*

The name of the button to enable. (**a**)

*input\_only*

(optional) The true/false flag that specifies whether the button is to be enabled only when being processed. This is the default state for all buttons. (**n**)

### Discussion

The %B\_ENABLE function enables a button in a window and either restores or prevents automatic button enabling and disabling. (Use %L\_BUTTONSTATE to enable a button on a list.)

## Button Routines

### %B\_ENABLE

By default, a button is automatically enabled when the window that contains the button is processed; otherwise, it is automatically disabled. There is an exception: if a button is in a composite window, the button will be automatically enabled when the composite window is processed (even if the button is on a child window that is not active) and disabled otherwise. Note the following:

- ▶ If you omit *input\_only* or pass it as false, %B\_ENABLE prevents the button from being automatically disabled and, if the button is disabled, enables it.
- ▶ If you pass *input\_only* as true, %B\_ENABLE restores the default behavior, which, incidentally, enables the button if the window or tab set (or composite window) for the button is being processed.

If *container\_id* is invalid or the window does not contain the specified button, an error occurs.

This routine has no effect on applications running on UNIX or OpenVMS or in Synergy .NET. It does, however, save button information on these platforms, so if the window is saved to a window library (by using U\_SAVE) and later loaded from that library on a Windows platform in traditional Synergy, the button will be on the window (assuming ISAM-compatible platforms).

## Examples

The following example enables the OK button in window **wndid**.

```
prev_state = %b_enable(wndid, "OK")
```

The next example enables the Exit button in window **inpid**, but enables it only when **inpid** is being processed.

```
prev_state = %b_enable(inpid, "Exit", TRUE)
```

## %B\_INFO – Return information about the buttons in a window



*return* = %B\_INFO (*window\_id*, *subfunction*, *args*)

### Return value

*return*

A value that is specific to the subfunction. (^VAL)

### Arguments

*window\_id*

The ID of a window (see Discussion below). (n)

*subfunction*

One of the following: (n)

|                          |                                                                                                                                        |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>DSB_COUNT</b>         | Return the number of buttons in a window. See <a href="#">page 5-23</a> .                                                              |
| <b>DSB_DEFAULT</b>       | Return the index of the default button. See <a href="#">page 5-24</a> .                                                                |
| <b>DSB_ENABLED</b>       | Return the enabled state of a button. See <a href="#">page 5-25</a> .                                                                  |
| <b>DSB_INDEX</b>         | Return the index (position in button set) of a button. See <a href="#">page 5-26</a> .                                                 |
| <b>DSB_JUSTIFICATION</b> | Return the justification setting for a window's button set. See <a href="#">page 5-27</a> .                                            |
| <b>DSB_METHOD</b>        | Return method information for a button. See <a href="#">page 5-28</a> .                                                                |
| <b>DSB_NAME</b>          | Return a button's name by passing its index. See <a href="#">page 5-30</a> .                                                           |
| <b>DSB_PER_ROW_COL</b>   | Return the maximum number of buttons that can be displayed in a button set row or column for a window. See <a href="#">page 5-31</a> . |
| <b>DSB_PLACEMENT</b>     | Return the placement (at the bottom of the window or along the right side) for a window's button set. See <a href="#">page 5-32</a> .  |
| <b>DSB_SELECTCHAR</b>    | Return the quick-select character for a button. See <a href="#">page 5-33</a> .                                                        |
| <b>DSB_TYPE</b>          | Return the button face type (text or graphic) for a button. See <a href="#">page 5-35</a> .                                            |
| <b>DSB_TOOTIP</b>        | Return the text and length for a button ToolTip. See <a href="#">page 5-37</a> .                                                       |

*args*

Arguments specific to *subfunction*.

## Discussion

On Windows and UNIX, the %B\_INFO function enables you to return information on a window's buttons. (On UNIX, buttons are not displayed, but they may be defined for a window.) Note the following:

- ▶ For lists, pass the ID of the list's containing window as *window\_id*. (The ID of a list's containing window is returned by the D\_LCTRID subfunction for L\_STATUS.)
- ▶ For tab sets, pass the window ID for the tab set.
- ▶ For composite windows, passing the composite container window's ID instructs %B\_INFO to return information about the buttons for that window only. For information on buttons for a child window, pass ID of the child window as *window\_id*.

On OpenVMS, this function ignores all parameters and returns a value of 0.



## %B\_INFO (continued)

### DSB\_COUNT

```
count = %B_INFO(window_id, DSB_COUNT)
```

### Return value

*count*

The number of buttons in the specified window or a value of 0 if the window has no buttons. (^VAL)

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (n)

### Discussion

The DSB\_COUNT subfunction returns the number of buttons in the window specified by *window\_id*. If the window has no buttons, DSB\_COUNT returns a value of 0.

### Examples

The following example returns the number of buttons in **wndid**:

```
btn_num = %b_info(wndid, DSB_COUNT)
```

## %B\_INFO (continued)

### DSB\_DEFAULT

*index* = %B\_INFO (*window\_id*, DSB\_DEFAULT)

### Return value

*index*

The index of the default button, or a value of 0 if no default button has been specified for the window. (^**VAL**)

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (**n**)

### Discussion

The DSB\_DEFAULT subfunction tells you whether the specified window has a default button (if it doesn't, DSB\_DEFAULT returns a value of 0) and returns the index for the default button if there is one. The index (base 1) specifies the numeric position (from left to right or from top to bottom) of the button in relation to other buttons in the window.

### Examples

The following example returns the index for the default button for **wndid**:

```
btn_dflt = %b_info(wndid, DSB_DEFAULT)
```

## %B\_INFO (continued)

### DSB\_ENABLED

*state* = %B\_INFO (*window\_id*, DSB\_ENABLED, *button*)

### Return value

*state*

One of the following: (^VAL)

**TRUE** The button is enabled.

**FALSE** The button is disabled.

**DSB\_INPUT\_ONLY** The button is enabled only when its window or composite container is being processed.

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (**n**)

*button*

The button name (if the passed value is alpha) or the index for the button (if passed value is numeric). (**a** or **n**)

### Discussion

The DSB\_ENABLED subroutine returns the enabled state of the button specified with *button*.

You can specify a button by name (case-insensitive) or by numeric position. If you pass a number for *button*, it is interpreted as an index (base 1) that specifies the position of the button in relation to the other buttons for the window (from left to right, or from top to bottom). Note that a fatal error will occur if you pass a number that is less than 1, a number that is greater than the number of buttons in the window, or an alpha value that is not the name of a button in the window.

For information on the input-only state, see [%B\\_ENABLE on page 5-19.](#)

### Examples

In the following example, %B\_INFO returns the enabled state of the first button in the window's button set:

```
btn_state = %b_info(wndid, DSB_ENABLED, 1)
```

## %B\_INFO (continued)

### DSB\_INDEX

*index* = %B\_INFO (*window\_id*, DSB\_INDEX, *name*)

### Return value

*index*

The index of the button specified by *name* or a value of zero if the specified button is not found. (^**VAL**)

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (**n**)

*name*

The name (case-insensitive) of a button on the window specified by *window\_id*. (**a**)

### Discussion

The DSB\_INDEX subfunction returns the index of the button specified by *name*, or it returns a value of 0 if there is no such button. The index (base 1) specifies the numeric position (from left to right or from top to bottom) of the button in relation to other buttons in the window.

### Examples

In the following example, %B\_INFO returns the index for a button named lookup:

```
btn_index = %b_info(widid, DSB_INDEX, "lookup")
```

## %B\_INFO (continued)

### DSB\_JUSTIFICATION

*justification* = %B\_INFO(*window\_id*, DSB\_JUSTIFICATION)

### Return value

*justification*

One of the following: (^VAL)

**DSB\_BEGIN** Buttons are left-justified if the button set is placed at the bottom of the window. If the button set is placed vertically along the right side of the window, buttons are top-justified.

**DSB\_CENTER** Buttons are centered along the bottom or along the right side of the window.

**DSB\_END** Buttons are right-justified if the button set is placed at the bottom of the window. If the button set is placed vertically along the right side of the window, buttons are bottom-justified.

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (n)

### Discussion

The DSB\_JUSTIFICATION subfunction returns the justification setting for a window's button set. For information on the justification setting for button sets, see [.BUTTON\\_SET on page 2-19.](#)

### See also

- ▶ [B\\_BUTTONSET on page 5-15.](#)
- ▶ [L\\_BUTTONSET on page 9-62.](#)

### Examples

In the following example, %B\_INFO returns the justification setting for the window's button set:

```
btn_just = %B_INFO(wndid, DSB_JUSTIFICATION)
```

## %B\_INFO (continued)

### DSB\_METHOD

*address* = %B\_INFO (*window\_id*, DSB\_METHOD, *button*, [*method\_name*][, *elb\_path*])

or

xcall B\_INFO (*window\_id*, DSB\_METHOD, *button*, [*method\_name*][, *elb\_path*])

### Return value

*address*

The address of the button's method, or a value of 0 if the button has no method. (^VAL)

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (n)

*button*

The button name (if this is passed as alpha) or the button index (if this is passed as numeric). (a or n)

*method\_name*

(optional) Returned name of the method (or blank if there is no method for the button). (a)

*elb\_path*

(optional) Returned path for the method's ELB (or blank if there is no method for the button or if there is no ELB specified for the method). (a)

### Discussion

The DSB\_METHOD subfunction

- ▶ tells you if a button has a method (if there is no method, DSB\_METHOD returns zero).
- ▶ returns the address for the method if there is one.
- ▶ optionally returns the name (*method\_name*) of the method.
- ▶ optionally returns the path (*elb\_path*) for the method's ELB.

You can specify a button by name (case-insensitive) or by numeric position. If you pass a number for *button*, it is interpreted as an index (base 1) that specifies the position of the button in relation to the other buttons for the window (from left to right, or from top to bottom). Note that a fatal error will occur if you pass a number that is less than 1, a number that is greater than the number of buttons in the window, or an alpha value that is not the name of a button in the window.

See also

[.BUTTON](#) on page 2-15.

## Examples

In the following example, %B\_INFO returns the button method address for the button specified by **btn\_index** and retrieves the button's name (**meth\_name**), as well as the path (**elb\_path**) to the ELB that contains the button method:

```
meth_addr = %B_INFO(wndid, DSB_METHOD, btn_index, meth_name,  
                    &                                elb_path)
```

## %B\_INFO (continued)

### DSB\_NAME

```
success = %B_INFO (window_id, DSB_NAME, index, name)
```

or

```
xcall B_INFO (window_id, DSB_NAME, index, name)
```

### Return value

*success*

True if *index* corresponds to a button; false if there is no button for *index*. (^VAL)

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (n)

*index*

The index of the button to access. This is an index (base 1) that specifies the numeric position (from left to right or from top to bottom) of the button in relation to other buttons in the window. (If *index* is non-numeric, a fatal Toolkit error will occur.) (n)

*name*

The returned name of the button specified by *index*. If no button is found for *index*, *name* is filled with spaces. (a)

### Discussion

The DSB\_NAME subfunction indicates whether there is a button that corresponds to a specified index and, if there is, retrieves the name of the button:

- ▶ If there is a button for *index*, DSB\_NAME returns true and passes the name of the button in *name*.
- ▶ If there is no button for *index*, DSB\_NAME returns false and fills *name* with spaces.

### Examples

In the following example, %B\_INFO tests to for the existence of a button in the window and, if there is, retrieves the name of the first button in the button set:

```
btn_index = 1
if (%B_INFO(wndid, DSB_NAME, btn_index, btn_name))
.
.
.
```



## %B\_INFO (continued)

### DSB\_PER\_ROW\_COL

*number* = %B\_INFO(*window\_id*, DSB\_PER\_ROW\_COL)

#### Return value

*number*

The maximum number of buttons per row or column, or zero if no maximum has been set for the specified window's button set. (^VAL)

#### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (n)

#### Discussion

The DSB\_PER\_ROW\_COL subfunction returns the maximum number of buttons that will be displayed in a row or column for the specified window's button set. If no maximum has been set for the button set, this function returns zero. For information on the maximum setting for rows and for columns, see [.BUTTON\\_SET on page 2-19.](#)

#### Examples

In the following example, %B\_INFO returns the maximum number of buttons that will be displayed in a row (if the button set for **wndid** is positioned at the bottom of the window) or in a column (if the button set for **wndid** is positioned vertically along the right side of the window):

```
num_btns = %B_INFO(wndid, DSB_PER_ROW_COL)
```

## %B\_INFO (continued)

### DSB\_PLACEMENT

*placement* = %B\_INFO(*window\_id*, DSB\_PLACEMENT)

### Return value

*placement*

One of the following: (^VAL)

**DSB\_BOTTOM** Buttons are placed horizontally along the bottom of container.

**DSB\_RIGHT** Buttons are placed vertically along the right side of the container.

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (n)

### Discussion

The DSB\_PLACEMENT subfunction returns the placement setting for a window's button set, telling you whether the buttons are placed horizontally along the bottom of the window or vertically along the right side of the window.

### See also

- ▶ [“Defining button placement and the default button” on page 5-3](#) for information on setting button placement.
- ▶ [“.BUTTON\\_SET” on page 2-19](#) for information on setting button placement for a window.
- ▶ [B\\_BUTTONSET on page 5-15](#) and [L\\_BUTTONSET on page 9-62.](#)

### Examples

In the following example, %B\_INFO returns the placement setting for the window specified by **wndid**:

```
btn_plc = %b_info(wndid, DSB_PLACEMENT)
```

## %B\_INFO (continued)

### DSB\_SELECTCHAR

*value* = %B\_INFO (*window\_id*, DSB\_SELECTCHAR, *button*[, *char*])

or

xcall B\_INFO (*window\_id*, DSB\_SELECTCHAR, *button*[, *char*])

### Return value

*value*

The ASCII value of the quick-select character for the button (specified with *button*), or 0 if the button has no quick-select character. (**^VAL**)

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (**n**)

*button*

The button name (if this is passed as alpha) or the button index (if this is passed as numeric). (**a** or **n**)

*char*

(optional) The returned quick-select character for the specified button, or %char(0) if the button has no quick-select character. (**a**)

### Discussion

The DSB\_SELECTCHAR function

- ▶ tells you if a button has a quick-select character. (If there is no quick-select character, the return value is 0.)
- ▶ returns the ASCII value (*value*) of the quick-select character, if there is one.
- ▶ optionally returns the quick-select character itself (in *char*).

You can specify a button by name (case-insensitive) or by numeric position. If you pass a number for *button*, it is interpreted as an index (base 1) that specifies the position of the button in relation to the other buttons for the window (from left to right, or from top to bottom). Note that a fatal error will occur if you pass a number that is less than 1, a number that is greater than the number of buttons in the window, or an alpha value that is not the name of a button in the window.

## Button Routines

### %B\_INFO

#### See also

- ▶ [.BUTTON](#) on page 2-15.
- ▶ [B\\_BUTTONSET](#) on page 5-15 and [L\\_BUTTONSET](#) on page 9-62.

#### Examples

In the following example, %B\_INFO tests for a select character for the first button in the window's button set and retrieves the quick-select character (in **sel\_char**) if there is one:

```
btn_index = 1
if (%B_INFO(wndid, DSB_SELECTCHAR, btn_index, sel_char)) then
.
.
.
```

## %B\_INFO (continued)

### DSB\_TYPE

*type* = %B\_INFO (*window\_id*, DSB\_TYPE, *button*[, *type\_data*])

or

xcall B\_INFO (*window\_id*, DSB\_TYPE, *button*[, *type\_data*])

### Return value

*type*

One of the following: (^VAL)

**DSB\_TEXT**           Text.

**DSB\_BITMAP**       Graphic.

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22](#).) (**n**)

*button*

The button name (if this is passed as alpha) or the button index (if this is passed as numeric). (**a** or **n**)

*type\_data*

(optional) The returned type-specific data, which is the text for the button face (if the type is DSB\_TEXT) or the image path (if the type is DSB\_BITMAP). (**a**)

### Discussion

The DSB\_TYPE subfunction returns the type of the button face (text or graphic) and optionally retrieves either the text for the button or the path for the button's graphic.

You can specify a button by name (case-insensitive) or by numeric position. If you pass a number for *button*, it is interpreted as an index (base 1) that specifies the position of the button in relation to the other buttons for the window (from left to right, or from top to bottom). Note that a fatal error will occur if you pass a number that is less than 1, a number that is greater than the number of buttons in the window, or an alpha value that is not the name of a button in the window.

### See also

- ▶ [.BUTTON](#) on [page 2-15](#), which includes “Toolkit button graphics,” a section that discusses the graphic formats supported for Toolkit buttons.
- ▶ [DSB\\_ADD](#) on [page 5-6](#) for B\_BUTTON and [DSB\\_ADD](#) on [page 9-56](#) for L\_BUTTON.

## Button Routines

### %B\_INFO

## Examples

In the following example, %B\_INFO returns the button type for the button named “lookup” and retrieves either the button’s text or the path for the button’s graphic in **btn\_data**:

```
btn_type = %b_info(wndid, DSB_TYPE, "lookup", btn_data)
```

## %B\_INFO (continued)

### DSB\_TOOLTIP

*length* = %B\_INFO (*window\_id*, DSB\_TOOLTIP, *button*[, *text*]) )

or

xcall B\_INFO (*window\_id*, DSB\_TOOLTIP, *button*[, *text*])

### Return value

*length*

The length of the button's ToolTip text, or zero if the button has no ToolTip. (^VAL)

### Arguments

*window\_id*

The ID of a window. (See Discussion on [page 5-22.](#)) (n)

*button*

The button name (if this is passed as alpha) or the button index (if this is passed as numeric). (a or n)

*text*

(optional) The returned text of the button's ToolTip. (a)

### Discussion

The DSB\_TOOLTIP subfunction

- ▶ enables you to determine if a button on a window or a list has a ToolTip (if it doesn't, this subfunction returns zero).
- ▶ returns the length of a button's ToolTip text (or zero if the button has no ToolTip).
- ▶ optionally returns the text of the button's ToolTip in *text* (or all blanks if the button has no ToolTip).

You can specify a button by name (case-insensitive) or by numeric position. If you pass a number for *button*, it is interpreted as an index (base 1) that specifies the position of the button in relation to the other buttons for the window (from left to right, or from top to bottom). Note that a fatal error will occur if you pass a number that is less than 1, a number that is greater than the number of buttons in the window, or an alpha value that is not the name of a button in the window.

## Button Routines

### %B\_INFO

Note the following for *text*:

- ▶ If *text* is not large enough to contain the ToolTip text for the button, that text shall be truncated to the size of *text*. (*Length* will still be returned with the full length of the ToolTip text.)
- ▶ If *text* is larger than the ToolTip text for the button, the remainder of *text* will contain spaces.
- ▶ If the button has no ToolTip, *text* is returned as all blanks.

## Examples

In the following example, %B\_INFO returns the ToolTip text (**ttip\_text**) and the length of the ToolTip text (**ttip\_len**) for a button named “lookup”:

```
ttip_len= %B_INFO(wndid, DSB_TOOLTIP, "lookup", ttip_text)
```



# 6

## Composite Window Routines

### Creating and Processing Composite Windows 6-2

Describes composite windows, how they work, and how you can create and use them.

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# Creating and Processing Composite Windows

The composite window routines and methods enable you to create and process composite windows, which are windows that consist of a parent window and child windows and/or lists. For example, you could create a composite window with input fields at the top for header information, a table in the middle for line item entry, a multi-line “notes” field that supports rich text editing through an ActiveX control, buttons, and so forth. A composite window functions and appears to the user as a single window.

The parent window in a composite window is the *composite container window*. Windows or lists within a composite container window are *child windows* or *child lists*. A child window or list can be any type of UI Toolkit window or list, including ActiveX windows, tab set windows, ActiveX Toolkit lists, .NET form windows, and other composite windows. (A composite window can have a maximum of 2047 children.) Note the following:

- ▶ On Windows, child windows and lists are wholly contained within the composite container window.
- ▶ On UNIX and OpenVMS, the display area for a child window or list is circumscribed if necessary to make it fit within the display area of the composite container window. Subsequent moving or resizing, however, may cause a child to exceed the boundaries of the container.

A composite window not only appears to users as a single, unified window, it is also treated in many ways as a single window by the application. Calls you make that affect the container affect the composite window as a whole:

- ▶ When a container is placed, all placed child windows and lists become visible.
- ▶ When a container is moved, all child windows and lists are moved with it.
- ▶ When a container is removed, all child windows and lists become invisible. (When a container is deleted, though, Toolkit automatically removes placed child windows and lists. It does not delete them.)

To create a composite window,

1. Create the composite container window with the DC\_CREATE subfunction for %C\_CONTAINER. See [DC\\_CREATE](#) on page 6-34.
2. Add child windows or lists or both to the container window. As you do this you can set properties for the child windows and lists, including placement, tabbing position, a menu column to be loaded when the child is processed, and the name of a routine to be used in place of the default method for the child. See [DC\\_ADD](#) on page 6-23.

## Placing, removing, and deleting

When you place a child, the child remains invisible until the composite container window is placed. When you place a composite window (by placing its container), only child windows and lists that have already been placed will appear on the window. Note that a container and its child windows and lists don't have to be logged in the same environment. When a container is placed, placed windows and lists will be displayed, even if they are logged in different environments.

- ▶ To instruct Toolkit to place a child, either pass both the *row* and *col* arguments in the DC\_ADD call that adds the child to the composite window, or use the D\_PLACE operation for U\_WINDOW or L\_PLACE to place the child after it has been added to a composite window.
- ▶ To place the composite container window, pass the window ID for the container to the D\_PLACE operation for U\_WINDOW.

To instruct Toolkit to remove a child from the screen, use the D\_REMOVE operation for U\_WINDOW or use L\_REMOVE. Note the following:

- ▶ If the composite container window has not yet been placed, the remove operation will have no visible effect because the child is already invisible. However, the child will not become visible when the container is placed.
- ▶ Removing a child with D\_REMOVE or L\_REMOVE removes the child from the display but does not remove (disassociate) the child from the container. The DC\_ADD call that added it to the container still stands, and the child retains its position in the tabbing order for the composite window.
- ▶ To remove a child from the display *and* from the container, use the DC\_REMOVE subfunction for %C\_CONTAINER.

To remove a composite window from the screen, pass the composite container window ID to the D\_REMOVE operation for U\_WINDOW. Removing the composite container window makes all child windows and lists invisible, no matter which environments they are logged in.

To delete a composite window, delete its composite container window. To delete a composite container window or a child, leave the environment in which it was logged or use the D\_DELETE operation for U\_WINDOW. Note, however, that deleting the container removes all child windows and lists but does not delete them.

## Processing composite windows

Once you have created and placed a composite window, you can process it by calling C\_PROCESS, which in turn calls methods that process the child windows and lists. Toolkit includes default processing methods, but you can instruct C\_PROCESS to call your own custom methods instead. See [C\\_PROCESS on page 6-45](#) and [“The Composite Window Processing Methods” on page 6-50](#).

## Controlling tabbing, focus, and input context

When a composite window is being processed, tabbing moves through placed child windows and lists according to the composite window's tabbing order, which by default is the order they were added to the composite window. Then, after child windows and lists, tabbing moves through any enabled buttons added to the composite container window.



Every child window and list for a composite window has a tabbing index. This number specifies the child's position in the tabbing order. Tabbing indices are base 1, so the first child for a composite window has a tabbing index of 1. To get the tabbing index of a child, use the DC\_CHILDINDEX subfunction for %C\_CONTAINER. (Note that buttons on the composite container window also have tabbing indices, which are also base 1.)

You can do the following to control the tabbing order or activate a specific child or button:

- ▶ To control a child's place in the tabbing order, add child windows and lists in the order that you want users to tab through them. (When you add a child, it's added to the end of the tabbing index by default.) You can, however, use the *tabindex* argument for DC\_ADD to insert a child into a different position when you add it.
- ▶ To change the active child, use one of the C\_ menu entries (see the Discussion for C\_PROCESS on [page 6-45](#)) or use the DC\_CONTEXT subfunction for %C\_CONTAINER. (You can also use DC\_CONTEXT to determine which child is active in a composite window.)
- ▶ To change focus to a specified button on the composite container window, use the DC\_BTNFOCUS subfunction for %C\_CONTAINER. (You can also use this function to determine whether a button on the composite container window has focus.)

### Tabbing within child windows and lists

When processing a child window or list with L\_INPUT, L\_INPFLD, S\_SELECT, T\_EDIT, T\_VIEW, or U\_CHR, pressing TAB (or otherwise signaling the C\_NEXT menu entry) moves focus to the first button for the window. Subsequent tabbing advances through any remaining buttons for the window and then, if the window is on a tab, advances through buttons on the tab set. Finally, tabbing causes the input routine to return with **g\_select** set to true and **g\_entnam** set to "C\_NEXT", which instructs C\_PROCESS to move focus to the next child window. SHIFT+TAB works the same way, but in reverse. It returns **g\_select** set to true, but it sets **g\_entnam** to "C\_PREV" to move to the preceding child.

The above also applies to I\_INPUT and I\_INPFLD, except that

- ▶ these include input fields in the tabbing order.
- ▶ signaling "C\_NEXT" or "C\_PREV" while in the tabbing order of the window itself (which includes buttons for the window and, if the button is on a tab, buttons for the tab set) does not move from field to field or button to button. Instead, these menu entries are returned to C\_PROCESS. To move from among fields and buttons in the window (and tab set if applicable), use the I\_NEXTCTL and I\_PREVCTL menu entries.

In any case, users won't be able to tab out of a window or list if the child processing method changes the value of **g\_entnamtab** or **g\_entnamstab** (defined in **tkctl.def**), if the ActiveX control for a child ActiveX window processes TAB and SHIFT+TAB as an accelerator without returning it as a keystroke (see “[ActiveX controls and tabbing](#)” below).

Additionally, Toolkit includes several routines that enable you to control the context of a child window or list. All of the following except **I\_NEXT** and **L\_NEXT** determine context based on the reason the child received focus. This enables child processing methods (the default methods and any methods you create) to provide an interface where users can smoothly tab through and click into composite windows.

- ▶ To control context for a child composite window, use the **DC\_CTRCONTEXT** subfunction for **%C\_CONTAINER**. See [DC\\_CTRCONTEXT](#) on page 6-35 for more information.
- ▶ To control context for a window or list on a child tab set, use the **DTS\_CTRCONTEXT** subfunction for **%TS\_TABSET**. See [DTS\\_CTRCONTEXT](#) on page 13-37 for more information.
- ▶ To control context for a child input window, use **I\_NEXT** or **I\_CTRCONTEXT**. See [I\\_NEXT](#) on page 8-67 or [I\\_CTRCONTEXT](#) on page 8-10 for more information.
- ▶ To control context for a child list, use **L\_NEXT** or **L\_CTRCONTEXT**. See [L\\_NEXT](#) on page 9-110 or [L\\_CTRCONTEXT](#) on page 9-82 for more information.
- ▶ To control context for other types of windows, use **U\_CTRCONTEXT**. See [U\\_CTRCONTEXT](#) on page 16-24 for more information.

Note that when processing tab sets, CTRL+TAB and CTRL+SHIFT+TAB apply to the innermost tab set. For example, if a tab set contains a composite window, and that composite window in turn contains a tab set, these key combinations apply to the inner tab set when the inner tab is being processed. When Toolkit is processing any other window in the composite window on the tab, they apply to the outer tab set. See [%TS\\_TABSET](#) on page 13-9 for more information on navigating tab sets.

For Windows, note the following:

- ▶ If an enabled tab on an inactive child window is clicked, Toolkit activates the child window and moves focus to the tab (instead of signaling the **TS\_TAB $n$**  menu entry). It then signals the “**C\_RESET**” menu entry (see the Discussion for **C\_PROCESS** on page 6-45).
- ▶ If a disabled tab on an inactive child window is clicked, Toolkit activates the child window, moves focus to the default tab, and then signals the “**C\_RESET**” menu entry (instead of signaling the **TS\_TAB $n$**  menu entry).
- ▶ For selection windows that are part of a composite window, TAB and SHIFT+TAB move focus to the next or previous child (unless TAB or SHIFT+TAB is a shortcut on a placed menu column). TAB instructs **S\_SELECT** to signal “**C\_NEXT**”, and SHIFT+TAB instructs **S\_SELECT** to signal “**C\_PREV**”.

## ActiveX controls and tabbing

There are a couple of situations in which tabbing may not automatically work seamlessly when a composite window includes an ActiveX control. The mechanisms for working around these issues are illustrated in [ActivexChildTabbing.zip](#), available from Synergy CodeExchange in the Resource Center on the Synergex web site.

- ▶ If the ActiveX control uses TAB or SHIFT+TAB internally (i.e., processes them as accelerators), users might not be able to tab out of the child unless you create a mechanism for this. To do this, code the control to invoke a method that signals the “C\_NEXT” or “C\_PREV” menu entry at the point a user would tab out of the control. (For information on “C\_NEXT” and “C\_PREV,” See the Discussion for C\_PROCESS on [page 6-45](#).) Note that often, however, this isn’t necessary. If a control uses TAB and SHIFT+TAB internally, but returns them as unprocessed when it reaches the end of its own tabbing order, TAB and SHIFT+TAB do tab out of the child. This is usually how controls created with VB6 work.
- ▶ If the ActiveX control consists of more than one control and has its own tabbing order, focus within the ActiveX control might not be where you want it when the user tabs to the ActiveX control. For example, if the ActiveX control consists of two edit controls, focus within the ActiveX control will generally be on the edit control that last had focus. To work around this, create a method for the child (a composite window processing method) that in turn uses a method in the ActiveX control to set focus.

## Buttons in composite windows

To add buttons to a composite window, you can use B\_BUTTON to add buttons to the container, and you can use B\_BUTTON or L\_BUTTON to add buttons to a child window or list. Note the following:

- ▶ Buttons on a composite window are enabled when the composite window is being processed and disabled when it’s not. This is true even of buttons in child windows and lists that are not active. See the Discussion for .BUTTON on [page 2-16](#) for details.
- ▶ You can create a panel of buttons that can be placed anywhere in the client area of a composite window. To do this, create an input window with buttons but with an empty input set (see [.SET on page 2-113](#) or [IB\\_SET on page 8-113](#)). You can then place the input window wherever you want the button panel to appear in the composite window’s client area.

## The default button

The following rules determine which button is the default for a composite window as a whole. Note that for usability and aesthetics, we recommend that you specify only one default button anywhere within a composite window—in other words, only one child window or list should have a default button (unless a default button is set for the composite container window). This prevents Toolkit from switching the default as context changes.

1. If the window being processed specifies a default button, and that button is enabled, that button becomes the default button for the composite window.
2. Otherwise, if the container for the active window specifies an enabled default button, that button becomes the default. If the container doesn't specify an enabled default button, but is itself contained, the default button for its container shall be the default, and so forth.
3. If no default button can be determined by the above, the default for another descendent window of a common container may become the default for the composite window. This, of course, will only come into play if there are several layers of containment (composite windows within composite windows). In this case, Toolkit starts with the innermost child and, if it is unable to establish a default from that, moves to its container, its container's container, and so forth.
4. If none of the above results in a default (i.e., if no default button is specified on any window with a common ancestor), the first button for the composite window becomes the default. The first button is determined according to the same hierarchy discussed in the previous rules. If the active window has a button, the first button on that window will be the default. If the active window doesn't have a button, the first button on the active window's container will be the default. If the parent has no button, the first button on the grandparent becomes the default, and so on. If none of these have buttons, the first button on a window that shares a common ancestor to the current window will be the default.

See the Discussion for `BUTTON_SET` [page 2-19](#) for more information on default buttons.

## ALT+key button activation

The following rules determine which button, if any, will be activated by an ALT+key combination:

1. If the window being processed contains an enabled button that specifies the entered key combination, Toolkit activates that button.
2. Otherwise, if the container for the active window has an enabled button that specifies the entered combination, Toolkit activates that button. If the container doesn't have an enabled button for the key combination, but is itself contained, Toolkit uses the enabled button for the key combination on the container's container, and so forth.
3. If no button is activated as a result of the above, Toolkit may activate a button that specifies the key combination in another descendent window of a common container. In this case, Toolkit starts with the innermost child and, if no button specifies the key combination in that window, moves to its container, its container's container, and so forth.

Note that for usability and aesthetics, we recommend that only one button for each `ALT+key` combination be specified anywhere within a container. This prevents Toolkit from switching key associations as context changes.

## Positioning composite windows and child windows and lists

To position a composite window (as a whole), position the composite container window by using one of the following:

- ▶ `D_PLACE` operation for `U_WINDOW` when placing the container
- ▶ `D_MOVE` operation for `U_WINDOW` to move the container after it has been placed

To control the placement of a child window or list, use one of the following. In all cases, settings are relative to the client area of the immediate parent.

- ▶ The *row* and *col* arguments for `DC_ADD` (a subfunction for `%C_CONTAINER`) when adding a child to the composite window
- ▶ `.PLACEMENT` when defining a child window or the window for a child list. Note that this will work only if you use the `D_MOVE` operation for `U_WINDOW` to place the child.
- ▶ `L_CREATE` when creating a child list. Note that this will work only if the *row* and *col* arguments are omitted in the `DC_ADD` call and the *row* and *column* arguments are omitted when using `L_PLACE` to place the child.
- ▶ The `D_PLACE` operation for `U_WINDOW` or `L_PLACE` when placing a child
- ▶ The `D_MOVE` operation for `U_WINDOW` or the `WP_POSITION` function for `W_PROC` to move a child after it has been placed

## Getting composite window information

The `%C_CONTAINER` function includes several subfunctions that enable you to get child and composite container window information. With `%C_CONTAINER` you can

- ▶ determine how many child windows and lists are associated with a composite container window (`DC_NUMCHILD`).
- ▶ determine if a child window or list is active (`DC_CONTEXT`).
- ▶ determine the tabbing index for a specified child window or list (`DC_CHILDINDEX`).
- ▶ determine if a child with a specified tabbing index exists, and/or get the ID and type of the child (`DC_CHILD`).
- ▶ determine if a window or list is a child (`DC_CONTAINER`, `DC_CHILDINDEX`).
- ▶ get the ID of the associated container (`DC_CONTAINER`).
- ▶ determine if focus is on a button for the container (not a button for a child window or list) and, if so, which button (`DC_BTNFOCUS`).
- ▶ get the address of a method routine for a child window/event pair (`DC_GETEVENT`).



Additionally, you can

- ▶ find out if a window is a composite container window by using the `D_WINDOW_TYPE` subfunction for `%E_INFO`.
- ▶ get the method set ID for a child by using the `D_GETEVENTS` subfunction for `%U_WNDEVENTS` or by using the `D_LGETEVENTS` flag for `L_STATUS`.
- ▶ get the address of a method routine for a given event in a method set by using the `D_GETEVENT` subfunction for `%U_WNDEVENTS`.
- ▶ get the ID of the container window for a window or list that's part of a composite window on a tab set by using the `DTS_TABSET` subfunction for `%TS_TABSET`.

## Event methods

When a window or list is added to a composite window (even if it's part of tab set that is added to a composite window), its `%UWNDEVENTS_METHOD` set is replaced by one that handles mouse clicks in composite windows. The previously registered method set, however, is registered as a set of extensions to the new method set if there is a difference between the two. See the Discussion for `DC_EVENT` on [page 6-39](#) for information on the default behavior and for information on replacing it. Note the following:

- ▶ You can use the `DC_EVENT` subfunction for `%C_CONTAINER` to replace these extensions.
- ▶ You can use the `D_GETEVENTS` subfunction for `%U_WNDEVENTS` to determine if a method set has been registered for a UI Toolkit window and, if it has, what the ID for the method is.
- ▶ You can use the `D_GETEVENT` subfunction for `%U_WNDEVENTS` to retrieve the address of a method routine for the specified event (*event*) in the specified method set (*method\_set*).

When a child is removed from its container, the `%UWNDEVENTS_METHOD` set for the child will remain as it was before the `DC_REMOVE` call, but the click event will no longer alter the container's context.

# The Composite Window Subroutines and Functions

This section discusses the syntax and arguments for each of the composite window subroutines and functions.

## %C\_CONTAINER – Perform composite window operations



*value* = %C\_CONTAINER (*subfunction*, *args*)

or

xcall C\_CONTAINER (*subfunction*, *args*)

### Return value

*value*

The return value specific to *operation*.

### Arguments

*subfunction*

One of the following: (**n**)

**DC\_ADD**

Add a child window or list to a composite window. See [page 6-23](#).

**DC\_BTNFOCUS**

Determine whether a button on a composite window has focus and return the tabbing index for the button and/or change focus to a specified button. See [page 6-27](#).

**DC\_CHILD**

Determine whether a child exists for a given tabbing index and, if so, return the type and ID of the child. See [page 6-29](#).

**DC\_CHILDINDEX**

Determine whether a window or list is a child and, if it is, return the tabbing index for the child. See [page 6-30](#).

**DC\_CONTAINER**

Return the ID of the container window associated with a child or, if the window or list is not a child, indicate this by returning zero. See [page 6-31](#).

**DC\_CONTEXT**

Use a tabbing index to change the active child for a composite window, and indicate which child is active by returning the tabbing index for that child. See [page 6-32](#).

**DC\_CREATE**

Create a composite container window. See [page 6-34](#).

**DC\_CTRCONTEXT**

Set the active child or button based on a code that indicates the reason the container received focus. See [page 6-35](#).

**DC\_ENABLE**

Determine if a child window or list is enabled or disabled and/or enable or disable the child window or list. See [page 6-37](#).

|                    |                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>DC_EVENT</b>    | Register an extension to the standard event methods for a child window or list. See <a href="#">page 6-38</a> .                         |
| <b>DC_GETEVENT</b> | Return the address for a currently registered extension for an event method for a child window or list. See <a href="#">page 6-41</a> . |
| <b>DC_NUMCHILD</b> | Return the number of children (windows and lists) associated with a composite container window. See <a href="#">page 6-43</a> .         |
| <b>DC_REMOVE</b>   | Remove a child window or list from a composite window. See <a href="#">page 6-44</a> .                                                  |

*args*

One or more arguments, depending on *subfunction*.

## Discussion

The %C\_CONTAINER function enables you to create a composite container window, add child windows and lists, set options, and get information about options for the composite window (button focus, input context for a child input window, and so forth).

## Examples

The following example creates and processes a composite window that includes a list and an input window to display and accept contact information. It also uses an ActiveX control to display an image and another for text editing. Note that the window script file and repository schema are included at the end of this example.

```
main composite
;
; Example of composite window usage
;

.include "WND:tools.def"
.align
stack record
    id_col      ,i4      ;ID of the general menu column

proc
    xcall u_start("composite", 1)
    xcall m_ldcol(id_col,, "c_general",,,, D_GLOBAL)
    xcall e_sect("Composite window example", D_HEADER)
    do
        xcall composite_example
    until (g_select)
    xcall u_finish
.end
```

```

subroutine composite_example
;
; Description: XCALLable example of composite window processing
;
; Arguments:   None
;
.include "DBLDIR:windows.def"
.include "WND:tools.def"
.align
stack record
    chan_contacts ,i4 ;Channel for updating the contacts database
    chan_icontacts ,i4 ;Channel for loading the contacts
    id_container ,i4 ;ID of the container
    id_listwnd ,i4 ;ID of the list input window
    id_list ,i4 ;ID of the list
    id_selcol ,i4 ;ID of a selection column for non-windows
    id_contact ,i4 ;ID of the contact input window
    id_inpcol ,i4 ;ID of an input column for non-windows
    id_text ,i4 ;ID of a text window
    id_editcol ,i4 ;ID of an edit column for non-windows
    id_image ,i4 ;ID of the ActiveX image window
    id_imgbtn ,i4 ;ID of the "Image..." button window
    request ,i4 ;List request
    read_one ,i4 ;Did we read a record?
    err ,i4 ;Error encountered

.include "contact" repository, record="list_contact"
.include "contact" repository, record="inp_contact"

.define D_KEYSIZ ,(^size(list_contact.lastname) +
^size(list_contact.firstname))

proc
    xcall e_enter
    xcall e_state(D_RETURNBTN)
    xcall e_method(D_METH_ENTRST, "entrst")
    call do_setup
    do
        call do_process
    until (g_select)
    xcall e_exit
    xreturn

```

## Composite Window Routines

%C\_CONTAINER

```
;
; do_setup - create and place windows
;
do_setup,
    ;Connect to the database.
    xcall u_open(chan_contacts, "U:I", "contacts",,, err)
    if (err)
        begin
            if (err == $ERR_FNF) then
                begin
                    xcall isamc("contacts", ^size(list_contact), 1,
                        &          "start=1,length="+%string(D_KEYSIZ))
                    goto do_setup
                end
            else
                xcall u_abort("Unable to open Contacts database,
                    &          error = " + %string(err))
            end

        clear read_one      ;No file context yet

        ;Open again read-only for loading.
        xcall u_open(chan_icontacts, "I:I", "contacts",,, err)

        ;Create the container and add the desired buttons.
        id_container = %c_container(DC_CREATE, "", g_bdysiz,
            &          %w_info(WIF_SCOLS))
        xcall b_button(id_container, DSB_ADD, "O_ADD", DSB_TEXT, "Add",,, "a")
        xcall b_button(id_container, DSB_ADD, "O_DEL", DSB_TEXT, "Delete"
            &          ,,, "d")
        xcall b_button(id_container, DSB_ADD, "O_EXIT", DSB_TEXT, "Exit"
            &          ,,, "x")

        ;Next, create the list and add it to the container.
        xcall i_ldinp(id_listwnd,, "il_contacts")
        xcall l_create(id_list, id_listwnd, list_contact, g_utlib,
            &          "l_contacts",,,,,1, %isinfo(chan_icontacts,"NUMRECS"))
        xcall l_sect(id_list, "Contacts", D_HEADER)
    .ifdef D_GUI
        clear id_selcol, id_inpcol
    .else
        xcall m_ldcol(id_selcol,, "c_listsel")
        xcall m_ldcol(id_inpcol,, "c_input")
    .endc
    xcall c_container(DC_ADD, id_container, DC_LIST, id_list, 1, 1, 3
        &          ,,, id_selcol)
```

```

;Next, the input window
xcall i_ldinp(id_contact,, "i_contact")
xcall i_frames(id_contact)
xcall c_container(DC_ADD, id_container, DC_WINDOW, id_contact, 8, 40,
&
4,,, id_inpcol)

;Next, a text window for editing notes
#ifdef D_GUI
;On Windows, we'll use a nice multi-line edit control
id_text = %ax_tksingle("", 6, 40, "SYNNOTES.SynNotesCtrl.1",
&
"SynNotes.ocx",, "notes_")
clear id_editcol
#else
;On non-Windows, we'll use a T_EDIT window
xcall w_proc(WP_CREATE, id_text, "", 6, 40)
xcall u_logwnd(id_text)
xcall t_setup(id_text)
xcall m_ldcol(id_editcol,, "c_edit")
#endifc
;Regardless, C_PROCESS knows what method to use by default.
xcall c_container(DC_ADD, id_container, DC_WINDOW, id_text, 13, 40,,,
&
id_editcol)

#ifdef D_GUI
;Now an image control
id_image = %ax_tksingle("", 6, 19, "SYNIMAGE.SynImageCtrl.1",
&
"SynImage.ocx")
;We have no need to put this into the tabbing order, so we use method
; c_methnop.
xcall c_container(DC_ADD, id_container, DC_WINDOW, id_image, 1, 40,,
&
"c_methnop")

xcall i_ldinp(id_imgbtn,, "i_imagebtn")
xcall c_container(DC_ADD, id_container, DC_WINDOW, id_imgbtn, 4,
&
61, 4)
#endifc

;Place the container and maximize it.
xcall u_window(D_PLACE, id_container, 1, 1)
xcall w_proc(WP_STATE, id_container, WPS_MAXIMIZED)
return

```

## Composite Window Routines

### %C\_CONTAINER

```
;
; do_process - run the input loop
;
do_process,
    xcall c_process(id_container, chan_icontacts, chan_contacts,
        &                list_contact, inp_contact)
    if (g_select)
        begin
            using g_entnam select
("O_ADD   "),    call add
("O_DEL   "),    call delete
("O_SEL   "),    call select
("O_IMAGE "),    call image
("O_EXIT  "),    begin
                    call update
                    g_select = TRUE      ;Force exit from loop.
                end
            endusing
        end
    return

;
; load_contact - load windows from inp_contact
;
load_contact,
    xcall i_display(id_contact,, inp_contact)
#ifdef D_GUI
    xcall ax_tkset(id_image, "ImagePath", %atrim(inp_contact.image))
    xcall ax_tkset(id_text, "Text", %atrim(inp_contact.notes))
#else
    xcall w_area(id_text, WA_COPY, WAC_WTOP)
    xcall w_info(WI_XFR, id_text, WIX_DPUT, inp_contact.notes)
#endif
    return

;
; add - add a new, empty contact
;
add,
    clear g_select
    xcall l_findspec(id_list, inp_contact,,,,, D_LFND_CURR)
    call update
    clear inp_contact
    call load_contact
    xcall i_init(id_contact)
    xcall c_container(DC_CONTEXT, id_container, 2)      ;Focus input window.
    xcall l_selstyle(id_list, D_OFF)
    return
```



```

;
; delete - delete the current contact
;
delete,
  clear g_select
  if (read_one && (%u_msgbox("Really delete this contact?", D_MYESNO)
    &                == D_MIDYES))
    begin
      delete(chan_contacts) [err=delerr]
      clear read_one, inp_contact
    .ifdef D_GUI
      xcall ax_tkset(id_text, "Text", "")
    .else
      xcall w_area(id_text, WA_COPY, WAC_WTOP, WA_FILL, ' ')
    .endc
    end
    call add
    return

delerr,
  xcall u_msgbox("Could not delete, error = " + %string(%ernum))
  clear read_one
  return

;
; select - select the contact in the list
;
select,
  clear g_select
  xcall l_findspec(id_list, list_contact,,,,, D_LFND_CURR)
  call update
  read(chan_contacts, inp_contact, list_contact(1:D_KEYSIZ))
  read_one = TRUE
  call load_contact
  return

;
; image - browse for an image file
;
image,
  clear g_select
  if (%u_getfilename(inp_contact.image, "Select image file",,,
    &                ,inp_contact.image))
    begin
      xcall ax_tkset(id_image, "ImagePath", %atrim(inp_contact.image))
    end
  return

```

## Composite Window Routines

%C\_CONTAINER

```
;
; update - update the current contact
;
update,
.ifdef D_GUI
    xcall ax_tkget(id_text, "Text", inp_contact.notes)
.else
    xcall w_area(id_text, WA_COPY, WAC_WTOP)
    xcall w_info(WI_XFR, id_text, WIX_DGET, inp_contact.notes)
.endc
    if (inp_contact)
        begin
            if (read_one)
                delete(chan_contacts)
                store(chan_contacts, inp_contact) [dup=duperr, err=write_err]
            end
        end

update_cont,
    ;xcall u_update(FALSE)
    xcall l_restart(id_list, 1, %isinfo(chan_icontacts,"NUMRECS"))
    xcall l_process(id_list, request=D_LFIND, list_contact,,
        & chan_icontacts)
    clear g_select, read_one
    return

duperr,
    xcall u_msgbox("Duplicate name, changes not saved")
    goto update_cont

write_err,
    xcall u_msgbox("Unable to save changes, error = " + %string(%ernum))
    goto update_cont
endsubroutine

subroutine load_contacts, reentrant
;
; Description: Load method for contacts list
;
; Arguments:
;
    a_listid      ,n      ;ID of the list

    a_request     ,n      ;List load request

    group a_data ,a      ;Data structure
.include "contact" repository, norecord
endgroup
```

```

    a_inpid      ,n      ;ID of the list's input window

    a_dsa        ,n      ;Item disabled flag

    a_index      ,n      ;Item index

    a_chan       ,n      ;Channel for loading

.align
stack record
    name         ,a35

proc
    if (a_index == 1) then
        read(a_chan, a_data, ^FIRST) [err=eof]
    else
        reads(a_chan, a_data, eof)
    name = a_data.lastname
    if (a_data.firstname)
        name = %atrim(name) + ", " + a_data.firstname
    xcall i_dspfld(a_inpid, "name", name)
    xreturn

eof,                ;EOF encountered
    a_request = D_LEOF
    xreturn
endsubroutine

subroutine arrive_contact      ,reentrant
;
; Description:  List item arrive method for contacts
;
; Arguments:    None used here
;
.include "WND:tools.def"

proc
    if (!g_select)
        xcall m_signal("O_SEL")      ;Select this one.
    xreturn
endsubroutine

```

## Composite Window Routines

### %C\_CONTAINER

```
subroutine entrst      ,reentrant
;
; Description: EENTRST_METHOD
;
; Arguments:
;
    a_nodata      ,n
    a_reset        ,n

proc
    if (!a_nodata)
        clear a_reset
    xreturn
endsubroutine

function notes_click      ,^val, reentrant
;
; Description: Stock click event for the notes control
;
; Arguments:
;
    a_ctl      ,i      ;Control ID

.align
stack record
    wndid      ,i4      ;ID of the containing window

proc
    wndid = %ax_getint(a_ctl, D_AXSINGLE_WNDID)      ;Get window ID.
    if (wndid)
        xcall u_wndevents(D_SIGNAL, wndid, D_EVENT_LEFT_CLICK,
            &                1, 1, 1, 1, 0)
        freturn TRUE
    endfunction
```

The following is the window script for the above example:

```
.script

.column c_general, "General"
.entry o_exit, "Exit", key(f4), select(x)
.entry c_next, "Next component", key(^n)
.entry c_prev, "Previous component", key(^b)
.end
```

```
.input il_contacts, 1, 35
.field name, a35
.end

.listclass l_contacts, header(1), load_method("load_contacts"), -
    arrive_method("arrive_contact")
.end

.column c_listsel, "Select"
.entry s_up, "Up", key(up)
.entry s_down, "Down", key(down)
.entry s_top, "First", key(^f)
.entry s_bottom, "Last", key(^l)
.end

.input i_contact, 5, 40
.repository_structure contact
.field firstname, pos(1,1), prompt("First name: "), required, fpos(1,15)
.field lastname, pos(2,1), prompt("Last name: "), fpos(2,15)
.field phone, pos(3,1), prompt("Phone number: "), fpos(3,15)
.field email, pos(4,1), prompt("E-mail: "), fpos(4,15), view_length(25)
.text t1, position(5,1)
Notes:
.end

.column c_input, "Input"
.entry i_nextctl, "Next", key(down)
.entry i_prevctl, "Previous", key(up)
.end

.column c_edit, "Edit"
.entry e_up, "Up", key(up)
.entry e_down, "Down", key(down)
.entry e_left, "Left", key(left)
.entry e_right, "Right", key(right)
.end

.input i_imagebtn, 1, 1
.button o_image, text("Image..."), select('i')
.button_set right(1)
.end
```

## Composite Window Routines

%C\_CONTAINER

The following is the schema for the repository used in the above example:

```
Structure CONTACT    DBL ISAM    Modified 20061108152400
  Description "Contacts"
```

```
Field LASTNAME      Type ALPHA    Size 20
  Description "Contact's last name"
```

```
Field FIRSTNAME     Type ALPHA    Size 15
  Description "Contact's first name"
```

```
Field PHONE         Type ALPHA    Size 15
  Description "Contact's phone number"
```

```
Field EMAIL         Type ALPHA    Size 64
  Description "E-mail address"
```

```
Field IMAGE         Type ALPHA    Size 256
  Description "Location of picture of contact"
```

```
Field NOTES        Type ALPHA    Size 1024
  Description "Notes on contact"
```

## %C\_CONTAINER (continued)

### DC\_ADD

```
tab_indx = %C_CONTAINER (DC_ADD, container_id, type, child_id, [row], [col], [recordindex],
&                                     [method], [tabindex][, col_id])
```

### Return value

*tab\_indx*

Returns the tabbing index of the child within the composite container window. (n)

### Arguments

*container\_id*

The ID of the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

*type*

The type of child. One of the following (defined in **WND:tools.def**): (n)

**DC\_LIST**                      A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                  A Toolkit window.

*child\_id*

The ID for the window or list to be associated with the container. See the Discussion below. (n)

*row*

(optional) Placement row. See the Discussion below. (n)

*col*

(optional) Placement column. See the Discussion below. (n)

*recordindex*

(optional) An index that determines which *a\_methoddata* argument passed in C\_PROCESS calls will be used as the data record or field to accept input data for the method. See the Discussion below. (n)

*method*

(optional) Method for processing the child. See the Discussion below. (a or n)

*tabindex*

(optional) Tabbing index (base 1) for the child, which enables you to insert the child at any position in the tabbing order. See the Discussion below. (n)

*col\_id*

(optional) ID of a menu column to place when processing this child. See the Discussion below. (n)

## Discussion

The DC\_ADD subfunction of %C\_CONTAINER adds an existing UI Toolkit window or list to a composite window. DC\_ADD can add any type of Toolkit window or list, including an ActiveX window, an ActiveX Toolkit list, a .NET form window, or another composite window. In any case, the added window or list becomes a child of the composite container window specified with *container\_id*. Note the following:

- ▶ When a child is added to a composite window, the child's border is turned off. You can, however, turn it back on with W\_BRDR or L\_BORDER. See [W\\_BRDR](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* and [L\\_BORDER](#) on [page 9-54](#) for more information.
- ▶ By default, child windows and lists are enabled for processing. For information on disabling or re-enabling a child, see [DC\\_ENABLE](#) on [page 6-37](#).
- ▶ When a window or list is added to a composite window, its %UWNDEVENTS\_METHOD set is replaced by one that better handles mouse clicks in composite windows. The previously registered method set, however, will be registered as extensions to the new method set if it does not match the new method set. See the Discussion for DC\_EVENT on [page 6-39](#) for more information.
- ▶ On Windows, if a child is too large to fit in its composite container window, Toolkit reduces the child's display area to fit in the container and adds scroll bars to the child. To prevent scroll bars from being added to the child, either make the container large enough for the display area defined for the child or call W\_BRDR with WB\_SBOFF for the child after calling DC\_ADD. For example:

```
xcall c_container(DC_ADD, ctrid, chldid, 1, 1)
xcall w_brdr(chldid, WB_SBOFF)
```

On UNIX and OpenVMS, if a child is too large to fit in its composite container window, the display area is circumscribed to make it fit within the display area of the container window.

- ▶ When a container is added to a tab set or another container, it may be resized to fit the display area of the container, which affects the amount of space available for subsequently added child windows and lists.



*Child\_id* must be the ID of an existing Toolkit window or list. You can add any type of window or list, but the window or list cannot be the child of another container. Additionally, a window or list must be logged with Toolkit environment processing (current, global, or another environment) before it can be added as a child.

*Row* and *col* optionally specify the position of the upper left corner of the child window or list. These settings are relative to the composite container window's client area, so if you pass 1 for *row* and 1 for *col*, the child will be placed in the upper left corner of the client area. Additionally, passing these arguments instructs Toolkit to place the child window or list. Omitting one or both of these arguments prevents the child from being placed. Note the following:

- ▶ If *row* is passed, *col* must also be passed. Attempting to pass *row* without *col* will cause a fatal Toolkit error.
- ▶ If *row* is not passed, the window or list will not be placed and *col*, if passed, will be ignored.

*Recordindex* specifies which *a\_methoddata* argument passed in C\_PROCESS calls will be passed as the *record* argument to the processing method for the child. When C\_PROCESS calls the method for the child, it passes on all supplied *a\_methoddata* arguments, and it passes as the *record* argument the *a\_methoddata* argument that corresponds to the *recordindex* value. (The default methods that use *record* use it as the data record or field that accepts input for the child. See [“The Composite Window Processing Methods” on page 6-50](#) for more information.) In the following, for example, because the value 2 is passed as *recordindex* in the DC\_ADD call, the second *a\_methoddata* argument (data2) in the C\_PROCESS call will be passed as the *record* argument (and as the second *a\_methoddata* argument) to the method for the child. If the method is the default input method (C\_METHINP), for example, the value for data2 will be passed as the third argument (*data\_area*) in the I\_INPUT call for the method.

```
xcall c_container(DC_ADD, cnt_id1, DC_WINDOW, input_id, 16, 1, 2)
.
.
.
xcall c_process(cnt_id1, data1, data2)
```

Note the following for *recordindex*:

- ▶ *Recordindex* is interpreted as an index. Passing a value of 1 as *recordindex* specifies the first *a\_methoddata* argument in a C\_PROCESS call, passing a value of 2 specifies the second, and so forth. If *recordindex* is not passed, is less than 1, or specifies an *a\_methoddata* argument that is not passed in a C\_PROCESS call, the *record* argument will not be passed to the method.
- ▶ Because the *record* argument is used by only three of the default methods (C\_METHINP for input windows, C\_METHLST for lists, and C\_METHSEL for selection windows), *recordindex* is required only if one of these methods (or a method you create that requires it) will be invoked for the child.
- ▶ The same *recordindex* value can be passed for more than one method. For instance, you could have two child input windows that operate on different fields within the same data record.

If *method* is alphanumeric, it specifies the name of a method to invoke to process the child window. If *method* is numeric and non-zero, it specifies the address (as returned by %XADDR) of a method to invoke to process the child window. Note the following:

- ▶ If you specify a *method*, the method must be available when the window or list is associated with the container.
- ▶ If *method* is blank or zero, the default method is used to process the child window or list. See [C\\_PROCESS on page 6-45](#).

Generally, you'll want to add child windows and lists to the container in the order that you want users to tab through them. However, you can use *tabindex* to specify a position (base 1) in the tabbing order. Indices for siblings at or beyond *tabindex* are incremented by 1.

- ▶ If you omit *tabindex* or pass it as zero, Toolkit adds the child at the end of the tabbing order.
- ▶ If you pass a value that is less than zero or greater than the number of children in the container plus 1, a fatal Toolkit error is generated.

*Col\_id*, if passed and non-zero, specifies the ID of a menu column to be loaded when C\_PROCESS is called for the container. If **g\_plc\_col\_args** is true, C\_PROCESS places the column prior to invoking a method and removes it after the method returns.

### See also

[“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.

## %C\_CONTAINER (continued)

WIN

---

### DC\_BTNFOCUS

*old\_button* = %C\_CONTAINER (DC\_BTNFOCUS, *container\_id*[, *new\_button*])

or

xcall C\_CONTAINER (DC\_BTNFOCUS, *container\_id*[, *new\_button*])

### Return value

*old\_button*

This function returns the tabbing index of the button that has focus when this function is called. If no button has focus, it returns a value of 0. (**n**)

### Arguments

*container\_id*

The ID of the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (**n**)

*new\_button*

(optional) The index or name of a button that you want to receive focus. (**a** or **n**)

### Discussion

The DC\_BTNFOCUS subfunction of %C\_CONTAINER does one or both of the following:

- ▶ Indicates whether focus is on a button on the composite container window, and if so, indicates which button has focus. If *old\_button* is returned as a value of 0, no button on the container window has focus. If *old\_button* is returned as a non-zero value, that value indicates which button has focus.
- ▶ Sets focus to a specified button (*new\_button*) on the composite container window. In this case, *old\_button* returns the index for the button that had focus *before* this function was called (or a value of 0 if no button had focus).

If you pass *new\_button*, and it is not zero or blank, this function does both of the above. Additionally, the context for the container is automatically set to zero (to focus buttons), and the context reason is set to “C\_SET”. (See the Discussion for C\_PROCESS on [page 6-45](#) for more information on “C\_SET”.) If no further context changes are made, the next call to C\_PROCESS moves focus to the specified button. Note the following:

- ▶ A non-blank alphanumeric value is interpreted as a button name. If you pass an alphanumeric value, it must match a button name for the container, or it will cause a fatal Toolkit error.
- ▶ A non-zero numeric value is interpreted as a button index (base 1). If you pass a non-zero numeric value, it must match an index for a button on the container, or it will cause a fatal Toolkit error.

If you do not pass *new\_button* (or pass a value of 0 or blank), this function does not set focus to a button, but only indicates (with *old\_button*) whether a button has focus and, if so, returns the tabbing index for that button.



If focus is on a child window or list when you call DC\_BTNFOCUS, context for the container is automatically set to 0, but focus will not be set to the specified button until the next call to C\_PROCESS. To do this without exiting the current C\_PROCESS processing, signal a menu entry, such as “C\_RESET”, in the method after the DC\_BTNFOCUS call.

---

Note that on UNIX and OpenVMS, DC\_BTNFOCUS does nothing unless *new\_button* is passed. If *new\_button* is passed, DC\_BTNFOCUS causes

- ▶ C\_PROCESS to process the first child window or list if a button that corresponds to *new\_button* is defined for the window.
- ▶ a fatal error if *new\_button* does not correspond to any button defined for the window.

### See also

- ▶ [I\\_CTRCONTEXT](#) on [page 8-10](#) and [I\\_NEXT](#) on [page 8-67](#) for information on setting focus on a button for a child window or list.
  - ▶ “Controlling tabbing, focus, and input context” on [page 6-4](#) for information on tabbing indices.
-

## %C\_CONTAINER (continued)

### DC\_CHILD

*status* = %C\_CONTAINER (DC\_CHILD, *container\_id*, *tabindex*, *type*, *child\_id*)

or

xcall C\_CONTAINER (DC\_CHILD, *container\_id*, *tabindex*, *type*, *child\_id*)

### Return value

*status*

This function returns true if the specified tabbing index (*tabindex*) exists for the composite window, false if not. (n)

### Arguments

*container\_id*

The ID of the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

*tabindex*

The tabbing index for the child window or list. (n)

*type*

The returned child type. One of the following (defined in **WND:tools.def**): (n)

**DC\_LIST**                      A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The returned ID of the child window or list. (n)

### Discussion

The DC\_CHILD subfunction of %C\_CONTAINER indicates whether a child exists for a given tabbing index (*tabindex*) and, if so, returns the type and ID for the child:

- ▶ If there is a child window or list for *tabindex*, *type* returns the type (DC\_LIST or DC\_WINDOW) of the child, and *child\_id* returns the ID of the child.
- ▶ If there is no child window or list for *tabindex*, *type* and *child\_id* are returned as 0, and the function returns *status* as false.

### See also

[“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.

## %C\_CONTAINER (continued)

### DC\_CHILDINDEX

*tabindex* = %C\_CONTAINER (DC\_CHILDINDEX, *container\_id*, *type*, *child\_id*)

### Return value

*tabindex*

This function returns the tabbing index of a child window or list, or it returns a value of 0 if the specified window or list is not a child of this container. (n)

### Arguments

*container\_id*

The ID for the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

*type*

The type of the child whose tabbing index you want returned. One of the following (defined in **WND:tools.def**): (n)

**DC\_LIST**                      A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID of the child window or list. (n)

### Discussion

The DC\_CHILDINDEX subfunction of %C\_CONTAINER enables you to determine if a window or list is a child of a specified container and, if it is, returns its tabbing index.

Use both *type* and *child\_id* (which must be a valid Toolkit window or list ID) to specify the window or list.

### See also

[“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.

## %C\_CONTAINER (continued)

### DC\_CONTAINER

*container\_id* = %C\_CONTAINER (DC\_CONTAINER, *type*, *child\_id*)

#### Return value

*container\_id*

This function returns the ID of the composite container window for a specified window or list. If the specified window or list is not part of a composite window, it returns a value of 0. **(n)**

#### Arguments

*type*

The type of the child whose container ID you want returned. One of the following (defined in **WND:tools.def**): **(n)**

**DC\_LIST**                      A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID of the child window or list. **(n)**

#### Discussion

The DC\_CONTAINER subfunction of %C\_CONTAINER returns the ID of the composite container window associated with a child or, if the window or list specified by *child\_id* is not a child, indicate this by returning zero. Note that for a composite window within another composite window, DC\_CONTAINER returns the ID for the immediate container.

Use both *type* and *child\_id* (which must be a valid Toolkit window or list ID) to specify the window or list.

## %C\_CONTAINER (continued)

### DC\_CONTEXT

*old\_context* = %C\_CONTAINER (DC\_CONTEXT, *container\_id*, [*new\_context*][, *reason*])

or

xcall C\_CONTAINER (DC\_CONTEXT, *container\_id*, [*new\_context*][, *reason*])

### Return value

*old\_context*

This function returns the tabbing index for the child window or list that was active when this function was called. If one of the buttons on the composite container window was active, this function returns a value of 0. (n)

### Arguments

*container\_id*

The ID for the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

*new\_context*

(optional) The tabbing index for the child window or list that you want to be active, or a value of 0 if you want focus to move to the container, which will have the effect of focusing the first button on the next call to C\_PROCESS, or the first child if there is no button. (n)

*reason*

(optional) The reason for the context change. This can be blank (indicating no change), a program-supplied reason passed when changing context programmatically, or one of the following: (a)

|                |                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------|
| <b>C_FIRST</b> | Attempt to reach first child.                                                                               |
| <b>C_LAST</b>  | Attempt to reach last child.                                                                                |
| <b>C_NEXT</b>  | Context shift from previous child (e.g., TAB).                                                              |
| <b>C_PREV</b>  | Context shift from next child (e.g., SHIFT+TAB).                                                            |
| <b>C_SET</b>   | Context explicitly placed on this child (e.g., mouse click or programmatically without a specified reason). |

If you pass *reason*, up to the first 30 characters of this argument are passed to the method for the new active child window or list when the method for that child is invoked.



## Discussion

The DC\_CONTEXT subfunction of %C\_CONTAINER does one or both of the following:

- ▶ Indicates which child window or list is active by returning the tabbing index of the active child, or indicates that a button on the composite container window is active by returning a value of 0.
- ▶ Makes the child window or list specified by *new\_context* active. Or, if *new\_context* is passed as a value of 0, makes the first button active or the first child active if there is no button.

If you do pass *new\_context*, this function does both of the above. If no further context changes are made, the next call to C\_PROCESS moves focus to the specified child window or list. Or, if you passed *new\_context* as zero, it moves focus either to the current button for the container (if the container has buttons) or to the first child (if the container does not have buttons). Note, however, that if *new\_context* is passed and is less than zero or greater than the number of children for the container, a fatal Toolkit error will result.

If you do not pass *new\_context*, this function does not make another child window or list active, but only returns the index for the currently active child or returns zero if a button on the container window is active.

## See also

- ▶ [C\\_PROCESS on page 6-45](#) for information on processing child windows and lists.
- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.

## %C\_CONTAINER (continued)

### DC\_CREATE

*container\_id* = %C\_CONTAINER (DC\_CREATE, *name*, *rows*, *cols*[, *title*])

### Return value

*container\_id*

This function returns the ID for the created composite container window. **(n)**

### Arguments

*name*

A name for the new composite container window. **(a)**

*rows*

The number of rows in the container. **(n)**

*cols*

The number of columns in the container. **(n)**

*title*

(optional) The title for the composite container window. **(a)**

### Discussion

The DC\_CREATE subfunction of %C\_CONTAINER creates a composite container window, which is a UI Toolkit window that can be associated with other Toolkit windows and lists to create a composite window. Note that when you create a composite container window, it is automatically logged with the current Toolkit environment. You can, however, promote it to global with U\_GBLWND.

If you pass a null string (“”) for *name*, Toolkit assigns a unique name in the form \_W\_ *nnn*, where *nnn* is the container ID.

If *title* is not passed, the container window will not have a title. (You can add one later using the WB\_TITLE subfunction of W\_BRDR.)

### See also

[“Creating and Processing Composite Windows” on page 6-2.](#)

## %C\_CONTAINER (continued)

### DC\_CTRCONTEXT

*new\_context* = %C\_CONTAINER (DC\_CTRCONTEXT, *container\_id*, *reason*)

#### Return value

*new\_context*

This function returns the tabbing index for the child window or list that became active as a result of this function. If focus moves to a button, this function returns a value of 0. **(n)**

#### Arguments

*container\_id*

The ID for the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. **(n)**

*reason*

The reason for the context change, which determines which child will become active (see the Discussion below). This can be blank (indicating no change), a program-supplied reason passed when changing context programmatically, or one of the following: **(a)**

|                |                                                                                                                                                      |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_FIRST</b> | Attempt to reach first child.                                                                                                                        |
| <b>C_LAST</b>  | Attempt to reach last child.                                                                                                                         |
| <b>C_NEXT</b>  | Context shift from previous child (e.g., TAB).                                                                                                       |
| <b>C_PREV</b>  | Context shift from next child (e.g., SHIFT+TAB).                                                                                                     |
| <b>C_SET</b>   | Context explicitly placed on a child or button on the composite container window (e.g., mouse click or programmatically without a specified reason). |

#### Discussion

The DC\_CTRCONTEXT subfunction of %C\_CONTAINER enables you to use the context change reason (*reason*) to activate a child on a composite window. Typically, this routine is used in the method for contained composite windows (see [C\\_METHCTR on page 6-53](#)). You can, however, pass “C\_LAST” to move to the last button or child without having to know how many of either one exist in the container:

```
c_container(DC_CTRCONTEXT, ctrid, "C_LAST")
```

DC\_CTRCONTEXT does one of the following based on the content of *reason*, which is typically the *reason* argument passed to the method from C\_PROCESS:

- ▶ If *reason* is “C\_FIRST” or “C\_NEXT”, it moves focus to the first child window or list. If there are buttons but no child windows or lists, it sets focus on the first button for the container.
- ▶ If *reason* is “C\_LAST” or “C\_PREV”, it moves focus to the last button (if the container has buttons), or the last child window or list (if the container has no buttons).
- ▶ If *reason* is set to any other value (“C\_SET”, blank, etc.), focus does not change.

## %C\_CONTAINER (continued)

### DC\_ENABLE

*old\_state* = %C\_CONTAINER (DC\_ENABLE, *container\_id*, *tabindex*[, *new\_state*])

or

xcall C\_CONTAINER (DC\_ENABLE, *container\_id*, *tabindex*[, *new\_state*])

### Return value

*old\_state*

This function returns 1 if the specified child is enabled when this function is called, or a value of 0 if the child window or list is disabled when this function is called. (n)

### Arguments

*container\_id*

The ID for the composite container window with a child whose enabled/disabled state you want to query and/or change. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

*tabindex*

The tabbing index for the child whose enabled/disabled state you want to query and/or change. (n)

*new\_state*

Either a non-zero value to enable the child window or list or zero to disable the child window or list. (n)

### Discussion

The DC\_ENABLE subfunction of %C\_CONTAINER enables you to enable or disable a child window or list (specified with *tabindex*). It also returns the state (enabled or disabled) of the child when DC\_ENABLE was called (prior to any change made by the call). If a child window or list is disabled, C\_PROCESS will not invoke its method, and on Windows mouse clicks will not trigger events for the window or list.

## %C\_CONTAINER (continued)

### DC\_EVENT

*return* = %C\_CONTAINER (DC\_EVENT, *container\_id*, *tabindex*, *event*, *method*)

or

xcall C\_CONTAINER (DC\_EVENT, *container\_id*, *tabindex*, *event*, *method*)

### Return value

*return*

This function always returns true. (n)

### Arguments

*container\_id*

The ID for the composite container window with a child window or list whose event method extension you want to replace. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

*tabindex*

The tabbing index for the child window or list whose event method extension you want to replace. (n)

*event*

The code for the event whose method extension will be replaced. One of the following (defined in **WND:tools.def**): (n)

|                              |                                   |
|------------------------------|-----------------------------------|
| <b>D_EVENT_LEFT_CLICK</b>    | Left mouse button event.          |
| <b>D_EVENT_MIDDLE_CLICK</b>  | Middle mouse button event.        |
| <b>D_EVENT_RIGHT_CLICK</b>   | Right mouse button event.         |
| <b>D_EVENT_LEFT_DBLCLK</b>   | Double-click left mouse button.   |
| <b>D_EVENT_MIDDLE_DBLCLK</b> | Double-click middle mouse button. |
| <b>D_EVENT_RIGHT_DBLCLK</b>  | Double-click right mouse button.  |
| <b>D_EVENT_MOVE</b>          | Move window event.                |
| <b>D_EVENT_SIZE</b>          | Size window event.                |
| <b>D_EVENT_MINIMIZE</b>      | Minimize window event.            |
| <b>D_EVENT_MAXIMIZE</b>      | Maximize window event.            |

|                        |                       |
|------------------------|-----------------------|
| <b>D_EVENT_RESTORE</b> | Restore window event. |
| <b>D_EVENT_SCROLL</b>  | Scroll window event.  |
| <b>D_EVENT_CLOSE</b>   | Close window event.   |

*method*

The name or address for the routine that will replace any automatically registered %UWNDEVENT\_METHOD method for the specified event. (**a** or **n**)

## Discussion

The DC\_EVENT subfunction of %C\_CONTAINER registers a routine (*method*) as an extension to the standard method for an event for a child window or list. This replaces any previously registered extension for the event.

The standard method set contains only one method, a left-click method that sets the context of the container to the clicked child window or list:

- ▶ For an input window, if the left click occurs on a field, drilldown button, or hyperlink prompt within the window, this method sets a state for the window indicating that the field was clicked. Then, when I\_INPUT processes the window, context is established on that item, and the click is simulated again (as long as the clicked item is in the current input set, and as long as context has not been changed for that window in the meantime).
- ▶ For a list, if the left click occurs on an item, the standard left click method queues a request to select the item. (If the click occurs anywhere else, such as in the header, this method merely returns.)
- ▶ For a composite container window (a contained container), this method sets the context of the container to the clicked window or list and then signals “C\_RESET” to reset focus for all containers.

You can register an extension for any event, including the left click event. Note the following:

- ▶ Extension routines must accept the arguments and return a value as specified in [%UWNDEVENTS\\_METHOD on page 16-249](#).
- ▶ If a routine has already been registered for the event, DC\_EVENT replaces that routine with the method specified with *method*.
- ▶ When a child window or list is added to a container window, Toolkit automatically registers any %UWNDEVENTS\_METHOD methods associated with that window as extensions to the standard method set for the child window. You can use DC\_EVENT to replace these extensions.

## Composite Window Routines

### %C\_CONTAINER

- ▶ If you register an extension for the left click event, the extension is called first, and then the standard left click event is called unless the extension returns a value of 0. If the extension returns a value of 0, the standard left click event will not be invoked.
- ▶ The standard left click event won't do any of the actions listed above if the clicked window is the currently active window in the currently active container (and its parent window, grandparent window, and so forth, are also the active windows in their containers). However, any extension registered with DC\_EVENT will be invoked.

### See also

- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249.
- ▶ “Controlling tabbing, focus, and input context” on page 6-4 for information on tabbing indices.



## %C\_CONTAINER (continued)

### DC\_GETEVENT

*method\_addr* = %C\_CONTAINER (DC\_GETEVENT, *container\_id*, *tabindex*, *event*)

#### Return value

*method\_addr*

The returned method address or, if no routine is registered as the extension for the specified child window / event pair, a value of 0. (**D\_ADDR**)

#### Arguments

*container\_id*

The ID for the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (**n**)

*tabindex*

The tabbing index for the child window or list. (**n**)

*event*

The code for the event whose method extension address you want to retrieve. One of the following (defined in **WND:tools.def**): (**n**)

|                              |                                   |
|------------------------------|-----------------------------------|
| <b>D_EVENT_LEFT_CLICK</b>    | Left mouse button event.          |
| <b>D_EVENT_MIDDLE_CLICK</b>  | Middle mouse button event.        |
| <b>D_EVENT_RIGHT_CLICK</b>   | Right mouse button event.         |
| <b>D_EVENT_LEFT_DBLCLK</b>   | Double-click left mouse button.   |
| <b>D_EVENT_MIDDLE_DBLCLK</b> | Double-click middle mouse button. |
| <b>D_EVENT_RIGHT_DBLCLK</b>  | Double-click right mouse button.  |
| <b>D_EVENT_MOVE</b>          | Move window event.                |
| <b>D_EVENT_SIZE</b>          | Size window event.                |
| <b>D_EVENT_MINIMIZE</b>      | Minimize window event.            |
| <b>D_EVENT_MAXIMIZE</b>      | Maximize window event.            |

## Composite Window Routines

%C\_CONTAINER

|                        |                       |
|------------------------|-----------------------|
| <b>D_EVENT_RESTORE</b> | Restore window event. |
| <b>D_EVENT_SCROLL</b>  | Scroll window event.  |
| <b>D_EVENT_CLOSE</b>   | Close window event.   |

### Discussion

The DC\_GETEVENT subfunction of %C\_CONTAINER returns the address for the currently registered extension for an event method for a child window.

### See also

- ▶ [DC\\_EVENT on page 6-38](#) for information on event extensions.
- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.

## %C\_CONTAINER (continued)

### DC\_NUMCHILD

*number* = %C\_CONTAINER (DC\_NUMCHILD, *container\_id*)

### Return value

*number*

This function returns the number of child windows and lists associated with a composite container window. If the composite container window has no children, or if the window is not a composite container window, it returns a value of 0. (n)

### Arguments

*container\_id*

The ID for the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

### Discussion

The DC\_NUMCHILD subfunction of %C\_CONTAINER returns the number of child windows and lists associated with a composite container window. For a container that is a child of another container, only immediate children are counted.

## %C\_CONTAINER (continued)

### DC\_REMOVE

```
xcall C_CONTAINER(DC_REMOVE, container_id, tabindex)
```

### Arguments

*container\_id*

The ID for the composite container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction). Any other value will cause a fatal Toolkit error. (n)

*tabindex*

The tabbing index for the child window or list to be removed. (n)

### Discussion

The DC\_REMOVE subfunction of %C\_CONTAINER removes a child window or list from a composite window by disassociating it from the composite container window.

Note that when a child is removed from its container,

- ▶ the tabbing indices for subsequent children are decremented.
- ▶ the child will no longer be placed.
- ▶ the child's border will retain the state it had before the DC\_REMOVE call.
- ▶ the %UWNDEVENTS\_METHOD set for the child will remain as it was before the DC\_REMOVE call, but the left click event for child windows or lists will be disabled.

If *tabindex* is less than 1 or greater than the number of child windows and lists, a fatal Toolkit error will result.

If %C\_CONTAINER is called as a function with DC\_REMOVE, it always returns true.

### See also

[“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.

## C\_PROCESS – Process a composite window



```
xcall C_PROCESS (container_id [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*container\_id*

The ID for the container window. Note that this must be the ID of a composite container window (created with the DC\_CREATE subfunction of %C\_CONTAINER). Any other value will cause a fatal Toolkit error. **(n)**

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. See the Discussion below. **(any)**

### Discussion

The C\_PROCESS subroutine processes composite windows by looping through and processing child windows and child lists as well as enabled buttons on the composite container window.

- ▶ To process a child window or list, C\_PROCESS calls the method for the child (see the “Processing Methods” table on page 6-47).
- ▶ To process a button on the container, C\_PROCESS merely waits for a user response.

If there are no placed and enabled child windows, child lists, or buttons on the container, C\_PROCESS immediately returns control to the routine that called it.

C\_PROCESS starts on whatever child currently has context. By default, it starts with the first child window or list in the tabbing order, which is the child with the tabbing index of 1. (If the window has no child, C\_PROCESS starts with the first button on the container window.) However, if the container has previously been processed, it starts with the child that was active when C\_PROCESS last exited. Additionally, if the DC\_CONTEXT subfunction for %C\_CONTAINER has been used to specify a child, C\_PROCESS starts with that child.

When the processing for a button or child has finished, C\_PROCESS checks **g\_entnam** to see if a C\_ menu entry that it recognizes is active and, if one is, moves focus as instructed by the C\_ menu entry. (Recognized menu entries are listed below.) It then continues the loop by processing the newly active child or button. However, if a processing method or button on the container returns after signaling a menu entry that C\_PROCESS does *not* recognize, C\_PROCESS returns control to the routine that called it, and the menu entry is passed on to that routine.

Note the following:

- ▶ When C\_PROCESS is first called, it does not check **g\_entnam**, so using %M\_SIGNAL to signal one of the C\_ menu entries before calling C\_PROCESS will not work. Use the DC\_CONTEXT subfunction for %C\_CONTAINER to instruct C\_PROCESS to start on a child or button other than the default.
- ▶ If a processing method returns without signaling a menu entry (and doesn't otherwise change focus to another child or button before returning), C\_PROCESS calls the method again, resulting in a possibly endless loop.
- ▶ C\_PROCESS clears **g\_select** after processing a menu entry that it recognizes. Otherwise it leaves this value as is. Additionally, C\_PROCESS does not in itself change the values of **g\_setsts**, **g\_fldnam**, or **g\_entnam**. However, a button or the processing method for a child may change these. For example, a child method will set these variables as documented in the Discussion for I\_INPUT on [page 8-58](#) if the method calls I\_INPUT and then returns without signaling another menu entry. (Such a method would need to change focus in some way to another child, or C\_PROCESS will again signal the input method for the same child. See note above.)
- ▶ If context moves to a disabled child, the method for the child is not called. Rather, context is automatically moved to the next or previous child or button. If the context reason is "C\_PREV" or "C\_LAST", the previous enabled child or button is activated. Otherwise, the next enabled child or button is activated.
- ▶ If a button is enabled on a child window or list that is not active and the user clicks that button, the signaled menu entry will be seen first by the method for the child that is active. If that method does not clear **g\_select**, the menu entry is passed out to C\_PROCESS. If C\_PROCESS doesn't recognize it, it is passed out to the routine that called C\_PROCESS. Consequently, the method for the window or list that contains the button will not see the menu entry, so we recommend that you do one or more of the following:
  - ▶ Handle button-generated menu entries in the outermost loop that calls C\_PROCESS.
  - ▶ Handle button-generated menu entries in a common routine that all methods can call.
  - ▶ Disable buttons explicitly when your application is not prepared to process them. See the Discussion for .BUTTON on [page 2-16](#) for information on disabling and enabling buttons.

To process a child window or list, C\_PROCESS calls either the processing method when the child was added (with the DC\_ADD subroutine for %C\_CONTAINER) or the default Toolkit-supplied method as listed in the table below.

| Processing Methods |                                        |
|--------------------|----------------------------------------|
| Child type         | Default processing method              |
| ActiveX window     | <a href="#">C_METHAX on page 6-51</a>  |
| Composite window   | <a href="#">C_METHCTR on page 6-53</a> |
| Input window       | <a href="#">C_METHINP on page 6-55</a> |
| List               | <a href="#">C_METHLST on page 6-58</a> |
| .NET form window   | <a href="#">C_METHNET on page 6-61</a> |
| Selection window   | <a href="#">C_METHSEL on page 6-65</a> |
| Tab set window     | <a href="#">C_METHTS on page 6-67</a>  |
| Text window        | <a href="#">C_METHTXT on page 6-69</a> |
| Other              | <a href="#">C_METHNOP on page 6-63</a> |

C\_PROCESS recognizes the following menu entries:

- ▶ “C\_FIRST” makes the first child (window or list) active, or it makes the first button on the composite container window active if there is no child. Note, however, that if the composite window is the child of another composite window, this menu entry is passed to the outer composite window.
- ▶ “C\_LAST” makes the last child on the composite window active if there are no buttons on the composite container window. If there are buttons, “C\_LAST” makes the last button active. Note, however, that if the composite window is the child of another composite window, this menu entry is passed to the outer composite window.
- ▶ “C\_NEXT” makes the next child active or, if the last child is currently active, it makes the first button on the composite container window active. If the last child or button is active, and the composite window is *not* the child of another composite window, “C\_NEXT” makes the first child active (or button if there is no child). If the composite window is the child of another composite window, however, and the last button is active (or child if there are no buttons), the menu entry is passed to the outer composite window.

- ▶ “C\_PREV” makes the previous child window, child list, or button on the container active. If the first child is active (or button if there is no child), “C\_PREV” makes the last button active, or if there are no buttons, it makes the last child active. Note, however, that if the composite window is the child of another composite window, and focus is on the first child (or button if there is no child), this menu entry is passed to the outer composite window.
- ▶ “C\_RESET” takes into account any programmatic context change (for example, with DC\_CONTEXT or DC\_BTNFOCUS) and resets the context in a composite window to the currently active child window, child list, or button. Note, however, that if the composite window is itself a child of another composite window, this menu entry is passed to the outer composite window.
- ▶ “C\_SETnnnn” makes the child window or list with the tabbing index *nnnn* active. (If *nnnn* is less than 1 or greater than the number of children, the menu entry is ignored.)

For the child processing methods (default or otherwise), C\_PROCESS passes the following: the container ID, the type of child (window or list), the child ID, the reason the child was activated, and as many method data arguments as are passed in the C\_PROCESS call. Additionally, note that

- ▶ the data record argument may also be passed and is required only if one of the following is invoked: C\_METHINP, C\_METHLST, C\_METHSEL, or a method you created that requires it.
- ▶ the data record argument will not be passed to the method if *recordindex* was not passed in the DC\_ADD call for the child, if it was passed as a value that was less than 1, or if the *a\_methoddata* argument that corresponds to *recordindex* is not passed in the C\_PROCESS call.

The *a\_methoddata* arguments are optional and are ignored unless C\_PROCESS invokes one of the following: the default method for input windows (C\_METHINP), the default method for lists (C\_METHLST), the default method for selection windows (C\_METHSEL), or a method you have created that requires these arguments. Note that for C\_METHINP, C\_METHLST, and C\_METHSEL,

- ▶ the only *a\_methoddata* argument required is the one specified by the *recordindex* value passed in the DC\_ADD call for the window or list. For example, if the value passed as *recordindex* in the DC\_ADD call is 3, you must include the third *a\_methoddata* argument in the C\_PROCESS call.
- ▶ the *a\_methoddata* argument you pass must be the data record or field for input for the child window or list. C\_PROCESS will not only pass this *a\_methoddata* argument on to the method, it will also pass this argument as the *record* argument for the method. This in turn is passed as the *data\_area* argument to I\_INPUT (called by C\_METHINP), the *data* argument passed to L\_SELECT (called by C\_METHLST), or the *field\_data* argument passed to S\_SELECT (called by C\_METHSEL).



## See also

- ▶ “Controlling tabbing, focus, and input context” on [page 6-4](#) for information on tabbing indices.
- ▶ [%C\\_CONTAINER](#) on [page 6-11](#) for information on this function and its subroutines.

## Examples

See the examples for `%C_CONTAINER` on [page 6-12](#).

# The Composite Window Processing Methods

To process a child window or list, `C_PROCESS` calls either the default processing method for the child or the processing method assigned to the child when it was added with `DC_ADD`. (See [C\\_PROCESS on page 6-45](#) for details.) This section documents

- ▶ the default Toolkit-supplied processing methods for composite windows.
- ▶ the arguments and return values needed for any processing methods you write for child windows or lists. Note that you must declare method arguments exactly as documented. Toolkit provides strong prototype validation for composite window processing methods. Incorrectly declared arguments will cause undefined results.

In addition to this section, see

- ▶ the Discussion for `C_PROCESS` on [page 6-45](#) which documents how `C_PROCESS` calls a method and how methods control the `C_PROCESS` loop by signaling menu entries.
- ▶ the **ctrmeths.dbl** file included in your UI Toolkit distribution. This file includes the code for the default methods and serves as an example of how to create your own composite window processing methods. (Note that modifying or compiling **ctrmeths.dbl** will not change the default methods; it is distributed simply to supply examples.)

## C\_METHAX – Process a child ActiveX window

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
subroutine C_METHAX, reentrant
in    req container_id      , n
in    req type              , n
in    req child_id         , n
in    req reason           , a
opt record                 , a
opt a_methoddata1         , any
.
.
opt a_methoddata20        , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. (n)

*type*

This argument is not used by the default processing methods. However, this argument passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this information: (n)

- DC\_LISTA Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).
- DC\_WINDOWA Toolkit window.

*child\_id*

The ID for the Toolkit container for the ActiveX control. (See “[Containers for ActiveX controls](#)” on page 4-4 for information.) (n)

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: (a)

- C\_FIRSTFocus moved in attempt to reach first child.
- C\_LASTFocus moved in attempt to reach last child.
- C\_NEXTFocus moved from previous child (e.g., TAB).

|               |                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_PREV</b> | Focus moved from next child (e.g., SHIFT+TAB).                                                                                                                               |
| <b>C_SET</b>  | Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason. |

#### *record*

(optional) This argument is not used by the default method C\_METHAX. However, this argument passes a copy of the *a\_methoddata* argument specified by *recordindex* (a DC\_ADD argument) for other methods that need this information. **(a)**

#### *a\_methoddata1* through *a\_methoddata20*

(optional) These arguments are not used by the default method C\_METHAX. However, up to 20 additional data arguments are passed for other methods that need this information. **(any)**

## Discussion

C\_METHAX is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child ActiveX window. If you want something other than the default processing described below, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the window.

C\_METHAX does the following:

1. Calls U\_CTRCONTEXT to set context within the ActiveX window.
2. Calls AX\_INPUT to process input.

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.

## See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [DC\\_ADD on page 6-23](#).
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.

## C\_METHCTR – Process a child composite window



```
subroutine C_METHCTR, reentrant
in    req container_id      , n
in    req type              , n
in    req child_id         , n
in    req reason           , a
opt record                 , a
opt a_methoddata1         , any
.
.
opt a_methoddata20        , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, it passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this: **(n)**

**DC\_LIST**                    A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID for the child container window. **(n)**

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

**C\_FIRST**                    Focus moved in attempt to reach first child.

**C\_LAST**                    Focus moved in attempt to reach last child.

**C\_NEXT**                    Focus moved from previous child (e.g., TAB).

**C\_PREV**                    Focus moved from next child (e.g., SHIFT+TAB).

**C\_SET**                    Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason.

*record*

(optional) This argument is not used by the default method C\_METHCTR. However, this argument passes a copy of the *a\_methoddata* argument specified by *recordindex* (a DC\_ADD argument) for other methods that need this information. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

C\_METHCTR is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child window that is itself a composite window. If you want something other than the default processing described below, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the child composite window.

C\_METHCTR does the following:

1. Establishes focus in the child composite window by calling the DC\_CTRCONTEXT subfunction of %C\_CONTAINER and passing the ID of the child container and *reason*.
2. Calls C\_PROCESS to process the child composite window, passing the ID of the composite container window and the *a\_methoddata* arguments.

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.

## See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [DC\\_ADD on page 6-23](#).
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.

## C\_METHINP – Process a child input window



```
subroutine C_METHINP, reentrant
in      req container_id      , n
in      req type              , n
in      req child_id         , n
in      req reason           , a
opt record                   , a
opt a_methoddata1           , any
.
.
opt a_methoddata20          , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, it passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this: **(n)**

**DC\_LIST**                    A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID for the child input window. **(n)**

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

**C\_FIRST**                    Focus moved in attempt to reach first child.

**C\_LAST**                    Focus moved in attempt to reach last child.

**C\_NEXT**                    Focus moved from previous child (e.g., TAB).

**C\_PREV**                    Focus moved from next child (e.g., SHIFT+TAB).

**C\_SET**                    Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason.

*record*

(optional) The data area for child window input. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

C\_METHINP is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child input window. If you want something other than the default processing described below, however, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the input window.

C\_METHINP does the following:

1. Sets focus for the child input window by calling I\_CTRCONTEXT and passing the following: the ID of the input window (*child\_id*), “\*CURR\*” for the input set name, and the context change reason (*reason*) that was passed to this method.

Note that the I\_CTRCONTEXT is designed specifically to be used in processing methods for child input windows. See [I\\_CTRCONTEXT on page 8-10](#) for more information.

2. Processes the input window by calling I\_INPUT and passing the following: the ID of the input window (*child\_id*), “\*CURR\*” for the input set name, the *record* argument passed to this method (see below), and all of the *a\_methoddata* arguments passed to this method. It also passes the D\_NOTERM argument to avoid the input window completion logic that displays the “Make corrections or press RETURN to continue” message.
3. If **g\_setsts** is false when control is returned to C\_METHINP (indicating that input is complete), C\_METHINP then calls %M\_SIGNAL, passing “C\_NEXT” as the menu entry name to signal. This makes the next child active (or the first button for the composite container window, if there are no more children). If **g\_setsts** is true, context remains on the same child window. For information on **g\_setsts**, see the Discussion for I\_INPUT on [page 8-58](#).

Note that for *record*, C\_PROCESS passes the *a\_methoddata* argument specified by the *recordindex* argument in the DC\_ADD call for the window. For details, see the information on *recordindex* in the Discussion for DC\_ADD on [page 6-24](#), and see the information on the *a\_methoddata* arguments in the Discussion for C\_PROCESS on [page 6-45](#).

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.



## See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.

## C\_METHLST – Process a child list



```
subroutine C_METHLST, reentrant
in      req container_id      , n
in      req type              , n
in      req child_id         , n
in      req reason           , a
opt record                   , a
opt a_methoddata1           , any
.
.
opt a_methoddata20          , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, this argument passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this information: **(n)**

**DC\_LIST**                    A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID for the child list. **(n)**

*reason*

This argument is not used by the default method C\_METHLST. However, this is passed for methods that do need the reason the child was activated. *Reason* can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

**C\_FIRST**                    Focus moved in attempt to reach first child.

**C\_LAST**                     Focus moved in attempt to reach last child.

**C\_NEXT**                    Focus moved from previous child (e.g., TAB).

|               |                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_PREV</b> | Focus moved from next child (e.g., SHIFT+TAB).                                                                                                                               |
| <b>C_SET</b>  | Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason. |

*record*

(optional) The data area for input for the child list. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

C\_METHLST is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child that is a standard Toolkit list or an ActiveX Toolkit list. If you want something other than the default processing described below, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the list.

For *record*, C\_PROCESS passes the *a\_methoddata* argument specified by the *recordindex* argument in the DC\_ADD call for the window. For details, see the information on *recordindex* in the Discussion for DC\_ADD on [page 6-24](#), and see the information on the *a\_methoddata* arguments in the Discussion for C\_PROCESS on [page 6-45](#).

C\_METHLST does the following:

1. Sets the highlight style for the selected item to highlight (as opposed to outline or off) by calling %L\_SELSTYLE with D\_ON.
2. If on UNIX or OpenVMS, calls L\_ENABLE. (See note below.)
3. Calls L\_CTRCONTEXT to set focus to either the list or a button for the list, depending on *reason*.
4. Processes the list by calling L\_SELECT and passing the following: the ID of the list (*child\_id*), a D\_LNOP request code, the *record* argument passed to this method, and all of the *a\_methoddata* arguments passed to this method.
5. If **g\_select** is false when control is returned to C\_METHLST (indicating that an item was selected), C\_METHLST then calls %M\_SIGNAL, passing "C\_NEXT" as the menu entry name to signal. This passes context to the next child (or the first button for the composite container window, if there are no more children). If **g\_select** is true, context remains on the list.
6. If on UNIX or OpenVMS, calls L\_DISABLE. (See note below.)
7. Sets the highlight style for the selected item to outline by calling %L\_SELSTYLE with D\_OUTLINE.

Note that to visually indicate when a child list is active on Windows, the default method sets the highlight style for the selected item to highlight ([step 1](#) above) when the child list is active and to outline ([step 7](#) above) when the child list is not active. This is generally effective for standard Toolkit lists in Windows environments, but not in UNIX and OpenVMS environments, where this

doesn't result in any visual difference. (On UNIX and OpenVMS, D\_OUTLINE has the same effect as D\_ON). So for UNIX and OpenVMS, this method enables the list when active ([step 2](#) above) and disables the list when inactive ([step 6](#) above).

ActiveX Toolkit lists ignore %L\_SELSTYLE settings, but automatically have a bold frame when active.

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.

### See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.

## C\_METHNET – Process a child .NET form window

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
subroutine C_METHNET, reentrant
in      req container_id      , n
in      req type              , n
in      req child_id         , n
in      req reason           , a
opt record                   , a
opt a_methoddata1           , any
.
.
opt a_methoddata20          , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, this argument passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this information: **(n)**

- DC\_LISTA Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).
- DC\_WINDOWA Toolkit window.

*child\_id*

The ID for the Toolkit container window for the .NET form. See [%DOTNET\\_TKWIN on page 11-15](#). **(n)**

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

- C\_FIRSTFocus moved in attempt to reach first child.
- C\_LASTFocus moved in attempt to reach last child.
- C\_NEXTFocus moved from previous child (e.g., TAB).

|               |                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_PREV</b> | Focus moved from next child (e.g., SHIFT+TAB).                                                                                                                               |
| <b>C_SET</b>  | Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason. |

#### *record*

(optional) This argument is not used by the default method C\_METHNET. However, this argument passes a copy of the *a\_methoddata* argument specified by *recordindex* (a DC\_ADD argument) for other methods that need this information. **(a)**

#### *a\_methoddata1* through *a\_methoddata20*

(optional) These arguments are not used by the default method C\_METHNET. However, up to 20 additional data arguments are passed for other methods that need this information. **(any)**

## Discussion

C\_METHNET is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child .NET form window. If you want something other than the default processing described below, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the window.

C\_METHNET does the following:

1. Calls U\_CTRCONTEXT to set context within the .NET form window.
2. Calls DOTNET\_TKINPUT to process input.

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods. Modifying or compiling this file will not change the default methods.

## See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.
- ▶ [Chapter 11, “.NET Routines,”](#) for information on .NET form windows.

## C\_METHNOP – Prevent a child from gaining focus



```

subroutine C_METHNOP, reentrant
in      req container_id      , n
in      req type               , n
in      req child_id          , n
in      req reason             , a
opt record                    , a
opt a_methoddata1             , any
.
.
opt a_methoddata20            , any

```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, this argument passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this information: **(n)**

**DC\_LIST**                    A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

This argument is not used by the default implementation of C\_METHNOP. However this argument passes the ID for the child for other methods that need this information. **(n)**

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

**C\_FIRST**                    Focus moved in attempt to reach first child.

**C\_LAST**                     Focus moved in attempt to reach last child.

**C\_NEXT**                    Focus moved from previous child (e.g., TAB).

|               |                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_PREV</b> | Focus moved from next child (e.g., SHIFT+TAB).                                                                                                                               |
| <b>C_SET</b>  | Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason. |

#### *record*

(optional) This argument is not used by the default method C\_METHNOP. However, this argument passes a copy of the *a\_methoddata* argument specified by *recordindex* (a DC\_ADD argument) for other methods that need this information. (**a**)

#### *a\_methoddata1* through *a\_methoddata20*

(optional) These arguments are not used by the default method C\_METHNOP. However, up to 20 additional data arguments are passed for other methods that need this information. (**any**)

## Discussion

C\_METHNOP is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child window that doesn't fit into one of the general classifications that invoke other default processing methods (see the Discussion for C\_PROCESS on [page 6-45](#)) and for which no method was assigned when it was added to the composite window. For example, this method will be used for a child window created with .WINDOW, assuming no method was assigned in its DC\_ADD call and assuming that T\_SETUP has not been called for it (which would cause C\_PROCESS to use C\_METHTXT).

If you want something other than the default processing for such windows—which is simply to skip over the window (C\_METHNOP calls %M\_SIGNAL with “C\_PREV” or “C\_NEXT”)—you can instruct C\_PROCESS to call a different routine when processing the window by passing the routine's name in the DC\_ADD call for the window. Additionally, you can assign this method to any child window or list that you don't want to be activated.

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.

## See also

- ▶ “Controlling tabbing, focus, and input context” on [page 6-4](#) for information on tabbing indices.
- ▶ C\_PROCESS on [page 6-45](#).
- ▶ “Overloading a Toolkit routine” on [page 18-8](#) for information on overloading this subroutine.



## C\_METHSEL – Process a child selection window



```
subroutine C_METHSEL, reentrant
in      req container_id      , n
in      req type              , n
in      req child_id         , n
in      req reason           , a
opt record                   , a
opt a_methoddata1           , any
.
.
opt a_methoddata20          , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, this argument passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this information: **(n)**

**DC\_LIST**                    A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID for the child selection window. **(n)**

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

**C\_FIRST**                    Focus moved in attempt to reach first child.

**C\_LAST**                     Focus moved in attempt to reach last child.

**C\_NEXT**                    Focus moved from previous child (e.g., TAB).

|               |                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_PREV</b> | Focus moved from next child (e.g., SHIFT+TAB).                                                                                                                               |
| <b>C_SET</b>  | Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason. |

*record*

(optional) The data area for input for the child list. **(a)**

*a\_methoddata1* through *a\_methoddata20*

(optional) These arguments are not used by the default method C\_METHSEL. However, up to 20 additional data arguments are passed for other methods that need this information. **(any)**

## Discussion

C\_METHSEL is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child selection window. If you want something other than the default processing described below, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the selection list.

C\_METHSEL does the following:

1. Calls U\_CTRCONTEXT to set context within the selection window.
2. Processes the selection window by calling S\_SELECT and passing the ID of the selection window (*child\_id*) and the *record* argument passed to this method.
3. If **g\_select** is false when control is returned to C\_METHSEL (indicating that an item was selected), C\_METHSEL then calls %M\_SIGNAL, passing "C\_NEXT" as the menu entry name to signal. This moves context to the next child (or to the first button for the composite container window if there are no more children). If **g\_select** is true, context remains on the selection window.

Note that for *record*, C\_PROCESS passes the *a\_methoddata* argument specified by the *recordindex* argument in the DC\_ADD call for the window. For details, see the information on *recordindex* in the Discussion for DC\_ADD on [page 6-24](#), and see the information on the *a\_methoddata* arguments in the Discussion for C\_PROCESS [page 6-45](#).

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.

## See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.

## C\_METHTS – Process a child tabbed dialog



```
subroutine C_METHTS, reentrant
in    req container_id      , n
in    req type              , n
in    req child_id         , n
in    req reason           , a
opt record                 , a
opt a_methoddata1         , any
.
.
opt a_methoddata20        , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, it passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this: **(n)**

**DC\_LIST**                    A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID for the child tabbed dialog. **(n)**

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

**C\_FIRST**                    Focus moved in attempt to reach first child.

**C\_LAST**                    Focus moved in attempt to reach last child.

**C\_NEXT**                    Focus moved from previous child (e.g., TAB).

**C\_PREV**                    Focus moved from next child (e.g., SHIFT+TAB).

**C\_SET**                    Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason.

*record*

(optional) This argument is not used by the default method C\_METHAX. However, this argument passes a copy of the *a\_methoddata* argument specified by *recordindex* (a DC\_ADD argument) for other methods that need this information. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

C\_METHTS is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child window that is a tabbed dialog. If you want something other than the default processing described below, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the list.

C\_METHTS does the following:

1. Establishes focus for the tab set by passing the *reason* argument on to the DTS\_CTRCONTEXT subfunction of %TS\_TABSET. (Note that the DTS\_CTRCONTEXT subfunction for %TS\_TABSET is designed specifically to be used in processing methods for child windows that are tabbed dialogs. See [DTS\\_CTRCONTEXT on page 13-37](#) for more information.)
2. Processes the tabbed dialog by calling %TS\_PROCESS with the ID of the child window and all of the *a\_methoddata* arguments passed in the C\_PROCESS call.

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.

## See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [DC\\_ADD on page 6-23](#).
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.

## C\_METHTXT – Process a child text window



```
subroutine C_METHTXT, reentrant
in    req container_id      , n
in    req type              , n
in    req child_id         , n
in    req reason           , a
opt record                 , a
opt a_methoddata1         , any
.
.
opt a_methoddata20        , any
```

### Arguments

*container\_id*

This argument is not used by the default processing methods. However, this argument passes the ID of the container window in case a method you supply needs this information. **(n)**

*type*

This argument is not used by the default processing methods. However, it passes one of the following (defined in **WND:tools.def**) in case a method you supply needs this: **(n)**

**DC\_LIST**                    A Toolkit list (a standard Toolkit list or an ActiveX Toolkit list).

**DC\_WINDOW**                A Toolkit window.

*child\_id*

The ID for the child text window. **(n)**

*reason*

The reason the child was activated, which can be blank (indicating that the child was already activated), a program-supplied reason passed because the child was activated programmatically, or one of the following: **(a)**

**C\_FIRST**                    Focus moved in attempt to reach first child.

**C\_LAST**                    Focus moved in attempt to reach last child.

**C\_NEXT**                    Focus moved from previous child (e.g., TAB).

**C\_PREV**                    Focus moved from next child (e.g., SHIFT+TAB).

**C\_SET**                    Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason.

*record*

(optional) This argument is not used by the default method C\_METHTXT. However, this argument passes a copy of the *a\_methoddata* argument specified by *recordindex* (a DC\_ADD argument) for other methods that need this information. **(a)**

*a\_methoddata1* through *a\_methoddata20*

(optional) These arguments are not used by the default method C\_METHTXT. However, up to 20 additional data arguments are passed for other methods that need this information. **(any)**

## Discussion

C\_METHTXT is a Toolkit-supplied processing method that C\_PROCESS calls by default when processing a child text window. If you want something other than the default processing described below, you can instruct C\_PROCESS to call a different routine by passing the routine's name in the DC\_ADD call for the text window.

C\_METHTXT does the following:

1. Calls U\_CTRCONTEXT to set context within the selection window.
2. Calls T\_EDIT for the window.

To see the code for this method, see the **ctrmeths.dbl** file included in your UI Toolkit distribution. Note that **ctrmeths.dbl** is distributed simply as a reference and as a starting point for writing your own composite window processing methods; modifying or compiling this file will not change the default methods.

## See also

- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.
- ▶ [DC\\_ADD on page 6-23](#).
- ▶ [C\\_PROCESS on page 6-45](#).
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for information on overloading this subroutine.

# 7

## Environment Routines

### What Is an Environment? 7-2

Explains the concept of an environment and the terminology associated with it.

### The Environment Subroutines and Functions 7-3

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# What Is an Environment?

An *environment* is a program state that consists of the current definition of the screen, any terminal settings and processing options, and open channels.

When you create (enter) a new environment, UI Toolkit saves the old environment and copies its attributes to the current one. Any change to an environment item supersedes the previous contents. When you delete (exit) the current environment, the previous environment is restored.

The advantage to using environments is to enable you to easily create and maintain “component” programs. For example, consider an inventory management application as a component. If inventory management enters a new environment upon entry, and exits it when returning to the calling program, the component is completely modular and it doesn’t matter who calls it. You can call the component not only from the main menu but also from the inventory receivings component or any other program.

A program can have more than one environment. An application moves from one environment to another with `E_ENTER`. Each new environment is at a new and deeper environment level. You can have a maximum number of 32 environment levels. You can control the maximum number of environment levels with the `U_START` subroutine. The default number of levels is 16.

When you exit an environment with the `E_EXIT` subroutine, UI Toolkit closes its current state (deletes locally created windows, closes locally opened files, deletes any new menus, and so forth). The current environment is then reset to the previous environment.

The current environment is maintained by UI Toolkit and owns the header, information, and footer lines. It also owns channels, state flags, windows, menu columns, lists, and possibly toolbars. Note that only toolbars created with `%TB_TKCREATE` or logged with `TB_TKLOG` are under the control of the environment.

The current display owns the menu bar and body of the screen as well as placement of the windows, menu columns, toolbars, and lists. The current display can be shared by more than one environment.

Windows, menu columns, channels, and toolbars are either global or local to an environment. These two statuses primarily determine deletion privileges: a local item is owned by the environment that defines it and can only be deleted by that particular environment, while a global item can be deleted at any environment level. Global items are owned by the environment system rather than a specific environment level. All local elements are automatically deleted when you exit the environment that owns them.

A display can also be designated as shared, which means that it is accessible by multiple environment levels (although it is still owned by the environment that defined it). A new environment whose display is defined as shared can access the previous environment’s menu bar, menu columns, and screen body. If you make changes to a shared display, those changes will be reflected in all environment levels that share the display.



# The Environment Subroutines and Functions

This section discusses the syntax and arguments for each of the environment subroutines.

# E\_ENTER – Enter a new environment



```
xcall E_ENTER([share])
```

## Arguments

*share*

(optional) The share-display flag: **(n)**

**D\_SHARE**                      Shared display.

**D\_NEW**                        New display. (default)

## Discussion

The E\_ENTER subroutine defines a new environment and determines whether the display is shared.

The presence of D\_SHARE flags the display as shared. This means that the new environment accesses the previous environment's menu bar, menu columns, toolbars, and screen body. However, the display is owned by the environment that defined it, and although the new environment can modify the menu bar and toolbars, it cannot delete local menu columns, toolbars, or windows. If you modify a shared display, that modification will affect the previous environment.

If D\_NEW is present (or *share* is not specified), a display is also created with the previous environment's menu bar, menu columns, toolbars, and screen body. However, if you make a modification (for example, removing a menu column or toolbar), that modification will not affect the previous environment.

E\_ENTER performs the following operations:

- ▶ Saves the description of the current environment
- ▶ Defines new display screen sections and copies the contents of the previous environment's sections into the new sections
- ▶ If the display is not shared, defines a new menu bar and remembers which windows, toolbars, and columns were placed (also remembers the enabled/disabled state of menu columns and entries and toolbar buttons)
- ▶ Copies the previous environment's state flags
- ▶ Initializes the new local window and local channel lists to empty

You do not need to call E\_ENTER after a U\_START. The U\_START subroutine automatically enters the first environment.

Note that even though you define a new environment, all previous environments still exist. Suppose, for example, that you have passed some global file channels and windows created in the caller's current environment to a routine. Even if you enter a new environment, you can use the passed channels and windows. Although they are not owned by the new environment, they still exist and are accessible. The non-owning environment, however, cannot delete windows and channels.

## Examples

This example defines a new environment with a shared display.

```
xcall e_enter(D_SHARE)
```

## E\_EXIT – Exit to the previous environment



```
xcall E_EXIT
```

### Discussion

The E\_EXIT subroutine exits to the previous environment. E\_EXIT performs the following operations:

- ▶ Deletes local windows, menu columns, and toolbars
- ▶ Purges local channels
- ▶ If the display was not shared with the previous level, restores the previous level's placed windows, menu columns, and toolbars. Note, however, that this does not apply to toolbar buttons. If a toolbar button is deleted, leaving the environment will not restore it.
- ▶ If a toolbar button was forced down (with the TBB\_SELECT subfunction of %TB\_BUTTON or because it is a member of a group) in a prior environment and then was popped up in the current environment, exiting the environment pushes the button down again. This also invokes the button's method and/or keystrokes associated with the left mouse button if any are registered.
- ▶ Restores the state of menu columns and menu entries, whether enabled or disabled, and the state of toolbar buttons, whether enabled or disabled. (Note that if a button was selected in a prior environment and then was deselected in the current environment, exiting the environment selects the button. This invokes the button's method and any registered keystrokes that are associated with the left mouse button.)
- ▶ Restores the previous level's header, footer, and information line

The UI Toolkit utilities remember only the placement and order of a placed window. If you modify any other characteristics (for example, color or contents), they will remain modified.

## %E\_FONT – Modify the font for the header, footer, or information line



```
prev_font = %E_FONT (section[, font_id])
```

or

```
xcall E_FONT (section[, font_id])
```

### Return value

*prev\_font*

On Windows, %E\_FONT returns the font handle of the previously selected font for the *section*. On UNIX and OpenVMS, this routine always returns zero. (^VAL)

### Arguments

*section*

The section identifier: (**n**)

**D\_HEADER**           Header section.

**D\_FOOTER**           Footer section.

**D\_INFO**             Information line.

*font\_id*

(optional) The name of a font palette entry, a font handle, or one of the following. (**a** or **n**)

**DF\_CURRENT**       Current font.

**DF\_DEFAULT**       Global font.

**DF\_ALTERNATE**   Alternate font.

**DF\_DEBUGGER**    Debugger font.

### Discussion

The %E\_FONT function modifies the font for the header, footer, or information line. This font information is used for the current environment only. It is not saved in **synergy.ini**.

If *font\_id* is not passed, the font is not changed.

The initial values for the header, footer, and information line can be specified in **synergy.ini** or in the environment by setting the FONT\_HEADER, FONT\_FOOTER, and FONT\_INFO environment variables. If no initial values are set, a font palette entry named “Status” is used. If a

font palette entry named “Status” is not defined, one is created using typeface “Arial,” point size 10, and sizing character “A.” Note that the sizing character is not used for the font for these sections, but it would affect the font’s reuse in other Synergy windows.

Changing the font of a displayed screen section at runtime will cause the application window to be resized. If more than one of these fonts or the application window font are to be changed at the same time, we recommend that you call `U_UPDATE(FALSE)` prior to `%E_FONT` and `U_UPDATE(TRUE)` afterwards to avoid excessive repainting.

### See also

- ▶ The “[Environment Variables](#)” chapter of *Environment Variables & System Options* for information on setting `FONT_HEADER`, `FONT_FOOTER`, and `FONT_INFO` in **synergy.ini**.
- ▶ “[Using Fonts on Windows](#)” on page 18-46 for information on fonts and font palettes.

### Examples

The following example sets the font for the footer section to be **footer\_font**, where **footer\_font** is a font defined in **synergy.ini** or **synuser.ini** or defined at runtime by calling `%U_WNDFONT(D_SETFONT)`.

```
old_font = %e_font(D_FOOTER, "footer_font")
```

The following example sets the font for the information line to be the font specified by **font\_hndl**. **Font\_hndl** would have been returned from a call to `%U_WNDFONT(D_SETFONT)` when the font palette entry was created.

```
old_info_font = %e_font(D_INFO, font_hndl)
```

## %E\_INFO – Return information about environment processing



*return* = %E\_INFO (*subfunction* [, *arg*, ...])

### Return value

*return*

This function returns an integer value, which indicates a result specific to the *subfunction*. See [page 7-13](#) through [page 7-37](#) for the specific return values. (^VAL)

### Arguments

*subfunction*

The specific function to perform. It must be one of the following: (n)

|                        |                                                                                                        |
|------------------------|--------------------------------------------------------------------------------------------------------|
| <b>D_CHANNEL_LEVEL</b> | Return the environment level at which a channel is logged. See <a href="#">page 7-13</a> .             |
| <b>D_CHANNEL_MAX</b>   | Return the highest channel number that Toolkit can use. See <a href="#">page 7-14</a> .                |
| <b>D_CHANNELS</b>      | Return the number of channels logged in a level. See <a href="#">page 7-15</a> .                       |
| <b>D_DSP_LEVEL</b>     | Return the current display level. See <a href="#">page 7-17</a> .                                      |
| <b>D_ENV_LEVEL</b>     | Return the current environment level. See <a href="#">page 7-18</a> .                                  |
| <b>D_LIST_LEVEL</b>    | Return the environment level at which a list is logged. See <a href="#">page 7-19</a> .                |
| <b>D_LISTS</b>         | Return the number of lists logged in a level. See <a href="#">page 7-20</a> .                          |
| <b>D_MAX_ENV_LEVEL</b> | Return the maximum environment level. See <a href="#">page 7-21</a> .                                  |
| <b>D_METHOD</b>        | Return the address of the current method routine. See <a href="#">page 7-22</a> .                      |
| <b>D_MONTH_ABBREV</b>  | Return true if successful; otherwise, false. See <a href="#">page 7-24</a> .                           |
| <b>D_MONTH_NUMBER</b>  | Return the month number (1-12). See <a href="#">page 7-25</a> .                                        |
| <b>D_SECT_ROWS</b>     | Return the number of rows available in a section. See <a href="#">page 7-26</a> .                      |
| <b>D_SECT_TEXT</b>     | Return the length of text in a section. See <a href="#">page 7-27</a> .                                |
| <b>D_STATE</b>         | Return a true/false flag indicating whether a state code is on or off. See <a href="#">page 7-29</a> . |

|                        |                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------|
| <b>D_TOOLBAR_LEVEL</b> | Return the environment level for a toolbar. See <a href="#">page 7-31</a> .               |
| <b>D_TOOLBARS</b>      | Return a list of toolbars at a given environment level. See <a href="#">page 7-32</a> .   |
| <b>D_WINDOW_LEVEL</b>  | Return the environment level at which a window is logged. See <a href="#">page 7-34</a> . |
| <b>D_WINDOW_TYPE</b>   | Return the type of a window. See <a href="#">page 7-35</a> .                              |
| <b>D_WINDOWS</b>       | Return the number of windows logged in a level. See <a href="#">page 7-36</a> .           |

*arg*

(optional) One or more arguments, depending on *subfunction*.

## Discussion

The %E\_INFO function is used to return information about the current environment. The syntax for each of these operations is documented on the following pages.

## Examples

The first example does the following: retrieves the total number of all windows in order to allocate an array to hold their IDs, determines which windows are input windows, and then displays all of the IDs of the input windows.

```
.align
stack record
    array_hndl    ,i4                ;Handle to an allocated array
    nmwnds        ,i4                ;Number of windows in the array
    ix            ,i4                ;An index into the array
    wndid         ,i4                ;A window ID

structure window_array                ;Structure for the allocated memory
    id            ,i4                ;A window ID

proc
    nmwnds = %e_info(D_WINDOWS,,, D_ALL)        ;Get number of windows
    array_hndl = %mem_proc(DM_ALLOC, nmwnds * ^size(window_array))
                                                ;Allocate the array
    xcall e_info(D_WINDOWS, nmwnds, ^m(window_array.id, array_hndl),
    &                D_ALL)                ;Retrieve the ID's
    for ix from 1 thru nmwnds                ;Loop through the ID's
    begin
        wndid = ^m(window_array[ix].id, array_hndl);Get one
                                                ;Is it an input window?
```



```

        if (%e_info(D_WINDOW_TYPE, wndid) .eq. D_WTYPE_INPUT)
            xcall u_message("ID " + %string(wndid) +
                &
                " is an input window")
        end
        xcall mem_proc(DM_FREE, array_hndl)    ;Free the array

```

The following example is similar to the first, but it uses the maximum array size.

```

.include "WND:system.def"
.align
stack record
    array      , [D_MAXWND] i4      ;Array of window ID's
    nmwnds     , i4                  ;Number of windows
    ix         , i4                  ;Index into the array

proc
    ;Retrieve the ID's and the count
    nmwnds = %e_info(D_WINDOWS, D_MAXWND, array, D_ALL)
    for ix from 1 thru nmwnds        ;Loop thru the ID's
        begin
            ;Is it an input window?
            if (%e_info(D_WINDOW_TYPE, array[ix]) .eq. D_WTYPE_INPUT)
                begin
                    xcall u_message("ID " + %string(array[ix]) +
                        &
                        " is an input window")
                end
            end
        end
    end
end

```

In the next example, an EUTILS\_METHOD environment method calls any previously registered method if it does not know how to handle a menu entry.

```

subroutine my_utils_method,reentrant
;
; Description: A utility menu entry method that can inherit from
;              the previously registered method.
;
; Arguments:
;
;          a_record      , a          ;(Optional) record passed to I_INPUT
;
.include "WND:tools.def"

.align
stack record
    my_method      , D_ADDR      ;Address of this routine
    prev_method    , D_ADDR      ;Address of previous level routine
    lvl            , i4          ;An environment level index

```

## Environment Routines

%E\_INFO

```
proc
    using g_entnam select                ;Do we know this entry?
("U_ENTRY1 "),call entry1
("U_ENTRY2 "),call entry2
()                ,call unknown        ;No, let's pass it back to previous
                                           ; method
    endusing
xreturn

entry1,                                ;(Code to process entry U_ENTRY1)
    return
entry2,                                ;(Code to process entry U_ENTRY2)
    return
unknown,
                                           ;First, get our address to compare
                                           ; against
my_method = %e_info(D_METHOD, D_METH_UTILS)

;Now, beginning with the previous level, find the method that was
; registered prior to this one
for lvl from (%e_info(D_ENV_LEVEL) - 1) thru 1 by -1
begin
    prev_method = %e_info(D_METHOD, D_METH_UTILS, lvl)
                                           ;Get the method for level lvl
    if (prev_method .ne. my_method)
begin
                                           ;Back to before my_method was
                                           ; registered
        if (prev_method)                ;Zero means "no method"
            xcall xsubr(prev_method, a_record)
                                           ;Invoke the previous method,
                                           ; if there was one registered
        exitloop
    end
end
return
endsubroutine
```

## %E\_INFO (continued)

### D\_CHANNEL\_LEVEL

*env\_level* = %E\_INFO (D\_CHANNEL\_LEVEL, *channel*)

#### Return value

*env\_level*

The D\_CHANNEL\_LEVEL subfunction returns the environment level at which the channel is logged or one of the following: (^VAL)

|                 |                                                        |
|-----------------|--------------------------------------------------------|
| <b>D_FREE</b>   | No channel is logged with the specified ID.            |
| <b>D_GLOBAL</b> | The channel is global.                                 |
| <b>D_SYS</b>    | The channel is owned by the Toolkit system processing. |

#### Arguments

*channel*

The channel number. (**n**)

#### Discussion

The D\_CHANNEL\_LEVEL subfunction obtains the environment level at which the specified channel is logged.

If the *channel* is invalid, a fatal error occurs.

## %E\_INFO (continued)

### D\_CHANNEL\_MAX

*max\_channel* = %E\_INFO (D\_CHANNEL\_MAX)

### Return value

*max\_channel*

The D\_CHANNELS subfunction returns highest channel number that Toolkit can use. (^VAL)

### Discussion

The D\_CHANNELS subfunction returns the highest channel number that Toolkit can use. This limit is set by U\_START.

## %E\_INFO (continued)

### D\_CHANNELS

```
channels_logged = %E_INFO (D_CHANNELS, [channels_req], [channels][, env_level])
```

or

```
xcall E_INFO (D_CHANNELS, [channels_req], [channels][, env_level])
```

### Return value

*channels\_logged*

The D\_CHANNELS subfunction returns the number of channels logged. (^VAL)

### Arguments

*channels\_req*

(optional) The number of channels requested. (n)

*channels*

(optional) The returned array of channel numbers. (n)

*env\_level*

(optional) The environment level, or one of the following. (n)

**D\_ALL** All environment levels including global.

**D\_GLOBAL** The global environment level.

**D\_LOCAL** The current environment level. (default)

### Discussion

The D\_CHANNELS subfunction obtains the number of channels logged.

Because the *channels\_req* and *channels* arguments are optional and the *channels\_logged* return value indicates the size needed to contain the *channels* argument, %E\_INFO(D\_CHANNELS) can be called once without passing *channels\_req* and *channels* to get the necessary size. Then, allocate the required space before calling the D\_CHANNELS subfunction again, passing *channels\_req* and *channels* to obtain the *array of channel numbers*.

In the case of an array return argument like *channels*, the number of elements requested can be specified in the *channels\_req* argument. This allows you to avoid overrunning the array boundary if the array passed is smaller than the total number of items. The array reference passed should refer to the array's first element. %E\_INFO will treat this as the base of a pseudo array into which to write the returned channels.

Instead of sizing the *channels* array dynamically, the calling routine can also allocate the maximum possible size by passing D\_MAXCHN for the *channels\_req* argument. D\_MAXCHN is defined in **WND: system.def**.

*Env\_level* can be a value between 1 and the current environment level, D\_ALL, D\_GLOBAL, or D\_LOCAL. If *env\_level* is not passed or 0, D\_LOCAL is assumed. If a value is passed that is greater than the current environment level, a fatal error occurs.

## %E\_INFO (continued)

### D\_DSP\_LEVEL

*dsp\_level* = %E\_INFO (D\_DSP\_LEVEL)

#### Return value

*dsp\_level*

The D\_DSP\_LEVEL subfunction returns the current display level. (^**VAL**)

#### Discussion

The D\_DSP\_LEVEL subfunction obtains the current display level.

## %E\_INFO (continued)

### D\_ENV\_LEVEL

```
env_level = %E_INFO(D_ENV_LEVEL)
```

### Return value

*env\_level*

The D\_ENV\_LEVEL subfunction returns the current environment level, or it returns 0 if Toolkit is not active. (**^VAL**)

### Discussion

The D\_ENV\_LEVEL subfunction enables you to determine if Toolkit is active (i.e., if it has been initialized with U\_START but not terminated with U\_FINISH). And if Toolkit is active, this subfunction returns the current environment level.

### Examples

The following example checks whether or not you can enter a new environment.

```
if (%e_info(D_ENV_LEVEL) .le. %e_info(D_MAX_ENV_LEVEL)) then
  xcall e_enter
else
  xcall u_message("Cannot enter a new environment - " +
    & "maximum levels already in use")
```

The next example determines whether Toolkit is active and initializes it if it's not active:

```
if (!%e_info(D_ENV_LEVEL)) then
  xcall u_start
.
.
.
```

For another example, see [page 7-10](#).



## %E\_INFO (continued)

### D\_LIST\_LEVEL

*env\_level* = %E\_INFO (D\_LIST\_LEVEL, *list\_id*)

#### Return value

*env\_level*

The D\_LIST\_LEVEL subfunction returns the environment level at which *list\_id* is logged or one of the following: (^VAL)

|                 |                                                     |
|-----------------|-----------------------------------------------------|
| <b>D_FREE</b>   | No list is logged with the specified ID.            |
| <b>D_GLOBAL</b> | The list is global.                                 |
| <b>D_SYS</b>    | The list is owned by the Toolkit system processing. |

#### Arguments

*list\_id*

The list ID. (n)

#### Discussion

The D\_LIST\_LEVEL subfunction obtains the environment level at which the specified list is logged.

If *list\_id* is invalid, a fatal error occurs.

## %E\_INFO (continued)

### D\_LISTS

*lists\_logged* = %E\_INFO(D\_LISTS, [*lists\_req*], [*list\_id*][, *env\_level*])

or

xcall E\_INFO(D\_LISTS, [*lists\_req*], [*list\_id*][, *env\_level*])

### Return value

*lists\_logged*

The D\_LISTS subfunction returns the number of lists logged at the specified level. (^VAL)

### Arguments

*lists\_req*

(optional) The number of lists requested. (**n**)

*list\_ids*

(optional) The returned array of list IDs. (**n**)

*env\_level*

(optional) The environment level, or one of the following. (**n**)

**D\_ALL** All environment levels including global.

**D\_GLOBAL** The global environment level.

**D\_LOCAL** The current environment level.

### Discussion

The D\_LISTS subfunction obtains the number of lists logged in a level.

Because the *lists\_req* and *list\_ids* arguments are optional and the *lists\_logged* return value indicates the size needed to contain the *list\_ids* argument, %E\_INFO(D\_LISTS) can be called once without passing *lists\_req* and *list\_ids* to get the necessary size. Then, allocate the required space before calling the D\_LISTS subfunction again, passing *lists\_req* and *list\_ids* to obtain the *array of list IDs*.

In the case of an array return argument like *list\_ids*, the number of elements requested can be specified in the *lists\_req* argument. This allows you to avoid overrunning the array boundary if the array passed is smaller than the total number of items. The array reference passed should refer to the array's first element. %E\_INFO will treat this as the base of a pseudo array into which to write the returned lists.

Instead of sizing the *list\_ids* array dynamically, the calling routine can also allocate the maximum possible size by passing D\_MAXLST for *lists\_req*. D\_MAXLST is defined in **WND: system.def**.

## %E\_INFO (continued)

### D\_MAX\_ENV\_LEVEL

```
max_env_level = %E_INFO (D_MAX_ENV_LEVEL)
```

### Return value

```
max_env_level
```

The D\_MAX\_ENV\_LEVEL subfunction returns the maximum environment level. (^VAL)

### Discussion

The D\_MAX\_ENV\_LEVEL subfunction obtains the maximum environment levels specified at the time that U\_START was called. This is usually D\_DFLTENV, but it can be as high as D\_MAXENV. Both of these constants are defined in **WND: system.def**.

### Examples

The following example checks whether or not you can enter a new environment.

```
if (%e_info(D_ENV_LEVEL) .le. %e_info(D_MAX_ENV_LEVEL)) then
  xcall e_enter
else
  xcall u_message("Cannot enter a new environment - " +
    & "maximum levels already in use")
```

### %E\_INFO (continued)

#### D\_METHOD

*method\_addr* = %E\_INFO (D\_METHOD, *method\_code*[, *env\_level*])

#### Return value

*method\_addr*

The D\_METHOD subfunction returns the address (D\_ADDR) of the specified method routine if registered. Otherwise, it returns 0. (^VAL)

#### Arguments

*method\_code*

One of the following: (n)

|                         |                                                         |
|-------------------------|---------------------------------------------------------|
| <b>D_METH_APPCLOSE</b>  | Get the address of the application close method.        |
| <b>D_METH_APPMOVE</b>   | Get the address of the application move method.         |
| <b>D_METH_APPSIZE</b>   | Get the address of the application resize method.       |
| <b>D_METH_APPSTATE</b>  | Get the address of the application state method.        |
| <b>D_METH_CENTURY</b>   | Get the address of the century method.                  |
| <b>D_METH_CHKFLD</b>    | Get the address of the user field validation method.    |
| <b>D_METH_DSPFLD</b>    | Get the address of the user field display method.       |
| <b>D_METH_EDTDS</b>     | Get the address of the user field edit display method.  |
| <b>D_METH_FKEY</b>      | Get the address of the key mapping method.              |
| <b>D_METH_HELP</b>      | Get the address of the help method.                     |
| <b>D_METH_SCRIPTERR</b> | Get the address of the script compilation error method. |
| <b>D_METH_UTILS</b>     | Get the address of the utilities method.                |

*env\_level*

(optional) Either the environment level or the following qualifier: (n)

|                |                                          |
|----------------|------------------------------------------|
| <b>D_LOCAL</b> | The current environment level. (default) |
|----------------|------------------------------------------|

#### Discussion

The D\_METHOD subfunction obtains the address of the routine defined in *method\_code*.

This subfunction is useful for nested components where each component provides a method for an environment-level event. In this case, the innermost component can add functionality without overloading the method of the outer component. Prior to registering the method for the new

environment, the component can save off the address of the previous method, then invoke it within the new method using %XSUBR. Note also that this address can be used to re-register the previous method without invoking E\_EXIT.

*Env\_level* can be a value between 1 and the current environment level or D\_LOCAL. If *env\_level* is not passed or 0, D\_LOCAL is assumed. If a value is passed that is greater than the current environment level, a fatal error occurs.

## See also

[E\\_METHOD on page 7-38](#) for information on registering methods.

## Examples

See Examples on [page 7-10](#).

## %E\_INFO (continued)

### D\_MONTH\_ABBREV

*status* = %E\_INFO (D\_MONTH\_ABBREV, *month\_num*, *month\_abbrev*)

#### Return value

*status*

The D\_MONTH\_ABBREV subfunction returns true if successful, or false (0) if not. (^**VAL**)

#### Arguments

*month\_num*

The month number (1-12). (**n**)

*month\_abbrev*

The returned month abbreviation as defined by UI Toolkit. (**a**)

#### Discussion

The D\_MONTH\_ABBREV subfunction obtains the month abbreviation for a specified month number.

If *month\_num* is not between 1 and 12, this subfunction returns false and no month abbreviation is returned.

#### See also

[U\\_MONTHS on page 16-104](#) for assigning alpha characters to represent months.

## %E\_INFO (continued)

### D\_MONTH\_NUMBER

*month\_num* = %E\_INFO (D\_MONTH\_NUMBER, *month\_abbrev*)

#### Return value

*month\_num*

The D\_MONTH\_NUMBER subfunction returns the month number (1-12) if found. Otherwise, it returns 0. (^**VAL**)

#### Arguments

*month\_abbrev*

The month abbreviation as defined by UI Toolkit. (**a**)

#### Discussion

The D\_MONTH\_NUMBER subfunction obtains the month number for a specified month abbreviation.

If *month\_abbrev* is not a valid month abbreviation as defined by UI Toolkit, this subfunction returns 0.

#### See also

[U\\_MONTHS](#) on page 16-104 for assigning alpha characters to represent months.

## %E\_INFO (continued)

### D\_SECT\_ROWS

*rows* = %E\_INFO (D\_SECT\_ROWS, *section*)

#### Return value

*rows*

The D\_SECT\_ROWS subfunction returns the number of rows available in a section, or 0 if the section doesn't exist. (^VAL)

#### Arguments

*section*

One of the following sections: (**n**)

**D\_CAPTION**           Reference a Microsoft Windows caption.

**D\_FOOTER**           Reference the footer section.

**D\_HEADER**           Reference the header section.

**D\_INFO**             Reference the information line.

#### Discussion

The D\_SECT\_ROWS subfunction obtains the number of rows available in a specified section of the display screen.

If *section* doesn't exist in the display screen, this subfunction returns 0.



## %E\_INFO (continued)

### D\_SECT\_TEXT

*text\_length* = %E\_INFO (D\_SECT\_TEXT, [*text\_buffer*], *section*, [*row*][, *env\_level*])

or

xcall E\_INFO (D\_SECT\_TEXT, [*text\_buffer*], *section*, [*row*][, *env\_level*])

### Return value

*text\_length*

The D\_SECT\_TEXT subfunction returns the length of text in a section if successful. Otherwise, it returns 0. (^VAL)

### Arguments

*text\_buffer*

(optional) The returned text buffer. (a)

*section*

One of the following sections: (n)

**D\_CAPTION**           Reference a Microsoft Windows caption.

**D\_FOOTER**           Reference the footer section.

**D\_HEADER**           Reference the header section.

**D\_INFO**             Reference the information line.

*row*

(optional) The row number. (n)

*env\_level*

(optional) Either the environment level or the following qualifier: (n)

**D\_LOCAL**           The current environment level. (default)

### Discussion

The D\_SECT\_TEXT subfunction returns the entire text for a specified section within an environment.

In traditional Synergy on Windows the text may not be displayed as one string (for example, left-justified, centered, and right-justified sections), but within UI Toolkit it is stored internally as one logical string.

## Environment Routines

### %E\_INFO

Because the *text\_buffer* argument is optional and the *text\_length* return value indicates the size needed to contain the *text\_buffer* argument, %E\_INFO (D\_SECT\_TEXT) can be called once without passing *text\_buffer* to get the necessary size. Then, allocate the required space before calling the D\_SECT\_TEXT subfunction again, passing *text\_buffer* to obtain the text.

If *section* doesn't exist in the display screen, this subfunction returns 0.

*Env\_level* can be a value between 1 and the current environment level or D\_LOCAL. If *env\_level* is not passed or 0, D\_LOCAL is assumed. If a value is passed that is greater than the current environment level, a fatal error occurs.

### See also

[E\\_SECT on page 7-42](#) for information on placing text into a section of the display screen.

## %E\_INFO (continued)

### D\_STATE

*state\_flag* = %E\_INFO (D\_STATE, *state*[, *env\_level*])

### Return value

*state\_flag*

The D\_STATE subfunction returns a true/false flag indicating whether a state code is on or off. (^VAL)

### Arguments

*state*

One of the following: **(n)**

- D\_CBADVANCE** Advance context for combo boxes.
- D\_CURSOR** Display a screen cursor.
- D\_ECHO** Echo terminal input.
- D\_EURO** Follow European formatting conventions.
- D\_INPPRCRND** Apply the Input Field Processing or Read-Only Input Field Processing renditions to the field that has focus during input processing.
- D\_INPRNDOVER** Override field-level rendition settings (color and attribute settings) with Input Field Processing or Read-Only Input Field Processing renditions.
- D\_INTR** Allow interrupt characters.
- D\_LOCKWAIT** Wait for locked records.
- D\_LOWER** Allow lowercase terminal input.
- D\_MSGWAIT** Wait for messages.
- D\_RETURNBTN** RETURN (ENTER) key simulates a key press of the default button.
- D\_VALSTCHG** Validate immediately on a state change of certain field types.

*env\_level*

(optional) Either an environment level or the following qualifier: **(n)**

- D\_LOCAL** The current environment level. (default)

### Discussion

The D\_STATE subfunction obtains the on/off status for a specified state code.

*Env\_level* can be a value between 1 and the current environment level or D\_LOCAL. If *env\_level* is not passed or 0, D\_LOCAL is assumed. If a value is passed that is greater than the current environment level, a fatal error occurs.

### See also

[E\\_STATE on page 7-45](#) for information on modifying the state of the current environment.

## %E\_INFO (continued)

### D\_TOOLBAR\_LEVEL

*env\_level* = %E\_INFO (D\_TOOLBAR\_LEVEL, *toolbar\_id*)

#### Return value

*env\_level*

The environment level at which a toolbar is logged, or it returns one of the following: (^VAL)

**D\_FREE**                      No toolbar is logged with the specified ID.

**D\_GLOBAL**                  The toolbar is global.

#### Arguments

*toolbar\_id*

The toolbar ID. (**n**)

#### Discussion

The D\_TOOLBAR\_LEVEL subfunction returns the environment level at which the specified toolbar is logged. If the toolbar was neither created or logged with Toolkit, D\_FREE is returned.

If *toolbar\_id* is invalid, a fatal error occurs.

## %E\_INFO (continued)

### D\_TOOLBARS

```
num_toolbars = %E_INFO (D_TOOLBARS, [toolbars_req], [toolbars_ids][, env_level])
```

or

```
xcall E_INFO (D_TOOLBARS, [toolbars_req], [toolbars_ids][, env_level])
```

### Return value

*num\_toolbars*

The number of toolbars logged for a given environment level. (^VAL)

### Arguments

*toolbars\_req*

(optional) The number of toolbars requested or the following: (**n**)

**D\_MAXTB**                      Allocates the maximum possible size for the returned array.

*toolbar\_ids*

(optional) The returned array of toolbar IDs. (**n**)

*env\_level*

(optional) The environment level, or one of the following: (**n**)

**D\_ALL**                         All environment levels including global.

**D\_GLOBAL**                    The global environment level.

**D\_LOCAL**                    The current environment level. (default)

### Discussion

The D\_TOOLBARS subfunction obtains the number of toolbars logged for a given environment level.

Because the *toolbars\_req* and *toolbar\_ids* arguments are optional and the *num\_toolbars* return value indicates the size needed to contain the *toolbar\_ids* argument, %E\_INFO (D\_TOOLBARS) can be called once without passing *toolbars\_req* and *toolbar\_ids* to get the necessary size. Then, allocate the required space before calling the D\_TOOLBARS subfunction again, passing *toolbars\_req* and *toolbar\_ids* to obtain the array of toolbar IDs.

The number of elements requested in the *toolbar\_ids* array can be specified in the *toolbars\_req* argument. This allows you to avoid overrunning the array boundary if the array passed is smaller than the total number of items. However, the array should have at least as many elements as the

number passed for *toolbars\_req*. The array reference passed should refer to the array's first element. %E\_INFO will then treat this as the base of a pseudo array into which to write the returned toolbar IDs.

The calling routine can also allocate the maximum possible size by passing D\_MAXTB for the *toolbars\_req* argument and sizing the array to this same maximum. D\_MAXTB is defined in **WND: system.def**.

*Env\_level* can be a value (between 1 and the current environment level), D\_ALL, D\_GLOBAL, or D\_LOCAL. If *env\_level* is not passed or is passed as 0, D\_LOCAL is assumed. If *env\_level* is greater than the current environment level, a fatal error occurs.

## %E\_INFO (continued)

### D\_WINDOW\_LEVEL

*env\_level* = %E\_INFO (D\_WINDOW\_LEVEL, *window\_id*)

#### Return value

*env\_level*

The D\_WINDOW\_LEVEL subfunction returns the environment level at which the window is logged or one of the following: (^VAL)

|                 |                                                       |
|-----------------|-------------------------------------------------------|
| <b>D_FREE</b>   | No window is logged with the specified ID.            |
| <b>D_GLOBAL</b> | The window is global.                                 |
| <b>D_SYS</b>    | The window is owned by the Toolkit system processing. |

#### Arguments

*window\_id*

The window ID. (**n**)

#### Discussion

The D\_WINDOW\_LEVEL subfunction obtains the environment level at which the specified window is logged.

If *window\_id* is invalid, a fatal error occurs.



## %E\_INFO (continued)

### D\_WINDOW\_TYPE

*window\_type* = %E\_INFO (D\_WINDOW\_TYPE, *window\_id*)

#### Return value

*window\_type*

The D\_WINDOW\_TYPE subfunction returns an identifier that specifies the window's type. (^VAL)

|                          |                                             |
|--------------------------|---------------------------------------------|
| <b>D_WTYPE_ACTIVEX</b>   | The window is an ActiveX container.         |
| <b>D_WTYPE_COLUMN</b>    | The window is a menu column or subcolumn.   |
| <b>D_WTYPE_CONTAINER</b> | The window is a composite container window. |
| <b>D_WTYPE_DOTNET</b>    | The window is a .NET form container.        |
| <b>D_WTYPE_LISTCLASS</b> | The window is a list class.                 |
| <b>D_WTYPE_INPUT</b>     | The window is an input window.              |
| <b>D_WTYPE_SELECT</b>    | The window is a selection window.           |
| <b>D_WTYPE_TABS</b>      | The window is a tab set container.          |
| <b>D_WTYPE_TEXT</b>      | The window is a text window.                |
| <b>D_WTYPE_OTHER</b>     | The window is none of the above.            |

#### Arguments

*window\_id*

The window ID whose type you want to retrieve. (n)

#### Discussion

The D\_WINDOW\_TYPE subfunction obtains the window type for a specified window ID.

More window types may be added in the future to the list of possible window types. Thus, D\_WTYPE\_OTHER could at some point encompass different types of windows and should therefore only be used as an “else” case.

#### Examples

See Examples on [page 7-10](#).

## %E\_INFO (continued)

### D\_WINDOWS

```
num_windows = %E_INFO (D_WINDOWS, [windows_req], [window_ids][, env_level])
```

or

```
xcall E_INFO (D_WINDOWS, [windows_req], [window_ids][, env_level])
```

### Return value

*num\_windows*

The D\_WINDOWS subfunction returns the number of windows logged in a level. (^**VAL**)

### Arguments

*windows\_req*

(optional) The number of windows requested. (**n**)

*window\_ids*

(optional) The returned array of window IDs. (**n**)

*env\_level*

(optional) The environment level, or one of the following: (**n**)

**D\_ALL**                      All environment levels including global.

**D\_GLOBAL**                The global environment level.

**D\_LOCAL**                The current environment level. (default)

### Discussion

The D\_WINDOWS subfunction obtains the number of windows logged in a level.

Because the *windows\_req* and *window\_ids* arguments are optional and the *num\_windows* return value indicates the size needed to contain the *window\_ids* argument, %E\_INFO (D\_WINDOWS) can be called once without passing *windows\_req* and *window\_ids* to get the necessary size. Then, allocate the required space before calling the D\_WINDOWS subfunction again, passing *windows\_req* and *window\_ids* to obtain the *array of window IDs*.

In the case of an array return argument like *window\_ids*, the number of elements requested can be specified in the *windows\_req* argument. This allows you to avoid overrunning the array boundary if the array passed is smaller than the total number of items. The array reference passed should refer to the array's first element. %E\_INFO will treat this as the base of a pseudo array into which to write the returned windows.

Instead of sizing the *window\_ids* array dynamically, the calling routine can also allocate the maximum possible size by passing `D_MAXWND` for the *windows\_req* argument. `D_MAXWND` is defined in **WND: system.def**.

*Env\_level* can be a value between 1 and the current environment level, `D_ALL`, `D_GLOBAL`, or `D_LOCAL`. If *env\_level* is not passed or 0, `D_LOCAL` is assumed. If a value is passed that is greater than the current environment level, a fatal error occurs.

## Examples

See Examples on [page 7-10](#).

## E\_METHOD – Register an environment method



```
xcall E_METHOD(event_method_pair[, ...])
```

### Arguments

*event\_method\_pair*

Has the following format:

*method\_option[, method|library]*

*method\_option*

One of the following environment method options:

|                        |                                                                                                                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_METH_APPCLOSE</b> | Specify the application close method, which is the subroutine that is called when U_FINISH is called or when the application is closed using the System menu, close box, or ALT+F4.                              |
| <b>D_METH_APPMOVE</b>  | Specify the application move method, which is the function that is called when the application window is moved.                                                                                                  |
| <b>D_METH_APPSIZE</b>  | Specify the application size method, which is the function that is called when the application window is resized.                                                                                                |
| <b>D_METH_APPSTATE</b> | Specify the application state method, which is the function that is called when the application window state is changed.                                                                                         |
| <b>D_METH_CENTURY</b>  | Specify the century method, which is the function that is called by U_DCDDAT whenever it needs to supply a default century. (Note that U_DCDDAT is called within the input processor to handle date defaulting.) |
| <b>D_METH_CHKFLD</b>   | Specify the user field validation method, which is the subroutine that is called to validate the contents of the current user-defined input field.                                                               |
| <b>D_METH_DSPFLD</b>   | Specify the user field display method, which is the subroutine that is called to display the contents of the current field if it is a user-defined input field.                                                  |

|                         |                                                                                                                                                                                                                                          |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_METH_EDTDSP</b>    | Specify the user field edit display method, which is the subroutine that is called to display the editable contents of a user-defined field differently than both the way it is stored and the way the D_METH_DSPFLD method displays it. |
| <b>D_METH_ENTRST</b>    | Specify the input override method, which is the subroutine that is called when an input field is exited due to a menu entry.                                                                                                             |
| <b>D_METH_FKEY</b>      | Specify the key mapping method, which is the subroutine that is called whenever a function key or control character is entered by the user.                                                                                              |
| <b>D_METH_HELP</b>      | Specify the help method, which is the subroutine that is called when the user selects the menu entry with the internal name “O_HELP”.                                                                                                    |
| <b>D_METH_LIBRARY</b>   | Specify the library for in which Toolkit will search for methods for subsequent event method pairs.                                                                                                                                      |
| <b>D_METH_SCRIPTERR</b> | Specify the script compilation error method, which is the subroutine to be called whenever the Script compiler external routine interface encounters a script compilation error.                                                         |
| <b>D_METH_UTILS</b>     | Specify the utilities method, which is the subroutine that is called when the user selects a menu entry whose internal name begins with “U_”.                                                                                            |

*method*

(optional) The name or integer address of the method to be used for the environment-level event specified with *method\_option*, or a value of 0, which resets the method pair so that no method is associated with the specified method. (Used for all *method\_option* options except D\_METH\_LIBRARY, which works with *library*.) (**D\_ADDR**)

*library*

(optional) The ELB or shared image that contains the methods for subsequent event method pairs. (Used only with D\_METH\_LIBRARY.) (**a**)

## Discussion

E\_METHOD registers method subroutine names for environment-level events. Use E\_METHOD if you want to do additional processing when an environment-level event is initiated. When that event occurs, Toolkit will call *method*, which is a routine you write, and if *library* is specified prior to the method, Toolkit will look in the specified library for the method.

Note the following for event methods:

- ▶ If passed, *method* must be either the name or the address of a routine. If the integer address is specified, such as the return value from %XADDR, it must be of type D\_ADDR (which is defined in **dbl.def** as either **i4** or **i8**, depending on the system). Note that Toolkit immediately locates the method routine (unlike input field methods and list methods, which aren't located until they need to be called).
- ▶ If you omit *method* from an *event\_method\_pair* (any but a D\_METH\_LIBRARY pair), Toolkit resets the method pair, so that no method is associated with the specified event.
- ▶ To enable the application to be closed with the System menu, the close box, or ALT+F4, you must either specify an application close method (D\_METH\_APPCLOSE) or use E\_STATE to set the D\_INTR state to allow interrupt characters.
- ▶ If a century method (D\_METH\_CENTURY) is not specified, the default century is the current century.

Note the following for D\_METH\_LIBRARY and *library*:

- ▶ *Library* is passed on to %XADDR as the *elb* argument, which means that on Windows and UNIX you can use an environment variable to specify the path—for example, “**ELB\_DIR:elb\_name**”. On OpenVMS, however, *library* can be either the filename of a shared image located in SYS\$SHARE or a logical name that refers to a shared image, which may reside anywhere (so if *library* consists of a path and a name, similar to the example above, the path is ignored). For more information, see %XADDR in the “System-Supplied Subroutines and Functions” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ A *library* specification applies only to methods specified by name after the *library* specification in the same E\_METHOD call. (*Library* is not used to look up *method* arguments passed as addresses, which represent routines that have already been located.) If there's more than one *library* setting in a call, each one affects only the methods specified between it and the next *library* setting.
- ▶ If you don't pass D\_METH\_LIBRARY, Toolkit uses the default mechanism for finding methods: it selects the first method it finds with the correct name in the program image or in a previously opened ELB or shared image.
- ▶ If you pass D\_METH\_LIBRARY without passing *library*, Toolkit returns to the default mechanism (described above) for finding methods for subsequently specified event method pairs. (In other words, it ignores previously specified D\_METH\_LIBRARY pairs.)

### See also

- ▶ [“The Environment Methods” on page 7-49.](#)
- ▶ [Chapter 2, “Script,”](#) for information on Script compilation errors.
- ▶ [“Appendix D: Methods”.](#)

## Examples

The following example registers “ap\_close” as the application close method. Because no library is specified, Toolkit will look for that routine in the program image or in a previously opened ELB.

```
xcall e_method(D_METH_APPCLOSE, "ap_close")
```

The next example specifies the method by passing its address.

```
xcall e_method(D_METH_APPCLOSE, %xaddr("ap_close"))
```

The following example registers “mydspfld” as the user field display method subroutine. This subroutine is to be found in the **userlib.elb** executable library.

```
xcall e_method(D_METH_LIBRARY, "userlib.elb", D_METH_DSPFLD, "mydspfld")
```

## E\_SECT – Place text into a section of the display screen



```
xcall E_SECT(text[, text_flag, ...])
```

### Arguments

*text*

Text to display. (**a**)

*text\_flag*

(optional) One or more of the following text flags: (**n**)

|                                             |                                                     |
|---------------------------------------------|-----------------------------------------------------|
| <b>D_HEADER</b>                             | Reference the header section.                       |
| <b>D_CAPTION</b>                            | Reference a Microsoft Windows caption.              |
| <b>D_FOOTER</b>                             | Reference the footer section.                       |
| <b>D_INFO</b>                               | Reference the information line. (default)           |
| <b>D_POSITION</b> , <i>row</i> , <i>col</i> | Specify the text's position.                        |
| <i>row</i>                                  | The row position.                                   |
| <i>col</i>                                  | The column position.                                |
| <b>D_NOCLEAR</b>                            | Don't clear the line of text.                       |
| <b>D_CLEAR</b>                              | Clear entire line of text. (default)                |
| <b>D_CLREOL</b>                             | Clear to end of line.                               |
| <b>D_CLRBOL</b>                             | Clear to beginning of line.                         |
| <b>D_DISPLAY</b>                            | Display after last text. (default)                  |
| <b>D_LEFT</b>                               | Left-justify the text.                              |
| <b>D_CENTER</b>                             | Center the text.                                    |
| <b>D_RIGHT</b>                              | Right-justify the text.                             |
| <b>D_VLINE</b>                              | Convert "i" characters to vertical lines. (default) |
| <b>D_NOVLINE</b>                            | Don't convert "i" characters to vertical lines.     |



## Discussion

The `E_SECT` subroutine places text into the various display screen sections (header, footer, and information line) in the current environment.

The *text* argument contains the text that will be displayed in one of the screen sections. The *text\_flag* arguments define where and how that text will be displayed. You can have a maximum of six *text\_flag* arguments.

### WIN

In a Windows environment, if your header section is exactly one line in size, the application's window caption is used to display the header. Use `D_HEADER` or `D_CAPTION` to set or modify the header text. For compatibility between all environments, we recommend that you always use `D_HEADER`. The maximum visible length of header or caption text is 78 characters.

If your header section is more than one line in size, an area below the application's window caption will be used for displaying the header. Use `D_HEADER` to access this area. Use `D_CAPTION` to set and modify an additional line of text in the application's window caption. The Windows theme in use determines the location of the title; Toolkit settings for titles are ignored on Windows.

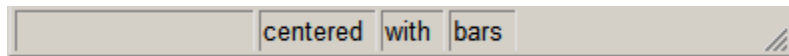
Microsoft Windows-style status bars are used for the information line and footer in the application window. These status bars are created outside the client area, allowing more space for your application. The information line and footer float with the bottom of the application window when the window is resized. Only one-line footers are supported.

The `D_LEFT`, `D_RIGHT`, and `D_CENTER` options divide the status bar into sections and specify the justification for text. Text is justified according to the option, but the status bar is divided differently depending on whether the text includes vertical bars and the `D_VLINE` option is set:

- If the `D_VLINE` option is set each section whose text contains vertical bars is divided with borders that are close to the left side of text. For example,

```
e_sect("centered|with|bars", D_INFO, D_CENTER, D_CLEAR)
```

will result in a status line with something like the following:



- If the `D_VLINE` option is not set or the text does not contain vertical bars, the status bar is generally divided evenly in half or thirds if you specify two or all three of these options.

The information line is loaded by default if `D_HEADER`, `D_CAPTION` or `D_FOOTER` is not specified.

The `D_POSITION` argument redefines the current position of the text by specifying the section row and column where the text should begin. This redefinition occurs before any clearing or justification. The default display position (`D_DISPLAY`) for the section text is after the last text placed into that section.

After positioning, the routine takes care of clearing the text. The entire line of text is cleared if none of the clearing function codes (D\_NOCLEAR, D\_CLEAR, D\_CLREOL, or D\_CLRBOL) are specified.

Justification occurs next. If D\_LEFT, D\_CENTER, or D\_RIGHT is not specified, the text is displayed at the current display position (D\_DISPLAY).

Next, if D\_NOVLINE is not passed, “i” characters will be converted to vertical lines.

Finally, the routine outputs text at the current position and updates the current position. The text is displayed in the current default rendition for the specified screen section.

If you attempt to place text in a section that does not exist (because it was not defined at the U\_START call), a fatal error occurs.

## Examples

The following example displays the quoted text at the left side of the information line (if there was no prior display to the information line). The line is cleared to blanks and the “i” character is converted to a vertical line.

```
xcall e_sect("RETURN to continue|^Z to exit")
```

This example centers the contents of **nam(i:j)** in the second line of the header section. The line is cleared to blanks and the “i” character is converted to a vertical line if it occurs in **nam**.

```
xcall e_sect(nam(i:j), D_HEADER, D_CENTER, D_POSITION, 2, 1)
```

The next example places the contents of **pagnm** at display row 2 and column 60 of the footer section. The line that will contain the text is not cleared, and any “i” characters are converted to vertical lines.

```
xcall e_sect(pagnm, D_FOOTER, D_NOCLEAR, D_POSITION, 2, 60)
```

The following example changes the Windows environment application caption to “Accounts Receivable” whether or not the caption is being used for the header section. This statement would be ignored in all other environments.

```
xcall e_sect("Accounts Receivable", D_CAPTION)
```

## E\_STATE – Modify the state of the current environment



```
xcall E_STATE([state, ...])
```

### Arguments

*state*

(optional) One or more of the following codes. The meaning of each is dependent on the preceding arguments. (**n**)

|                     |                                                                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_ON</b>         | Turn on (set) options. (default)                                                                                                                                                                            |
| <b>D_OFF</b>        | Turn off (reset) options.                                                                                                                                                                                   |
| <b>D_CBADVANCE</b>  | Advance context for combo boxes.                                                                                                                                                                            |
| <b>D_CURSOR</b>     | Display a screen cursor.                                                                                                                                                                                    |
| <b>D_ECHO</b>       | Echo terminal input.                                                                                                                                                                                        |
| <b>D_EURO</b>       | Allow European formatting conventions.                                                                                                                                                                      |
| <b>D_INPPRCRND</b>  | Apply the Input Field Processing or Read-Only Input Field Processing renditions to the field that has focus during input processing.                                                                        |
| <b>D_INPRNDOVER</b> | Override field-level rendition settings (color and attribute settings) with Input Field Processing or Read-Only Input Field Processing renditions. (D_INPPRCRND must also be set to D_ON for this to work.) |
| <b>D_INTR</b>       | Allow interrupt characters.                                                                                                                                                                                 |
| <b>D_LOCKWAIT</b>   | Wait for locked records.                                                                                                                                                                                    |
| <b>D_LOWER</b>      | Allow lowercase terminal input.                                                                                                                                                                             |
| <b>D_MSGWAIT</b>    | Wait for messages.                                                                                                                                                                                          |
| <b>D_RETURNBTN</b>  | RETURN (ENTER) key simulates a key press of the default button.                                                                                                                                             |
| <b>D_VALSTCHG</b>   | Validate immediately on a state change of certain field types.                                                                                                                                              |

### Discussion

The E\_STATE subroutine sets or modifies the following states or behavior for the current environment:

- ▶ Synergy DBL FLAGS subroutine states
- ▶ Synergy DBL DFLAG subroutine states
- ▶ Synergy low-level window system states
- ▶ UI Toolkit behavior

The D\_ON and D\_OFF codes indicate whether the codes that follow in the argument list are to be turned on or off. D\_ON is the default for any code that is passed as a *state* argument. (For example, if you pass D\_INPRNDOVER without passing D\_ON or D\_OFF, D\_INPRNDOVER is set to D\_ON, even though it is turned off by default.)

U\_START sets all environment states to their defaults. Use E\_STATE after calling U\_START to modify these states.

Codes D\_EURO, D\_LOWER, D\_ECHO, and D\_INTR refer to controls 1, 2, 5, and 8 of the FLAGS subroutine, respectively. The codes D\_MSGWAIT and D\_LOCKWAIT refer to controls 2 and 3 of the DFLAG subroutine, respectively. The D\_CURSOR code refers to the WP\_CURSOR function state of the W\_PROC subroutine.

---

## WIN

When D\_CBADVANCE is turned on, which it is by default, context will advance when the user selects an entry in a combo box by using its drop-down list. If the list is not dropped down, or if D\_CBADVANCE is turned off, the context will remain on that field. If a user presses ENTER or the TAB key while in a combo box (the field or the drop-down list), context is advanced to the next field regardless of the D\_CBADVANCE setting. If you always want the context to advance, regardless of how the user selects the item, you will need to handle this by using I\_NEXT.

If you disable interrupt characters using the following combination: D\_OFF, D\_INTR, the close box and the “Close” entry (in the Windows system menu), your Windows application will also be disabled. To provide true Windows look-and-feel in your application, you should *not* disable interrupt characters, and you should support an application close method that performs a clean shutdown of your application.

D\_RETURNBTN determines the behavior the RETURN (ENTER) key will have on Windows systems. It is ignored on UNIX and OpenVMS systems. If D\_RETURNBTN is set, pressing the RETURN (ENTER) key will simulate pressing the default button. The default button is visually indicated by a thicker border around the button. If the default button is not specified, it will be the first button in the tabbing order. In this case, when a window has no buttons but its tab set container does, the first button on the tab set is the default button. A tab set cannot have a default button when a list is on the current tab.

If a tab set container and its contained window both have buttons, the following rules are used to determine which button is the default:

- ▶ If only one, either the contained window or the tab set container, defines a default button, the specified button is the default button.
  - ▶ If neither the contained window nor the tab set container defines a default button, the first button on the contained window is the default button.
  - ▶ If both the contained object and the tab set container define a default button, the default button of the contained window is the default button.
-

When D\_INPPRCRND is set to D\_ON, Toolkit applies the Input Field Processing or Read-Only Input Field Processing renditions to the currently active input field during I\_INPUT or I\_INPFLD processing. When D\_INPPRCRND is set to D\_OFF, Toolkit does not change renditions for the active field. (By default, D\_INPPRCRND is set to D\_OFF on Windows and D\_ON on UNIX and OpenVMS.)

For information on renditions see [“Renditions” on page 18-28](#).

Note the following:

- ▶ To instruct Toolkit to override field-level rendition settings (.FIELD, I\_FLDMOD, and IB\_FIELD settings) with Input Field Processing renditions, set D\_INPRNDOVER and D\_INPPRCRND to D\_ON. By default, D\_INPRNDOVER is set to off, so field-level rendition settings override the Input Field Processing renditions.
- ▶ On Windows, D\_INPPRCRND does not affect screen updates caused by calls to W\_DISP. (So neither Input Field Processing nor Read-Only Input Field Processing renditions are used in this case.)

The D\_VALSTCHG code allows immediate validation of check boxes, radio buttons, and combo boxes. Immediate validation occurs when a check box is toggled, the selected entry of a group of radio buttons is changed or the selected item in a combo box is changed. Validation means that the entry will pass through any Toolkit tests as well as any change method specified, and, if it passes, the associated data area will be updated with the new contents and any break processing would then occur. Focus will remain on this field unless the change method or break processing forces a change of focus (for instance, by calling I\_NEXT) or D\_CBADVANCE is specified. Likewise, leave and arrive methods will not be invoked unless such a change of focus occurs.

To enable or disable this option *per* field, toggle the option in the field’s arrive method.

E\_STATE can have a total of 10 *state* arguments.

A special case occurs when you don’t pass any arguments to this subroutine. In this case, all environment states are assumed to be unknown, and they are set or reset according to the current environment level.

You must use this subroutine exclusively to manipulate the specified states. If you directly manipulate them in any other way, the states as they are “known” by the UI Toolkit environment may be incorrect.

The E\_STATE subroutine does not affect displays during input processing. (.FIELD controls the displays in this situation.) For example, during input processing, the echo state won’t be altered.

Any E\_STATE option can be set within private environments, and E\_EXIT will revert the option to the value defined in the previous environment level.

#### See also

- ▶ [E\\_METHOD](#) on page 7-38, [U\\_FINISH](#) on page 16-45, and [ECLOSE\\_METHOD](#) on page 7-63 for more information about shutdown operations in Windows environments.
- ▶ [FLAGS](#) and [DFLAG](#) in the “System-Supplied Subroutines and Functions” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ [W\\_PROC](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ [.BUTTON\\_SET](#) on page 2-19, [B\\_BUTTONSET](#) on page 5-15, [IB\\_BUTTONSET](#) on page 8-93, [L\\_BUTTONSET](#) on page 9-62, or [%TS\\_TABSET](#) on page 13-9 for specifying the default button.

#### Examples

This example disallows lowercase on terminal input and turns the screen cursor off.

```
xcall e_state(D_OFF, D_LOWER, D_CURSOR)
```

This example disables terminal interrupt characters (CTRL+C on most systems), turns the screen cursor on, and enables lowercase input.

```
xcall e_state(D_OFF, D_INTR, D_ON, D_CURSOR, D_LOWER)
```

## The Environment Methods

This section contains specification pages for environment method subroutines. These method subroutines are written by you, and their names specified as arguments to `E_METHOD`. UI Toolkit then calls them at the appropriate time.

Method subroutines are important in applications that will run in a Windows environment.

## %EAPPMOVE\_METHOD – Perform application move processing

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
function EAPPMOVE_METHOD, ^val
    a_x          , n
    a_y          , n
```

### Return value

This function should return true (1), so that other return values may be used in the future. **(n)**

### Arguments

*a\_x*

The pixel position in the x-direction. **(n)**

*a\_y*

The pixel position in the y-direction. **(n)**

### Discussion

%EAPPMOVE\_METHOD is a function that you write *and name*. The name of your function is registered with UI Toolkit using the E\_METHOD subroutine.

UI Toolkit calls your %EAPPMOVE\_METHOD function when the application window is moved.

The pixel coordinates *a\_x* and *a\_y* correspond to the position of the upper-left corner of the application window's frame, relative to the entire screen.

Because Toolkit invokes this function as a direct callback, the code in this function should be kept to a minimum, and operations that could conflict with concurrent processing avoided. For example, any action causing the rebuilding of an input set (such as I\_SETDEL) must be avoided because this would give the user the opportunity to create a fatal error condition in I\_INPUT. Instead, use %M\_SIGNAL to synchronize processing for all such cases.

### See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this function.
- ▶ [“Appendix D: Methods”](#).



## %EAPPSIZE\_METHOD – Perform application resize processing

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
function EAPPSIZE_METHOD, ^val
    a_columns      , n
    a_rows         , n
    a_width        , n
    a_height       , n
```

### Return value

This function should return true (1), so that other return values may be used in the future. (n)

### Arguments

*a\_columns*

The number of columns visible in the application window. (n)

*a\_rows*

The number of rows visible in the application window. (n)

*a\_width*

The number of horizontal pixels visible in the application window. (n)

*a\_height*

The number of vertical pixels visible in the application window. (n)

### Discussion

%EAPPSIZE\_METHOD is a function that you write *and name*. The name of your function is registered with UI Toolkit using the E\_METHOD subroutine.

UI Toolkit calls your %EAPPSIZE\_METHOD function when the application window is resized.

*A\_columns* and *a\_rows* specify the visible area in the application window. Note that this could be different from the value returned by %W\_INFO(WIF\_SCOLS), which returns the logical size of the application window.

*A\_width* and *a\_height* report the size *inside* the application window's client area. This does not include the size of the frame, caption bar, menu bar, toolbars, information line, nor footer.

Because Toolkit invokes this function as a direct callback, the code in this function should be kept to a minimum, and operations that could conflict with concurrent processing avoided. For example, any action causing the rebuilding of an input set (such as I\_SETDEL) must be avoided because this would give the user the opportunity to create a fatal error condition in I\_INPUT. Instead, use %M\_SIGNAL to synchronize processing for all such cases.

## Environment Routines

%EAPPSIZE\_METHOD

### See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this function.
- ▶ [“Appendix D: Methods”](#).

## %EAPPSTATE\_METHOD – Perform application state processing

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
function EAPPSTATE_METHOD, ^val
    a_state      , n
```

### Return value

This function should return true (1), so that other return values may be used in the future. (n)

### Arguments

*a\_state*

One of the following states defined in **tools.def**: (n)

|                      |                       |
|----------------------|-----------------------|
| <b>WPS_NORMAL</b>    | Window was restored.  |
| <b>WPS_MINIMIZED</b> | Window was minimized. |
| <b>WPS_MAXIMIZED</b> | Window was maximized. |
| <b>WPS_HIDDEN</b>    | Window was hidden.    |

### Discussion

%EAPPSTATE\_METHOD is a function that you write *and name*. The name of your function is registered with UI Toolkit using the E\_METHOD subroutine.

UI Toolkit calls your %EAPPSTATE\_METHOD function when the state of the application window changes.

Because Toolkit invokes this function as a direct callback, the code in this function should be kept to a minimum, and operations that could conflict with concurrent processing avoided. For example, any action causing the rebuilding of an input set (such as I\_SETDEL) must be avoided because this would give the user the opportunity to create a fatal error condition in I\_INPUT. Instead, use %M\_SIGNAL to synchronize processing for all such cases.

### See also

- ▶ “Overloading a Toolkit routine” on page 18-8 for more information on creating this function.
- ▶ “Appendix D: Methods”.

### %ECENTURY\_METHOD – Perform century processing



```
function ECENTURY_METHOD, ^val
    a_data      , a
    a_type      , n
    a_today     , n
    a_year      , n
    a_month     , n
    a_day       , n
```

#### Return value

%ECENTURY\_METHOD returns the two-digit century to use by default (for example, 19 or 20). (**n**)

#### Arguments

*a\_data*

The data being decoded. (**a**)

*a\_type*

One of the following: (**n**)

**D\_DATE\_Y2P**      Date, format YYPP.

**D\_DATE\_Y2J**      Date, format YYJJ.

**D\_DATE\_Y2MD**     Date, format YYMMDD.

**D\_DATE\_Y4P**      Date, format YYYYPP.

**D\_DATE\_Y4J**      Date, format YYYYJJ.

**D\_DATE\_Y4MD**     Date, format YYYYMMDD.

*a\_today*

The default to today flag. (**n**)

*a\_year*

The two-digit year entered. (**n**)

*a\_month*

The month entered. (**n**)

*a\_day*

The day entered. (**n**)

## Discussion

%ECENTURY\_METHOD is a function that you write *and name*. The name of your function is registered with UI Toolkit using the E\_METHOD subroutine. Your %ECENTURY\_METHOD function must be declared as a ^VAL function.

%ECENTURY\_METHOD is called whenever UI Toolkit needs to supply a default century.

You will never call %ECENTURY\_METHOD directly; it is called only by UI Toolkit.

A\_data is the string passed to U\_DCDDAT. For input processing, a\_data is the string typed in by the user.

A\_type is one of the definitions defined in **tools.def**.

If a\_today is true, the date defaults to today's date.

A\_year, a\_month, and a\_day are the decoded year, month, and day entered. Note that a\_year is a two-digit year.

## See also

- ▶ [SYNCENTURY](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for more information about defining a sliding window used to determine the default century.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this function.
- ▶ [“Appendix D: Methods”](#).

## Examples

The following example shows the default century method behavior when SYNCENTURY is used.

```
function mycentury,^val, reentrant
;
; Description: Century method implementing SYNCENTURY behavior
;
; Arguments:
    a_data          ,a      ;The date as entered
    a_type          ,n      ;The type of date field
    a_today         ,n      ;The "default to today" flag
    a_year          ,n      ;The two-digit year parsed from input
    a_month         ,n      ;The month parsed
    a_day           ,n      ;The day parsed

; Return value:
;     The two-digit century
;
```

## Environment Routines

### %ECENTURY\_METHOD

```
.align
stack record
    length            ,i4      ;Length of contents of SYNCENTURY
                                ; logical
    syncentury        ,d2      ;Value contained in SYNCENTURY
    first_century      ,d2      ;First of the two centuries in our
                                ; sliding range
    group todays_ds    ,a20     ;%datetime
    group today        ,d8      ;The date portion thereof
    group yyyy         ,d4      ;The year out of that
    cc                ,d2      ;The century part
    yy                ,d2      ;The year (non-century)
    endgroup
    mm                ,d2      ;The month
    dd                ,d2      ;The day
    endgroup
endgroup
string                ,a80     ;String buffer for SYNCENTURY contents

proc
    todays_ds = %datetime      ;Load the current date to get the year
                                ;Is SYNCENTURY defined?
    xcall getlog("SYNCENTURY", string, length)
    if (length) then          ;Yes, use it
        begin
            onerror ($ERR_DIGIT) nosyncentury ;Catch conversion errors
            syncentury = string ;Convert from alpha to numeric
        end
    else                      ;No, SYNCENTURY is not defined
        begin                ; or is defined non-numeric
    nosyncentury,
        clear syncentury      ;Default to zero
        end
    offerror

    if (yy .ge. syncentury) then ;Are we on or after SYNCENTURY?
        first_century = cc      ;Yes, later numbers are in this
                                ; century
    else
        first_century = cc - 1  ;No, later numbers are in
                                ; previous century

    if (a_year .ge. syncentury) ;Entered a year on or after?
        freturn first_century  ;Yes, return the earlier century

        freturn (first_century + 1) ;No, return the later century
endfunction
```

## ECHKFLD\_METHOD – Perform user field validation



```
subroutine ECHKFLD_METHOD
  a_input      , a
  a_type       , a
  a_text       , a
  a_status     , n
  a_inpinfo    , a
```

### Arguments

*a\_input*

The contents of the input field. **(a)**

*a\_type*

The *user\_type* string specified in the .FIELD USER qualifier. **(a)**

*a\_text*

(optional) The *user\_text* string specified in the .FIELD USER qualifier. **(a)**

*a\_status*

Must be returned with a value of zero if the input is valid, and with a non-zero value if the input is invalid. Refer to **tools.def** for the list of valid return values. **(n)**

*a\_inpinfo*

The structure of input information. **(a)**

### Discussion

ECHKFLD\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine.



We recommend using an input field change method (%ICHANGE\_METHOD) instead of ECHKFLD\_METHOD. Unlike ECHKFLD\_METHOD, your %ICHANGE\_METHOD adds to Toolkit functionality rather than replaces it. %ICHANGE\_METHOD also provides access to the structure defined in **inpinf.def** and to the 20 optional arguments passed to I\_INPUT and L\_INPUT. See [page 8-122](#) for more information on %ICHANGE\_METHOD.

The UI Toolkit input routine calls your ECHKFLD\_METHOD subroutine to validate the contents of the current input field. It is only called if the field definition uses the *user\_type* argument from the .FIELD USER qualifier.

You will never call ECHKFLD\_METHOD directly; it is called only by UI Toolkit.

This subroutine replaces the default field validation that Toolkit does for the current field.

Note that the length of the text passed in *a\_input* is defined by the input length for the field. It is not limited by either the display length or the view length.

If *a\_status* is returned non-zero, UI Toolkit will display the appropriate error message. (See ECHKFLD\_METHOD section of the **tools.def** file for the error flags.) If you return an *a\_status* value of D\_EMITTEDERR, no error message will be emitted, but input will be performed again for the field. This assumes that you have emitted any appropriate messages from within ECHKFLD\_METHOD.

The **inpinf.def** file defines *a\_inpinf*. See [page 8-118](#) for information.

S/DE Repository allows you to specify a subtype (or class) for user-defined fields. The default subtype is alpha, but you can optionally specify numeric or date. To access this subtype within the Toolkit user-defined processing routines, use the window ID and field number contained within the **inputinfo** structure (the *a\_inpinf* argument). Pass these two values to the I\_FLDINF subroutine to retrieve the **gs\_inpfld** structure (the *controls* argument) which contains the **gs\_class** (user subtype) value. For user-defined *alpha* fields; **gs\_class** = 0; for user-defined *numeric* fields, **gs\_class** = 1; for user-defined *date* fields, **gs\_class** = 2.

If ECHKFLD\_METHOD doesn't exist, your code will still run but UI Toolkit will not check whether the data entered by the user meets any user-defined criteria.

The ECHKFLD\_METHOD subroutine works together with the EDSPFLD\_METHOD and EEDTDSP\_METHOD subroutines (which you write also). See [page 7-68](#) for more information on the steps that occur when a user-defined field is displayed, edited, and validated. If you have both *Exxx\_METHODs* and an %ICHANGE\_METHOD specified, the %ICHANGE\_METHOD will be called after the *Exxx\_METHODs* for the user-defined field.

Be sure that you write ECHKFLD\_METHOD in such a way that it returns the validated data in storage format. EDSPFLD\_METHOD, which is called by ECHKFLD\_METHOD, needs the data in proper storage format to display the data correctly.

The following is a sample window script for both the following example and the example for the EDSPFLD\_METHOD subroutine:

```
.input window, 1, 17
.placement 5, 29
.title " Zip Test "
.field zip, a10, pos(1, 2), prompt("Zip   "), -
  user(, "TYP_ZIPCODE"), uc
.end
```

### See also

- ▶ “Overloading a Toolkit routine” on [page 18-8](#) for more information on creating this subroutine.
- ▶ “Appendix D: Methods”.



## Examples

This following example validates a ZIP Code field. It checks the length of the input.

If the length is either five or nine digits, the ZIP Code is a U.S. code. If the length is six characters, the ZIP Code is Canadian format. The routine verifies that U.S. ZIP Codes contain only numbers.

If the ZIP Code contains any errors, the subroutine sets the *a\_status* return variable to D\_EMITTEDERR (a non-zero value). This tells the UI Toolkit input routine that the input is invalid and needs to be re-entered. When the subroutine verifies that the input is valid, it returns a value of zero in *a\_status*. This tells the UI Toolkit input routine that the input is valid and to call EDSPFLD\_METHOD to display the data.

```
subroutine echkfld_method
    a_input    ,a      ;Characters input by user
    a_type     ,a      ;User-defined designation of this field
    a_text     ,a      ;Optional user string associated with this field
    a_status   ,n      ;Returned with zero if input valid
    a_inpinfo  ,a      ;Input information

    .include "WND:tools.def"

record
    len        ,i4
    num        ,i4

proc
    clear a_status      ;Assume valid at outset
    case (a_type) of
        begin
            "TYP_ZIPCODE":      ;Accept either 5 or 9 digits only
                begin
                    len = %trim(a_input)
                    if (len.eq.1 .and. a_input.eq." ")
                        len = 0 ;(Trim returns 1 if all blanks)
                    if (len.eq.5 .or. len.eq.9) then
                        begin
                            onerror bad_digit
                            num = a_input
                            offerror
                            a_input = num,"xxxxxxxxx"
                            exit
                        bad_digit,
                            xcall u_message("Only 5 or 9 digits are valid", D_ERROR)
                            a_status = D_EMITTEDERR
                        end
                    else if (len.eq.6)then                ;Canadian ZIP Code format
                        nop                                ;All characters valid, do nothing
                    else if (len.ne.0)                    ;Ignore empty field
```

```

        begin
            xcall u_message("Invalid U.S. or Canadian zip", D_ERROR)
            a_status = D_EMITTEDERR
        end
    end
;Enter code of other user-types here
endcase
xreturn
endsubroutine

```

The first example subroutine would work in conjunction with the EDSPFLD\_METHOD and EEDTDSP\_METHOD example subroutines (shown on [page 7-66](#) and [page 7-71](#), respectively).

The next example comprehensively shows how you can use ECHKFLD\_METHOD and EDSPFLD\_METHOD to handle user-defined field types:

```

; Description:  Routines for handling user-defined field types
;
; Reprinted by permission of BancTec, Inc.
;
; Routines:
;
;     ECHKFLD_METHOD - Validation of user-defined types
;     EDSPFLD_METHOD - Display and storage of user-defined types
;
subroutine ECHKFLD_METHOD
;
; Description: Validate user-defined data types
;
; Arguments:
;
;     a_input      ,a      ;Text as input
;
;     a_type       ,a      ;User-defined data type
;
;     a_text       ,a      ;User text for field
;
;     a_status     ,n      ;Returned status
;
;     a_inpinfo    ,a      ;Input information

.include "WND:tools.def"

.align
record
    sts            ,i4      ;Decoding status
    yr             ,i4
    mo             ,i4
    da             ,i4

```

```

proc
  case a_type of
    begin
      case
        "MDYDATE ":call mdydate
      endcase
    else
      begin
        xcall u_message("Unrecognized user type "+a_type)
      end
    end
  xreturn
;
; Description: Handle MM/DD/YY date format
;
mdydate,
  xcall u_dcddat(sts, a_input, 3,, yr, mo, da)
  if (sts) then
    a_status = D_DATERR
  else
    begin
      clear a_status
      a_input = %string(mo, "XX")+%string(da, "XX")
        &               +%string(yr, "XX")
    end
  end
  return
endsubroutine

subroutine EDSPFLD_METHOD
;
; Description: Handle display and storage of user-defined data types
;
; Arguments:
;
  a_input      ,a           ;Contents of field

  a_type       ,a           ;User-defined type

  a_text       ,a           ;User text

  a_window     ,n           ;Input window ID

  a_fldnm      ,n           ;Display field number

  a_dest       ,a           ;Destination (optional)

  a_attr       ,n           ;Display attribute

```

## Environment Routines

### ECHKFLD\_METHOD

```
        a_color      ,n           ;Display color

        a_inpinfo    ,a           ;Input information
;
.include "WND:tools.def"
.include "WND:windows.def"
;
record
    group yymmdd      ,d
        yy           ,d2
        mm           ,d2
        dd           ,d2
    endgroup
    buf              ,a8
;
proc
    case a_type of
        begincase
            "MDYDATE ":call mdydate
        endcase
    else
        begin
            xcall u_message("Unrecognized user type "+a_type)
        end
    xreturn
;
; Description: Display and store MM/DD/YY dates
;
mdydate,
    yy = a_input(5:2)
    mm = a_input(1:2)
    dd = a_input(3:2)
    xcall u_fmtat(3, buf, yy, mm, dd)
    xcall w_flds(a_window, WF_PUT, a_fldnm, buf, WF_ATTR,
        & a_fldnm, a_attr, WF_COLOR, a_fldnm, a_color)
    if (^passed(a_dest))
        a_dest(1:6) = a_input           ;Note: (1:6) to avoid clobbering
                                         ;following fields. Defined as d8, but
                                         ;stored as d6.

    return
endsubroutine
```

## ECLOSE\_METHOD – Perform application close processing

|    |    |   |   |
|----|----|---|---|
| WT | WN | U | V |
|----|----|---|---|

```
subroutine ECLOSE_METHOD
  a_noclr      , n
  a_cancel     , n
  a_type       , n
```

### Arguments

*a\_noclr*

Returned with any *no\_clear* flag passed to U\_FINISH. (n)

*a\_cancel*

(optional) The cancel shutdown flag which is passed to U\_FINISH. (n)

*a\_type*

The flag defining the type of shutdown in progress: (n)

- 0** U\_FINISH was called directly.
- 1** The user is closing the application.
- 2** An interrupt (^C) was received.

### Discussion

ECLOSE\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine.

UI Toolkit calls your ECLOSE\_METHOD subroutine to allow customized shutdown processing for your application. On Windows, ECLOSE\_METHOD is called when

- ▶ U\_FINISH is called.
- ▶ the user closes the application using the System menu, close box, or Close menu entry. (This is applicable only if you have previously called U\_START and interrupt is enabled.)

On UNIX and OpenVMS, ECLOSE\_METHOD is invoked only when U\_FINISH is called (so *a\_type* is always 0 on these platforms).

If *a\_cancel* is passed, this method can set it to true to cancel application shutdown if you passed the cancel argument to U\_FINISH.

## See also

- ▶ [E\\_METHOD on page 7-38](#) for registering your ECLOSE\_METHOD with the environment.
- ▶ [E\\_STATE on page 7-45](#) for more information on enabling interrupt characters.
- ▶ [U\\_FINISH on page 16-45](#) for more information about managing your application's shutdown procedures.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).

## Examples

The following method would have to be registered in the transaction routine's environment.

```
subroutine trx_close
;
; Description: Close method for transaction entry
;
; Arguments:
;
;         a_noclr      ,n      ;"No clear" option for U_FINISH
;
;         a_cancel     ,n      ;(Optional) cancel shutdown flag
;
;         a_type       ,n      ;Type of shutdown:
;                               ; 1 = Close
;                               ; 2 = Interrupt

.include "trxgbls.def"      ;Global fields (g_changes, etc.)
;
.align
record
;
;         style        ,i4      ;Message box style
proc
;
;         if (g_changes)      ;Are there unsaved changes
;                               ; to the transactions?
;
;         begin
;             if (^passed(a_cancel)) then          ;Can we cancel
;                                                     ; shutdown?
;                 style = D_MYESNOCANCEL           ;Yes, include
;                                                     ; cancel button
;
;             else
;                 style = D_MYESNO                  ;No, only allow
;                                                     ; yes/no
;                 style = style + D_MICONEXCLAM     ;Put an exclamation
;                                                     ; icon on
```

```

        using %u_msgbox("Save changes to transactions?",
&                style) select
        (D_MIDYES),    call save                ;Save the transactions
        (D_MIDNO),    nop                    ;No action required
        (D_MIDCANCEL),a_cancel = TRUE        ;Cancel shutdown
        endusing
    end
xreturn

save,
    ;Insert code here to save all changes to
    ; transaction file
    return
endsubroutine

```

The following code shows how you would use E\_METHOD to register this method:

```

proc
    xcall e_enter
    xcall e_method(D_METH_APPCLOSE, "trx_close")
    .
    .
    .
    xcall e_exit
    xreturn
.end

```

## EDSPFLD\_METHOD – Perform user field display



```

subroutine EDSPFLD_METHOD
  a_input      , a
  a_type       , a
  a_text       , a
  a_window     , n
  a_fldnum     , n
  a_dest       , a
  a_attr       , n
  a_color      , n
  a_inpinfo    , a

```

### Arguments

*a\_input*

The contents of the input field. **(a)**

*a\_type*

The *user\_type* string specified in the .FIELD USER qualifier. **(a)**

*a\_text*

(optional) The *user\_text* string specified in the .FIELD USER qualifier. **(a)**

*a\_window*

The ID of the input window being processed. **(n)**

*a\_fldnum*

Contains the internal field number of the current display field. **(n)**

*a\_dest*

(optional) The data area in which to store the displayed data. If it is present, EDSPFLD\_METHOD must load *a\_dest* in storage format. **(a)**

*a\_attr*

The attribute to apply to the display. **(n)**

*a\_color*

The color to apply to the display. **(n)**

*a\_inpinfo*

The structure of input information. **(a)**



## Discussion

EDSPFLD\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine.



Note the following:

- ▶ We recommend using an input field display method (%IDISPLAY\_METHOD) instead of EDSPFLD\_METHOD. Unlike EDSPFLD\_METHOD, your %IDISPLAY\_METHOD adds to Toolkit functionality rather than replaces it. %IDISPLAY\_METHOD also provides access to the structure defined in **inpinf.def** and to the 20 optional arguments passed to I\_INPUT and L\_INPUT. See [page 8-126](#) for more information on %IDISPLAY\_METHOD.
- ▶ EDSPFLD\_METHOD cannot populate a field that has a view length that's shorter than the display length.

The UI Toolkit input subroutine calls your EDSPFLD\_METHOD subroutine to display the contents of the current input field. It is also called after the ECHKFLD\_METHOD subroutine validates the user-defined input to display the validated data in the specified format. It is only called if the field definition uses the *user\_type* argument in the .FIELD USER qualifier.

You will never call EDSPFLD\_METHOD directly; it is called only by UI Toolkit.

The **inpinf.def** file defines *a\_inpinfo*. See [page 8-118](#) for information.

S/DE Repository enables you to specify a subtype (or class) for user-defined fields. The default subtype is alpha, but you can also specify numeric or date. To access this subtype within the Toolkit user-defined processing routines, use the window ID and field number contained within the **inputinfo** structure (the *a\_inpinfo* argument). Pass these two values to the I\_FLDINF subroutine to retrieve the **gs\_inpfld** structure (the *controls* argument) which contains the **gs\_class** (user subtype) value. For user-defined *alpha* fields, **gs\_class** = 0; for user-defined *numeric* fields, **gs\_class** = 1; for user-defined *date* fields, **gs\_class** = 2.

To display the user-defined input in a special format, you must call the Synergy DBL subroutine W\_FLDS. The subroutine call can look like this:

```
xcall w_flds(a_window, WF_PUT, a_fldnum, display_text, WF_ATTR, a_fldnum,
&          a_attr, WF_COLOR, a_fldnum, a_color)
```

*display\_text*

The specially formatted input to display in the input field. (a)

EDSPFLD\_METHOD works in conjunction with the ECHKFLD\_METHOD and EEDTDSP\_METHOD subroutines. The following steps occur for a user-defined field:

1. When your program calls I\_DISPLAY or I\_DSPFLD, UI Toolkit also calls EDSPFLD\_METHOD and passes it the field's data in the format it was stored. EDSPFLD\_METHOD displays the data in the field with the formatting you have specified in the EDSPFLD\_METHOD subroutine.

For example, if you have written EDSPFLD\_METHOD so that it formats all case "A" numbers with a dollar sign and a decimal point, it will display \$350.00 when passed the stored data "350A."

2. When the user selects the field for editing, UI Toolkit calls EEDTDSP\_METHOD and passes it the data in storage format. The supplied EEDTDSP\_METHOD displays the editable data in the stored format. If you want the editable data to display differently, you must write your own version of EEDTDSP\_METHOD.

For example, once the user has selected the "350A" data for editing, your EEDTDSP\_METHOD might re-display the data as "350." If you used the supplied version of EEDTDSP\_METHOD, the editable data would display as "350A."

3. After the user edits the data, UI Toolkit calls ECHKFLD\_METHOD to validate the new data, determining if it meets all of your specified criteria. If ECHKFLD\_METHOD validates the data, EDSPFLD\_METHOD is called again to display the new data including the proper formatting.

If the user has changed "350" to "150," ECHKFLD\_METHOD is called and checks to make sure "150" is an acceptable entry for that field. If it is, EDSPFLD\_METHOD displays "\$150.00" in the field.

### See also

- ▶ [I\\_DISPLAY on page 8-14](#) for more information on specifying a display method for an input field.
- ▶ ["Overloading a Toolkit routine" on page 18-8](#) for more information on creating this subroutine.
- ▶ ["Appendix D: Methods"](#).

### Examples

The following ZIP Code program puts a space between the numbers in a Canadian postal code (for example, **1G3 234**) and inserts a hyphen in nine-digit U.S. ZIP Codes. To get this space, EDSPFLD\_METHOD has to manipulate the input (**1G3234**) and then call Synergy DBL routines to display the data. It then passes the displayed result into the *a\_dest* argument.

This example subroutine will work in conjunction with the ECHKFLD\_METHOD and EEDTDSP\_METHOD example subroutines (shown on [page 7-57](#) and [page 7-71](#), respectively).

See the Discussion for ECHKFLD\_METHOD on [page 7-57](#) for a sample window script that corresponds with this example.

The ECHKFLD\_METHOD section's second example also comprehensively shows how ECHKFLD\_METHOD and EDSPFLD\_METHOD can be used together to handle user-defined field types.

```
subroutine edspfld_method
    a_buf      ,a      ;Characters input by user
    a_typ      ,a      ;User-defined designation of this field
    a_usr      ,a      ;Optional user string associated with this field
    a_inpid    ,n      ;Window ID
    a_fld      ,n      ;Window field number
    a_dest     ,a      ;Optional destination area in storage record.
                        ; If present, this routine must fill with the
                        ; storage representation.
    a_attr     ,n      ;Attribute for display
    a_color    ,n      ;Color for display
    a_inpinfo  ,a      ;Input information

    .include "WND:tools.def"
    .include "WND:windows.def"

record
    dsptxt     ,a20
    dsp10      ,a10    @dsptxt
    dspcz1     ,a3      @dsptxt
    dspczd     ,a1      @dspcz1+3
    dspcz2     ,a3      @dspczd+1
    numzip     ,d9
    firstfour  ,d4      @numzip
    canzip     ,a6
    canz1      ,a3      @canzip
    canz2      ,a3      @canz1+3

proc
    clear numzip, canzip, dsptxt
    case (a_typ) of
        begincase

"TMP_ZIPCODE ":
        begin
            onerror (20) canadian      ;Assume numeric,
            numzip = a_buf              ; otherwise Canadian
            if (.not.firstfour) then   ;Either 5 or 9 digits
                begin
                    dsp10 = numzip(5:5), "XXXXX" [left]
                    numzip=numzip*10000
                end
            end
        end
    endcase
end
```

## Environment Routines

### EDSPFLD\_METHOD

```
        else
            dsp10 = numzip, "XXXXX-XXXX"
            if (^passed(a_dest))
                ^d(a_dest) = numzip
            if (FALSE)                                ;Enter here if error #20 from above
                begin
canadian,      canzip = a_buf                        ;Canadian ZIP Code
                dspcz1 = canz1                        ;Load first 3 characters
                dspcz2 = canz2                        ;Load second 3 characters
                if (^passed(a_dest))
                    a_dest = canzip
                end
            end
            end                                         ;Enter code for other user-types here
        endcase
        xcall w_flds(a_inpid, WF_PUT, a_fld, dsptxt, WF_ATTR,
&              a_fld, a_attr, WF_COLOR, a_fld, a_color)
        xreturn
endsubroutine
```

## EEDTDSP\_METHOD – Perform user field editing



```
subroutine EEDTDSP_METHOD
  a_data      , a
  a_type      , a
  a_text      , a
  a_edit      , a
  a_inpinfo   , a
```

### Arguments

*a\_data*

The data as stored in the field. **(a)**

*a\_type*

The *user\_type* string specified in the .FIELD USER qualifier. **(a)**

*a\_text*

(optional) The *user\_text* string specified in the .FIELD USER qualifier. **(a)**

*a\_edit*

The returned text to be edited. **(a)**

*a\_inpinfo*

The structure of input information. **(a)**

### Discussion

EEDTDSP\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine.



We recommend using an input field edit format method (%IEDITFMT\_METHOD) instead of EEDTESP\_METHOD. Unlike EEDTDSP\_METHOD, your %IEDITFMT\_METHOD adds to Toolkit functionality rather than replaces it. %IEDITFMT\_METHOD also provides access to the structure defined in **inpinf.def** and to the 20 optional arguments passed to I\_INPUT and L\_INPUT. See [page 8-132](#) for more information on %IEDITFMT\_METHOD.

The UI Toolkit input subroutine calls the EEDTDSP\_METHOD subroutine to display the editable contents of a user-type field differently than both the way it is stored and the way EDSPFLD\_METHOD displays it (with formatting). If an edit format method is specified for the input field (using %IEDITFMT\_METHOD), the edit format method is called after the EEDTDSP\_METHOD subroutine. Use EEDTDSP\_METHOD if you need the text of user-defined data type fields to display in another way than the way they are stored.

Note that the length of the text passed in *a\_edit* is defined by the input length for the field. It is not limited by either the display length or the view length.

You will never call EEDTDSP\_METHOD directly; it is called only by UI Toolkit.

The **inpinf.def** file defines *a\_inpinfo*. See [page 8-118](#) for information.

S/DE Repository allows you to specify a subtype (or class) for user-defined fields. The default subtype is alpha, but you can optionally specify numeric or date. To access this subtype within the Toolkit user-defined processing routines, use the window ID and field number contained within the **inputinfo** structure (the *a\_inpinfo* argument). Pass these two values to the **I\_FLDINF** subroutine to retrieve the **gs\_inpfld** structure (the *controls* argument) which contains the **gs\_class** (user subtype) value. For user-defined *alpha* fields; **gs\_class** = 0; for user-defined *numeric* fields, **gs\_class** = 1; for user-defined *date* fields, **gs\_class** = 2.

Although you can manage the display and validation of user-defined fields using **EDSPFLD\_METHOD** and **ECHKFLD\_METHOD**, when the field is edited (with the *E\_xxx* menu entries) the field is treated as alphanumeric. Thus if the storage form of the data differs from the manner in which it was entered, confusion can result. EEDTDSP\_METHOD can solve this problem.

Toolkit's default method is named **TKP\_EDTDSP** and is listed below:

```
subroutine tkp_edtdsp
;
; Description:
; Format the editable text for a user-defined data type
;
; Arguments:
;   a_data           ,a       ;Data as stored in the field
;   a_type           ,a       ;User-defined data type
;   a_text           ,a       ;(Optional) user text string
;   a_edit           ,a       ;Returned text to be edited
;   a_inpinfo        ,a       ;Input information
;
; Notes:
;
;   Overload this routine if you need to have user-defined data types
;   display data other than as stored when the user begins to edit the
;   field.
;
;   This default version merely moves the stored data into the editing
;   buffer. You should retain this functionality for any unknown user data
;   types. If you remove the semi-colons which "comment out" the case
;   statement, then replace the "MYTYPE" case shown with one or more of
;   your own, the "else" on the endcase will handle the default condition.
```

```
proc
; case a_usertype of
;   begincase
;     "MYTYPE ":call format_my_type
;   endcase
; else
      a_edit = a_data
      xreturn
endsubroutine
```

## See also

- ▶ [%IEDITFMT\\_METHOD on page 8-132](#) for more information on specifying an edit format method for an input field.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).

## Examples

The following is an example of an EEDTDSP\_METHOD subroutine you could write. This example subroutine would work in conjunction with the ECHKFLD\_METHOD and EDSPFLD\_METHOD example subroutines (shown on [page 7-57](#) and [page 7-66](#), respectively).

```
subroutine eedtdsp_method
      a_data      ,a              ;Data as stored
      a_type      ,a              ;Data type
      a_text      ,a              ;User text
      a_edit      ,a              ;Returned edit data
      a_inpinfo   ,a              ;Input information

.align
record
      numeric,i4              ;Numeric test field

proc
      case a_type of
      begincase
      "TYP_ZIPCODE ": call zipcode
      endcase
      else
      a_edit = a_data
      xreturn
```

```
zipcode,  
    onerror (20) canzip  
    numeric = a_data  
    offererror  
    a_edit = numeric [left]      ;Left-justify numeric  
    return  
canzip,  
    offererror  
    a_edit = a_data              ;Just move alphanumeric  
    return  
endsubroutine
```

See the Discussion for ECHKFLD\_METHOD on [page 7-57](#) for a sample window script that corresponds with this example.



## EENTRST\_METHOD – Perform input override processing



```
subroutine EENTRST_METHOD
  a_nomod      , n
  a_reset      , n
```

### Arguments

*a\_nomod*

The true/false flag that specifies whether the data was modified. (**n**)

*a\_reset*

The true/false flag that determines whether to reset the field's contents. (**n**)

### Discussion

When the user selects a menu entry, the default behavior is to cancel pending input. EENTRST\_METHOD enables you to override this default behavior, so you can retain the pending input.

EENTRST\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine.

UI Toolkit calls your EENTRST\_METHOD subroutine when an input field is exited due to a menu entry being invoked. This occurs when %M\_SIGNAL is called or when the user selects a menu entry, presses a menu entry shortcut, or presses a standard button. On Windows, this includes I\_CANCEL; EENTRST\_METHOD overrides I\_CANCEL.

When this subroutine is called, if the user has not modified the input field contents, *a\_nomod* is passed as true; otherwise it's passed as false.

When this subroutine is called, *a\_reset* is always passed as true unless the field is a check box or a multi-line text field, in which case it's passed as false. On Windows, *a\_reset* is also passed as false if the field is a radio button or combo box (selection window).

If this subroutine sets *a\_reset* to false, Toolkit will accept and validate the pending data. If *a\_reset* is set to false when *a\_nomod* is true, this means that the existing contents of the field will be validated as if they were entered for the first time, even though no change has been made. Note that this can cause validation errors on existing data, for example an error will occur on a required field that is blank. Also, setting *a\_reset* to false can cause a break to occur on a field.

If using I\_INPFLD, validation does not occur until you leave the field, so a button with a method does not trigger the EENTRST\_METHOD unless the button method signals a menu entry.

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).

## Examples

Note that the IF statement in the following example tests for the I\_CANCEL menu entry and prevents the EENTRST\_METHOD from overriding the cancel, which it would do on Windows systems. (You can create similar tests for other menu entries for which you do not want to accept pending data.)

```
subroutine eentrst_method
    a_nomod            ,n
    a_reset            ,n

    .include 'WND:tools.def'

proc

    if(g_entnam.ne.'I_CANCEL'.and..not.a_nomod)
        a_reset = 0
    xreturn

endsubroutine
```

## EFKEY\_METHOD – Perform key mapping



```
subroutine EFKEY_METHOD
  a_key_code , n
```

### Arguments

*a\_key\_code*

The key value to map. (**n**)

### Discussion

EFKEY\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine. (On Windows, this routine is ignored.)

UI Toolkit calls EFKEY\_METHOD whenever a function key or control character is entered by the user, enabling you to assign a key to a reserved function. The version of EFKEY\_METHOD supplied with Toolkit does nothing. You can use it, however, to remap any function code you desire.

The distributed include file **inpctl.def** defines the function codes for key mapping.

EFKEY\_METHOD is passed *a\_key\_code*, which is the key code that resulted from any interpretation of the key map. You can modify this function code and change it to any other code defined in **inpctl.def** or zero to have nothing happen.

At the end of the list of defined codes, you may notice definitions for DELETE\_KEY, PROCESS\_MENU, SCREEN\_REDRAW, and EOF\_KEY. To assign these functions to a different key, all you need to change in your EFKEY\_METHOD subroutine is the usual code generated by the desired keystroke to one of these codes.

### See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).

## EHELP\_METHOD – Perform help processing



```
subroutine EHELP_METHOD
  a_ident , a
```

### Arguments

*a\_ident*

(optional) The help identifier. (**a**)

### Discussion

EHELP\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine.

EHELP\_METHOD is called by UI Toolkit when a menu entry with the internal name O\_HELP is selected. This routine will not be called unless that entry name is present on one of your menu columns.

UI Toolkit provides a help processing subroutine named TKP\_HELP. You can overload it with a more robust or application-specific version.

EHELP\_METHOD can be passed one argument, *a\_ident*. UI Toolkit determines whether it will pass this argument, and if so, what it will pass in it. This is determined as follows:

- ▶ If the user has a menu column dropped down and selects O\_HELP, UI Toolkit will set **g\_enthlp** to the internal menu entry name of the highlighted menu entry. The *a\_ident* argument will not be passed.
- ▶ If the user has no menu column dropped down and selects O\_HELP while on an input field that has a help identifier specified (either in the .FIELD script or with IB\_FIELD), UI Toolkit will pass help identifier as the *a\_ident* argument.
- ▶ If the user has no menu column dropped down and is not on an input field with a help identifier specified, but the current subroutine was passed a help identifier, UI Toolkit will pass that help identifier value as the *a\_ident* argument. Those subroutines that can be passed a help identifier are listed below:

IB\_FIELD

L\_CHR

L\_SELECT

M\_PROCESS

S\_SELECT

S\_SELECTCB

T\_EDIT  
T\_VIEW  
U\_CHR  
U\_EDITKEYS  
U\_EDITTREND  
U\_FLD  
%U\_GETFILENAME  
U\_MODREND  
%U\_MSGBOX

- ▶ In all other cases, UI Toolkit will not pass the *a\_ident* argument. (This includes the case where O\_HELP is selected while the input termination message is displayed.)

The help identifier associated with an input field or passed to one of the above routines can be used to support the mechanism you choose to provide help for the user. The help identifier can be the name of a help window or, perhaps, the key for an ISAM record that contains help text.

When writing your EHHELP\_METHOD, be sure to consider whether you want to support a second O\_HELP request (for example, enabling the user to select Help while they are viewing the first Help window).

The TKP\_HELP subroutine distributed with UI Toolkit goes through the following steps:

1. If **g\_enthlp** is non-blank, UI Toolkit will search the window library for the window *h\_name* where *name* is the contents of **g\_enthlp**. This window will be displayed, if found, and UI Toolkit will skip to step 4. If not found, UI Toolkit proceeds to step 2.
2. If **g\_enthlp** is blank or if the window *h\_name* (in step 1) was not found, and if *a\_ident* was passed, UI Toolkit will search the library for a window *name*, where *name* is the contents of *a\_ident*. (If *a\_ident* was not passed, UI Toolkit goes to step 3.) This window will be displayed, if found, and UI Toolkit will skip to step 4. If the window is not found, Toolkit will issue the message “No help available for identifier *name*” and proceed to step 3. (This message is in the text message file, facility DTK, mnemonic NOHELP. See “[The Synergy UI Toolkit Control Panel](#)” in the “General Utilities” chapter of *Synergy Tools* for information on customizing messages using the Synergy UI Toolkit Control Panel.)
3. If **g\_enthlp** is blank or if the window *h\_name* (in step 1) was not found, and *a\_ident* was not passed, the window library is searched for a window named *h\_general*. If this window cannot be found, Toolkit will issue the message “No help available for identifier ‘h\_general.’”

If a window could be loaded, then TKP\_HELP carries out steps 4 through 7.

4. It loads the information line with the message found in text message facility DTK, mnemonic HELPINFO, and a column named c\_help is sought in the library opened on **g\_utlib**. If found, TKP\_HELP places the column. If not, no error occurs, but the user probably won't be able to scroll the text. (Some of these actions are only applicable for scrollable windows. See the comments within the TKP\_HELP source listed on [page 7-81](#).)
5. TKP\_HELP calls U\_HELPREND and applies any help renditions to the window. TKP\_HELP also places the window at this time.
6. The help window is displayed:
  - ▶ If in a Windows environment, TKP\_HELP calls U\_WINDOW and uses a Windows-style pop-up window with an OK button.
  - ▶ If in a UNIX or OpenVMS environment and the entire window is visible (i.e., the display area matches the window area), TKP\_HELP displays a message requesting the user to press RETURN (ENTER) when done viewing the window.
  - ▶ If in a UNIX or OpenVMS environment and if TKP\_HELP can show only part of the window, the window is considered scrollable, and T\_VIEW is used to enable the user to browse the window.
7. If the user makes another selection of O\_HELP, TKP\_HELP looks for and displays a second help window named h\_help (if found). When the user exits from this second help window, they will return to the first help window. (TKP\_HELP will then return to the calling routine when one of the first two scenarios is true.)
8. TKP\_HELP returns to the calling routine when
  - ▶ the entire window is visible and the user presses RETURN or, in Windows, the user clicks on the OK button.
  - ▶ the window is scrollable and the user selects any menu entry that T\_VIEW does not recognize (other than O\_HELP). If the entry is O\_EXIT, **g\_select** is returned false to the caller in order to avoid further exiting. Any other menu entry is returned to the caller.

### See also

- ▶ [“The Synergy UI Toolkit Control Panel”](#) in the “General Utilities” chapter of *Synergy Tools* for information on customizing the HELPINFO and NOHELP text messages.
- ▶ [S\\_SELECT on page 12-11](#) for an example of how a help identifier is passed.
- ▶ [U\\_HELPREND on page 16-72](#) for help window renditions.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).

## Examples

The following is a listing of the TKP\_HELP subroutine supplied with UI Toolkit. It includes comments that explain the operation of the subroutine. While you review it, note that **g\_select** must be cleared so that the menu processing subroutine (M\_PROCESS or I\_INPUT) continues without interruption.

```
subroutine tkp_help
;
; Description: Default version of help utility
;
;      a_id      ,a              ;(Optional) help identifier
;
; Notes:
;
;      This routine is called from within the higher-level input
;      routines whenever the menu entry "O_HELP" is selected.
;      Developers are encouraged to replace this version with
;      whatever help mechanisms are desired.
;
;      If a_id is passed, it is a help identifier, which is either
;      associated with an input field or was passed into the
;      routine which performed input. If no such help identifier
;      exists, a_id is not passed.
;
;      If g_enthlp is non-blank, it contains the name of a menu
;      entry which was highlighted on a dropped-down menu column
;      when the shortcut for O_HELP was pressed.
;
;      This default version operates as follows:
;
;      1. Determine the help identifier to use
;          A. If g_enthlp is non-blank, use "h_%a", where %a is
;             the contents of g_enthlp.
;          B. Otherwise
;              1. If a_id is passed, use it
;              2. Otherwise, use "h_general"
;      2. Attempt to load a window from g_utlib named after the
;         identifier
;          A. If unsuccessful and 1.A. was used above, go to
;             1.B.
;          B. If unsuccessful and 1.B. was used above, issue an
;             error and exit.
;      3. Apply help renditions to the window.
```

```
;      4. Compare the display area to the size of the window
;      A. If the entire window is visible, ask the user to
;          press return.
;      B. If part of the window is not visible, perform text
;          viewing.
;          1. Load an information line from the text message
;              file.
;          2. Attempt to load column "c_help" from g_utlib,
;              ignoring errors.
;          3. Setup the window for text viewing.
;          4. View the text with T_VIEW.
;          5. Exit on any non-text-viewing menu entry,
;              clearing any "O_EXIT" to avoid further exiting.
;      5. Return to the calling routine.
;
;      This routine also enters a private environment and exits it
;      before returning.
```

```
.include "WND:tools.def"
.include "UTL:dtkmsg.def"
.include "WND:windows.def"
.include "UTL:inpctl.def"
```

```
.align
```

```
record
```

```
len      ,i4          ;Length of message line
wnd      ,2i4         ;Help window ID
ndx      ,i4          ;Index into help windows
col      ,i4          ;Help column ID
err      ,i4          ;Error return
srch     ,i4          ;Search flag for window loads
mnu      ,i4          ;Are we attempting menu entry help?
line     ,a132        ;Message line
helpid   ,a15         ;Help identifier to use
chr      ,a1          ;Character typed
wareas   ,8d3         ;Window areas from W_INFO
display ,a12 @wareas  ;Display area coordinates
proc     ,a12 @wareas+12 ;Processing area coordinates
```

```
proc
```

```
clear g_select, ndx      ;Assume we will satisfy O_HELP

if (g_enthlp) then      ;Were we sitting on a menu entry?
begin
    mnu = TRUE           ;Yes, attempt menu help
    xcall s_bld(helpid, , "h_%a", g_enthlp)
end
```



```

        else
        begin
use_id,      clear mnu          ;No, use any passed identifier
              if (^passed(a_id)) then
                  helpid = a_id
              else
                  helpid = "h_general"      ;Or h_general if none
              end
        call do_help
        xreturn

do_help,
        xcall e_enter          ;Enter a private environment
        xcall e_state(D_OFF, D_ECHO, D_CURSOR)
        incr ndx

                                ;Attempt to load the window
        xcall u_ldwnd(wnd(ndx), g_utlib, helpid,, srch, err,, TRUE)
        if (err)
        begin
                                ;Could not find it
            if (mnu)              ;If we were attempting menu entry
            begin
                decr ndx
                xcall e_exit
                call use_id        ;try any passed identifier
                return            ;instead
            end
            xcall u_msg("DTK", DTK_NOHELP, D_ERROR, , helpid)
            goto exit            ;Issue error message and exit
        end
        xcall u_helpprend(wnd(ndx))    ;Apply help renditions to the
                                ;window

.ifdef D_DTKGUI
        xcall u_window(D_REMOVE, wnd(ndx))
        xcall synmsw_popup(wnd(ndx))

.else
        xcall w_area(wnd(ndx), WA_COPY, WAC_WTOP)    ;Test window areas
        xcall w_info(WI_AREAS, wnd(ndx), wareas)
        if (display .ne. proc) then                ;Scrollable?
        begin
            xcall u_text(g_txtlib, "DTK", DTK_HELPINFO2, line, len)
            xcall e_sect(line(1:len), D_INFO, D_CENTER);Load info from msg
                                                    ;file
        end
        end
    
```

```

                                ;Attempt to load column, ignoring errors
xcall m_ldcol(col, g_utlib, "c_help", D_NOPLC, srch, err)
xcall t_setup(wnd(ndx))          ;Setup for text viewing
repeat
  begin
    xcall t_view(wnd(ndx), col, err) ;View the text
    if (g_select) then
      begin
        case g_entnam of
          begincase
            "O_EXIT ": clear g_select
            "O_ABANDON ": clear g_select
            "O_HELP ": begin
              clear g_select
              if (helpid .ne. "h_help ")
                begin
                  helpid = "h_help"
                  clear mnu
                  call do_help
                end
              nextloop
            end
          endcase
        exitloop
      end
    else
      if (err) then
        xcall u_beep
      else
        exitloop ;On return
      end
    end
  end
else
  begin
    xcall u_text(g_txtlib, "DTK", DTK_HELPINFO2, line, len)
    xcall e_sect(line(1:len), D_INFO, D_CENTER);Load info line
                                                ;from our message
                                                ;file

    repeat ;Full window
      begin
        xcall u_chr_p(chr)

```

```

        if (g_select) then
            begin
                case g_entnam of
                    begin
                        "O_EXIT ":      clear g_select
                        "O_ABANDON ":    clear g_select
                        "O_HELP ":       begin
                            clear g_select
                            if (helpid .ne. "h_help")
                                begin
                                    helpid = "h_help"
                                    clear mnu
                                    call do_help
                                end
                            nextloop
                        end
                    endcase
                exitloop
            end
        else
            if (gi_sts .eq. RETURN_KEY) then
                exitloop
            else
                xcall u_beep
            end
        end
    .endc

exit,
    decr ndx
    xcall e_exit
    return
endsubroutine
;Exit the private environment
;Return to caller

```

## ESCRIPERR\_METHOD – Perform script compilation error processing

|    |  |   |   |
|----|--|---|---|
| WT |  | U | V |
|----|--|---|---|

```
subroutine ESCRIPERR_METHOD
  a_type           , n
  a_message        , a
  a_filename       , a
  a_linenum        , n
  a_textline       , a
  a_tokennum       , n
  a_tokenlen       , n
```

### Arguments

*a\_type*

The flag defining the type of error message: **(n)**

**D\_ERROR**                Error.

**D\_ALERT**                Warning.

**D\_INFO**                Informational text.

*a\_message*

The text of the message. **(a)**

*a\_filename*

(optional) The name of the file in which the error occurred. **(a)**

*a\_linenum*

(optional) The line number within the file, at which the error occurred. **(n)**

*a\_textline*

(optional) The text of the line at which the error occurred. **(a)**

*a\_tokennum*

(optional) The index of the token within *a\_textline*, at which the error occurred. **(n)**

*a\_tokenlen*

(optional) The length of *a\_tokennum*. **(n)**

## Discussion

ESCRIPTErr\_METHOD is a subroutine that you write *and name*. The name of your subroutine is registered with UI Toolkit using the E\_METHOD subroutine.

UI Toolkit calls your ESCRIPTERR\_METHOD subroutine to allow customized script compilation error processing for your application, when using the external routine interface of the Script compiler only.

Once registered, ESCRIPTERR\_METHOD will be called when an error occurs while using any of the following routines, defined in [chapter 2, “Script.”](#)

- ▶ %SCR\_OPENLIBRARY
- ▶ %SCR\_CLOSELIBRARY
- ▶ %SCR\_PROCESS
- ▶ %SCR\_ERRORCOUNT

If an ESCRIPTERR\_METHOD is not registered, the U\_START subroutine registers a default routine that displays a message box for each error.

If *a\_type* is set to D\_INFO and *a\_message* is blank, *a\_textline* contains the output resulting from a ..LOG script command.

There is no maximum length for *a\_message*. The ESCRIPTERR\_METHOD routine is responsible for wrapping or truncating the message appropriately.

*A\_filename* can contain up to 256 characters, and is one of the following:

- ▶ The name of the script file, if a script file open or syntax error occurred
- ▶ The name of the library if a library file open or creation error occurred
- ▶ Not passed if not one of the above

*A\_linenum*, *a\_textline*, *a\_tokennum*, and *a\_tokenlen* are only passed if a script syntax error occurred.

*A\_textline* can contain up to 255 characters.

## See also

- ▶ [“Accessing the Script Compiler from Your Application” on page 2-138](#) for more information about using the Script compiler’s external routine interface.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).

## EUTILS\_METHOD – Perform utilities processing



```
subroutine EUTILS_METHOD
  a_record      , a
  a_inpinfo     , a
  a_methoddata1 , any
  .
  .
  a_methoddata20, any
```

### Arguments

*a\_record*

(optional) The data area associated with the input window of the calling program. **(a)**

*a\_inpinfo*

(optional) The structure of input information. **(a)**

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

### Discussion

EUTILS\_METHOD is a subroutine that you write *and* name. You must use E\_METHOD to register the name of your subroutine.

The EUTILS\_METHOD subroutine is called by UI Toolkit when the user selects a menu entry whose internal name begins with “U\_”.

The *a\_record* argument is passed only if EUTILS\_METHOD is called from I\_INPUT or L\_INPUT.

The *a\_inpinfo* argument is passed only if EUTILS\_METHOD is called from I\_INPUT, I\_INPFLD, L\_INPUT, or L\_INPFLD. The **inpinf.def** file defines *a\_inpinfo*. See [page 8-118](#) for information.

The *a\_methoddata* arguments are passed only if they are passed to the routine within which the EUTILS\_METHOD method is called.

UI Toolkit’s default utility processing routine is named TKP\_UTILS, which generates the error “Unknown utility entry xxxx received” (where xxxx is the name of a utility entry) if the user selects a U\_ menu entry and no overloaded EUTILS\_METHOD subroutine is registered.

## Examples

In the following example, because EUTILS\_METHOD is called only when a U\_ menu entry is selected, **g\_entnam** will always contain the entry name of a U\_ entry. (There's no need to check **g\_select**.)

After the entry is processed, **g\_select** must be cleared so the menu processing subroutine (M\_PROCESS or I\_INPUT, for example) will continue as if no menu selection were made. If **g\_select** is true on return, the menu entry is returned to the calling routine.

```
subroutine my_eutils_method
  a_record      ,a          ; optional data area
  .include "WND:tools.def"

proc
  case g_entnam of
    begincase
      "U_COMM " :      xcall comment
      "U_PUZZ " :      xcall puzzle
      "U_SCRPRN " :     xcall scrprn
    endcase
  else
    xcall u_message("Unrecognized utility menu entry")
    clear g_select
  xreturn
endsubroutine
```

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).





# 8

## Input Routines

### What Is an Input Window? 8-3

Defines and discusses the basic concepts of input windows.

### Building Input Windows at Runtime 8-7

Discusses the IB\_xxx subroutines, which enable you to build input windows “on-the-fly.”

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# What Is an Input Window?

The UI Toolkit addresses an application's need to process terminal input through an input window. An input window is a standard window that can contain text, input fields, and buttons. Input windows are defined with the `.INPUT` script command or at runtime with the `IB_INPUT` subroutine (see [“Building Input Windows at Runtime” on page 8-7](#)).

Note that you can also create windows that accept input and that are made up of input windows, lists, ActiveX controls, and/or other types of windows. These windows are processed by Toolkit and appear to the user as a single window. See [chapter 6, “Composite Window Routines.”](#)

## Input fields

Each input field is associated with a position and length within the window, as well as a set of qualifiers that defines how the field should be processed.

### Qualifiers

Input field qualifiers enable you to define input field characteristics, which include the following:

- ▶ Name for the field
- ▶ Type and length of the data
- ▶ Number of digits to the right of the decimal point (if numeric)
- ▶ Redisplay format (if applicable)
- ▶ Defaults that occur as a result of omitted data
- ▶ Help message to display
- ▶ Selection window to use
- ▶ Valid range or set of values (if applicable)

### Organization of fields

You define and determine the order of the input fields and field qualifiers in an input window script using the `.FIELD` command. (See [chapter 2, “Script,”](#) for more information on input window script commands.) Because the maintenance of your field qualifiers takes place in a script file (outside of your application), you can modify the characteristics of your input window or input fields without ever touching your actual code.

The following rules apply to field organization:

- ▶ Fields can be placed anywhere in an input window.
- ▶ Fields are organized into one or more data areas.
- ▶ A specific field can only be specified in one data area definition.
- ▶ Each data area can be associated with one or more input sets.
- ▶ An input set can consist of one or more fields from a specific data area.

## Processing and editing field input

The input utilities support menu entries for moving between and editing input fields (`I_xxx` menu entries), for editing text (`E_xxx` menu entries), and for moving around selection windows (`S_xxx`). These menu entries are often referred to as reserved menu entries.

Applications on UNIX and OpenVMS require that you place the corresponding reserved menu entry on a placed menu column to make the function available to the user. Refer to [“Appendix B: Reserved Menu Entries”](#) for a list of the specific menu entries available. On Windows, these reserved menu entries are ignored, as functions are already a part of the Windows environment.

When UI Toolkit processes input for an empty field, it clears the field to blanks and then displays the default value for the field, if one exists. The user can do one of the following:

- ▶ Accept the default by pressing ENTER.
- ▶ Edit the default by selecting any editing function from the menu.
- ▶ Enter a new value in the field.

As soon as the user types any character in the field, the field is cleared and the typed character is the first character of the input. If the field doesn't have a default, input proceeds normally.

Field editing is automatically performed during all input processing. Therefore, if the user moves to a field that already contains data, the user can edit it.

For example, in a UNIX or OpenVMS environment, if the entry `“E_RIGHT”` is present on the menu and the user selects it, UI Toolkit will move the cursor to the right one character and place the input position at that character. The user can go into edit mode by selecting any one of the `“E_”` reserved menu entries listed in the Discussion for `I_INPUT` on [page 8-58](#).

Let's assume a user of an application on UNIX or OpenVMS originally typed a telephone number as `“3334545,”` and the number was reformatted and displayed in the field as `“333-4545.”` If the user moved back to the field and selected `“E_RIGHT,”` `“333-4545”` would be cleared from the field and `“3334545”` would be redisplayed, left-justified. The user could then edit this data.

If the user presses the BACKSPACE or rubout key at a field that contains data, the field is cleared and the input is redone. If the user presses any other character, the field is cleared and the typed character is used as the first data of the input.

When the user types data in an input field and presses ENTER, that data goes into the data area associated with the input field in your program. If the user terminates the input field by selecting a menu entry (for example, a search function) instead of pressing ENTER, the field reverts back to its original contents. You must use the `I_FORCE` subroutine to force the data from the internal input field buffer into the associated data area in your program if this is the action desired. (See [I\\_FORCE on page 8-43](#) for information on overriding this default behavior.)

By default, Toolkit sets no time limit for input; it waits until I/O processing is completed before returning to the calling subroutine. You can, however, change the default, and you can override the default for a field. Then, if the user does not complete input within the time you specify, input times out. For more information, see the documentation for the `.FIELD` qualifier WAIT on [page 2-84](#).

To facilitate redirection of input, UI Toolkit enables you to configure the number of successive end-of-file characters to allow on input. The field **g\_eof\_max** (in **tkctl.def**), which is set at 100 by default, specifies this maximum. After **g\_eof\_max** successive EOF characters (CTRL+D on UNIX, CTRL+Z on OpenVMS) have been encountered, a message is displayed on the screen and the program stops. You can set this field to zero to disable this behavior.

## Text fields

Your input windows can contain dimensioned alpha fields that offer full editing capabilities similar to text windows. (Note that only single-dimension alpha arrays are supported. See [chapter 14, “Text Routines,”](#) for more information about text windows.) This feature is ideal for any field in which the user must enter a significant amount of text. For example, if a window in your application has a field for comments, the user would probably appreciate being able to edit the text that she types into that field.

The primary difference between edit processing in a text field and edit processing in a text window is that pressing ENTER in a text field terminates the field’s input (rather than inserting a new line at the cursor position). We made text input fields work this way so that they would terminate in the same way as all other input fields. But this shouldn’t be a problem; words automatically wrap to a new line during data entry. Also, you can override this action by modifying the value of **g\_txt\_rtrn** (defined in the **tools.def** file).

---

### WIN

Arrayed text fields are displayed as a multi-line edit control. Because the sizing of this field includes extra leading for each line, the edit control will contain extra space into which no text can be entered. You can minimize the amount of extra space by setting the environment variable **MINIMIZE\_LEADING** to 1 and using fixed fonts. When using proportional fonts, if the text field uses a smaller font than the input window, the input window’s background color will extend beyond the bottom of the edit control.

---

### UNIX, VMS

When the user begins performing input to a text field, any specified text editing menu column is placed on the menu bar, and the user can access these editing commands as if the field were a text window. A menu column entry that inserts a new line is available, if you choose to put it in your text editing menu column. You may decide to make only a subset of the editing commands available on the menu for text field entry, since some of the entries are already available for normal field editing, and the user may not need such functions as paragraph movement or top and bottom buffer movement for small amounts of text. See [“Appendix B: Reserved Menu Entries”](#) for a complete list of reserved menu entries.

---

## Understanding display, input, and view lengths

Input fields have the following length settings:

- ▶ display length—the maximum number of characters that can be displayed in the field
- ▶ input length—the maximum number of characters that the user can enter in the field
- ▶ view length—the amount of space (width) on the screen that the field will take

Toolkit automatically calculates the display length and the input length by looking at field settings like size, type, and the format string. Toolkit then uses the greater of the display length or input length to determine the width of the field, which is referred to as the view length.

Typically, Toolkit's default calculations are sufficient, but you can override them if necessary.

- ▶ If you want a field to take up less room on the screen than the greater of the input or display length, set an explicit view length. On Windows this makes the contents of the field scrollable. On UNIX and OpenVMS, the contents of a field will be truncated to the view length if you move the cursor in the field or modify the contents of the field.
- ▶ Because the input length determines how many characters are passed to a change method, you may want to override the input length to enable users to input more or fewer characters than the field can store. For example, if you store a temperature in Celsius, but allow users to enter a temperature followed by either "F" or "C" to indicate Fahrenheit or Celsius, you could set the input length to 4, while the storage size might allow for only 2 digits. The change method could then convert Fahrenheit temperatures to Celsius before storing the value. See [page 2-66](#) for more information on overriding the input length.
- ▶ If you have a display method that requires a different display length than the default, you can override the display length. You could set this override, for example, if your display method formats data based on runtime considerations (so you can't use a format string) and you know you'll need more or fewer characters than the input length. See [page 2-57](#) for more information on overriding the display length.

View length, display length, and input length can be specified in Repository, in a window script (as .FIELD qualifiers), or at runtime (with I\_FLDMOD or IB\_FIELD).

For more information on these settings, including information on their default values, see "DSP\_LENGTH(display\_length)" on [page 2-57](#), "INPUT\_LENGTH(input\_length)" on [page 2-66](#), and "VIEW\_LENGTH(view\_length)" on [page 2-83](#).

## Building Input Windows at Runtime

In addition to generating input window definitions from script files, you can generate them at runtime. The subroutines that begin with “IB\_” (for “input build”) support runtime generation of input windows. These subroutines provide an alternative to defining your input windows in script files.

We recommend that you only use these subroutines when you cannot determine the contents of your input window until runtime. Loading windows from window libraries is faster and more modular than generating windows at runtime.

There is almost a one-to-one correspondence between the IB\_xxx subroutines and the script commands that build an input window (along with I\_LDINP). For example:

- ▶ IB\_INPUT provides essentially the same functionality as the .INPUT script command.
- ▶ IB\_FIELD gives you the same results as the .FIELD script command.
- ▶ IB\_PAINT corresponds to the .PAINT script command.

These subroutines are also called in the same order as the input window script commands (IB\_INPUT, IB\_FIELD, ..., IB\_END).

Each subroutine must be passed a *build\_id* variable, which is initially returned by IB\_INPUT. This variable should be an aligned **i4**.

Multiple fields, sets, and structures are supported, but the fields used in a set or structure must be defined before you define a set or structure. Also, the structure used in a set must be defined before the set.

IB\_RPS\_STRUCTURE must be called prior to the IB\_FIELD calls for fields to be drawn from a repository structure. IB\_STRUCTURE can only be used for local fields (fields not drawn from the Repository). Before either IB\_RPS\_STRUCTURE or IB\_LOCAL is called, the default state is local.

IB\_INPUT must be called once at the beginning and IB\_END once at the end to complete the input window. After IB\_END returns successfully, the *build\_id* may be discarded. At this point, the input window is ready to use. Note that build warnings for IB\_xxx subroutines display only if **g\_dtkbounds** is set to 1 or 2. And if IB\_FIELD creates a text field that is too large for a window, a warning will display only if **g\_dtkbounds** is set to 2 or greater. See [“g\\_dtkbounds” on page 18-3](#).

See the “IB\_” subroutine specification pages later in this chapter for the syntax, arguments, and discussion of these routines.

# The Input Subroutines and Functions

This section discusses the syntax and arguments for each of the input subroutines and functions.



# I\_ACTIVATE – Specify characters for input termination



```
xcall I_ACTIVATE([activation,] character[, ...])
```

## Arguments

*activation*

(optional) One of the following options: **(n)**

**D\_ACTIVATE**      Activate specified character(s). (default)

**D\_DEACTIVATE**    Deactivate specified character(s).

*character*

One or more numeric values, separated by commas, that represent ASCII character(s). Valid values are 0 through 255. **(n)**

## Discussion

The I\_ACTIVATE subroutine enables you to activate a character or set of characters. This instructs UI Toolkit to treat the characters as ENTER. You can also deactivate characters, which instructs Toolkit *not* to treat them as ENTER. You can include both D\_ACTIVATE and D\_DEACTIVATE in the same I\_ACTIVATE call. (See Examples below.)

I\_ACTIVATE calls the ACCHR or DACHR Synergy DBL subroutine for each specified character. On subsequent field input, characters activated by this subroutine will behave like the ENTER key and terminate input for the field. Deactivated characters are returned to their normal state. They are accepted as printable characters unless they're entered as part of a shortcut.

Note the following:

- ▶ %RDTRM returns the numeric value for an activated character if tested on a field break or within ECHKFLD\_METHOD.
- ▶ The activation state of a character remains constant until it's changed by another call to I\_ACTIVATE. Activation state is not affected by entering or exiting an environment.

## Examples

The following I\_ACTIVATE call instructs UI Toolkit to treat the period key as ENTER.

```
xcall i_activate(%decml('.'))
```

The following example deactivates the period and hyphen keys. This returns these characters to their normal state as input characters. In addition, this example activates the TAB key. After this call, TAB will terminate a field as if the user pressed ENTER, and %RDTRM will return 9.

```
xcall i_activate(D_DEACTIVATE, %decml('.'), %decml('-'), D_ACTIVATE, 9)
```

## I\_CTRCONTEXT – Establish input context for child input window



```
xcall I_CTRCONTEXT(inp_id, [set_name], reason)
```

### Arguments

*inp\_id*

The ID of the child input window. **(n)**

*set\_name*

(optional) The name of the input set to receive input context or the following. Note that if you use the following, it must be in capital letters and enclosed in quotation marks. **(a)**

**\*CURR\*** Use the currently active input set.

*reason*

The reason the input window was activated, which determines what I\_CTRCONTEXT will move input context to. This argument can be passed as blank (indicating that it was already activated), a program-supplied reason passed because it was activated programmatically, or one of the following: **(a)**

**C\_FIRST** Focus moved in attempt to reach the first child in the composite window. This instructs I\_CTRCONTEXT to move context to the first active field in the input set. If there is no active field, context moves to the first button for the window.

**C\_LAST** Focus moved in attempt to reach the last child in the composite window. This instructs I\_CTRCONTEXT to move context to the last active button on the tab set (if the window is on a tab). If there is no such button, it moves context to the last active button for the window. If there's no active button for the window, it moves context to the last input field in the input set.

**C\_NEXT** Focus moved from the previous child in the composite window—e.g., by pressing TAB. This instructs I\_CTRCONTEXT to move context to the first active field in the input set. If there is no active field, context moves to the first button for the window.

**C\_PREV** Focus moved from the next child in the composite window—e.g., by pressing SHIFT+TAB. This instructs I\_CTRCONTEXT to move focus to the last active button on the tab set (if the window is on a tab). If there is no such button, it moves focus to the last active button for the window. If there's no active button for the window, it moves focus to the last input field in the input set.

**C\_SET** Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason. With this reason, I\_CTRCONTEXT does not change focus.

If *reason* is blank or any value other than the above, I\_CTRCONTEXT does not change input context.

## Discussion

Like I\_NEXT, the I\_CTRCONTEXT subroutine sets input context for an input window. Unlike I\_NEXT, however, it uses a *reason* to determine where to set input context. This is because I\_CTRCONTEXT is designed for use in child input window methods (C\_METHINP by default), where you likely want input context to initially reflect the reason the input window received focus. For example, if you have a composite window with two input windows for children, and the user presses SHIFT+TAB to move from the second input window back to the first, you may want the last button or field in the first input window to receive input context.

To use in a child method, pass the reason passed to the child method (by C\_PROCESS) as the *reason* argument for I\_CTRCONTEXT. See the **ctrmeths.dbl** file included in your UI Toolkit distribution for an example. This file includes code for the C\_METHINP method, which uses I\_CTRCONTEXT.

The *set\_name* argument determines which input set will be used to set input context.

- ▶ If the name of an input set in the window is passed as *set\_name*, I\_CTRCONTEXT uses this input set to determine input context.
- ▶ If *set\_name* is passed as \*CURR\*, I\_CTRCONTEXT uses the most recently accessed input set for the window. If no input set has been accessed, input context defaults to the first input set for the window to determine input set context.
- ▶ If *set\_name* is not passed, I\_CTRCONTEXT uses the first input set to determine input context.

Note that in a utility subroutine where you do not know the name of the currently active set, you can use \*CURR\* to specify the set that was most recently accessed in the window.

## See also

- ▶ [C\\_METHINP](#) on page 6-55.
- ▶ “Controlling tabbing, focus, and input context” on page 6-4 for information on tabbing indices.
- ▶ [DC\\_CTRCONTEXT](#) on page 6-35 for information on moving focus to a specific child window.

## I\_DISABLE – Disable input fields



```
xcall I_DISABLE ([D_FLDS,] window_id[, field_list, ...])
```

```
xcall I_DISABLE (D_SET, window_id, set_name)
```

```
xcall I_DISABLE (D_ALL, window_id)
```

### Arguments

#### D\_FLDS

(optional) Disables all specified input fields. (default)

#### D\_SET

Disables all input fields in a set.

#### D\_ALL

Disables all input fields in a window.

*window\_id*

The ID of the input window containing the field(s) to be disabled. (**n**)

*field\_list*

(optional) One or more field specifications. (**a**)

*set\_name*

The name of the set containing the field(s) to be disabled. (**a**)

### Discussion

The I\_DISABLE subroutine disables one or more fields in an input window.

On Windows, the disabled fields will be grayed and unable to receive keyboard focus either by mouse click or by pressing TAB/ARROW/RETURN (ENTER).

You can specify up to nine field lists (*field\_list* arguments), each of which can have from one to nine field specifications. If a *field\_list* has multiple field specifications, separate the field specifications with any character other than an identifier character or a square bracket—either [ or ], which are used to enclose dimension specifications for repository arrayed fields. (Identifier characters include alpha characters, numeric characters, the dollar sign, and the underscore character.) For example:

```
"name"
```

or

```
"name, birthday, soc_sec_no, employer, phone, policy_no, conditions[2]"
```

The maximum length of a *field\_list* is 99 characters. Additional characters are ignored. For information on field specifications, see [“Field specifications” on page 2-47](#).

If any of the designated fields are not contained within the window, a fatal error occurs.

Although *field\_list* is optional, if it isn't specified when using D\_FLDS, I\_DISABLE will have no effect.

When using D\_SET, it is important to remember that the field remains disabled even when you are not processing the set to which you applied D\_SET. This is because enablement is a field-specific attribute. When using D\_ALL, it is important to note that buttons aren't disabled. To disable buttons you should use the B\_DISABLE subroutine.

Calling I\_INPFLD on a disabled field, returns immediately.

Note that when a break occurs in input processing the input set context for the next input has already been determined. Thus, altering the enabled state of a field in the set during break processing will not alter the input set context, even if you are enabling the field that would have been processed next. You must call I\_NEXT to alter the context in any way. For example, consider the following scenario: An input set consists of fields A, B, and C. Field C is a break field. The user keys a value into field C and terminates by selecting the menu entry I\_PREV, which creates a break. In the break processing, field B is disabled. The next field accessed is field C again, because the I\_PREV logic had targeted field B as the next field to process. When it came time to process it, field B was disabled, thus field C was accessed instead. If, on the other hand, field B was disabled within the leave method for field C, then field A would be accessed next, because the input set context is determined after the leave method is called.

## See also

- ▶ [I\\_ENABLE on page 8-21](#) for more information on enabling input fields.
- ▶ [I\\_NEXT on page 8-67](#) for more information on setting input set context when there are disabled fields.

## Examples

The following example disables the fields **state**, **addr[2]**, and **zip**.

```
xcall i_disable(wndid, "state, addr[2], zip")
```

## I\_DISPLAY – Display data to input fields



```
xcall I_DISPLAY (window_id, [set_name], data_area, [field_list1], [field_list2],
&                [field_list3], [field_list4], [field_list5], [field_list6], [field_list7],
&                [field_list8], [field_list9], a_methoddata1, ..., a_methoddata20)
```

### Arguments

*window\_id*

The ID of the input window containing the fields to be displayed. **(n)**

*set\_name*

(optional) The name of the input set associated with the fields. **(a)**

*data\_area*

The data area for the structure associated with the input set that contains the data to display. **(a)**

*field\_list1* to  
*field\_list9*

(optional) Up to nine field specifications or the following: **(a)**

**\*ENABLED\***            Display enabled fields only.

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

### Discussion

The `I_DISPLAY` subroutine loads data in input fields according to the structure associated with the input set. For example, suppose you want to display some support information such as item name, sales amount, or delivery date while a transaction is being input. You can create an input field for each of the information displays (defining their data types and display formats) and then place these fields in their own input set. If you set breaks in the transaction input set at appropriate input fields, you can use `I_DISPLAY` to perform your information displays. (An additional benefit of this method is that it also places the controls for the information displays, along with the input fields, outside of the programs.)

If *set\_name* is not present, `I_DISPLAY` defaults to the first input set.

`I_DISPLAY` loads data from *data\_area* to the corresponding field(s) in the window and marks the field(s) “not empty.” Note that by default, Toolkit does not ensure that *data\_area* is large enough for the fields it references. Toolkit generates an error for this condition only if `g_dtkbounds` is set to 1 or greater. See “[g\\_dtkbounds](#)” on page 18-3.

The fields referenced by this subroutine must be part of an input set for the window.

You can specify up to nine field lists (*field\_list* arguments), each of which can have from one to nine field specifications. If a *field\_list* has multiple field specifications, separate the field specifications with any character other than an identifier character or a square bracket—either [ or ], which are used to enclose dimension specifications for repository arrayed fields. (Identifier characters include alpha characters, numeric characters, the dollar sign, and the underscore character.) For example:

```
"name "
```

or

```
"name, birthday, soc_sec_no, employer, phone, policy_no, conditions[2]"
```

The maximum length of a *field\_list* is 99 characters. Additional characters are ignored. For information on field specifications, see [“Field specifications” on page 2-47](#).

If you don’t specify any fields, all fields within the set will be displayed.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to I\_DISPLAY. I\_DISPLAY, in turn, passes them directly to %IDISPLAY\_METHOD. This allows you to communicate additional information to your display method. Be careful to specify method data arguments only after you have passed *all* of the field lists, so that *a\_methoddata1* is the 13th argument passed, with any subsequent method data arguments following.

Note that if I\_DISPLAY is used with an unframed field after the input window for the field has been added to a tab set, renditions will be applied to the field that may not match the renditions for the window. See [%TS\\_TABSET on page 13-9](#) for more information.

## See also

- ▶ [.SET on page 2-113](#) for defining an input set in a script file.
- ▶ [.STRUCTURE on page 2-115](#) for defining a structure in a script file.
- ▶ [I\\_SETINF on page 8-83](#) for retrieving the names of input sets.

## Examples

The following example loads all input fields in input set **maindcs** with data from the **dcsmast** data area.

```
xcall i_display(dcswnd, "maindcs", dcsmast)
```

The next example loads the input fields **name**, **addr[2]**, **city**, **st**, and **zip** using the data in the **cusmas** data area, and these fields reside in the **cusmas** input set.

```
xcall i_display(inpid, "cusmas", cusmas, "name, addr[2], city, st, zip")
```

## Input Routines

### I\_DISPLAY

The following example displays only the enabled fields in the input set **inpset**, and does not alter disabled fields. It passes **method\_data** as the method data argument.

```
xcall i_display(inp_id, "inpset", record, "*ENABLED*",,,,,,,,,,
&                method_data)
```



## I\_DSPAREA – Set the display area for an input window



```
xcall I_DSPAREA (window_id, [orig_row], [orig_col], [height][, width])
```

### Syntax

*window\_id*

The ID of the input window to affect. **(n)**

*orig\_row*

(optional) The new origin row for the display area. **(n)**

*orig\_col*

(optional) The new origin column for the display area. **(n)**

*height*

(optional) The new height for the display area in number of rows. **(n)**

*width*

(optional) The new width for the display area in number of columns. **(n)**

### Discussion

The I\_DSPAREA subroutine sets the display area for an input window.

If any of the optional arguments are omitted, their corresponding display area coordinates are unaffected. The resulting values are passed directly to the Synergy DBL W\_AREA subroutine, where any limitations are applied.

You should use this subroutine when setting the display area for an input window. After changing the actual display area, the input window's internal control data is updated to reflect the resulting display area. This ensures that the input processor will move the display area as needed to make input fields visible.

If you use this subroutine for a non-input window, a fatal error occurs. For non-input windows, directly call the W\_AREA subroutine.

### See also

[W\\_AREA](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.

## Examples

The following example sets the display area for the input window whose ID is contained in **inpid**. The new display area will begin at row 1, column 1 in the window, and will be 10 rows high and 78 columns wide.

```
xcall i_dsparea(inpid, 1, 1, 10, 78)
```

The next example moves the display area origin row to row 10 of the window. The origin column, height, and width remain unchanged.

```
xcall i_dsparea(inpid, 10)
```

## I\_DSPFLD – Display data to one input field



```
xcall I_DSPFLD(window_id, field_spec, data[, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*window\_id*

The ID of the input window containing the field to display. (**n**)

*field\_spec*

The specification for the field that I\_DSPFLD will display data to. (See “[Field specifications](#)” on page 2-47 for information.) (**a**)

*data*

The data to display. (**a** or **n**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

### Discussion

The I\_DSPFLD subroutine displays *data* to an input field, regardless of any input set associations.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

*Data* is interpreted and displayed according to the input field’s definition, regardless of the actual type of *data*. The *data* is not put into any structure associated with the field, and a field does not have to be part of an input set. You can use this subroutine to access a field whether or not it is associated with any set.

Note that by default, Toolkit does not require the size of *data* to match the size of the referenced field (*field\_spec*). If the sizes don’t match, Toolkit generates an error only if **g\_dtkbounds** is set to 2 or greater (see “[g\\_dtkbounds](#)” on page 18-3). And note that Toolkit also generates a fatal error with this setting if an integer value is passed for a non-integer field or vice versa (though no error is generated for user-defined data types).

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to I\_DSPFLD. I\_DSPFLD, in turn, passes them directly to %IDISPLAY\_METHOD. This allows you to communicate additional information to your display method.

Note that if I\_DSPFLD is used with an unframed field after the input window for the field has been added to a tab set, renditions will be applied to the field that may not match the renditions for the window. See [%TS\\_TABSET](#) on page 13-9 for more information.

## See also

- ▶ [I\\_INPUT on page 8-57](#) for more information on putting data into a field.
- ▶ [I\\_FORCE on page 8-43](#) for more information on forcing data to a field.

## Examples

In the following example, the data “Smith” is loaded into the field **LSTNAME**:

```
last_name="Smith"  
xcall i_dspfld(wndid, "LSTNAME", last_name)
```

In the next example, the data “AB101” is loaded into the field **ORDNO[3]**:

```
ordno="AB101"  
xcall i_dspfld(wndid, "ORDNO[3]", ordno)
```

## I\_ENABLE – Enable input fields



```
xcall I_ENABLE ([D_FLDS,] window_id[, field_list, ...])
```

```
xcall I_ENABLE (D_SET, window_id, set_name)
```

```
xcall I_ENABLE (D_ALL, window_id)
```

### Arguments

#### D\_FLDS

(optional) Enables all specified input fields. (default)

#### D\_SET

Enables all input fields in a set.

#### D\_ALL

Enables all input fields in a window.

*window\_id*

The ID of the input window containing the field(s) to be enabled. **(n)**

*field\_list*

(optional) One or more field specifications. **(a)**

*set\_name*

The name of the set containing the field(s) to be enabled. **(a)**

### Discussion

The I\_ENABLE subroutine enables one or more fields in an input window. By default, input fields are enabled. Use I\_ENABLE to re-enable disabled fields.

You can specify up to nine field lists (*field\_list* arguments), each of which can have from one to nine field specifications. If a *field\_list* has multiple field specifications, separate the field specifications with any character other than an identifier character or a square bracket—either [ or ], which are used to enclose dimension specifications for repository arrayed fields. (Identifier characters include alpha characters, numeric characters, the dollar sign, and the underscore character.) For example:

```
"name"
```

or

```
"name, birthday, soc_sec_no, employer, phone, policy_no, conditions[2]"
```

The maximum length of a *field\_list* is 99 characters. Additional characters are ignored. For information on field specifications, see [“Field specifications” on page 2-47](#).

If any of the designated fields are not contained within the window, a fatal error occurs.

Although *field\_list* is optional, if it isn't specified when using D\_FLDS, I\_ENABLE will have no effect.

When using D\_SET, it is important to remember that the field remains enabled even when you are not processing the set to which you applied D\_SET. This is because enablement is a field-specific attribute. When using D\_ALL, it is important to note that buttons are not enabled. To enable buttons you should use the B\_ENABLE subroutine.

Note that when a break occurs in input processing the input set context for the next input has already been determined. Thus, altering the enabled state of a field in the set during break processing will not alter the input set context, even if you are enabling the field that would have been processed next. You must call I\_NEXT to alter the context in any way. For example, consider the following scenario:

- ▶ An input set consists of fields A, B, and C.
- ▶ Field B is disabled.
- ▶ Field A is a break field.

If a break occurs on field A, and the code executed after the break enables field B, the next field processed is still field C because the context for the next input was determined before the break occurred. To access field B next, I\_NEXT should be used.

If, on the other hand, field B was enabled within a leave method for field A, field B would be the next field accessed, because the input context for the next input is determined after calling the leave method for a field.

## See also

[I\\_DISABLE on page 8-12](#) for more information on disabling input fields.

## Examples

The following example enables the fields **state** and **zip**.

```
xcall i_enable(inpid, "state, zip")
```

## %I\_FLDDIM – Retrieve an input field’s dimension or number of elements



*elements* = %I\_FLDDIM(*window\_id*, *field\_spec*)

### Return value

*elements*

This function returns the number of elements as an integer value. (^VAL)

### Arguments

*window\_id*

The ID of the input window containing the field. (n)

*field\_spec*

The specification for the field whose dimension or number of elements %I\_FLDDIM will retrieve. (See “Field specifications” on page 2-47 for information.) (a)

### Discussion

%I\_FLDDIM returns the number of elements for a field. If the field is not an array, the return value is 1, and if the field references a repository array field element, the return value is 1. Though this function is useful in a variety of situations, it can be particularly useful as an argument to the L\_FINDSPEC subroutine.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

You do not need to declare this function to use it. It is defined in **tools.def**.

### Examples

In this example, the beginning position and length of the find area for the list identified by **lstid** are determined by the structure position and scope (size \* dimension) of the field named in **fndfield** within the input window identified by **inpid**. A usual scenario would have **inpid** identify the input window associated with the list, and the input window set’s structure would also double as the data passed to the list processor.

```
xcall l_findspec(lstid,, %i_fldstrpos(inpid, fndfield),
&                %i_fldsize(inpid, fndfield)*%i_flddim(inpid, fndfield))
```

## I\_FLDINF – Return input field information



```
xcall I_FLDINF (window_id, [field_spec], [field_number], [empty], [controls],
&                [selection_id][, enabled])
```

### Arguments

*window\_id*

The ID of the input window containing the field. **(n)**

*field\_spec*

(optional) The specification for the field whose information I\_FLDINF will retrieve. (See [“Field specifications” on page 2-47](#) for information.) **(a)**

*field\_number*

(optional) The field number supplied/returned. **(n)**

*empty*

(optional) The returned empty status. **(n)**

*controls*

(optional) The returned field controls. **(a)**

*selection\_id*

(optional) The returned selection window ID. **(n)**

*enabled*

(optional) The returned enabled status. **(n)**

### Discussion

The I\_FLDINF subroutine returns information about an input field. In order to use it, however, be sure to .INCLUDE these two distributed .def files (in the following order):

- ▶ **WND:system.def**
- ▶ **WND:fldinf.def**

*Window\_id* must contain the ID of a loaded input window.

If *field\_spec* is found and non-blank, the input field number is returned in *field\_spec*. (If *field\_spec* is not found, *field\_number* is returned as 0.) If *field\_spec* is blank, *field\_number* must be non-zero and the field specification is returned in *field\_spec*. In either case, *empty*, *controls*, and *selection\_id* may optionally be returned.



The *field\_number* argument identifies the ordinal number of the .FIELD statement within the specific window script or the ordinal number of the call to IB\_FIELD within the program. This does not necessarily correspond to the position of the field within any input set, nor to a low-level window field number (for example, using W\_FLDS). If you want to know a field's position within the input set, use I\_SETINF to find out. If you want the number of the field in a low-level Synergy window, use **gs\_fnum**, contained in the **gs\_inpfld** record within the **fldinf.def** file (see “Notes on **gs\_inpfld** fields for multi-line text fields” below).

*Empty* is returned true if the input field is currently empty.

*Controls* is the input field control record defined in the **gs\_inpfld** record (in the file **fldinf.def**). For more information, see the comments in **fldinf.def**, and see “Notes on **gs\_inpfld** fields for multi-line text fields” below. Note that to retrieve the strings referenced by the **gs\_xxx** options using the function %I\_GETSTRING (see page 8-48 for more information), you must first call I\_FLDINF with the *controls* argument to load the control structure.

If *selection\_id* is returned with a value of 0, the field is not associated with a selection window.

*Enabled* is returned true if the input field is currently enabled; false if it is disabled.

### Notes on **gs\_inpfld** fields for multi-line text fields

The fields **gs\_edtrow**, **gs\_edtcol**, **gs\_edtltrow**, and **gs\_edtltcol** apply only to multi-line text fields. For all other fields, they will be zero. They are used to establish and record the cursor position within a multi-line text field.

The first two fields, **gs\_edtrow** and **gs\_edtcol**, dictate the cursor position that is to be established when the field next receives focus. If they are zero, the field will exercise the default behavior of awaiting the first keypress from the user before entering edit mode. On Windows platforms, this means that the entire field contents will be highlighted.

If **gs\_edtrow** is non-zero, it specifies the low-level field number of the row to focus. This can be transformed into the ordinal row within the field by subtracting **gs\_fnum** (the first field number) and adding 1. Thus, if an input field's first field number (**gs\_fnum**) is 4, and **gs\_edtrow** is 6, then when the field receives focus, the cursor will be placed in the third row of that field.

If **gs\_edtcol** is non-zero, it specifies the column within the field where the cursor will be placed. On Windows, the cursor will be placed before this position. On non-Windows, the cursor is placed on that column.

The **gs\_edtltrow** and **gs\_edtltcol** fields use the same coordinate system, but they refer to the last cursor position established within the field. Note that if the user accessed the field but never left the default initial state (in other words, they never entered edit mode), these fields will not be modified from their previous value. These fields are used by the Toolkit in two cases:

- ▶ As the reference position for a call to I\_TXTPOS when using the D\_LAST argument
- ▶ To set **gs\_edtrow** and **gs\_edtcol** when exiting a field that has the RETAIN\_POSITION qualifier

For fields with the RETAIN\_POSITION qualifier, **gs\_edtrow** and **gs\_edtcol** will usually contain the same value as **gs\_edtltrow** and **gs\_edtltcol**, respectively, unless I\_TXTPOS has been called since the last input.

Note that I\_TXTPOS never changes the value of **gs\_edtltrow/gs\_edtltcol**, so D\_LAST always refers to the last input position, not the last position established by I\_TXTPOS. D\_CHANGE, however, refers to **gs\_edtrow/gs\_edtcol**, so those changes can be made cumulatively.

## Examples

The following example returns the field number for field **fld1[2,5]** in the input window associated with the window ID (**id**).

```
xcall i_fldinf(id, "fld1[2,5]", fldnum)
```

The next example returns the name of field number three in **fldname**. If this field has an associated selection window, the selection window ID is returned in **selid**. Otherwise, **selid** contains zero upon return.

```
xcall i_fldinf(id, fldname, 3,,, selid)
```

The following example includes a calculation that determines the row position of the cursor in a multi-line field.

```
xcall i_fldinf(id, fldname,,, gs_inpfld)
row_num = gs_edtltrow - gs_fnum + 1
```

## I\_FLDMOD – Modify an input field’s attributes at runtime



```
xcall I_FLDMOD (window_id, field_spec, [length], [type][, qualifier, ...])
```

### Arguments

*window\_id*

The ID of the input window containing the field to be modified. **(n)**

*field\_spec*

The specification for the field whose attributes I\_FLDMOD will modify. (See “[Field specifications](#)” on page 2-47 for information.) **(a)**

*length*

(optional) The maximum input length. **(n)**

*type*

(optional) The requested field type: **(n)**

|                  |                            |
|------------------|----------------------------|
| <b>D_ALPHA</b>   | Alphanumeric.              |
| <b>D_DECIMAL</b> | Decimal.                   |
| <b>D_INTEGER</b> | Integer.                   |
| <b>D_NUMERIC</b> | Numeric (same as decimal). |

*qualifier*

(optional) One or more of the following field qualifiers: **(a or n)**

**D\_FLD\_DEC**, *num\_places*      Decimal places.

**D\_FLD\_FPOS** [, **D\_CHANGE**], *row, col*  
Field position.

**D\_FLD\_POS** [, **D\_CHANGE**], *row, col*  
Prompt position.

**D\_FLD\_SIZE**, *storage\_size*      Storage size.

**D\_FLD\_TYPE**, *type*      Field type.

*type* is one of the following:

**D\_ALPHA**      Alphanumeric.

**D\_DECIMAL**      Decimal.

|                                                                              |                                                                                                                                                   |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_INTEGER</b>                                                             | Integer.                                                                                                                                          |
| <b>D_NUMERIC</b>                                                             | Numeric (same as decimal).                                                                                                                        |
| <b>D_USERTYPE</b> , <i>string</i>                                            | User-defined.                                                                                                                                     |
| <b>D_ON</b>                                                                  | Turn on one or more of the following field qualifiers.<br>(default)                                                                               |
| <b>D_OFF</b>                                                                 | Turn off one or more of the following field qualifiers.<br>When qualifiers are preceded by D_OFF, flags that normally require an argument do not. |
| <b>D_FLD_ARRIVE</b> , <i>arrive_method</i>                                   | Arrive method.                                                                                                                                    |
| <b>D_FLD_ATTR</b> , <i>attribute</i>                                         | Attributes.                                                                                                                                       |
| <i>attribute</i> is one of the following flags defined in <b>tools.def</b> : |                                                                                                                                                   |
| <b>A_ALL</b>                                                                 | All attributes (same as A_BHRU).                                                                                                                  |
| <b>A_NONE</b>                                                                | No attributes.                                                                                                                                    |
| <b>A_B   A_I</b>                                                             | Blinking (on UNIX and OpenVMS) or italic (on Windows). “I” can be substituted whenever “B” appears in the following flags.                        |
| <b>A_BH</b>                                                                  | Blinking, highlighted.                                                                                                                            |
| <b>A_BHR</b>                                                                 | Blinking, highlighted, reverse.                                                                                                                   |
| <b>A_BHRU</b>                                                                | Blinking, highlighted, reverse, underlined.                                                                                                       |
| <b>A_BHU</b>                                                                 | Blinking, highlighted, underlined.                                                                                                                |
| <b>A_BR</b>                                                                  | Blinking, reverse.                                                                                                                                |
| <b>A_BRU</b>                                                                 | Blinking, reverse, underlined.                                                                                                                    |
| <b>A_BU</b>                                                                  | Blinking, underlined.                                                                                                                             |
| <b>A_H</b>                                                                   | Highlighted.                                                                                                                                      |
| <b>A_HR</b>                                                                  | Highlighted, reverse.                                                                                                                             |
| <b>A_HRU</b>                                                                 | Highlighted, reverse, underlined.                                                                                                                 |
| <b>A_HU</b>                                                                  | Highlighted, underlined.                                                                                                                          |
| <b>A_R</b>                                                                   | Reverse.                                                                                                                                          |
| <b>A_RU</b>                                                                  | Reverse, underlined.                                                                                                                              |
| <b>A_U</b>                                                                   | Underlined.                                                                                                                                       |
| <b>D_FLD_AUTO</b>                                                            | Automatic input.                                                                                                                                  |

|                                                                   |                                                   |
|-------------------------------------------------------------------|---------------------------------------------------|
| <b>D_FLD_BREAK</b>                                                | Break on change.                                  |
| <b>D_FLD_BRK_ALWAYS</b>                                           | Break always.                                     |
| <b>D_FLD_BRK_RTRN</b>                                             | Break on return only.                             |
| <b>D_FLD_BZRO</b>                                                 | Blank if zero.                                    |
| <b>D_FLD_CHANGE</b> , <i>change_method</i>                        | Change method.                                    |
| <b>D_FLD_CHECKBOX</b>                                             | Check box field.                                  |
| <b>D_FLD_COLOR</b> , <i>palette#</i>                              | Color.                                            |
| <b>D_FLD_COPY</b>                                                 | Copy default.                                     |
| <b>D_FLD_DATE</b> , <i>date_type</i>                              | Date format.                                      |
| <i>date_type</i> is one of the following:                         |                                                   |
| <b>D_DATE_Y2J</b>                                                 | YYJJJ date format.                                |
| <b>D_DATE_Y2MD</b>                                                | YYMMDD date format.                               |
| <b>D_DATE_Y2P</b>                                                 | YYPP date format.                                 |
| <b>D_DATE_Y4J</b>                                                 | YYYYJJJ date format.                              |
| <b>D_DATE_Y4MD</b>                                                | YYYYMMDD date format.                             |
| <b>D_DATE_Y4P</b>                                                 | YYYYPP date format.                               |
| and optionally one or both of the following:                      |                                                   |
| <b>D_DATE_SHORT</b>                                               | Add to any of the above for short date qualifier. |
| <b>D_DATE_TODAY</b>                                               | Add to any of the above to default to today.      |
| <b>D_FLD_DECR</b>                                                 | Decrement default.                                |
| <b>D_FLD_DISABLED</b>                                             | Disabled.                                         |
| <b>D_FLD_DISPLAY</b> , <i>display_method</i>                      | Display method.                                   |
| <b>D_FLD_DFLT</b> , <i>string</i>                                 | Default entry.                                    |
| <b>D_FLD_DRILL</b> , <i>drill_method</i>                          | Drill method.                                     |
| <b>D_FLD_DSPLEN</b> , <i>display_len</i>                          | Display length.                                   |
| <b>D_FLD_EDITFMT</b> , <i>editfmt_method</i>                      | Edit format method.                               |
| <b>D_FLD_ENUM</b> , <i>[dlen]</i> , <i>[base]</i> , <i>[step]</i> | Enumeration properties.                           |
| <b>D_FLD_FMT</b> , <i>string</i>                                  | Format string.                                    |

|                                                                                             |                                                                    |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| <b>D_FLD_FONT</b> , <i>font_id</i>                                                          | Field font.                                                        |
| <i>font_id</i> is the name of a font palette entry, a font handle, or one of the following: |                                                                    |
| <b>DF_ALTERNATE</b>                                                                         | Alternate font.                                                    |
| <b>DF_CURRENT</b>                                                                           | Current font.                                                      |
| <b>DF_DEBUGGER</b>                                                                          | Debugger font.                                                     |
| <b>DF_DEFAULT</b>                                                                           | Global font.                                                       |
| <b>D_FLD_HELP</b> , <i>string</i>                                                           | Help identifier.                                                   |
| <b>D_FLD_HYPERLINK</b> , <i>hyper_method</i>                                                | Hyperlink method.                                                  |
| <b>D_FLD_INCR</b>                                                                           | Increment default.                                                 |
| <b>D_FLD_INFO</b> , <i>string</i>                                                           | Information text.                                                  |
| <b>D_FLD_INPLEN</b> , <i>input_len</i>                                                      | Maximum input length.                                              |
| <b>D_FLD_JUST</b> , <i>just_flag</i>                                                        | Justification.                                                     |
| <i>just_flag</i> is one of the following:                                                   |                                                                    |
| <b>D_JST_CENTER</b>                                                                         | Centered.                                                          |
| <b>D_JST_LEFT</b>                                                                           | Left-justified.                                                    |
| <b>D_JST_RIGHT</b>                                                                          | Right-justified.                                                   |
| <b>D_FLD_LEAVE</b> , <i>leave_method</i>                                                    | Leave method.                                                      |
| <b>D_FLD_NEG</b>                                                                            | Negative allowed.                                                  |
| <b>D_FLD_NEGONLY</b>                                                                        | Negative allowed only.                                             |
| <b>D_FLD_NEGORZERO</b>                                                                      | Negative or zero allowed only.                                     |
| <b>D_FLD_NODEC</b>                                                                          | No decimal required.                                               |
| <b>D_FLD_NOECHO</b>                                                                         | No echo.                                                           |
| <b>D_FLD_NOECHR</b> , <i>char</i>                                                           | Fill character when D_FLD_NOECHO is specified (otherwise ignored). |
| <b>D_FLD_NOTERM</b>                                                                         | No termination.                                                    |
| <b>D_FLD_PAINT</b> , <i>char</i>                                                            | Paint character.                                                   |
| <b>D_FLD_PROMPTFONT</b> , <i>font_id</i>                                                    | Prompt font.                                                       |
| <i>font_id</i> is the name of a font palette entry, a font handle, or one of the following: |                                                                    |
| <b>DF_ALTERNATE</b>                                                                         | Alternate font.                                                    |
| <b>DF_CURRENT</b>                                                                           | Current font.                                                      |

|                                                                            |                                                                                                          |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>DF_DEBUGGER</b>                                                         | Debugger font.                                                                                           |
| <b>DF_DEFAULT</b>                                                          | Global font.                                                                                             |
| <b>D_FLD_RADIO</b>                                                         | Radio buttons.                                                                                           |
| <b>D_FLD_RANGE</b> , <i>minimum, maximum</i>                               | Range.                                                                                                   |
| <b>D_FLD_READONLY</b>                                                      | Read-only.                                                                                               |
| <b>D_FLD_REQUIRED</b>                                                      | Required input.                                                                                          |
| <b>D_FLD_RETPOS</b>                                                        | Retain position in text field.                                                                           |
| <b>D_FLD_TIME</b> , <i>time_type</i>                                       | Time format.                                                                                             |
| <i>time_type</i> is one of the following:                                  |                                                                                                          |
| <b>D_TIME_HM</b>                                                           | HHMM time format.                                                                                        |
| <b>D_TIME_HMS</b>                                                          | HHMMSS time format.                                                                                      |
| and optionally one or both of the following:                               |                                                                                                          |
| <b>D_TIME_AMP</b>                                                          | Add to either of the above to display as AM/PM.                                                          |
| <b>D_TIME_NOW</b>                                                          | Add to either of the above to default to the current time.                                               |
| <b>D_FLD_TIMESTAMP</b> , <i>format</i>                                     | Timestamp.                                                                                               |
| <i>format</i> is one or both of the following, or 0 (for neither):         |                                                                                                          |
| <b>D_TIMESTAMP_AMP</b>                                                     | Use 12-hour notation and AM or PM designation.                                                           |
| <b>D_TIMESTAMP_SHORT</b>                                                   | Use short display format (no century, seconds, or milliseconds).                                         |
| <b>D_FLD_UC</b>                                                            | Uppercase only.                                                                                          |
| <b>D_FLD_USER</b> , <i>string</i>                                          | User-defined text string.                                                                                |
| <b>D_FLD_VIEWLEN</b> , <i>view_length</i>                                  | The width of the field (i.e., the width of the area on the screen that will display data for the field). |
| <b>D_FLD_WAIT</b> , <i>wait_time</i>                                       | Input time-out for the field.                                                                            |
| <i>wait_time</i> is the number of seconds to wait or one of the following: |                                                                                                          |
| <b>D_FOREVER</b> or <b>-1</b>                                              | Wait until I/O processing is completed.                                                                  |
| <b>D_GLOBAL</b> or <b>-2</b>                                               | Use the globally specified time-out.                                                                     |
| <b>D_IMMEDIATE</b> or <b>0</b>                                             | Time out immediately.                                                                                    |

## Discussion

I\_FLDMOD modifies various input field attributes at runtime. You can use I\_FLDMOD to change the fields in your current input set. Note that I\_FLDMOD changes only the field's display, not the internal input buffer layout. You should also be aware that in order to prevent invalid data, *field\_spec* is always initialized, so alterations to the displayed data are reflected on the next input or display.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

I\_FLDMOD's options are also available with the .FIELD script command. If you need more information on a specific option, see [.FIELD on page 2-34](#).

You can use *length* to shorten a field or re-lengthen a field after it has been shortened. The modified length must be greater than zero and less than or equal to the original length.

*Type* is retained for compatibility with earlier versions of UI Toolkit. It duplicates the functionality of D\_FLD\_TYPE with the exception of D\_USERTYPE. A user-defined field can only be specified using D\_FLD\_TYPE.

I\_FLDMOD will change the field type between alpha, decimal, and integer; requests to change to or from text fields will be ignored.

If you change the field type from alpha, the following defaults apply unless you specifically override them:

- ▶ Zero decimal places (D\_FLD\_DEC, 0)
- ▶ Negative not allowed (D\_OFF, D\_FLD\_NEG)

If you change the field type to alpha, the following defaults apply unless you specifically override them:

- ▶ Lowercase allowed (D\_OFF, D\_FLD\_UC)
- ▶ No echo character is blank (D\_FLD\_NOECHR)
- ▶ No matching case (.FIELD's MATCH(NOCASE))

If you change the field type to D\_INTEGER, the storage size is changed to the nearest (but not larger) valid integer storage size. Valid sizes are 1, 2, 4, or 8. Integer fields support all qualifiers that are valid for decimal fields without precision.

If you want the field to become an implied-decimal field, you can pass D\_FLD\_DEC, *num\_places* as a qualifier. Regardless of its original setting, any field type can be converted to implied-decimal. Note that you can specify up to nine digits after the decimal point.

If you change the type of a field (for example, alpha to numeric) and you are using any of the FONT\_ initialization settings, be aware that the corresponding font isn't automatically applied. To update the font, use D\_FLD\_FONT. (Note that if a view length is specified on Windows, changing the font may change the width of the field. See [“VIEW\\_LENGTH\(view\\_length\)” on page 2-83](#) for information.)



Because a list has only one font setting, using I\_FLDMOD to change the font for a field in a list has no effect. With the ActiveX Toolkit list, however, you can manipulate the font for individual cells by using the API Extension methods SetCellFont, SetHeaderCellFont, and SetFooterCellFont.



On Windows systems, do not use I\_FLDMOD to change font settings for a column in a Toolkit list or an ActiveX implementation of a Toolkit list. This doesn't work on Windows: the font will revert to the standard typeface and size, and data in the column will be blanked out. This is because input field fonts are not applied to lists. For an ActiveX Toolkit list, you can use the SetCellFont method to change the font of a specific cell.

I\_FLDMOD settings for an ActiveX Toolkit list will not override cell-level colors or fonts specified by the SetCellColor and SetCellFont ActiveX Toolkit list methods.

If you specify a qualifier (other than D\_FLD\_DEC) that does not apply to the field's destination type, it is ignored.

Any D\_FLD\_xxx argument flag not listed in the "Arguments" section will result in the fatal error "Invalid I\_FLDMOD code (*code*)," where *code* is the invalid value passed.

D\_FLD\_POS modifies the position of the prompt only. It does not affect the field's position (unlike changing the default field position for IB\_FIELD or .FIELD). To modify the field position, you must use D\_FLD\_FPOS. You must also use D\_FLD\_FPOS to modify the position of a check box prompt on Windows because the position of a check box's prompt is determined by its field position. If either position places any part of a field or prompt outside the window, the positions are automatically adjusted so that the field and prompt fit in the window.

The D\_ON and D\_OFF codes indicate whether the field qualifiers that follow in the argument list are to be turned on or off. The D\_ON state is the default for any qualifiers listed.

When qualifiers are preceded by D\_OFF, flags that normally require an argument do not. For example, the first I\_FLDMOD call below turns no echo on. The second call turns it off.

```
xcall i_fldmod(inpid, "myfield",,, D_FLD_NOECHR, '*')
xcall i_fldmod(inpid, "myfield",,, D_OFF, D_FLD_NOECHR)
```

Turning off D\_FLD\_BRK, D\_FLD\_BRK\_ALWAYS, or D\_FLD\_BRK\_RTRN results in a field with no break.

The D\_FLD\_DSPLLEN and D\_FLD\_INPLEN qualifiers cannot be specified for check boxes, radio buttons, selection windows, or multi-line fields.

To use D\_FLD\_ENUM, the field must already be an enumerated field. You cannot use this to turn a non-enumerated field into an enumerated field, and you cannot use D\_OFF with this qualifier to change an enumerated field into a non-enumerated field. (D\_OFF causes D\_FLD\_ENUM to be ignored.)

Additionally, note the following:

- ▶ A display length (*dlen*) set with `D_FLD_ENUM` overrides any previously specified display length (for example, any display length set with `D_FLD_DSPLEN`).
- ▶ If you use `D_FLD_ENUM`, you must include all comma placeholders for the arguments (even those you don't pass) unless this is the last qualifier for the `I_FLDMOD` call. If it is the last qualifier for the call, include all comma placeholders that precede the last argument you specify for `D_FLD_ENUM`.
- ▶ If you omit an argument, the corresponding enumeration property will remain unchanged.

`D_FLD_RANGE` can be specified only for input fields that had a range originally, either using the `RANGE` qualifier in Script, or using `IB_FIELD`. The field must also be numeric, and *minimum* and *maximum* must not exceed the field's storage size.

If you use `D_FLD_READONLY` for a field that can't be set to read-only (in other words, for a field that's a check box, a radio button set, or a field with a selection list or a selection window), the read-only setting will be accepted, but it won't affect the field. (For these field types, use `I_DISABLE` rather than `I_READONLY`.) However, if the field is subsequently changed to a regular text field, Toolkit may use this setting. When a field is changed to a text field, the most recent read-only state setting is used to determine whether the field will be read-only or read/write. Note the following:

- ▶ You can also use `I_READONLY` to set a field's read-only state. See [I\\_READONLY on page 8-74](#) for information on the differences between using `D_FLD_READONLY` and `I_READONLY`.
- ▶ For information on changing read-only settings from an input method for the field, see [“Notes on Input Methods” on page D-3](#).

`D_FLD_TIMESTAMP` changes a timestamp field to a standard read-only 8-byte integer field (if `D_OFF` is in effect), or it changes a read-only 8-byte integer field to a timestamp field (if `D_ON` is in effect). Additionally, if `D_ON` is in effect, `D_FLD_TIMESTAMP` accepts an argument, *format*, that enables you to change the formatting used for a timestamp field. Note the following:

- ▶ For `D_ON`, `D_FLD_TYPE` must be set to `D_INTEGER`, and the field must be a read-only, 8-byte integer, and it cannot be a selection field, a radio button set, or a check box. Otherwise, the `D_FLD_TIMESTAMP` qualifier is ignored.
- ▶ When `D_ON` is in effect, `D_FLD_TIMESTAMP` must be followed by the *format* argument. To specify both flags (`D_TIMESTAMP_AMPM` and `D_TIMESTAMP_SHORT`), use the bitwise OR operator (`.BOR.` or `|`) or add them. If you don't want to specify either flag, pass a value of zero as *format*. Note that if a flag isn't passed, it will be reset to its default value. For example, if you don't pass `D_TIMESTAMP_SHORT`, the long display format will be used even if the field was previously set to use the short format.
- ▶ When `D_OFF` is in effect, you must omit the *format* argument. (If you include it, it will be interpreted as another qualifier.)

The `D_FLD_VIEWLEN` qualifier cannot be specified for check boxes or radio buttons.

For all the qualifiers that have text string arguments, you can only specify a *string* that is equal to or shorter than the original length of the text string. If you shorten the length, you can re-lengthen or restore the text string for the field as long as it doesn't exceed the length of the original string; if it does exceed the original length, the modification will be ignored.

User-defined field methods are passed the user type and user text strings as arguments. Thus, it is important to know the order methods are invoked if the developer modifies either of these strings within a method. The input field methods are invoked in the following order: arrive method, `EEDTDSP_METHOD`, `%IEDITFMT_METHOD`, `ECHKFLD_METHOD`, change method, `EDSPFLD_METHOD` or `%IDISPLAY_METHOD`, leave method, and drill or hyperlink method.

You can use the `D_FLD_ARRIVE`, `D_FLD_CHANGE`, `D_FLD_DISPLAY`, `D_FLD_DRILL`, `D_FLD_EDITFMT`, `D_FLD_HYPERLINK`, and `D_FLD_LEAVE` methods even if the field did not originally define that method.

The default qualifiers are also inspected when arriving upon the field so the default value can be displayed. Thus, modifying the default value within a method (other than the arrive method) will not cause that new default value to be used if the user presses ENTER.

Because the information line is displayed when arriving on a field, modifying a field's information line within a method (other than the arrive method) may not take visible effect until the next time the field is arrived upon. Otherwise, to immediately affect the information line, use either `E_SECT` to modify it or `%M_SIGNAL` to exit the method and force the arrival on the field to occur again.

## See also

- ▶ [.FIELD on page 2-34](#) for more information about the various field options.
- ▶ [“Renditions” on page 2-46](#) for information and notes on setting field-level renditions.
- ▶ [“Using Fonts on Windows” on page 18-46](#) for information on fonts and font palettes.

## Examples

The following is a sample interface for a room scheduler. This program assumes two different companies in the same building use this scheduler. Company Alpha likes to describe all of its rooms with an alpha field, such as “Conference room,” “Laboratory,” and “Break room.” Company Numeric, however, prefers to use room numbers that are no larger than 9999. Company Alpha does not allow a blank room name, but Company Numeric allows a room #0.

The first field in this input window asks whether Company Alpha or Company Numeric is entering the schedule, and it modifies the room field accordingly.

```
.include "WND:tools.def"
record
    id                ,i4
    colid             ,i4
```

```

record data
  company          ,a30
  room             ,a20
  time             ,a5
  ampm             ,a2

proc

;Set up stuff

xcall u_start("rmsched")
xcall i_ldinp(id, g_utlib, "rmsched")

;Start input processing

do forever
  begin
    xcall i_input(id,, data)
    if (g_setsts) then                                ;At company break field
      begin
        if (company .eq. "Numeric Company") then
          xcall i_fldmod(id, "room", 4, D_NUMERIC, D_OFF, D_FLD_REQUIRED)
        else
          xcall i_fldmod(id, "room", 20, D_ALPHA, D_ON, D_FLD_REQUIRED)
        end
      end
    else
      begin                                           ;Process the input
        xcall i_init(id)
      end
    end                                             ;End of "do forever"
  xcall u_finish
end

```

The input window looks like this:

```

.input rmsched, 10, 65
.field company, a30, req, break, prompt("Company Name  "),-
  sel(0, 30, 2, "Alpha Company", "Numeric Company")
.field room, a20, pos(2, 9), prompt("Room  ")
.field time, d5, pos(3, 9), prompt("Time  "), format("ZX:XX")
.field ampm, a2, sel(0, 2, 2, "am", "pm"), pos(change, 0, 1)
.end

```

The following example changes the **custno** field to type alpha, with uppercase input only.

```
xcall i_fldmod(inpid, "custno",,, D_FLD_TYPE, D_ALPHA, D_FLD_UC)
```

The next example removes the “required” status from the field **creditref**.

```
xcall i_fldmod(inpid, "creditref",,, D_OFF, D_FLD_REQUIRED)
```

The following example modifies the field **date** to default to today's date.

```
xcall i_fldmod(inpid, "date",,, D_FLD_DATE, D_DATE_Y4MD+D_DATE_TODAY)
```

## %I\_FLDPREC – Retrieve an input field’s precision



*precision* = %I\_FLDPREC (*window\_id*, *field\_spec*)

### Return value

*precision*

This function returns the precision as an integer value. (^VAL)

### Arguments

*window\_id*

The ID of the input window containing the field. (n)

*field\_spec*

The field specification for the field whose precision %I\_FLDPREC will retrieve. (See “[Field specifications](#)” on page 2-47 for information.) (a)

### Discussion

%I\_FLDPREC returns the precision (number of places to the right of the decimal point) for the field. If the field is not an implied-decimal field, the return value is zero.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

You do not need to declare this function to use it. It is defined in **tools.def**.

### Examples

The following example returns the number of decimal places for field **amount**.

```
numdec=%i fldprec (wndid, "amount")
```

## I\_FLDSEL – Assign a new selection window to an input field



```
xcall I_FLDSEL (window_id, field_spec, [selection_id][, row, column])
```

### Arguments

*window\_id*

The ID of the input window containing the field. (**n**)

*field\_spec*

The specification for the field that the selection window will be assigned to. (See “[Field specifications](#)” on page 2-47 for information.) (**a**)

*selection\_id*

(optional) The ID of the selection window. (**n**)

*row*

(optional) The row offset from the field at which to place the upper-left corner of the selection window. (**n**)

*column*

(optional) The column offset from the field at which to place the upper-left corner of the selection window. (**n**)

### Discussion

The I\_FLDSEL subroutine assigns a selection window to a field.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

If *selection\_id* is passed and a local selection window is already assigned to the field (SELECT qualifier on . FIELD), it will be deleted. The specified window will be assigned to the field and marked as non-local. It will not be considered owned by the input window. In this situation, the selection window will not be deleted when you delete the input window. Deleting the selection window becomes your responsibility.

If *selection\_id* is omitted or has a value of zero, the specified field will not display a selection window. Thus, you have the ability to assign or deassign a selection window at runtime. (For example, you may want to use the same input field to enter an existing code and define a new code. You can assign the selection window to your field with one call to I\_FLDSEL, and then remove the selection window from the field with another call to I\_FLDSEL.)

If you don't specify *row* and *column*, the new selection window will be placed where the old one was. If there was not a selection window before, the selection window will be placed immediately below the field.

## See also

- ▶ [S\\_SELBLD on page 12-6](#) and [S\\_SELLD on page 12-18](#) for information about building selection windows dynamically within your programs (“on-the-fly”).
- ▶ [U\\_WINDOW on page 16-166](#) for information about deleting windows.

## Examples

The following example assigns the **yesno** selection window to the **taxable** field in the **arcust** input window. The selection window is placed two rows below and three columns to the right of the beginning of the **taxable** field.

```
xcall i_ldinp(inpwd, g_utlib, "arcust")
xcall u_ldwnd(selwd, g_utlib, "yesno")
xcall i fldsel(inpwd, "taxable", selwd, 2, 3)
```



## %I\_FLDSIZE – Retrieve an input field’s size



*size* = %I\_FLDSIZE(*window\_id*, *field\_spec*)

### Return value

*size*

This function returns the field size as an integer value. (^VAL)

### Arguments

*window\_id*

The ID of the input window containing the field. (n)

*field\_spec*

The specification for the field whose size %I\_FLDSIZE will retrieve. (See “[Field specifications](#)” on page 2-47 for information.) (a)

### Discussion

%I\_FLDSIZE returns the storage size of the field in bytes. If the field is an array, this is the size of one element.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

This function may be particularly useful as an argument to the L\_FINDSPEC subroutine, although it has a variety of uses.

You do not need to declare this function to use it. It is defined in **tools.def**.

### Examples

In this example, the beginning position and length of the find area for the list identified by **lstid** are determined by the structure position and scope (size \* dimension) of the field named in **fndfield** within the input window identified by **inpid**. A usual scenario would have **inpid** identify the input window associated with the list, and the input window set’s structure would also double as the data passed to the list processor.

```
xcall l_findspec(lstid,, %i_fldstrpos(inpid, fndfield),
&                %i_fldsize(inpid, fndfield)*%i_flddim(inpid, fndfield))
```

## %I\_FLDSTRPOS – Retrieve an input field’s structure position



```
struct_pos = %I_FLDSTRPOS (window_id, field_spec)
```

### Return value

*struct\_pos*

This function returns the position as an integer value. (^VAL)

### Arguments

*window\_id*

The ID of the input window containing the field. (n)

*field\_spec*

The specification for the field whose structure position %I\_FLDSTRPOS will retrieve. (See “Field specifications” on page 2-47 for information.) (a)

### Discussion

%I\_FLDSTRPOS returns the starting character position of the field within its local or repository structure. If the field is not associated with a structure, the return value is zero. If the field was created from an element in repository array field, %I\_FLDSTRPOS returns the starting character position for the element (rather than the starting character position for the beginning of the array).

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

This function may be particularly useful as an argument to the L\_FINDSPEC subroutine, although it has a variety of uses.

You do not need to declare this function to use it. It is defined in **tools.def**.

### Examples

In this example, the beginning position and length of the find area for the list identified by **lstid** are determined by the structure position and scope (size \* dimension) of the field named in **fndfield** within the input window identified by **inpid**. A usual scenario would have **inpid** identify the input window associated with the list, and the input window set’s structure would also double as the data passed to the list processor.

```
xcall l_findspec(lstid,, %i fldstrpos(inpid, fndfield),
& %i fldsize(inpid, fndfield)*%i flddim(inpid, fndfield))
```

## I\_FORCE – Force data to or from an input field



```
xcall I_FORCE([new_data][, old_data])
```

### Arguments

*new\_data*

(optional) The new data to force. **(a)**

*old\_data*

(optional) Returned with the current contents of the force buffer. **(a)**

### Discussion

The I\_FORCE subroutine forces a data string as input to the next field. This operation is equivalent to entering the desired data for the field from the terminal. (Note, however, that this routine does not do any of the actual forced data processing. It simply sets up the force buffers so the field input routine can access the data. The data will be the input delivered to the next field processed by I\_INPUT or I\_INPFLD.)

The force buffer is the location to which UI Toolkit copies the contents of an input field if the user selects a menu entry before pressing ENTER. (Note that the length of the data in the force buffer is not set.) The field is then reset to its initial entering state. You can use I\_FORCE with the *old\_data* argument to obtain the field's contents at the time the menu entry was selected; if *old\_data* is passed, the current contents of the force buffer are copied to *old\_data* prior to any new data processing.

If *new\_data* is passed, its contents are loaded into the force buffer. If a null string ("") is passed as *new\_data*, the force buffer is cleared and any pending I\_FORCE is cancelled.

If I\_FORCE is being used in a selection window field and *new\_data* is not a selection in the selection window, a beep will sound and *new\_data* will not be accepted into the field. UI Toolkit will then wait for input (with the selection window dropped down if the field is empty).

The force buffer is cleared when a field exits without pending input. As a result, I\_FORCE returns only the pending input for the last field accessed.

A call to I\_FORCE is valid at any time. If a hot entry is processed by EUTILS\_METHOD during input window processing and I\_FORCE is called, the input field that was "interrupted" will have the value of the I\_FORCE argument.

You can override the UI Toolkit's default behavior of canceling pending input by registering an EENTRST\_METHOD subroutine. See ["Environment Routines" on page 7-1](#) for more information.

## See also

- ▶ [I\\_PUTFLD on page 8-72](#) for information about putting data into a field.
- ▶ [I\\_DSPFLD on page 8-19](#) for information about displaying data in a field.

## Examples

This example searches for the data string input by the user and places the string it finds back into the input field.

```
xcall i_input(wnd,, data, inpcol, selcol, edtccl)
if (g_select)
  case g_entnam of
    begincase
      "SEARCH":                                ; If input terminated by user
        begin                                  ; and user wants to look up
          xcall i_force(, string)               ; a name, see if user entered
          xcall lookup(g_fldnam, string)        ; a partial name. Go do
          xcall i_force(string)                 ; the search and put the
        end                                     ; found information back
        .                                       ; into the field.
        .
        .
      endcase
```

## I\_FRAMES – Display frames on input fields



```
xcall I_FRAMES (window_id[, set_name])
```

### Arguments

*window\_id*

The ID of the input window. (**n**)

*set\_name*

(optional) The set name containing the fields to frame, or the following: (**a**)

**\*NONE\*** Remove all frames.

### Discussion

Generally, input fields have frames around them only when the input set they belong to is being processed using I\_INPUT. Using I\_FRAMES, however, you can display frames on input fields within a given set without calling I\_INPUT. (On UNIX and OpenVMS, this routine is ignored.)

Only the fields contained in the specified set will be framed. (This allows for display-only fields that function as labels.) If *set\_name* is not passed, then the default (first) will be used. Frames can only be displayed on one set at a time. If *set\_name* is the special value “\*NONE\*,” then all field frames will be removed from the window.

Note that the window must be placed before you pass its ID (as *window\_id*) to I\_FRAMES.

If you use I\_FRAMES to remove the frame from a field that has been displayed or cleared since its input window was added to a tab set, renditions will be applied to the field that may not match the renditions for the window. See [%TS\\_TABSET on page 13-9](#) for more information.

### Examples

The following example displays frames on all the input fields in the input set **set1**.

```
xcall i_frames(id, "set1")
```

The next example clears all the frames from the input window **inpid**.

```
xcall i_frames(inpid, "*NONE*")
```

## I\_GETFLD – Get data from an input field’s data area



```
xcall I_GETFLD(window_id, [set_name], data_area, field_spec, data)
```

### Arguments

*window\_id*

The ID of the input window containing the field. **(n)**

*set\_name*

(optional) The name of the input set. **(a)**

*data\_area*

The data area for the input set. **(a)**

*field\_spec*

The specification for the field whose data area data will be retrieved from. (See “[Field specifications](#)” on page 2-47 for information.) **(a)**

*data*

Returned with the obtained data. **(a or n)**

### Discussion

The I\_GETFLD subroutine gets data from an input field’s data area.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

If you omit *set\_name*, it defaults to the first input set.

*Data\_area* must correspond to the structure associated with the input set.

The data is loaded into *data* according to the definitions in the input window, regardless of the actual type of *data*. If the data type is text, *data* is assumed to be the first element of an array dimensioned as specified in the field’s definition.

Note that by default, Toolkit does not ensure that the size of *data\_area* or the size of *data* matches the size of the referenced field (*field\_spec*) or that they are even large enough for the field. However, bounds checking can check for the following conditions. (See “[g\\_dtkbounds](#)” on page 18-3 for more information.)

- ▶ If **g\_dtkbounds** is set to 1, Toolkit generates a fatal error if *data\_area* is not large enough for the field.
- ▶ If **g\_dtkbounds** is set to 2 or greater, Toolkit generates a fatal error if *data\_area* is not large enough (as it does if **g\_dtkbounds** is set to 1). And it generates a non-fatal error if *data* is smaller than the field.

## Examples

The following example locates the position of the **fax** field in **cusmas** and copies the data to **fax\_number**.

```
xcall i_getfld(inpid,, cusmas, "fax", fax_number)
```

The next example locates the position of the **addr** field in **cusmas** and copies the data to **address**.

```
xcall i_getfld(inpid,, cusmas, "addr", address)
```

## %I\_GETSTRING – Retrieve a string referenced by an input window data pointer



```
string = %I_GETSTRING(window_id, ctrl_pointer[, length])
```

### Return value

*string*

This function returns either the string referenced by the specified pointer or a single space if *ctrl\_pointer* is null. (a)

### Arguments

*window\_id*

The ID of the input window. (n)

*ctrl\_pointer*

One of the following 16-bit pointers, which are defined in the distributed **fldinf.def** and **inpinf.def** files: (i)

|                     |                              |
|---------------------|------------------------------|
| <b>gs_hlpptr</b>    | Help identifier.             |
| <b>gs_fmtptr</b>    | Format.                      |
| <b>gs_info</b>      | Information line.            |
| <b>gs_dfltptr</b>   | Default value or string.     |
| <b>gs_usrptr</b>    | User-defined string.         |
| <b>gs_usrtyp</b>    | User-defined data type.      |
| <b>gs fldnam</b>    | Name of the field.           |
| <b>inp_setnam</b>   | Name of current input set.   |
| <b>inp fldnam</b>   | Name of current input field. |
| <b>inp_usertype</b> | User-defined data type.      |
| <b>inp_usertext</b> | User text string.            |

*length*

(optional) The returned length of the string. (n)



## Discussion

The `%I_GETSTRING` function enables you to retrieve the strings referenced by an input window's internal pointers when you use the control argument in `I_FLDINF`.

The *ctrl\_pointer* options from the **gs\_pts** array in **fldinf.def** are valid after calling `I_FLDINF` to load the control structure. The *ctrl\_pointer* options from **inpinf.def** are valid while within a method subroutine.

In the case of a null pointer, if passed, *length* will be returned as zero.

*Ctrl\_pointer* is assumed to be valid if non-null. Make sure that only pointers created during construction of the input window are used. An invalid pointer cannot be detected by this routine, and its use will have extremely unpredictable results.

You do not need to declare this function to use it. It is declared in **tools.def**.

## %I\_INFO – Return general information about an input window

|    |    |   |   |
|----|----|---|---|
| WT | WN | U | V |
|----|----|---|---|

*return* = %I\_INFO(*window\_id*, *qualifier*)

### Return value

*return*

Returns a value that is specific to the requested information. (^VAL)

### Arguments

*window\_id*

The ID of the input window whose information you want returned. (n)

*qualifier*

One of the following: (n)

**D\_NMFLDS**            Return the number of input fields in the window.

**D\_NMSETS**            Return the number of input sets in the window.

### Discussion

The %I\_INFO function returns information about an input window.

*Window\_id* must contain the ID of a loaded input window. Otherwise a fatal Toolkit error will occur.

If a value other than those listed above is passed for *qualifier*, a fatal Toolkit error will occur.

### Examples

The following example returns the number of input fields in an input window with the window ID **inpid**:

```
num_flds=%i_info(inpid, D_NMFLDS)
```

The next example returns the number of input sets in an input window with the window ID **inpid**:

```
num_sets=%i_info(inpid, D_NMSETS)
```

## I\_INIT – Initialize input fields



```
xcall I_INIT(window_id, [set_name], [data_area][, field_list, ...])
```

### Arguments

*window\_id*

The ID of the input window to process. **(n)**

*set\_name*

(optional) The name of the input set. **(a)**

*data\_area*

(optional) The name of the data area for the input set. **(a)**

*field\_list*

(optional) One or more field specifications, or the following: **(a)**

**\*ENABLED\***            Initialize enabled fields only.

### Discussion

The I\_INIT subroutine initializes input fields. To initialize means to clear the input field(s) in the window, fill the field(s) with the appropriate paint character, and flag the field(s) as empty. I\_INIT does not affect the enabled state of the field(s).

*Data\_area* must correspond to the structure associated with the input set. *Data\_area* only applies if you specify a *set\_name*. Note that by default, Toolkit does not ensure that *data\_area* is large enough for the fields it references. Toolkit generates an error for this condition only if **g\_dtkbounds** is set to 1 or greater. See [“g\\_dtkbounds” on page 18-3](#).

You can specify up to nine field lists (*field\_list* arguments), each of which can have from one to nine field specifications. If a *field\_list* has multiple field specifications, separate the field specifications with any character other than an identifier character or a square bracket—either [ or ], which are used to enclose dimension specifications for repository arrayed fields. (Identifier characters include alpha characters, numeric characters, the dollar sign, and the underscore character.) For example:

"name"

or

"name, birthday, soc\_sec\_no, employer, phone, policy\_no, conditions[2]"

The maximum length of a *field\_list* is 99 characters. Additional characters are ignored. For information on field specifications, see [“Field specifications” on page 2-47](#).

You can do the following:

- ▶ Specify only *window\_id*. All fields in the window are initialized. The context is reset to the first field for each set (that is, the next field processed is the first enabled input field in the set).
- ▶ Specify *set\_name* without any additional arguments. All fields in the input set are initialized. The context is reset to the first field.
- ▶ Specify *set\_name* and *data\_area*. All fields associated with the specified input set are initialized. The areas in the data area associated with the fields will also be cleared.
- ▶ Specify one or more fields without *set\_name*. All designated fields are initialized, regardless of what input set they're in. Any *data\_area* will be ignored.
- ▶ Specify *set\_name*, *data\_area*, and *field\_list*. I\_INIT checks to make sure all designated fields reside in the specified input set before initializing them. The areas in the data area associated with the fields are also cleared.

Note that if I\_INIT is used to clear an unframed field after the input window for the field has been added to a tab set, renditions will be applied to the field that may not match the renditions for the window. See [%TS\\_TABSET on page 13-9](#) for more information.

## Examples

The following examples illustrate the five specification possibilities described above.

In this example only a window ID is specified. All fields in the window whose ID is stored in **inpid** will be initialized.

```
xcall i_init(inpid)
```

In this example both a window ID and a set name are specified. All fields in input set **cusmas** will be initialized.

```
xcall i_init(inpid, "cusmas")
```

In this example a window, a set, and a data area are specified. All fields in the data area **cusmas** that are associated with the input set named **cusmas** will be initialized.

```
xcall i_init(inpid, "cusmas", cusmas)
```

In this example window and a list of fields are specified. **fld1** and **fld2[2,7]** will be initialized. Their associated data areas will not be modified.

```
xcall i_init(inpid,, "fld1, fld2[2,7]")
```

The final example specifies a window, a set, a data area, and a field specification containing two fields. The I\_INIT routine will initialize the fields **name** and **addr[2]** after verifying that these fields are in input set **cusmas**.

```
xcall i_init(inpid, "cusmas", cusmas, "name, addr[2]")
```

## I\_INPFLD – Process an input field



```
xcall I_INPFLD (window_id, field_spec, data_location, [input_column]
&               [, select_column][, text_column], [decimal_value], {reserved}
&               [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*window\_id*

The ID of the input window to process. **(n)**

*field\_spec*

The specification for the field to process. (See “Field specifications” on page 2-47 for information.) **(a)**

*data\_location*

Where to place the input data. **(a or n)**

*input\_column*

(optional) The input column ID. **(n)**

*select\_column*

(optional) The selection column ID. **(n)**

*text\_column*

(optional) The text editing column ID. **(n)**

*decimal\_value*

(optional) The first character to input (specified as a decimal value). **(n)**

*{reserved}*

A reserved placeholder for a future Toolkit argument. You do not specify any argument here, but do add the additional comma if specifying any *a\_methoddata* arguments.

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

### Discussion

The I\_INPFLD subroutine enables a *single input field* to accept user input. All other fields are not modifiable and, on Windows, do not have a frame. If you want to process a set of input fields, see [I\\_INPUT on page 8-57](#). If you want to process input for a list item, see [L\\_INPFLD on page 9-100](#).

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

*Data\_location* is loaded according to the input field's definition, directly from the field, regardless of any input set associations. Note that by default, Toolkit does not ensure that the size of *data\_location* matches the size of the referenced field (*field\_spec*) or that it is even large enough for the field. However, bounds checking can check for these conditions. (See “[g\\_dtkbounds](#)” on [page 18-3](#) for more information.)

- ▶ If **g\_dtkbounds** is set to 1, Toolkit generates a fatal error if *data\_location* is not large enough for the field.
- ▶ If **g\_dtkbounds** is set to 2 or greater, Toolkit generates a fatal error if *data\_location* is not large enough (as it does if **g\_dtkbounds** is set to 1), and it generates a non-fatal error if *data\_location* is large enough, but isn't the exact size of the field.

## UNIX, VMS

---

Field editing and movement within the field can be automatically performed during input processing if the appropriate reserved menu entries are present on a loaded *input\_column*, *select\_column*, or *text\_column*.

If the *input\_column* is present and non-zero, that column will be placed on the menu and removed on exit. If the *select\_column* is present and non-zero, it will be placed on the menu when a field with a selection window is processed. If the *text\_column* is present and non-zero, it will be placed on the menu when a text field is processed.

I\_INPFLD recognizes the following menu entries, which are described in “[Appendix B: Reserved Menu Entries](#)”:

|         |         |          |
|---------|---------|----------|
| E_LEFT  | S_UP    | I_CANCEL |
| E_RIGHT | S_DOWN  | O_HELP   |
| E_EMOV  | S_LEFT  | U_xxx    |
| E_BMOV  | S_RIGHT |          |
| E_MODE  |         |          |
| E_CDEL  |         |          |
| E_LCLR  |         |          |
| E_XUP   |         |          |
| E_XDOWN |         |          |

To edit a field that already contains data, the user can use the “E\_” entries above. These “E\_” entries are a subset of the text editing functions supported by the T\_EDIT subroutine.

Insert mode is the default for editing. When editing text fields (dimensioned alpha fields) all menu entries for T\_EDIT are recognized. Text field editing is very similar to text window editing, except that the text field's input is terminated when the user presses ENTER unless **g\_txt\_rtrn** is true.

The entries that begin with “S\_” are for selection windows.

If a user selects the menu entry `I_CANCEL`, any input being performed will be cancelled, and the field will be reset to its initial state (prior to the start of the input).

Note that `I_INPFLD` does not invoke arrive or leave methods on UNIX or OpenVMS.

---

## WIN

---

If any of the column arguments (*input\_column*, *select\_column*, or *text\_column*) are passed, Toolkit will not, by default, place or remove the specified columns. These columns usually contain reserved menu entries that are automatically supported by the Windows environments. You can override this default behavior as noted below.

`I_INPFLD` recognizes the following menu entries, which are described in [“Appendix B: Reserved Menu Entries”](#):

- `E_CLEAR`
- `E_COPY`
- `E_CUT`
- `E_MARK`
- `E_MODE`
- `E_PASTE`
- `I_CANCEL`

Note that regardless of the available menu entries, the left and right arrow keys and the HOME, END, and DELETE keys are processed within `I_INPFLD`. Additionally, the up and down arrow keys are reserved and processed within `I_INPFLD` for multi-line edit controls, radio buttons, and selection fields. Therefore, with the following exception, these keys are never returned to the calling subroutine. However, when a single-line input field has focus, the up and down arrow keys and the HOME, END, and DELETE keys can be mapped to menu entries.

To edit a field that already contains data, the user can use the “E\_” entries above. These “E\_” entries are the same text editing functions supported by the `T_EDIT` subroutine.

If a user selects the menu entry `I_CANCEL`, any input being performed will be cancelled, and the field will be reset to its state prior to the start of the input, its initial state. (Note, however, that an `EENTRST_METHOD` can override `I_CANCEL`.)

Insert mode is the default for editing. Text field editing is very similar to text window editing, except that the text field’s input is terminated when the user presses ENTER unless `g_txt_rtrn` is true.

---

Note that `E_XUP` and `E_XDOWN` operate differently than `E_UP` and `E_DOWN` when the cursor is already on the first or last row of a field. See the Discussion for [I\\_INPUT](#) on page 8-57 for more information.

If a non-reserved menu entry is selected and the call to I\_INPFLD returns, **g\_select** will be true and **g\_entnam** will hold the name of the menu entry. You will need to clear **g\_select** after you satisfy the event.

The default behavior for each environment's handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. See [“g\\_plc\\_col\\_args” on page 18-4](#) for information.

I\_INPFLD will also call EHELP\_METHOD and EUTILS\_METHOD on menu selections whose internal names are “O\_HELP” or begin with “U\_”, respectively.

If a time-out occurs, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as “O\_TIMEOUT”.

---

#### UNIX, VMS

If passed, *decimal\_value* is converted to its alpha (ASCII) equivalent and placed into the window as if it were the first character entered by the user. *Decimal\_value* is ignored on Windows.

---

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to I\_INPFLD. I\_INPFLD, in turn, passes them directly to %ICHANGE\_METHOD, %IDISPLAY\_METHOD, and %IEDITFMT\_METHOD. This allows you to communicate additional information to your change, display, and edit format methods.

#### See also

- ▶ [“Processing and editing field input” on page 8-4](#) for more information about input processing.
- ▶ [“Input fields” on page 8-3](#) and [.DISPLAY\\_AREA on page 2-26](#) for defining a display area (or “view”) for an input window.
- ▶ [“Appendix B: Reserved Menu Entries”](#) for more information about the text editing functions.

#### Examples

The following example accepts the data into **whchnam** according to the definition of the input field **which**.

```
xcall i_inpfld(popid, "which", whchnam)
```



## I\_INPUT – Process an input set



```
xcall I_INPUT (window_id, [set_name], data_area, [input_column], [select_column],
&               [text_column], [no_termination], [decimal_value], {reserved}
&               [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*window\_id*

The ID of the input window to process. **(n)**

*set\_name*

(optional) The name of the input set. **(a)**

*data\_area*

Where to place the input data (a field or record defined within the calling program). **(a)**

*input\_column*

(optional) The input column ID. **(n)**

*select\_column*

(optional) The selection column ID. **(n)**

*text\_column*

(optional) The text editing column ID. **(n)**

*no\_termination*

(optional) The “no set termination processing” flag: **(n)**

**D\_NOTERM**            Disable termination processing.

*decimal\_value*

(optional) The first character to input (specified as a decimal value). **(n)**

*{reserved}*

A reserved placeholder for a future Toolkit argument. You do not specify any argument here, but do add the additional comma if specifying any *a\_methoddata* arguments.

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

## Discussion

The `I_INPUT` subroutine performs terminal input to the fields in an input set. If the input window has a movable view (or display), the view will be automatically adjusted, if necessary, to include the entire input field. (If you are processing input on a list item, use the `L_INPUT` subroutine instead of `I_INPUT`. See [page 9-103](#) for more information about `L_INPUT`.)

The `I_INPUT` subroutine can return for one of the following reasons (or a combination of the third and fourth reasons), which set `g_select`, `g_setsts`, `g_fldnam`, and `g_entnam`:

- ▶ Input to the input set is complete. When all active fields in the input set have been processed, `I_INPUT` displays a termination message, which is defined by `g_inp_trm_msg` (see [“g\\_inp\\_trm\\_msg” on page 18-4](#)).
- ▶ The input set has no active fields and there are no active buttons. (In this case, `g_setsts` is set to false, indicating that input is complete.)
- ▶ Input to a field that has a break specification is complete.
- ▶ A menu entry that the input system does not recognize is signaled (through user-interaction or by `%M_SIGNAL`).
- ▶ TAB or a call to `I_NEXTCTL` from the last button (or field if there is no active button) for an input window that is part of a composite window. (This signals “C\_NEXT”, which `I_INPUT` doesn’t recognize but instead passes on to the calling routine.)
- ▶ SHIFT + TAB or a call to `I_PREVCTL` from the first field (or button if there is no active field) for an input window that is part of a composite window. (This signals “C\_PREV”, which `I_INPUT` doesn’t recognize, but instead passes on to the calling routine.)

Use the following table to determine the reason(s) for the return.

| Reason                  | <code>g_select</code> | <code>g_setsts</code> | <code>g_fldnam</code>                           | <code>g_entnam</code>                   |
|-------------------------|-----------------------|-----------------------|-------------------------------------------------|-----------------------------------------|
| Input set complete      | False                 | False                 | n/a                                             | n/a                                     |
| Break                   | n/a                   | True                  | Name <sup>a</sup> of the break field            | n/a                                     |
| Unrecognized menu entry | True <sup>b</sup>     | True <sup>c</sup>     | Name <sup>a</sup> of the field that was focused | Name <sup>a</sup> of the selected entry |

- a. Field and entry names are always returned in uppercase characters.
- b. An unrecognized menu entry can be signaled through a user interaction or by `%M_SIGNAL`. After you have processed the event, you must clear `g_select`.
- c. If a button was focused while the user exited input, `g_setsts` will be set to 255. This means that while a button was focused, the user did one of the following: pressed the button, but its menu entry was not handled by `I_INPUT`, pressed another button whose entry was not handled by `I_INPUT`, selected a menu entry (or shortcut) that was not handled, or invoked a method (toolbar or input field, etc.), which signaled a menu entry that was not handled.

I\_INPUT maintains the “context” of an input set. In other words, it remembers the next field to process in an input set. If a field has a break specified (see the documentation for BREAK on [page 2-51](#)), the context changes to the field after the field with the break, and an I\_INPUT command will go to the field after the break. When you first load an input window, the context for all sets is reset. If the context is reset, the first field is the next field to be processed. (You can also reset context with I\_INIT.)

The context for each input window set is separate from all other input window sets. You can change the context with the I\_NEXT subroutine.

You can call I\_INPUT at any time, and it will continue where input processing left off in that set. This means that you can process any number of input sets at any time and not lose context.



You should not call I\_INPUT from a button method that's called during I\_INPUT processing; this will cause unpredictable results. Instead, you may be able to code the method to call an input method on the original window or signal a menu entry to handle input without calling I\_INPUT directly.

---

If input is “interrupted” by a menu selection (in other words, the user selects a menu entry before pressing ENTER), any current contents of that input field are copied into the force buffer (but the length of the data in the force buffer is not set), and the field is reset to its initial entering state (unless you use EENTRST\_METHOD to override this behavior). You must call I\_FORCE with only the *old\_data* argument to obtain the input that was in the field at the time the menu entry was selected.

If *set\_name* is not present, I\_INPUT will, by default, process the first input set in the window.

The *data\_area* is accessed according to the structure specification associated with this input set. This entire *data\_area* is passed to the EUTILS\_METHOD subroutine when a hot entry is selected, giving it access to fields other than just the current field. Note that by default, Toolkit does not ensure that *data\_area* is large enough for the fields it references. Toolkit generates an error for this condition only if **g\_dtkbounds** is set to 1 or greater. See “[g\\_dtkbounds](#)” on [page 18-3](#).

## WIN

---

If any of the column arguments (*input\_column*, *select\_column*, or *text\_column*) are passed, Toolkit will not, by default, place or remove the specified columns. These columns usually contain reserved menu entries that are automatically supported by Windows environments. You can override this default behavior as noted below.

I\_INPUT recognizes the following menu entries which are described in “[Appendix B: Reserved Menu Entries](#)”:

|         |          |           |           |
|---------|----------|-----------|-----------|
| E_CLEAR | E_PASTE  | I_FRST    | I_NEXTCTL |
| E_COPY  | I_CANCEL | I_FRSTCLR | I_NXTCLR  |
| E_CUT   | I_DFLT   | I_HYPER   | I_OK      |
| E_MARK  | I_DONE   | I_LAST    | I_PREV    |
| E_MODE  | I_DRILL  | I_NEXT    | I_PREVCTL |

Note that regardless of the available menu entries, the left and right arrow keys and the HOME, END, and DELETE keys are processed within I\_INPUT. Additionally, the up and down arrow keys are reserved and processed within I\_INPUT for multi-line edit controls, radio buttons, and selection fields. Therefore, with the following exception, these keys are never returned to the calling subroutine. However, when a single-line input field has focus, the up and down arrow keys and the HOME, END, and DELETE keys can be mapped to menu entries.

If the menu entry I\_CANCEL is present on the menu and the user selects it, any input being performed will be cancelled, and the field will be reset to its state prior to the start of the input, its initial state. (Note, however, that an EENTRST\_METHOD can override I\_CANCEL.)

Insert is the default mode for editing. Text field editing is very similar to text window editing, except that the text field’s input is terminated when the user presses ENTER unless **g\_txt\_rtrn** is true.

Note the following for multi-line text fields:

- ▶ When pasting within or in front of existing text, text that follows the pasted text will be pushed out of the field (i.e., the data will be truncated) if there is not enough room.
- ▶ I\_INPUT’s handling of line ends in incoming data is controlled by the **g\_txt\_softreturn** field, which is defined in **tools.def**. See “[g\\_txt\\_softreturn](#)” on [page 18-7](#) for information.

*Decimal \_value* is ignored on Windows.

---

## UNIX, VMS

Field editing and movement within input fields is automatically performed during input processing if the appropriate reserved menu entries are present on a loaded *input\_column*, *select\_column*, or *text\_column*.

If the *input\_column* is present and non-zero, that column will be placed on the menu and removed on exit. If the *select\_column* is present and non-zero, it will be placed on the menu when a field with a selection window is processed. If the *text\_column* is present and non-zero, it will be placed on the menu when a text field is processed. The alternative to specifying any of the “column” arguments is to place the column before calling I\_INPUT. (However, then the column may be on the menu even when it has no meaning.)

I\_INPUT recognizes the following menu entries, which are described in “[Appendix B: Reserved Menu Entries](#)”. (Note that I\_INPUT recognizes the S\_ entries only when processing a selection field.)

|         |           |           |           |
|---------|-----------|-----------|-----------|
| E_BMOV  | I_CANCEL  | I_HYPER   | I_PREVCTL |
| E_CDEL  | I_DFLT    | I_LAST    | O_HELP    |
| E_EMOV  | I_DONE    | I_NEXT    | S_DOWN    |
| E_LCLR  | I_DRILL   | I_NEXTCTL | S_LEFT    |
| E_LEFT  | I_EDIT    | I_NXTCLR  | S_RIGHT   |
| E_MODE  | I_FRST    | I_OK      | S_UP      |
| E_RIGHT | I_FRSTCLR | I_PREV    | U_xxx     |

I\_INPUT also recognizes the following when on a multi-line text field:

|          |        |        |         |
|----------|--------|--------|---------|
| E_BOTTOM | E_ILIN | E_PDEL | E_WDEL  |
| E_DIR    | E_JOIN | E_PMOV | E_WMOV  |
| E_DOWN   | E_LDEL | E_TOP  | E_XDOWN |
| E_EDEL   | E_LMOV | E_UP   | E_XUP   |

To edit a field that already contains data, the user can move to that field using one of the field movement input entries (such as I\_PREV or I\_NEXT) listed above. The “E\_” entries perform the field editing functions. These “E\_” entries are a subset of the text editing functions supported by the T\_EDIT subroutine.

Insert mode is the default for editing. When editing text fields (dimensioned alpha fields) all menu entries for T\_EDIT are recognized. Text field editing is very similar to text window editing, except that the text field’s input is terminated when the user presses ENTER unless **g\_txt\_rtrn** is true.

The entries that begin with “S\_” are for selection windows.

If the menu entry I\_CANCEL is present on the menu and the user selects it, any input being performed will be cancelled, and the field will be reset to its initial state (prior to the start of the input).

---

Additionally, I\_INPUT will call EHELP\_METHOD and EUTILS\_METHOD on menu selections whose internal names are “O\_HELP” or begin with “U\_”, respectively.

Note that E\_XUP and E\_XDOWN operate the same as E\_UP and E\_DOWN, except when the cursor is already on the first row of the field (for E\_XUP) or the last row of the field (for E\_XDOWN). E\_XUP moves the cursor up one row within the field, unless the cursor is already on the top row. In that case, E\_XUP is returned to the routine that called I\_INPUT. Likewise, E\_XDOWN moves the cursor down one row in the field, unless the cursor is already on the bottom

row. In that case, E\_XDOWN is returned to the calling routine. If you use E\_XUP or E\_XDOWN, we recommend that you wrap I\_INPUT in a routine that handles these menu entries when they are returned.

If I\_INPUT encounters an entry name that begins with “I\_” that is not in the list above, it generates an error. In other words, if you’re using I\_INPUT, none of your application’s menu entry names (except for the reserved ones listed above) should begin with “I\_”.

The default behavior for each environment’s handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. See “[g\\_plc\\_col\\_args](#)” on [page 18-4](#) for information.

If D\_NOTERM is present, completion processing is disabled. This means that when an input set is completed, control returns directly to the calling subroutine, and the message specified by **g\_inp\_trm\_msg** is not be displayed.

If a time-out occurs, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as “O\_TIMEOUT”.

---

### UNIX, VMS

If passed, *decimal\_value* is converted to its alpha (ASCII) equivalent and placed into the window as if it were the first character entered by the user.

---

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to I\_INPUT. I\_INPUT, in turn, passes them directly to each field’s methods. This allows you to communicate additional information to your input field methods.

### See also

- ▶ “[Using Fonts on Windows](#)” on [page 18-46](#) for information on using proportional and fixed fonts.
- ▶ “[Processing and editing field input](#)” on [page 8-4](#) for more information about input processing.
- ▶ [M\\_LDCOL](#) on [page 10-40](#) for information on loading menu columns.
- ▶ [I\\_LDINP](#) on [page 8-64](#) for information on loading input windows.
- ▶ “[Appendix B: Reserved Menu Entries](#)” for more information about the text editing functions.

### Examples

The following example processes the input set **cusmas** in the input window stored in **inpid** and places the data in **cusmas**.

```
xcall i_input(inpid, "cusmas", cusmas)
```

The next example processes the input set **artran**, places the input data in variable **artran**, and disables set termination processing.

```
xcall i_input(inpid, "artran", artran,,, D_NOTERM)
```

The following example loads the menu column whose ID is stored in **inpcol** and whose name is **input** from the window library channel that is stored in **g\_utlib**. The column will not be placed on the menu. The I\_INPUT subroutine processes the input set named **cusmas** and places the data in the record **cusmas**. The column whose ID is stored in **inpcol** will be placed on the menu and removed before I\_INPUT returns.

```
xcall m_ldcol(inpcol, g_utlib, "input", D_NOPLC)
.
.
.
xcall i_input(inpid, "cusmas", cusmas, inpcol)
```

The following code fragment illustrates how you can use the I\_INPUT subroutine in a program.

```
do
  begin
    xcall i_input(inpid, setname, datarec)
    if (g_setsts) then          ;Will be true for menu entries & break fields
      begin
        if (g_select) then          ;Test for menu entry
          using g_entnam select
            ("ABT"), call abort
            ("EXT"), done=TRUE
          endusing
        else
          using g_fldnam select      ;Test for break processing
            ("FLD1"), call fstbreak
            ("FLD2"), call sndbreak
            ("FLD3"), call thdbreak
          endusing
        end
      else
        ;Input complete
        done=TRUE
      end
    until (done)
```

## I\_LDINP – Load an input window from a library



```
xcall I_LDINP (window_id, [channel], window_name, [no_placement], [search], [error]
&                [, saved_name])
```

### Arguments

*window\_id*

Returned with the ID of the input window. **(n)**

*channel*

(optional) The channel of the window library. **(n)**

*window\_name*

The name of the window to load (a maximum of 15 characters). **(a)**

*no\_placement*

(optional) The no-placement flag: **(n)**

**D\_NOPLC**

Don't place the window.

*search*

(optional) The search variable. **(n)**

*error*

(optional) The error return variable. **(n)**

*saved\_name*

(optional) The name of the window when it was originally saved. **(a)**

### Discussion

The I\_LDINP subroutine loads an input window from a library. An input window must be loaded before it can be referenced by any other I\_xxx routine.

If *channel* is not passed, **g\_utlib** is used.

When an input window is loaded, all associated selection windows are also loaded. These selection windows are marked as being owned by the input window. When you delete the window (with U\_WINDOW or E\_EXIT), the selection windows using the .FIELD SELECT qualifier are also deleted. (Those using the .FIELD SELWND qualifier are not.)

If you pass a null string (“”) for *window\_name*, Toolkit assigns a unique window name in the form \_W\_nnn, where *nnn* is the window ID. You must pass *saved\_name* in this case.



If you want to create multiple instances of the same window, you can call I\_LDINP as many times as you need, using *window\_name* to give each succeeding window a new unique name. You must also pass *saved\_name*, if *window\_name* is different than the name under which the window was saved.

If D\_NOPLC is present, the loaded input window won't be placed on the screen.

If you place the window (you omit D\_NOPLC), the window must fit on the screen or you will receive a "Window manager error" when Toolkit loads the window.

If *search* is present, I\_LDINP searches for an existing window with the specified name before attempting to load the window. If the window is found, a successful load is simulated, *window\_id* is set to the ID of the window that was found, and the *search* variable is set to true. If the window is not found, the *search* variable is cleared and loading continues normally.



You can use *search* to make your subroutines more modular. If you have written your routines to call E\_ENTER on entry and E\_EXIT before returning, use the *search* variable with I\_LDINP within your subroutines to load windows.

*Search* will find the window, if already loaded, or it will enable I\_LDINP to load it if it can't find it. Since the window will be a local window in the latter case, E\_EXIT will delete it when it returns to the calling routine. If *search* finds the window already loaded and if it was loaded at a prior level, E\_EXIT will leave it loaded when it returns.

---

If *error* is present, it is returned with a value of

- ▶ 0 (false) if the requested window was found in the specified library.
- ▶ 1 (true) if the window was not found.
- ▶ -1 if the window (*window\_id*) has an associated selection window that cannot be loaded. You can use %U\_GETWNDERR to get the text of the error: "Window *name* not found in library *channel*," where *name* is the name of the missing selection window, and *channel* is the channel number passed to I\_LDINP (or the value of **g\_utlib** if no channel was passed).

A fatal error occurs if *error* is not present and the window (*window\_id*) or an associated selection window cannot be found.

## See also

- ▶ [M\\_LDCOL on page 10-40](#) for information on loading menu columns.
- ▶ [U\\_LDWND on page 16-95](#) for information on loading general windows and for information on directly loading selection windows that may not be associated with input windows.

## Examples

In the first example, the subroutine attempts to load the window named **cusmas** from the library opened on channel **g\_utlib**. The variable **inpid** is returned with the ID of the input window. If the window isn't in the library, a fatal error occurs.

```
xcall i_ldinp(inpid,, "cusmas")
```

In the second example, I\_LDINP attempts to load but does not place the window **artran** from the library opened on **libchn**. Again, **inpid** is returned with the ID of the input window. The success of the operation is reported in **errcode**. If the window already exists, an error occurs.

```
xcall i_ldinp(inpid, libchn, "artran", D_NOPLC,, errcode)
```

In the third example, I\_LDINP searches for the window named **cusmas** before it attempts to load it and place it on the screen. If it finds the window, it will store the window ID in **inpid** and set **find** to true; otherwise, it will load the window named **cusmas**. If the window is loaded successfully, **errcode** is returned with a value of false.

```
xcall i_ldinp(inpid,, "cusmas",, find, errcode)
```

## I\_NEXT – Specify the next input field or button to be processed



```
xcall I_NEXT(window_id, [set_name][, field_spec])
```

### Arguments

*window\_id*

The ID of the input window containing the field. **(n)**

*set\_name*

(optional) The name of the input set to use. It can be a specific name, or the following: **(a)**

**\*CURR\*** Use the currently loaded set.

*field\_spec*

(optional) The specification for the field or one of the keywords listed below (which must be specified in all uppercase characters). *Field\_spec* must be enclosed in quotation marks. (For information on field specifications, see “[Field specifications](#)” on page 2-47.) **(a)**

**\*FRST\*** First enabled field.

**\*LAST\*** Last enabled field.

**\*NEXT\*** Next enabled field.

**\*PREV\*** Previous enabled field.

**\*FCLR\*** First empty enabled field. (default)

**\*NCLR\*** Next empty enabled field.

**\*MENU\*** Set the context based on the contents of **g\_entnam**.

**\*NMBR\***, *field#* *Field#* if enabled, otherwise next enabled field after *field#*.

**\*BUTTON\***, *button* Specified button on Windows. *Button* can be either the name (case-insensitive) or index number of a button.

**\*NONE\*** No field.

**\*DFLT\*** Fill default values on all empty fields with defaults and set context to next enabled empty field.

**\*DONE\*** Complete input on all empty, enabled fields.

**\*LASTCTL\*** Last enabled control (field or button).

**\*NEXTCTL\*** Next enabled control (field or button).

**\*PREVCTL\*** Previous enabled control (field or button).

## Discussion

The `I_NEXT` subroutine sets the input context. When processing input, Toolkit moves through fields according to their order in the input set. So, when a user is finished with a field, Toolkit moves to the next active field in the set. With `I_NEXT`, however, you can determine which field or button (on Windows) Toolkit will advance to. For example, if your Toolkit application displays an error when a user enters an invalid item code, Toolkit automatically advances to the next field in the input set after the error is displayed. Using `I_NEXT`, however, you can instruct Toolkit to go back to the field that caused the break instead.

Note the following general rules for context changes:

- ▶ If a field or button specified with `I_NEXT` is disabled, Toolkit sets the context to the next enabled field or button.
- ▶ If `I_NEXT` specifies a field, but all fields in the input set are disabled, Toolkit moves input context to the first enabled button.
- ▶ If a field or button specified with `I_NEXT` is disabled and is the last field in the input set or the last button in the window, Toolkit sets the context to the first enabled input field in the set.
- ▶ If all fields and all buttons in the input set are disabled, Toolkit proceeds to input set completion.

Note that set names are sometimes inaccessible to the utility subroutines. To call `I_NEXT` from within a utility subroutine, use `*CURR*` instead of a specific set name. This enables `I_NEXT` to use the current set even if it can't access the name of the current set.

If `set_name` is not passed, `I_NEXT` uses the first input set in the window.

If you don't pass `field_spec`, the context is set to the first empty enabled field, which is the equivalent of setting `*FCLR*`. (An empty field is one that the user hasn't entered anything in and that has not been displayed using `I_DSPFLD` or `I_DISPLAY`.)

Use `*NMBR*` followed by a numeric argument (*field#*) to specify the next field by index. This index is a number that represents the field's position in the input set and is limited to the valid range for the input set. (A value less than 1 or greater than the number of fields in the window will result in a fatal Toolkit error.) For example, the following sets the context to the third field in an input set named **setnam**.

```
xcall i_next(inpid, setnam, "*NMBR*", 3)
```

On Windows, use `*BUTTON*` followed by a button name or index to move context to a specific button. (On UNIX and OpenVMS, passing `*BUTTON*` will cause a fatal Toolkit error.) The *button* argument is required if you pass `*BUTTON*`.

- ▶ If you pass an alphanumeric value for *button*, Toolkit treats it as a case-insensitive name. (If the name is not a valid name for a button in the window, you'll get a fatal Toolkit error.)
- ▶ If you pass a numeric value, Toolkit treats it as an index, which represents the button's position in the input set and is limited to the valid range for the input set. (A value less than 1 or greater than the number of buttons in the window will result in a fatal Toolkit error.) For example, the following sets the context to the second button in the window:

```
xcall i_next(inpid,, "*BUTTON*", 2)
```

`*NONE*` prevents I\_INPUT from performing input to any field. Instead, Toolkit uses single-keystroke input. This option is rarely used.

Using `*DONE*` or `*DFLT*` is like pressing ENTER for each remaining field without entering any input. The difference is that `*DONE*` completes the input set while `*DFLT*` displays any defaults that are specified in the script file, leaves all other fields unmodified (which does not affect their empty state), and allows input to continue on the next empty field.

On Windows, `*NEXTCTL*`, `*LASTCTL*`, and `*PREVCTL*` set context to the next, last, or previous enabled field or button. On UNIX or OpenVMS, if you are using termination processing, you can use `*NEXTCTL*`, `*LASTCTL*`, and `*PREVCTL*` to set context to the termination message.



If you call I\_NEXT with `*FCLR*` or `*NCLR*` in a change method, I\_NEXT uses the current state of the field set to determine where to move input context. This causes I\_NEXT to set input context to the current field if it's empty. To instead move context to the next enabled empty field, use %M\_SIGNAL to signal I\_NXTCLR. This moves context to the next empty field (unless you signal some other menu entry at the same time) because I\_NXTCLR won't be processed until the change method has returned and the input has been accepted. And because a menu entry was generated, Toolkit won't move input context until the menu entry is processed.

---

If an application is in I\_DONE (`*DONE*`), I\_DFLT (`*DFLT*`), or I\_OK processing, calling I\_NEXT from a method will cancel that processing and move focus to the field specified by I\_NEXT. If you do not want this to happen, test the value of `inp_nulinp` (which is in the `inputinfo` group defined in `inpinf.def`) before calling I\_NEXT. If `inp_nulinp` is non-zero, the application is performing one of these types of processing.

`*MENU*` is useful when a menu entry has been signaled while outside of an input routine (such as I\_INPUT, I\_INPFLD, etc.) in order to force that menu entry to be applied upon re-entry to that routine. For example, while within a method in I\_INPUT, passing "I\_OK" to M\_SIGNAL will cause validation of all fields to occur upon exiting the method, and (presuming no validation errors

result) I\_INPUT will then exit. However, if you make the same call to M\_SIGNAL during break processing, then that menu entry will not apply to the next call to I\_INPUT unless you also call I\_NEXT with \*MENU\*.

### See also

- ▶ [I\\_DISABLE on page 8-12](#) for information on disabling input fields.
- ▶ [I\\_ENABLE on page 8-21](#) for information on enabling input fields.

### Examples

In the following example, I\_NEXT resets the context in input set **cusmas** by skipping all remaining fields without entering input. The next time I\_INPUT is called on this set, it will complete the set as if the user pressed ENTER at each field (using the default for each) and perform termination processing.

```
xcall i_next(inpid, "cusmas", "*DONE*")
```

The next example sets the context of **maindcs** to the first empty field (the default).

```
xcall i_next(dcswnd, "maindcs")
```

## I\_PROMPT – Set a variable prompt



```
xcall I_PROMPT(window_id, field_spec, prompt)
```

### Arguments

*window\_id*

The ID of the input window in which you want the prompt to be displayed. **(n)**

*field\_spec*

The specification for the field the prompt is associated with. **(a)**

*prompt*

The prompt to display. **(a)**

### Discussion

I\_PROMPT sets the prompt for a field.

- ▶ If a prompt has already been assigned to the field, I\_PROMPT changes the prompt to *prompt*. Note that the length of *prompt* must be less than or equal to the length of the original prompt for the field.
- ▶ If no prompt has been assigned to the field, but a number was specified for the PROMPT qualifier for .FIELD, the D\_FIELD\_PROMPT qualifier for IB\_FIELD, or the prompt field in Repository (if the field is imported from a repository), I\_PROMPT sets the prompt to *prompt*. Note that the number of characters in *prompt* must be less than or equal to the number specified for the qualifier.
- ▶ If no prompt or number was specified for the PROMPT qualifier for .FIELD, the D\_FIELD\_PROMPT qualifier for IB\_FIELD, or the prompt field in Repository, I\_PROMPT cannot set a prompt for the field.

For more information on setting prompts, see “[PROMPT\(prompt\)](#)” on [page 2-72](#).

### Examples

In the following, a number is specified for the PROMPT qualifier for .FIELD, so the field **fld1** has no prompt, but space for 20 characters has been allocated for a prompt.

```
.input inp, 5, 40
.field fld1, a10, prompt(20)
.end
```

The following call assigns a prompt to **fld1**:

```
xcall i_prompt(id, "fld1", "This is field one")
```

## I\_PUTFLD – Put data into an input field



```
xcall I_PUTFLD (window_id, [set_name], data_area, field_spec, new_data
&                [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*window\_id*

The ID of the input window containing the field. **(n)**

*set\_name*

(optional) The name of the input set. **(a)**

*data\_area*

The data area for the input set. **(a)**

*field\_spec*

The specification for the field that I\_PUTFLD will load data into. (See “[Field specifications](#)” on page 2-47 for information.) **(a)**

*new\_data*

The data to load. **(a)**

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

### Discussion

The I\_PUTFLD subroutine places data into an input field. It displays *new\_data* in the field and puts it into *data\_area*.

If you do not specify a set name, *set\_name* defaults to the first input set.

*Data\_area* must correspond to the structure associated with the input set.

*Field\_spec* must be part of the input set, and if either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

Data is retrieved from *new\_data* according to the definition within the input window (regardless of the actual type of *new\_data*) so you need to make sure the data you pass as *new\_data* has the same type and precision as the input field (*field\_spec*). If the input field is a dimensioned alpha field, *new\_data* is assumed to be the first element of the array as specified in the field’s definition, and remaining elements are assumed to follow *new\_data* in memory. (If the other elements aren’t



defined in the memory that follows *new\_data*, subsequent elements of the alpha array field will be filled with garbage.) For dimensioned alpha fields then, it's best to define the data for all elements in the field in an identical dimensioned alpha variable, and then pass the first element as *new\_data*.

Note that by default, Toolkit does not ensure that the size of *data\_area* or the size of *new\_data* matches the size of the referenced field (*field\_spec*) or that they are even large enough for the field. However, bounds checking can check for the following conditions. (See “[g\\_dtkbounds](#)” on [page 18-3](#) for more information.)

- ▶ If **g\_dtkbounds** is set to 1, Toolkit generates a fatal error if *data\_record* is not large enough for the field.
- ▶ If **g\_dtkbounds** is set to 2 or greater, Toolkit generates a fatal error if *data\_area* is not large enough (as it does if **g\_dtkbounds** is set to 1). It generates a non-fatal error if *data\_area* is large enough for the field, but isn't the exact size. And it generates a non-fatal error if *new\_data* is smaller than the field.

Note that if **g\_dtkbounds** is set to 2 or greater, Toolkit also generates a fatal error if an integer value is passed for a non-integer field or vice versa (though no error is generated for user-defined data types).

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to I\_PUTFLD. I\_PUTFLD, in turn, passes them directly to %IDISPLAY\_METHOD. This allows you to communicate additional information to your display method.

If I\_PUTFLD is used with an unframed field after the input window for the field has been added to a tab set, renditions will be applied to the field that may not match the renditions for the window. See [%TS\\_TABSET](#) on [page 13-9](#) for more information.

## See also

- ▶ [I\\_DSPFLD](#) on [page 8-19](#) for information on displaying data in a field.
- ▶ [I\\_FORCE](#) on [page 8-43](#) for information on forcing data into a field.

## Examples

In the following example, the contents of **total** are loaded into the field **TOTAL**, as well as into the corresponding area of **dcsmast**, as defined by the structure associated with the **maindcs** set.

```
xcall i_putfld(dcswnd, "maindcs", dcsmast, "TOTAL", total)
```

## I\_READONLY – Set read-only state for input fields



```
xcall I_READONLY ([operation,] [subfunction,] arguments)
```

### Arguments

#### *operation*

(optional) One of the following, which determine whether specified fields will be set to read-only or read/write. (**n**)

**D\_OFF** Set fields to read/write.

**D\_ON** Set fields to read-only. (default)

#### *subfunction*

(optional) One of the following, which determine which fields will be affected. (**n**)

**D\_ALL** Set the read-only state for all fields in the specified window. See [page 8-76](#).

**D\_FLDS** Set the read-only state for individually specified fields. See [page 8-77](#). (default)

**D\_SET** Set the read-only state for all fields in the specified input set. See [page 8-79](#).

#### *arguments*

One or more arguments, depending on *subfunction*.

### Discussion

I\_READONLY enables you to set the read-only state of one or more input fields in an input window, regardless of the current input context.

This routine differs from I\_FLDMOD in that it can set the read-only state for multiple fields, and it preserves the contents of affected fields. (I\_FLDMOD can set the read-only state for only one field, and it initializes the field.) If an affected field is empty when I\_READONLY is called, it will remain empty. If the field has text, I\_READONLY will preserve the text.

If a field specified in a call to I\_READONLY can't be set to read-only (in other words, if the field is a check box, a radio button set, or a field with a selection list or selection window), a read-only setting will be accepted, but it won't affect the field. (For these field types, use I\_DISABLE rather than I\_READONLY.) However, if the field is subsequently changed to a regular text field, Toolkit may use this setting. When a field is changed to a text field, the most recent read-only state setting is used to determine whether the field will be read-only or read/write.

## See also

[“Notes on Input Methods” on page D-3](#) for information on changing read-only settings from an input method.

## I\_READONLY (continued)

### D\_ALL

```
xcall I_READONLY ([operation,] D_ALL, window_id)
```

### Arguments

*operation*

(optional) One of the following, which determine whether the specified fields will be set to read-only or read/write. (**n**)

**D\_OFF**                      Set fields to read/write.

**D\_ON**                        Set fields to read-only. (default)

*window\_id*

The ID of the input window whose fields you want to modify. (**n**)

### Discussion

The D\_ALL subfunction of I\_READONLY enables you to set the read-only state for all of the input fields in an input window.

### Examples

The following examples set all of the fields in a window (the window whose ID is stored in **win\_id**) to read-only:

```
xcall i_readonly(D_ON, D_ALL, win_id)
```

```
xcall i_readonly(D_ALL, win_id)
```

The next example sets all of the fields in a window to read/write:

```
xcall i_readonly(D_OFF, D_ALL, win_id)
```

## I\_READONLY (continued)

### D\_FLDS

```
xcall I_READONLY ([operation,] [D_FLDS,] window_id, field_spec[, ...])
```

### Arguments

*operation*

(optional) One of the following, which determine whether the specified fields will be set to read-only or read/write. **(n)**

**D\_OFF**                      Set fields to read/write.

**D\_ON**                        Set fields to read-only. (default)

*window\_id*

The ID of the input window whose fields you want to modify. **(n)**

*field\_spec*

One or more field specifications. **(a)**

### Discussion

The D\_FLDS subfunction of I\_READONLY enables you to set the read-only status for a specified field or list of fields in an input window. Note the following:

- ▶ You can specify up to nine field names in *field\_spec*, and the maximum length of *field\_spec* is 99 characters. Additional characters are ignored.
- ▶ A field specification (*field\_spec*) can consist of one or more field names (up to nine). To specify multiple field names in *field\_spec*, separate the field names with any character other than an identifier character or a square bracket (either [ or ], which are used to enclose dimension specifications for repository arrayed fields). Identifier characters include alpha characters, numeric characters, the dollar sign (\$), and the underscore (\_) character. All other characters and spaces are non-identifier characters. For example, the following could be passed as a *field\_spec*:  

```
"name, b_day, hr_dt, soc_sec, emp, policy, phone, conditions[2,4]"
```
- ▶ You can specify up to nine field specifications (nine occurrences of *field\_spec*), which enables you to specify a maximum of 81 fields per D\_FLDS call.
- ▶ If a specified field does not exist in the input window, a fatal error will occur.

## Examples

The first two examples set the specified fields (which are the same in both cases) to read-only. One difference is that in the second example the *operation* and *subfunction* arguments have been omitted. (These examples use the defaults for these arguments, so they are optional.) Another difference is that in the first example, the fields have been grouped into three *field\_spec* arguments, while in the second example, the fields have been grouped into two *field\_spec* arguments.

```
xcall i_readonly(D_ON, D_FLDS, win_id, "name, b_day, hr_date, soc_sec",
&
    "employer, policy, phone, fax, email",
&
    "addr[1,1], addr[1,2], addr[1,3]")
```

```
xcall i_readonly(win_id, "name, b_day, hr_date, soc_sec, employer",
&
    "policy, phone, fax, email, addr[1,1], addr[1,2],
&
    addr[1,3]")
```

The following examples set the specified fields to read/write:

```
xcall i_readonly(D_OFF, D_FLDS, win_id, "name, b_day, hr_date, soc_sec",
&
    "employer, policy, phone, fax, email",
&
    "addr[1,1], addr[1,2], addr[1,3]")
```

```
xcall i_readonly(D_OFF, win_id, "name, b_day, hr_date, soc_sec, employer",
&
    "policy, phone, fax, email, addr[1,1], addr[1,2],
&
    addr[1,3]")
```

## I\_READONLY (continued)

### D\_SET

```
xcall I_READONLY ([operation,] D_SET, window_id, set_name)
```

### Arguments

*operation*

(optional) One of the following, which determine whether the specified fields will be set to read-only or read/write. **(n)**

**D\_OFF**                      Set fields to read/write.

**D\_ON**                        Set fields to read-only. (default)

*window\_id*

The ID of the input window whose fields you want to modify. **(n)**

*set\_name*

(optional) The case-insensitive name of an input set. **(a)**

### Discussion

The D\_SET subfunction of I\_READONLY enables you to set the read-only state for all of the fields in an input set.

If the specified input set does not exist in the window, a fatal error will occur.

### Examples

The following examples set all of the fields in an input set (the input set whose name is stored in **in\_set**) to read-only:

```
xcall i_readonly(D_ON, D_SET, win_id, in_set)
```

```
xcall i_readonly(D_SET, win_id, in_set)
```

The next example sets all of the fields in an input set to read/write:

```
xcall i_readonly(D_OFF, D_SET, win_id, in_set)
```

## I\_SETDEL – Delete fields from an input set



```
xcall I_SETDEL (window_id, set_name, field_list[, ...][, status])
```

### Arguments

*window\_id*

The ID of the input window containing the fields. **(n)**

*set\_name*

The name of the input set. **(a)**

*field\_list*

One or more field specifications. **(a)**

*status*

(optional) Returned with a non-zero value if the field or fields were not found in the set, or with zero if the field or fields were found and successfully deleted from the set. *Status must be the twelfth argument.* **(n)**

### Discussion

The I\_SETDEL subroutine enables you to remove up to nine fields or lists of fields (specified in *field\_list*) from an input set during program execution.

The specified fields or lists of fields are deleted from the loaded input window set. You can use I\_SNAPSHOT to save or restore the set definition.

You can specify up to nine field lists (*field\_list* arguments), each of which can have from one to nine field specifications. If a *field\_list* has multiple field specifications, separate the field specifications with any character other than an identifier character or a square bracket—either [ or ], which are used to enclose dimension specifications for repository arrayed fields. (Identifier characters include alpha characters, numeric characters, the dollar sign, and the underscore character). For example:

```
"name"
```

or

```
"name, birthday, soc_sec_no, employer, phone, policy_no, conditions[2]"
```

The maximum length of a *field\_list* is 99 characters. Additional characters are ignored. For information on field specifications, see [“Field specifications” on page 2-47](#).



If passed, *status* must be the twelfth argument. Therefore, if you pass *status*, but you specify less than nine fields or lists to be removed, you must still use commas in place of the non-specified fields.

If you pass *status*, the first field that is not found within the set causes I\_SETDEL to cease processing and return with the error status true. In this case, none of the fields following the one that caused I\_SETDEL to terminate are deleted from the set. If you don't pass *status* and a specified field is not found within the set, a fatal error occurs.

## Examples

The following example does input to the set that gets a name and asks whether there is a co-signer. If no co-signer exists, the next set is modified to skip the fields for the name and address of the co-signer. Then the full set is re-established and the process is repeated.

```
.include "WND:tools.def"
record
    id          ,i4
    c_id        ,i4
    stat        ,d3
    snapshot    ,a20
record data
    applicant   ,a30
    joint       ,a3
    addr        ,3a30
    cosign      ,a30
    coaddr      ,3a30
proc
    xcall u_start("setdel")
    xcall i_ldinp(id, g_utlib,"setdel")
    xcall i_snapshot(D_COPY, id, snapshot)
    xcall m_ldcol(c_id, g_utlib, "input", D_NOPLC)
    do
        begin
            xcall i_input(id, "name", data, c_id)
            if (g_select)
                exitloop
            if (joint.eq."No") then
                xcall i_setdel(id, "detail", "cosign coaddr",,,,,,,,,, stat)
            else
                xcall i_snapshot(D_LOAD, id, snapshot)
                xcall i_input(id, "detail", data, c_id)
                xcall i_init(id)
            end
        until (g_select)
    xcall u_finish
.end
```

The input window definition looks like this:

```
.input setdel, 10, 65
.field applicant, a30, pos(1,1), prompt("Applicant's name "), req
.field joint, a3, pos(1,50), prompt("Co-signer? "), sel(0,2,2,"YES","NO")
.text applicant, pos (4,1)
\hAddress of Applicant\~h
.field addr, 3a30, pos(5,1)
.text cosigner, pos (4,34)
\hName & Address of Co-signer\~h
.field cosign, a30, pos(5,34)
.field coaddr, 3a30, pos(6,34)
.set name, setdel, applicant, joint
.set detail, setdel, addr, cosign, coaddr
.end
```

## I\_SETINF – Retrieve information about an input set



```
xcall I_SETINF (window_id, [set_name], [set_num], [next_field], [set_controls]
&               [, processing_state])
```

### Arguments

*window\_id*

The ID of the input window containing the set. **(n)**

*set\_name*

(optional) The returned set name. **(a)**

*set\_num*

(optional) The returned set number. **(n)**

*next\_field*

(optional) The returned next input entry index. **(n)**

*set\_controls*

(optional) The returned set controls. **(a)**

*processing\_state*

(optional) The processing state for an input set. One of the following: **(n)**

|                      |                                        |
|----------------------|----------------------------------------|
| <b>D_MODE_NORMAL</b> | Normal input processing mode.          |
| <b>D_MODE_DONE</b>   | Done (I_DONE) processing occurring.    |
| <b>D_MODE_DFLT</b>   | Default (I_DFLT) processing occurring. |
| <b>D_MODE_OK</b>     | OK (I_OK) processing occurring.        |

### Discussion

The I\_SETINF subroutine retrieves information about an input set. In order to use it, however, be sure to **.INCLUDE** these two distributed **.def** files (in the following order):

- ▶ **WND:system.def**
- ▶ **WND:setinf.def**

*Window\_id* must contain the ID of a loaded input window.

You must specify either *set\_name* or *set\_num*, but you don't need to specify both. If you specify both and

- ▶ *set\_num* is non-zero on entry, *set\_name* is returned with the name of the set specified by *set\_num*. (Sets are numbered sequentially as defined by the .SET script qualifier or by the order of calls to IB\_SET.)
- ▶ *set\_num* is zero on entry, *set\_name* is assumed to contain the name of the desired set, and *set\_num* is returned with its ordinal number as defined above.

If *next\_field* is passed, *next\_field* is returned with the ordinal number of the next input field in the set to be processed.

If *set\_controls* is passed, *set\_controls* is returned with the control structure for the indicated set. The format of the control structure is defined in the distributed file **setinf.def**.

If *processing\_state* is passed, *processing\_state* is returned with a value used to determine whether done, default, or OK processing is in progress on the set. In this case, the processing has not yet completed.

If *processing\_state* returns D\_MODE\_DONE, this means that I\_NEXT(\*DONE\*) was called for the current set or the user selected I\_DONE. All remaining fields are filled with their default values, blank, or zero. Validation and any break processing occurs next. When complete, if any buttons exist on the window, the first button will be focused; otherwise, termination processing will occur.

If *processing\_state* returns D\_MODE\_DFLT, this means that I\_NEXT(\*DFLT\*) was called for the current set or the user selected I\_DFLT. All remaining empty fields that have a default value are filled with defaults. Validation and any break processing occurs next. When complete, the first empty field or first button will be focused, or termination processing will occur, in that order.

If *processing\_state* returns D\_MODE\_OK, this means that I\_OK was selected. Processing is identical to D\_MODE\_DONE, except that when complete I\_INPUT is exited with **g\_setsts** = 0.

Within the distributed **setinf.def** file, the field **gs\_setcnt** contains the number of fields in the input set. The field **gs\_setnam** is a 16-bit pointer and will not be useful. The array **gs\_setfld** contains one 8-bit value for each field in the set. By using %DECML on each element, you can determine the UI Toolkit field number for each of the fields in the set. You can then use I\_FLDINF to retrieve information about each of these fields, including the actual window field numbers (which may differ). See the I\_FLDINF specification on [page 8-24](#) for more information.

## Examples

The following example returns the number of the next input field in **context** and the control structure for the **entries** set in **gs\_fldset**.

```
xcall i_setinf (wndid, "entries",, context, gs_fldset)
```

The following example returns the name of the third input set in **set\_name**, and the processing state for that set in **state**.

```
xcall i_setinf (wndid, set_name, 3,,, state)
```

## I\_SNAPSHOT – Save/restore an input window’s controls



```
xcall I_SNAPSHOT (operation, window_id, snapshot, [length], [record]
&                [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*operation*

The operation to perform: **(n)**

**D\_COPY**                      Copy the current controls.

**D\_LOAD**                     Load previously copied controls.

*window\_id*

The ID of the input window. **(n)**

*snapshot*

The snapshot information field. **(a)**

*length*

(optional) The returned length of the snapshot information. **(n)**

*record*

(optional) The structure data for redisplaying the fields on a D\_LOAD operation. **(a)**

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

### Discussion

The I\_SNAPSHOT routine enables you to “take a picture” of the input window’s controls, then restore them at a later time. The information that is saved/restored includes the following:

- ▶ Cleared state of all input fields
- ▶ Context of all input sets
- ▶ What fields are in what sets
- ▶ Enabled/disabled state of all input fields

Additionally, on a D\_LOAD (restore) operation, the fields can be redisplayed according to their cleared states. This is done by passing *record*, which will be used as the structure data for all input sets. If *record* is not passed, the display will not be affected.

This subroutine is useful in conjunction with I\_SETDEL, as it can restore fields that had been previously deleted from a set.

I\_SNAPSHOT has the following limitations:

- ▶ If *record* is passed, it must be usable as the structure data for all input sets in the window.
- ▶ The *snapshot* argument must be large enough to contain the snapshot information. This length is presently computed as the total number of fields in the window, plus 8 times the number of input sets, plus the number of fields used in each set, for a maximum length of 6,778. (The equation would be represented as  $maxfields + [maxsets * 8] + [maxsets * maxfields]$ .) The *length* argument can optionally be returned with this length.
- ▶ You must not modify the data in *snapshot* between D\_COPY or D\_LOAD operations. This data has a private format that will be changed in future versions of UI Toolkit.
- ▶ The D\_LOAD operation always removes frames from fields. To restore field frames, call I\_FRAMES.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to I\_SNAPSHOT. I\_SNAPSHOT, in turn, passes them directly to %IDISPLAY\_METHOD. This allows you to communicate additional information to your display method.

## Examples

The following example copies the current input window control information for the window identified by **inpid** into the field **inpinfo**, and returns the length of that information in **infolen**.

```
xcall i_snapshot(D_COPY, inpid, inpinfo, infolen)
```

The next example resets the same input window to its state at the time that the D\_COPY operation in the first example occurred.

```
xcall i_snapshot(D_LOAD, inpid, inpinfo(1:infolen))
```

The example for I\_SETDEL also shows the I\_SNAPSHOT subroutine being used. (See [page 8-81](#) for more information.).

## I\_TXTPOS – Get or set the input position for a multi-line text field



```
xcall I_TXTPOS (window_id, field_spec, D_LAST)
xcall I_TXTPOS (window_id, field_spec, [D_CHANGE,] row, column)
xcall I_TXTPOS (window_id, field_spec, D_GETNEXT | D_GETLAST, row, column)
```

### Arguments

*window\_id*

The ID of the input window containing the field. **(n)**

*field\_spec*

The specification for the multi-line text field. (See “[Field specifications](#)” on page 2-47 for information.) **(a)**

#### D\_LAST

Sets the position for subsequent input to *field\_spec* to the position the cursor last occupied when accepting input.

#### D\_CHANGE

(optional) Specifies that the values passed in *row* and *column* are offsets relative to the last position occupied during input (if you pass D\_CHANGE), or it specifies that *row* and *column* are absolute coordinates relative to the field origin if you omit D\_CHANGE (i.e., if you pass *row* and *column* without a D\_ option).

#### D\_GETNEXT

Returns in *row* and *column* the next projected position that will be used for input (or zeros if there is no projected next position).

#### D\_GETLAST

Returns in *row* and *column* the last position occupied by the cursor to accept input (or zeros if there has been no previous input).

*row*

A row within the multi-line text field. **(n)**

*column*

A column within the multi-line text field. **(n)**

## Discussion

I\_TXTPOS gets or sets the input position for a multi-line text field:

- ▶ If you pass D\_LAST or D\_CHANGE, or if you pass *row* and *column* without a D\_ option, I\_TXTPOS sets the cursor position for subsequent input. The next time *field\_spec* is processed through one of Toolkit's input routines, the cursor will be placed at the specified position. (Note that you can also use **gs\_inpfld** fields to set the cursor position for a multi-line text field. See [“Notes on gs\\_inpfld fields for multi-line text fields” on page 8-25.](#))
- ▶ If you pass D\_GETNEXT or D\_GETLAST, I\_TXTPOS returns (in *row* and *column*) the next projected position or the last position that the cursor occupied when an input routine processed *field\_spec*.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

Note the following when setting the position for subsequent input (D\_LAST, D\_NEXT, or no D\_ option):

- ▶ If you pass *row* and *column* without passing any of the D\_ options for I\_TXTPOS, do not include a comma placeholder for the omitted D\_ option. For example:  

```
xcall i_txtpos(inpid, "mytext", 2, 1)
```
- ▶ *Field\_spec* must be set to RETAIN\_POSITION (.FIELD) or D\_FLD\_RETPOS (IB\_FIELD and I\_FLDMOD). If it is *not* set to one of these, *row* and *column* are treated as zero, even if they are passed as other values.
- ▶ If *row* and *column* lie outside valid bounds for the field, Toolkit automatically limits them to valid values when *field\_spec* is next processed by one of Toolkit's input routines.

Note that if you use D\_GETNEXT, and the field is not set to RETAIN\_POSITION (.FIELD) or D\_FLD\_RETPOS (IB\_FIELD or I\_FLDMOD), *row* and *column* are returned as zero unless you have set them to something else (with I\_TXTPOS). In that case, they'll return the values they were set to, as long as input hasn't occurred on the field since they were set.

## Examples

This example sets the position for the next input of the text field **mytext** to be the same position as last occupied during input of this field:

```
xcall i_txtpos(inpid, "mytext", D_LAST)
```

This example moves the position within the text field down one row from the previous input position (if the text field is set to RETAIN\_POSITION or D\_FLD\_RETPOS):

```
xcall i_txtpos(inpid, "mytext", D_CHANGE, 1, 0)
```

The next example moves the position to the beginning of the second row of the text field:

```
xcall i_txtpos(inpid, "mytext", 2, 1)
```



The following examples retrieve the next projected input position and the last input position:

```
xcall i_txtpos(inpid, "mytext", D_GETNEXT, next_row, next_col)
```

```
xcall i_txtpos(inpid, "mytext", D_GETLAST, last_row, last_col)
```

## I\_USER – Retrieve/load the user-defined string for an input field



```
xcall I_USER(window_id, field_spec, [data][, new_data])
```

### Arguments

*window\_id*

The ID of the input window containing the field. **(n)**

*field\_spec*

The specification for the field whose user-defined string I\_USER will retrieve or modify. (See [“Field specifications” on page 2-47](#) for information.) **(a)**

*data*

(optional) Returned with the user data string. **(a)**

*new\_data*

(optional) The new user data string. **(a)**

### Discussion

The I\_USER subroutine reads or modifies a user-defined string (up to 80 characters) for a field.

If either *window\_id* or *field\_spec* is invalid, a fatal error occurs.

If no user data was defined for the field (in other words, you did not specify a **user** qualifier on the .FIELD script command), no operations will occur and no errors will be generated. Even if you specify *data*, it will not be modified. (Thus you could check for user field data by placing a known string in *data* before the call and seeing if it is still there after the I\_USER call.)

Note that by default Toolkit does not check for size. It truncates the user field data if *data* or *new\_data* is not large enough. Toolkit checks the size of these arguments and generates an error for a size mismatch only if **g\_dtkbounds** is set to 2 or greater. See [“g\\_dtkbounds” on page 18-3](#).

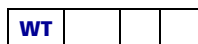
Also note that the size of the user field data is fixed by the size of the string used during the set’s compilation. Writing data out to the string won’t change the size of the string.

### Examples

The following example gets the user data associated with the **password** field. In this example, the system password could be maintained in the input window for easy verification.

```
xcall i_user(inp_id, "password", sec_chk)
```

## IB\_BUTTON – Include a Windows-style button



```
xcall IB_BUTTON(build_id, name, [type], [type_data], [method], [elb],  
&                [select_char], [position][, tooltip])
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*name*

The name of the button to add (a maximum of 30 characters). **(a)**

*type*

(optional) The button face type: **(n)**

**DSB\_TEXT**           Text. (default)

**DSB\_BITMAP**       Graphic.

*type\_data*

(optional) Text if *type* is DSB\_TEXT. A filename for the graphic if *type* is DSB\_BITMAP. **(a)**

*method*

(optional) The name of the method subroutine to invoke. **(a)**

*elb*

(optional) The name of the library from which to draw *method*. **(a)**

*select\_char*

(optional) The quick-select character. **(a)**

*position*

(optional) The position the button will be inserted in the button set. **(a or n)**

*tooltip*

(optional) The text of a ToolTip to be displayed when the mouse pointer rests over the button. **(a)**

## Discussion

The `IB_BUTTON` subroutine creates a Windows-style button in a new input window. This subroutine is used when building a new input window at runtime.

The default location for a set of buttons is at the bottom, left-justified, with as many buttons on a row as will fit before wrapping to a new row. `IB_BUTTONSET` can be called to change these defaults.

The basic functionality for this routine is documented in the Discussion for `B_BUTTON` on [page 5-5](#).

This routine has no effect on applications running on UNIX or OpenVMS or in Synergy .NET. It does, however, save button information on these platforms, so if the window is saved to a window library (by using `U_SAVE`) and later loaded from that library on a Windows platform in traditional Synergy, the button will be on the window (assuming ISAM-compatible platforms).

## See also

- ▶ [.BUTTON on page 2-15](#) for more information on defining an input window's buttons in a script file.
- ▶ [IB\\_BUTTONSET on page 8-93](#) for information about specifying button placement for an input window built at runtime.

## Examples

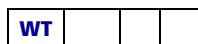
The following example defines an OK button named **I\_OK**. When the button is pressed, the remaining input fields are filled with defaults and standard termination processing occurs. The OK button has the quick-select character "K." When ALT+K is pressed, a click of the OK button is simulated.

```
xcall ib_button(inpid, "I_OK", DSB_TEXT, "OK",,, "K")
```

The next example creates a button named **lookup** with the graphic **lookup.gif** on its face. Pressing this button will invoke the subroutine **lookup** located in the library **button.elb**.

```
xcall ib_button(bldid, "lookup", DSB_BITMAP, "lookup.gif", "lookup",  
& "button.elb")
```

## IB\_BUTTONSET – Define the placement of a set of buttons



```
xcall IB_BUTTONSET (build_id, [placement], [per_row_col], [justification], button_name)
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*placement*

(optional) One of the following: **(n)**

**DSB\_BOTTOM**

The set of buttons will be placed horizontally along the bottom of the window with a maximum of *per\_row\_col* buttons per row. (default)

**DSB\_RIGHT**

The set of buttons will be placed vertically along the right side of the window with a maximum of *per\_row\_col* buttons per column.

*per\_row\_col*

(optional) The maximum number of buttons to place on a row if DSB\_BOTTOM is specified, or on a column if DSB\_RIGHT is specified. The default behavior is to display as many buttons as will fit and wrap to the next row or column. **(n)**

*justification*

(optional) One of the following: **(n)**

**DSB\_BEGIN**

The buttons will be left-justified if DSB\_BOTTOM is specified, or positioned towards the top if DSB\_RIGHT is specified. (default)

**DSB\_CENTER**

The buttons will be centered along the designated side.

**DSB\_END**

The buttons will be right-justified if DSB\_BOTTOM is specified, or positioned towards the bottom if DSB\_RIGHT is specified.

*button\_name*

(optional) The name of the default button. **(a)**

### Discussion

IB\_BUTTONSET defines the placement of a set of buttons within a new input window. This subroutine is used when building a new input window at runtime.

Every button is contained within a set and only one button set is allowed per input window; therefore, calling IB\_BUTTONSET will affect all buttons in an input window.

If the E\_STATE option D\_RETURNBTN is set, the default button will be selected if you press RETURN, no matter what field you're on in the window. If *button\_name* is not specified and D\_RETURNBTN is set, the first button in the window is the default.

This routine has no effect on applications running on UNIX or OpenVMS or in Synergy .NET. It does, however, save button information on these platforms, so if the window is saved to a window library (by using U\_SAVE) and later loaded from that library on a Windows platform in traditional Synergy, the button will be on the window (assuming ISAM-compatible platforms).

### See also

- ▶ [.BUTTON\\_SET on page 2-19](#) for information on defining the placement of an input window's button set in a script file.
- ▶ [IB\\_BUTTON on page 8-91](#) for information about creating input window buttons at runtime.

### Examples

The following example places the input window's buttons on the right side of the window, centered, with, three buttons per column (at most).

```
xcall ib_buttonset(bldid, DSB_RIGHT, 3, DSB_CENTER)
```

## IB\_DSP\_AREA – Set the display area for a new input window



```
xcall IB_DSP_AREA (build_id, win_row, win_column, rows, columns)
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*win\_row*

The row position of the upper-left corner of the display area (relative to the upper-left corner of the window, not the screen). **(n)**

*win\_column*

The column position of the upper-left corner of the display area (relative to the upper-left corner of the window, not the screen). **(n)**

*rows*

The height of the display area. **(n)**

*columns*

The width of the display area. **(n)**

### Discussion

The IB\_DSP\_AREA subroutine sets the display area for a new input window. This subroutine is used when building a new input window at runtime.

The default display area is the entire input window.

The view is movable if the display area is smaller than the size of the window. If the window is an input window, the input processing system adjust the view as necessary to include the entire input field being processed. If you want a moveable view, note that you must use this subroutine rather than the W\_AREA windowing routine.

### See also

[“Notes and Tips for ActiveX Toolkit Lists” on page 9-15](#) for information on setting the display area for an input window that is associated with an ActiveX Toolkit list.

## Input Routines

### IB\_DSP\_AREA

## Examples

The following example defines a display area for the current input window being built. The upper-left corner of the display area is at window position row 2, column 1, and the area is 10 rows deep by 25 columns wide.

```
xcall ib_dsp_area(bldid, 2, 1, 10, 25)
```



## IB\_END – Define the end of a new input window



```
xcall IB_END (build_id, window_id, [channel][, no_load])
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*window\_id*

Returned with the ID of the input window that is created. **(n)**

*channel*

(optional) The window library channel from which to load any pre-built selection windows. **(n)**

*no\_load*

(optional) Any non-zero value. If passed, it will specify that the input window should not be loaded at this time. **(n)**

### Discussion

The IB\_END subroutine ends an input window specification session. This subroutine is used when building a new input window at runtime.

*Window\_id* is the identifier for the new input window. If *window\_id* is returned zero, the input window building was unsuccessful.

After you call IB\_END, no other IB\_xxx subroutines can be used on this window (*build\_id*). In fact, *build\_id* should be discarded as it is no longer valid. However, you can still define other window features such as the border, display area, and text, just as you can with any input window.

After calling IB\_END, you can place the window since you have the final ID (*window\_id*).

If any of the fields in the input window use a prebuilt selection window (with the D\_FLD\_SELWND qualifier on IB\_FIELD), and that selection window is not currently resident, *channel* is required in order to provide a window library channel from which to load the selection window, unless *no\_load* is specified or the selection windows are already loaded.

*No\_load* enables you to build an input window without using it right away. You can save it to a window library and load it later with I\_LDINP. To do this, you must pass *no\_load*, and then call U\_SAVE for *window\_id*. You will also need to specify the window name in the U\_SAVE subroutine.

## Examples

The following example ends the specification of an input window being built. The ID for the new input window is returned in **wndid**. Any associated selection windows will be loaded from the window library opened on **g\_utlib**.

```
xcall ib_end(bldid, wndid, g_utlib)
```

## IB\_FIELD – Add an input field to a new input window



```
xcall IB_FIELD(build_id, field_spec[, qualifier, ...])
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*field\_spec*

The field specification for the input window field. (See “[Field specifications](#)” on page 2-47 for information.) **(a)**

*qualifier*

(optional) One or more of the following field qualifiers: **(n)**

|                                                              |                                                                                                                                                                        |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_FLD_TYPE</b> , <i>type</i>                              | Field type.                                                                                                                                                            |
| <i>type</i> is one of the following:                         |                                                                                                                                                                        |
| <b>D_ALPHA</b>                                               | Alphanumeric.                                                                                                                                                          |
| <b>D_DECIMAL</b>                                             | Decimal.                                                                                                                                                               |
| <b>D_INTEGER</b>                                             | Integer.                                                                                                                                                               |
| <b>D_NUMERIC</b>                                             | Numeric (same as decimal).                                                                                                                                             |
| <b>D_USERTYPE</b> , <i>type_string</i>                       | User-defined.                                                                                                                                                          |
| <b>D_FLD_SIZE</b> , <i>storage_size</i>                      | Storage size.                                                                                                                                                          |
| <b>D_FLD_DEC</b> , <i>num_places</i>                         | Decimal places.                                                                                                                                                        |
| <b>D_FLD_DIM</b> , <i>dim_size</i>                           | Dimension. (Only single dimension alpha arrays are supported.)                                                                                                         |
| <b>D_ON</b>                                                  | Turn on one or more of the following field qualifiers. (default)                                                                                                       |
| <b>D_OFF</b>                                                 | Turn off one or more of the following field qualifiers. When qualifiers are preceded by D_OFF, flags that normally require a following value argument do not need one. |
| <b>D_FLD_ALLOW</b> , <i>num_entries</i> , <i>entry_array</i> | Allow list.                                                                                                                                                            |
| <b>D_FLD_ARRIVE</b> , <i>arrive_method</i>                   | Arrive method.                                                                                                                                                         |

|                                                                              |                                                                                                                            |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>D_FLD_AUTO</b>                                                            | Auto entry.                                                                                                                |
| <b>D_FLD_ATTR</b> , <i>attribute</i>                                         | Attributes.                                                                                                                |
| <i>attribute</i> is one of the following flags defined in <b>tools.def</b> : |                                                                                                                            |
| <b>A_ALL</b>                                                                 | All attributes (same as A_BHRU).                                                                                           |
| <b>A_NONE</b>                                                                | No attributes.                                                                                                             |
| <b>A_B   A_I</b>                                                             | Blinking (on UNIX and OpenVMS) or italic (on Windows). “I” can be substituted whenever “B” appears in the following flags. |
| <b>A_BH</b>                                                                  | Blinking, highlighted.                                                                                                     |
| <b>A_BHR</b>                                                                 | Blinking, highlighted, reverse.                                                                                            |
| <b>A_BHRU</b>                                                                | Blinking, highlighted, reverse, underlined.                                                                                |
| <b>A_BHU</b>                                                                 | Blinking, highlighted, underlined.                                                                                         |
| <b>A_BR</b>                                                                  | Blinking, reverse.                                                                                                         |
| <b>A_BRU</b>                                                                 | Blinking, reverse, underlined.                                                                                             |
| <b>A_BU</b>                                                                  | Blinking, underlined.                                                                                                      |
| <b>A_H</b>                                                                   | Highlighted.                                                                                                               |
| <b>A_HR</b>                                                                  | Highlighted, reverse.                                                                                                      |
| <b>A_HRU</b>                                                                 | Highlighted, reverse, underlined.                                                                                          |
| <b>A_HU</b>                                                                  | Highlighted, underlined.                                                                                                   |
| <b>A_R</b>                                                                   | Reverse.                                                                                                                   |
| <b>A_RU</b>                                                                  | Reverse, underlined.                                                                                                       |
| <b>A_U</b>                                                                   | Underlined.                                                                                                                |
| <b>D_FLD_BREAK</b>                                                           | Break on change.                                                                                                           |
| <b>D_FLD_BRK_ALWAYS</b>                                                      | Break always.                                                                                                              |
| <b>D_FLD_BRK_RTRN</b>                                                        | Break on return only.                                                                                                      |
| <b>D_FLD_BZRO</b>                                                            | Blank if zero.                                                                                                             |
| <b>D_FLD_CASE</b>                                                            | Match case.                                                                                                                |
| <b>D_FLD_CHANGE</b> , <i>change_method</i>                                   | Change method.                                                                                                             |
| <b>D_FLD_CHECKBOX</b>                                                        | Check box.                                                                                                                 |
| <b>D_FLD_COLOR</b> , <i>palette#</i>                                         | Color.                                                                                                                     |

|                                                                                             |                                                   |
|---------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>D_FLD_COPY</b>                                                                           | Copy default.                                     |
| <b>D_FLD_DATE</b> , <i>date_type</i>                                                        | Date field.                                       |
| <i>date_type</i> is one of the following:                                                   |                                                   |
| <b>D_DATE_Y2J</b>                                                                           | YYJJJ date format.                                |
| <b>D_DATE_Y2MD</b>                                                                          | YYMMDD date format.                               |
| <b>D_DATE_Y2P</b>                                                                           | YYPP date format.                                 |
| <b>D_DATE_Y4J</b>                                                                           | YYYJJJ date format.                               |
| <b>D_DATE_Y4MD</b>                                                                          | YYYYMMDD date format.                             |
| <b>D_DATE_Y4P</b>                                                                           | YYYYPP date format.                               |
| and optionally one or both of the following:                                                |                                                   |
| <b>D_DATE_SHORT</b>                                                                         | Add to any of the above for short date qualifier. |
| <b>D_DATE_TODAY</b>                                                                         | Add to any of the above to default to today.      |
| <b>D_FLD_DECR</b>                                                                           | Decrement default.                                |
| <b>D_FLD_DISABLED</b>                                                                       | Disabled.                                         |
| <b>D_FLD_DISPLAY</b> , <i>display_method</i>                                                | Display method.                                   |
| <b>D_FLD_DFLT</b> , <i>default_string</i>                                                   | Default entry.                                    |
| <b>D_FLD_DSPLN</b> , <i>display_len</i>                                                     | Display length.                                   |
| <b>D_FLD_DRILL</b> , <i>drill_method</i>                                                    | Drill method.                                     |
| <b>D_FLD_EDITFMT</b> , <i>editfmt_method</i>                                                | Edit format method.                               |
| <b>D_FLD_ENUM</b> , <i>dsp_len</i> , [ <i>base</i> ], [ <i>step</i> ]                       | Enumerated.                                       |
| <b>D_FLD_EXACT</b>                                                                          | Match exact.                                      |
| <b>D_FLD_FMT</b> , <i>string</i>                                                            | Format string.                                    |
| <b>D_FLD_FONT</b> , <i>font_id</i>                                                          | Field font.                                       |
| <i>font_id</i> is the name of a font palette entry, a font handle, or one of the following: |                                                   |
| <b>DF_ALTERNATE</b>                                                                         | Alternate font.                                   |
| <b>DF_CURRENT</b>                                                                           | Current font.                                     |
| <b>DF_DEBUGGER</b>                                                                          | Debugger font.                                    |
| <b>DF_DEFAULT</b>                                                                           | Global font.                                      |

|                                                         |                                                                           |
|---------------------------------------------------------|---------------------------------------------------------------------------|
| <b>D_FLD_FPOS</b> [, <b>D_CHANGE</b> ], <i>row, col</i> | Field position.                                                           |
| <b>D_FLD_HELP</b> , <i>help_id</i>                      | Help identifier.                                                          |
| <b>D_FLD_HYPERLINK</b> , <i>hyper_method</i>            | Hyperlink method.                                                         |
| <b>D_FLD_INCR</b>                                       | Increment default.                                                        |
| <b>D_FLD_INFO</b> , <i>string</i>                       | Information text.                                                         |
| <b>D_FLD_INPLEN</b> , <i>input_len</i>                  | Maximum input length.                                                     |
| <b>D_FLD_JUST</b> , <i>just_flag</i>                    | Justification.                                                            |
| <i>just_flag</i> is one of the following:               |                                                                           |
| <b>D_JST_CENTER</b>                                     | Centered.                                                                 |
| <b>D_JST_LEFT</b>                                       | Left-justified.                                                           |
| <b>D_JST_RIGHT</b>                                      | Right-justified.                                                          |
| <b>D_FLD_LEAVE</b> , <i>leave_method</i>                | Leave method.                                                             |
| <b>D_FLD_NEG</b>                                        | Negative allowed.                                                         |
| <b>D_FLD_NEGONLY</b>                                    | Negative allowed only.                                                    |
| <b>D_FLD_NEGORZERO</b>                                  | Negative or zero allowed only.                                            |
| <b>D_FLD_NODEC</b>                                      | No decimal point required.                                                |
| <b>D_FLD_NOECHO</b>                                     | No echo.                                                                  |
| <b>D_FLD_NOECHR</b> , <i>char</i>                       | Fill character when <b>D_FLD_NOECHO</b> is specified (otherwise ignored). |
| <b>D_FLD_NOTERM</b>                                     | No termination required.                                                  |
| <b>D_FLD_PAINT</b> , <i>char</i>                        | Paint character.                                                          |
| <b>D_FLD_POS</b> [, <b>D_CHANGE</b> ], <i>row, col</i>  | Prompt position.                                                          |
| <b>D_FLD_PROMPT</b> , <i>prompt_string</i>              | Prompt.                                                                   |

|                                                                                                                            |                                                                  |
|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>D_FLD_PROMPTFONT</b> , <i>font_id</i>                                                                                   | Prompt font.                                                     |
| <i>font_id</i> is the name of a font palette entry, a font handle, or one of the following:                                |                                                                  |
| <b>DF_ALTERNATE</b>                                                                                                        | Alternate font.                                                  |
| <b>DF_CURRENT</b>                                                                                                          | Current font.                                                    |
| <b>DF_DEBUGGER</b>                                                                                                         | Debugger font.                                                   |
| <b>DF_DEFAULT</b>                                                                                                          | Global font.                                                     |
| <b>D_FLD_PROMPTLEN</b> , <i>length</i>                                                                                     | Runtime prompt.                                                  |
| <b>D_FLD_RADIO</b>                                                                                                         | Radio buttons.                                                   |
| <b>D_FLD_RANGE</b> , <i>beg</i> , <i>end</i>                                                                               | Range.                                                           |
| <b>D_FLD_READONLY</b>                                                                                                      | Read-only.                                                       |
| <b>D_FLD_REQUIRED</b>                                                                                                      | Required entry.                                                  |
| <b>D_FLD_RETPOS</b>                                                                                                        | Retain position in text field.                                   |
| <b>D_FLD_SELECT</b> , <i>row</i> , <i>col</i> , <i>nmrows</i> , [ <i>nmcols</i> ], <i>num_entries</i> , <i>entry_array</i> | Selection list.                                                  |
| <b>D_FLD_SELWND</b> , <i>row</i> , <i>col</i> , <i>window_name</i>                                                         | Selection window.                                                |
| <b>D_FLD_TIME</b> , <i>time_type</i>                                                                                       | Time field.                                                      |
| <i>time_type</i> is one of the following:                                                                                  |                                                                  |
| <b>D_TIME_HM</b>                                                                                                           | HHMM time format.                                                |
| <b>D_TIME_HMS</b>                                                                                                          | HHMMSS time format.                                              |
| and optionally one or both of the following:                                                                               |                                                                  |
| <b>D_TIME_AMPM</b>                                                                                                         | Add to either of the above for display as AM/PM.                 |
| <b>D_TIME_NOW</b>                                                                                                          | Add to either of the above for default to current time.          |
| <b>D_FLD_TIMESTAMP</b> , <i>format</i>                                                                                     | Timestamp field.                                                 |
| <i>format</i> is one or both of the following, or 0 (for neither):                                                         |                                                                  |
| <b>D_TIMESTAMP_AMPM</b>                                                                                                    | Use 12-hour notation and AM or PM designation.                   |
| <b>D_TIMESTAMP_SHORT</b>                                                                                                   | Use short display format (no century, seconds, or milliseconds). |
| <b>D_FLD_UC</b>                                                                                                            | Uppercase only.                                                  |
| <b>D_FLD_USER</b> , <i>string</i>                                                                                          | User-defined text string.                                        |

|                                                                            |                                                                                                          |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>D_FLD_VIEWLEN</b> , <i>view_length</i>                                  | The width of the field (i.e., the width of the area on the screen that will display data for the field). |
| <b>D_FLD_WAIT</b> , <i>wait_time</i>                                       | Input time-out for the field.                                                                            |
| <i>wait_time</i> is the number of seconds to wait or one of the following: |                                                                                                          |
| <b>D_FOREVER</b> or <b>-1</b>                                              | Wait until I/O processing is completed.                                                                  |
| <b>D_GLOBAL</b> or <b>-2</b>                                               | Use the globally specified time-out.                                                                     |
| <b>D_IMMEDIATE</b> or <b>0</b>                                             | Time out immediately.                                                                                    |

## Discussion

The IB\_FIELD subroutine adds a field to a new input window being built at runtime. The maximum number of input fields in an input window or input set is 253. IB\_FIELD's options are also available with the .FIELD script command. For more information on an option, see [.FIELD on page 2-34](#).

Defaults are used for qualifiers that are not specified. If IB\_RPS\_STRUCTURE has been called prior to IB\_FIELD, default values will be drawn from the repository, and the field must exist in the repository or a fatal error will occur. For notes on fields drawn from repositories, see the Discussion for .FIELD on [page 2-44](#).

If you specify a qualifier that does not apply to the field's destination type, it is ignored. (Integer fields support all qualifiers that are valid for decimal fields without precision.)

Any D\_FLD\_xxx *qualifier* not listed in the "Arguments" section will result in the fatal error "Invalid IB\_FIELD code (*code*)," where *code* is the invalid value passed.

For D\_FLD\_SIZE, alpha and alpha array fields can have up to 65,535 characters. Decimal fields (including implied decimal fields) have a maximum size of 28, and for implied-decimal fields, up to 28 digits can follow the decimal point. Integer fields on any operating system can have 1, 2, 4, or 8 digits, depending on size. If the size is not correct, Toolkit will ignore the field.

If IB\_FIELD creates a text field that is too large for the window, a warning will display only if **g\_dtkbounds** is set to a value of 2 or greater. See ["g\\_dtkbounds" on page 18-3](#).

If you use D\_FLD\_TYPE to change the field to D\_INTEGER type, the storage size is changed to the nearest (but not larger) valid integer storage size. Supported sizes are 1, 2, 4, and 8. Integer fields support all qualifiers that are valid for decimal fields without precision.

D\_FLD\_DIM enables you to create a single dimension alpha array. Only single dimension alpha arrays are supported for text fields.

The D\_ON and D\_OFF codes indicate whether the field qualifiers that follow in the argument list are to be turned on or off. The D\_ON state is the default for any qualifiers listed.



When qualifiers are preceded by D\_OFF, flags that normally require a following value argument do not need one. Thus, a prompt defined with the following call to IB\_FIELD

```
xcall ib_field(bldid, "myfield", D_FLD_PROMPT, "Help")
```

can be turned off with the following:

```
xcall ib_field(bldid, "myfield", D_OFF, D_FLD_PROMPT)
```

Note that even though it's a text prompt, the prompt defined above could also be turned off by using D\_OFF with D\_FLD\_PROMPTLEN. This is because, when used with either D\_FLD\_PROMPT or D\_FLD\_PROMPTLEN, D\_OFF always turns off the specified prompt, regardless of its type (text or runtime).

Turning off either D\_FLD\_BRK, D\_FLD\_BRK\_ALWAYS, or D\_FLD\_BRK\_RTRN results in no break for the field.

The D\_FLD\_DSPLEN and D\_FLD\_INPLEN qualifiers cannot be specified for check boxes, radio buttons, selection windows, or multi-line text fields.

The D\_FLD\_VIEWLEN qualifier cannot be specified for check boxes or radio buttons.

If you use D\_FLD\_RADIO with either D\_FLD\_SELECT or D\_FLD\_SELWND on Windows, the field will be a group of radio buttons. (If you use D\_FLD\_SELECT or D\_FLD\_SELWND without specifying RADIO on Windows, the field will be a combo box.)

- ▶ If you use D\_FLD\_SELECT with D\_FLD\_RADIO, the *numrows* argument for D\_FLD\_SELECT determines how many radio buttons can fit in a column. If you don't pass *numrows*, the radio buttons will be placed vertically in a single column.
- ▶ If you use D\_FLD\_SELWND with D\_FLD\_RADIO, the height of the associated selection window determines how many buttons can fit in a column. You can control spacing between radio button columns by changing the column width for the selection window. This spacing is calculated by adding the width of the radio button to the width of a column in the selection window (which is equal to the number of characters times the character width for the font).

For more information on radio buttons, see the documentation for the RADIO/NORADIO qualifier on [page 2-73](#).

If you use variables for the *beg* and *end* arguments for D\_FLD\_RANGE, you must use alpha variables. Decimal variables will not work.

By default, an autotime field from a repository results in a timestamp field in a Toolkit application. You can, however, use D\_FLD\_TIMESTAMP with

- ▶ D\_OFF to create a standard integer field from a repository autotime field.
- ▶ D\_ON to create a timestamp field from scratch or from a standard repository 8-byte integer field.

Additionally, when D\_ON is in effect, D\_FLD\_TIMESTAMP accepts an argument, *format*, that enables you to change the formatting used for a timestamp field.

Note the following for D\_FLD\_TIMESTAMP:

- ▶ For D\_ON, D\_FLD\_TYPE must be set to D\_INTEGER, and the field must be a read-only, 8-byte integer, and it cannot be a selection field, a radio button set, or a check box. Otherwise, an error will occur.
- ▶ When D\_ON is in effect, D\_FLD\_TIMESTAMP must be followed by the *format* argument. To specify both flags (D\_TIMESTAMP\_AMPM and D\_TIMESTAMP\_SHORT), use the bitwise OR operator (.BOR. or |) or add them. If you don't want to specify either flag, pass a value of zero as *format*. Note that if a flag isn't passed, it will be reset to its default value. For example, if you don't pass D\_TIMESTAMP\_SHORT, the long display format will be used even if the field was previously set to use the short format.
- ▶ When D\_OFF is in effect, you must omit the *format* argument. (If you include it, it will be interpreted as another qualifier.)

### See also

- ▶ [.FIELD on page 2-34](#) for information about the various field options.
- ▶ [“Renditions” on page 2-46](#) for information and notes on setting field-level renditions.
- ▶ [I\\_FLDMOD on page 8-27](#) to modify an existing field at runtime.
- ▶ [“Basic field information”](#) in the “Working with Fields” chapter of the *Repository User's Guide* for information on using implicit groups to combine repository structures.
- ▶ [“Using Fonts on Windows” on page 18-46](#) for information on fonts and font palettes.

### Examples

The following example adds the field **company** to the current input window being built. It is an alpha field, 15 characters long.

```
xcall ib_field(bldid, "company", D_FLD_TYPE, D_ALPHA, D_FLD_SIZE, 15)
```

The next example adds the field **age** to the current input window being built. It is a three-digit decimal field, which the user is required to input. The field will prompt the user with the string “Enter your age.”

```
xcall ib_field(bldid, "age", D_FLD_TYPE, D_DECIMAL, D_FLD_SIZE, 3,  
              & D_FLD_REQUIRED, D_FLD_PROMPT, "Enter your age ")
```

The following example adds the field **date[2,6]** to the current input window being built. It is an eight-digit decimal field from an array named *date* defined in a repository named *cusmas*. Note that the IB\_FIELD call specifies the format (YYYYMMDD), information that Toolkit does not import from the repository. The field will default to today's date if the user presses ENTER without entering any data.

```
xcall ib_rps_structure(bldid, "cusmas")  
xcall ib_field(bldid, "date[2,6]", D_FLD_DATE, D_DATE_Y4MD+D_DATE_TODAY)
```

## IB\_INPUT – Create a new input window



```
xcall IB_INPUT (build_id, name, rows, columns, [no_log], window_id)
```

### Arguments

*build\_id*

Returned with the input window build ID. **(n)**

*name*

The name of the input window (a maximum of 15 characters). **(a)**

*rows*

The number of rows in the window. **(n)**

*columns*

The number of columns in the window. **(n)**

*no\_log*

(optional) The true/false flag that specifies whether UI Toolkit should skip logging the input window with the environment. **(n)**

*window\_id*

(optional) Returned with the intermediate stage window ID. **(n)**

### Discussion

The IB\_INPUT subroutine is used to begin building a new input window at runtime. Like .INPUT does in a script file, IB\_INPUT starts the input window building definition. The IB\_END subroutine (like .END) ends the definition. All other IB\_xxx subroutines associated with this window should be called in between IB\_INPUT and IB\_END.

The *build\_id* variable should be an aligned **i4**. This *build\_id* is passed as the first argument to all other IB\_xxx subroutines.

If you pass a null string (“”) for *name*, Toolkit assigns a unique window name in the form *\_W\_nnn*, where *nnn* is the window ID.

The new input window will be logged in the current environment, unless *no\_log* is passed and is true.

The intermediate *window\_id* can be useful if you want to display text in the window or set other window features. The final input window (created when you call IB\_END) will inherit the features of this window (such as title and border), with the exception that the window fields and controls will be added later.

The display area must only be changed using `IB_DSP_AREA` until after the window is finished (with `IB_END`). If you set it directly, the input processor will not know that the window has a movable view.

## Examples

The following example initiates an input window specification session. The name of the input window will be **questions** and the working ID that will be used is returned in **bldid**. The height of the new input window is determined by **grows** and its width by **qcols**. The new input window will be logged in the current environment.

```
xcall ib_input(bldid, "questions", grows, qcols)
```

## IB\_LOCAL – Set the current input window structure to local



```
xcall IB_LOCAL(build_id)
```

### Arguments

*build\_id*

The ID of the input window under construction. (n)

### Discussion

The IB\_LOCAL subroutine specifies that subsequent fields are to be created, instead of drawn from the repository. This is the default state when you call IB\_INPUT. This subroutine is used after you have used IB\_RPS\_STRUCTURE to draw fields from the repository and you want to create local fields.

This subroutine is used when building a new input window at runtime.

### Examples

The following example sets the current state of the input window being built to local. Any subsequent fields specified by IB\_FIELD are to be created rather than retrieved from the repository.

```
xcall ib_local(bldid)
```

## IB\_PAINT – Set the paint character for a new input window



```
xcall IB_PAINT(build_id, character)
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*character*

The paint character. **(a)**

### Discussion

The IB\_PAINT subroutine determines which character “paints” an empty input field in the new input window. This subroutine is used when building a new input window at runtime.

Initially, the paint character is a blank. IB\_PAINT resets the default paint character. Note that IB\_FIELD’s D\_FLD\_PAINT option will override the character specified with IB\_PAINT. Fields drawn from the Repository always override IB\_PAINT.

A paint character can only be a printable character.

On Windows, paint characters have no meaning.

### Examples

In the following example, the dot character will indicate where the user should type input in the input window being built. This paint character takes effect for all fields defined in the input window after this point using IB\_FIELD.

```
xcall ib_paint(bldid, '.')
```

## IB\_RPS\_STRUCTURE – Specify the repository structure for a new input window



```
xcall IB_RPS_STRUCTURE (build_id, structure_name, [main_file, text_file][, alias_name])
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*structure\_name*

The name of the repository structure to access. **(a)**

*main\_file*

(optional) The name of the main repository file to use. **(a)**

*text\_file*

(optional) The name of the repository text file to use. **(a)**

*alias\_name*

(optional) The name by which *structure\_name* will be referenced within this input window. **(a)**

### Discussion

The IB\_RPS\_STRUCTURE subroutine specifies that subsequent calls to IB\_FIELD are to draw the definitions from the given repository structure. This subroutine is used when building a new input window at runtime.

The IB\_RPS\_STRUCTURE subroutine automatically creates a .STRUCTURE in the input window with the specified *structure\_name*, containing all of the referenced fields in the appropriate positions. You do not need to call IB\_STRUCTURE for this structure.

If *main\_file* and *text\_file* are not specified, the repository filenames specified by the RPSMFIL and RPSTFIL logicals will be used. (RPSMFIL should be set to the name of the main repository file. RPSTFIL should be set to the name of the repository text file.) If these logicals are not set, the default repository file name will be used: **RPSDAT:rpsmain.ism** and **RPSDAT:rpsttext.ism**, respectively.

You should use the *alias\_name* qualifier in the following circumstances:

- ▶ When you include the same repository structure more than once within an input window.
- ▶ When you include two or more fields that have the same name although they are referenced from different repository structures.

In either of the preceding situations, you must rename the second and succeeding “same” structures using the *alias\_name* argument.

After you have assigned an *alias\_name* to a structure, any runtime references to the structure must use the *alias\_name*. If you have given the structure an *alias\_name* and are referencing a field during runtime, the reference to the field will have the following syntax:

```
alias_name.field_name
```

This syntax can be used only for fields that are in a renamed structure.

The first 30 characters of the full reference above must be unique within the input window. Thus, we recommend that you use short alias names.

You can combine multiple repository structures, enabling their access as one structure, by using the implicit group feature of Repository.

## See also

[“Basic field information”](#) in the “Working with Fields” chapter of the *Repository User’s Guide* for information on using implicit groups to combine repository structures.

## Examples

The following example specifies that subsequent fields in the input window being built are to be drawn from the **cusmas** structure in the default repository.

```
xcall ib_rps_structure(bldid, "cusmas")
```

The next example specifies that subsequent fields in the input window being built are to be drawn from the **order** structure in the repository residing in the files **frnchmn.ism** and **frnctx.ism**.

```
xcall ib_rps_structure(bldid, "order", "frnchmn.ism", "frnctx.ism")
```



## IB\_SET – Add a set definition to a new input window



```
xcall IB_SET(build_id, set, [structure,] [count][, fields])
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*set*

The name of the input set (a maximum of 30 characters). **(a)**

*structure*

(optional) The name of the structure to associate with the set. **(a)**

*count*

(optional) The number of fields in the set. **(n)**

*fields*

(optional) The array of field specifications for the set. (See [“Field specifications” on page 2-47](#) for information.) **(a)**

### Discussion

The IB\_SET subroutine creates a named set of fields, specifies their order of reference, and associates the input set with the input window being built. This subroutine is used when building a new input window at runtime. (Remember, you don’t have to put all fields in sets—you can process fields individually as well.)

If no structure has been defined (with IB\_RPS\_STRUCTURE or IB\_STRUCTURE) when you call IB\_SET, you must pass the default structure name as *structure* if you want the input set to have any fields. The default structure has the same name as the input window, and will include all of the fields defined for the input set.

If you omit *structure* and *fields*, Toolkit creates an empty input set. (If you omit *structure*, you must also omit *fields*.) This is useful if you want a set of buttons that can be placed anywhere in a composite window. See [“Buttons in composite windows” on page 6-6](#) for more information.

If you use the *fields* array,

- ▶ include field specifications in the order in which you want them processed at runtime.
- ▶ the number of fields that you can specify in the array is 1 to *n*, where *n* is the total number of fields in the structure specification.
- ▶ all fields specified must be members of the same *structure* specification. (See [“IB\\_STRUCTURE” on page 8-115](#) and [“IB\\_RPS\\_STRUCTURE” on page 8-111.](#))

If you include *structure* and omit *fields*, all of the fields within the specified structure will be used in the order of their definition within the structure.

Note that if *count* is passed and non-zero, *fields* is required and must have at least *count* elements. If *count* is not passed or is zero, *fields* is ignored and all fields in the structure are included in the set.

If you don't call IB\_SET, a default set with the name of the input window being built will be created. This set will contain all of the fields defined in the first structure (or the default structure if *structure* is not specified), in the order they are defined.

## Examples

This example passes an array of field specifications from structure **mystruct** in order to define the set.

```
bldid      ,i4
nmflds     ,i4
fldnames   ,[10]a30,
&  "field1",
&  "field2",
&  "field3[7]",
&  "field4[2,7]",
      .
      .
      .
xcall ib_set(bldid, "myset", "mystruct", nmflds, fldnames)
```

## IB\_STRUCTURE – Define a local structure within a new input window



```
xcall IB_STRUCTURE(build_id, structure, count, fields, [pos][, offset_fields])
```

### Arguments

*build\_id*

The ID of the input window under construction. **(n)**

*structure*

The name of the local structure (a maximum of 30 characters). **(a)**

*count*

The number of structure specifications in the *fields* array. **(n)**

*fields*

An array of structure specifications. A structure specification can be either a field name, or “<*value*>” where *value* is the number of pad characters. You can use *value* to skip space in your structure between fields. *Value* must be enclosed in angle brackets. **(a)**

*pos*

(optional) An array, parallel to the *fields* array, which contains absolute record positions. **(n)**

*offset\_fields*

(optional) An array, parallel to the *fields* array, which contains the field names from which to offset. **(a)**

### Discussion

The IB\_STRUCTURE subroutine defines a local structure within the input window being built.

This subroutine is used when building a new input window at runtime.

Structure definitions are used to verify that no input sets contain fields from different structures; a field can only be a member of one structure. Note, however, that a field does not have to be a member of any structure.

Structure definitions are used to transfer data to and from the field’s data position within its record buffer.

Although a given field can only be a member of one structure you can define up to 25 structures per input window.

The maximum size of a structure is 9999 characters (**d4**). Text fields take up space that equals (*size \* dimension*).

You should not call IB\_STRUCTURE for fields drawn from a repository structure. In fact, calling IB\_STRUCTURE with the same structure name as in IB\_RPS\_STRUCTURE will result in a “Structure already defined” error.

IB\_STRUCTURE is only needed for fields defined after calling IB\_LOCAL. (IB\_LOCAL is also the default state.)

If you do not call IB\_STRUCTURE or IB\_RPS\_STRUCTURE for a given input window, a default structure is defined. Its name is the name of the input window, and it is composed of all fields in the order that they are created in the order the IB\_FIELD calls were made. (If the input window has no fields, the default structure will have no fields.) Thus, if you need only one record, you don’t need to define it with IB\_STRUCTURE. It will be created by default.

IB\_STRUCTURE defines membership and position for each field specified. If you do not pass fields, all of the fields will be used in the order they were defined.

If *pos* is zero or not passed, the next position after the previous specification will be used.

If *offset\_fields* is passed and non-blank for a given *fields* entry, the corresponding *pos* entry is assumed to be the relative offset from that field.

## See also

[.STRUCTURE on page 2-115](#) for information on structure field specifications.

## Examples

This example passes an array of field names and their absolute record positions in order to define the structure.

```
bldid      ,i4
nmflds     ,i4
fldnames   ,10a30
fldpos     ,10d3
.
.
.
xcall ib_structure(bldid, "mystruct", nmflds, fldnames, fldpos)
```

## The Input Methods

This section contains specification pages for input method subroutines. These method subroutines are written by you and their names specified as arguments to Toolkit subroutines (such as `I_FLDMOD` or `IB_FIELD`) or the `.FIELD` script command. UI Toolkit then calls them at the appropriate time.

Method subroutines are important in applications that will run in a Windows environment.

## IARRIVE\_METHOD – Perform input field arrive processing



```
subroutine IARRIVE_METHOD
  a_inpinfo          , a
  a_inprec           , a
  a_methoddata1      , any
  .
  .
  a_methoddata20     , any
```

### Arguments

*a\_inpinfo*

The structure of input information. (**a**)

*a\_inprec*

The *data\_area* argument (or *data\_location* argument for I\_INPFLD on Windows) passed to the calling input routine. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

### Discussion

IARRIVE\_METHOD is a subroutine you write and name when you want your program to perform extra actions before a specific input field is processed.

This subroutine is called by I\_INPUT, I\_INPFLD (Windows only), and L\_INPUT when an arrive method is specified for the field about to be processed. You can specify an arrive method for the field by using the ARRIVE\_METHOD qualifier in a .FIELD script command or the D\_FLD\_ARRIVE option in I\_FLDMOD or IB\_FIELD.

The *a\_inpinfo* argument is defined in **inpinf.def**. It is defined as a group and must be included within a record or as an argument. You can define multiple copies of it within your method routine. For example:

```
record data1
  .include "WND:inpinf.def"
record data2
  .include "WND:inpinf.def"
```

You can also use `.INCLUDE` to define this group argument without having to move it into a local data area. For example:

```
subroutine my_arrive_method
  .include "WND:inpinf.def"
  a_inprec      ,a
  a_methoddata1 ,any
  .
  .
  a_methoddata20 ,any
```

Note the following:

- ▶ For performance, make sure that this group is aligned.
- ▶ Do not modify the data in *a\_inpinfo*.
- ▶ To retrieve the strings associated with the pointers, use the function `%I_GETSTRING`. (See [page 8-48](#) for more information.)
- ▶ The **inp\_entered** and **inp\_return** fields in *a\_inpinfo* will be false in the arrive method. (See [“Appendix D: Methods”](#) for information on values for these fields in leave methods.)

For information on *a\_inpinfo* group members, see the comments in **inpinf.def**. Additionally, note that the **inp\_navevent** field lists the event that triggered navigation (arriving or leaving a field). It can have one of the following values (defined in **WND:tools.def**):

- ▶ **D\_NAVMOUSE**, which indicates that a mouse click occurred in the field (and that no subsequent event triggered focus). Note, however, that in a change, display, or leave method, this indicates that a mouse click occurred on some other window (and that no subsequent event triggered a loss of focus).
- ▶ **D\_NAVTAB**, which indicates that the user pressed TAB to arrive on this field. Note that the same is true for edit format methods. For change, display, and leave methods, however, this indicates that the user pressed TAB to leave the field.
- ▶ **D\_NAVSTAB**, which indicates that the user pressed SHIFT+TAB to arrive on this field. Note that the same is true for edit format methods. For change, display, and leave methods, however, this indicates that the user pressed SHIFT+TAB to leave the field.
- ▶ **D\_NAVNONE**, which indicates that navigation happened for some reason other than those listed above (RETURN, menu entry, or I\_NEXT, for example). Note that on UNIX and OpenVMS, this is always the value in **inp\_navevent**, so you will need to use other data members (**inp\_return**, **g\_select**, and **g\_entnam**) to determine the cause.

*A\_inprec* is the record passed to the *data\_area* argument for `I_INPUT` and `L_INPUT` and, on Windows, the *data\_location* argument for `I_INPFLD`. (On UNIX and OpenVMS, this argument is not passed if `I_INPFLD` is the calling routine.)

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to *I\_INPUT*, *I\_INPFLD*, or *L\_INPUT*. They are passed, in turn, directly to *IARRIVE\_METHOD*. This enables you to communicate additional information to *IARRIVE\_METHOD*.

## See also

- ▶ “Overloading a Toolkit routine” on page 18-8 for more information on creating this subroutine.
- ▶ “Appendix D: Methods”.

## Examples

```
.field custno, d6, user("h_popup=h_custno"), arrive_method("popup")
```

Given the above field definition, the following arrive method, **popup**, displays a popup-style window for the **custno** field.

```
subroutine popup
.include "WND:inpfld.def"          ;Input window information
      a_inprec          ,a          ;Input record

.include "WND:fldinf.def"
.include "WND:tools.def"

external common
      g_popupwnd      ,i4          ;ID of currently placed popup
.align
record
      ndx              ,i4          ;instr index
      scrch            ,i4          ;Search
      err              ,i4          ;Error
      name              ,a30         ;Doubles as field name/window name
      user              ,a80         ;User text

.define D_POPID , "hpopup="

proc
      if (g_popupwnd)          ;Any currently placed window?
      begin
            xcall u_window(D_DELETE, g_popupwnd)          ;Delete it
            clear g_popupwnd          ;Note none placed
      end

                                ;Get field
                                ;information
      xcall i_fldinf(inp_wndid, name, inp_fldnum,, gs_inpfld)

      user = %i_getstring(inp_wndid, inp_usertext)      ;Get user text
```



```

if (ndx = %instr(1, user, D_POPID))           ;Any popup
                                              ;specified?
    name = user(ndx+^size(D_POPID),^size(user)) ;Load it
if (ndx = %instr(1, name, ','))
    clear name(ndx,^size(name))               ;Allow comma
                                              ;delimiter

if (.not. name)                               ;Just "hpopup="
    xreturn
xcall u_ldwnd(g_popupwnd, g_utlib, name,, srch, err);Load the
                                              ;window

if (err)
    xreturn                                   ;No such window

;Place the window one row below and one column beyond the field being
;processed.

    xcall u_window(D_PLACE, g_popupwnd,
&          %w_info(WIF_PLCROW, inp_wndid) + gs_frow,
&          %w_info(WIF_PLCCOL, inp_wndid) + gs_fcol + gs_dsplen)
    xreturn
endsubroutine

```

## %ICHANGE\_METHOD – Perform input field change processing



```
function ICHANGE_METHOD, ^val
    a_data_entered      , a
    a_data_stored       , a
    a_pending_status    , n
    a_inpinfo           , a
    a_inprec            , a
    a_methoddata1       , any
    .
    .
    a_methoddata20      , any
```

### Return value

%ICHANGE\_METHOD must return one of the values listed under *a\_pending\_status* below. (n)

### Arguments

*a\_data\_entered*

A buffer containing the field data as entered by the user. (a)

*a\_data\_stored*

A buffer for the final storage of the data. (a)

*a\_pending\_status*

The result of Toolkit's field validations; one of the following (defined in **tools.def**): (n)

|                 |                                       |
|-----------------|---------------------------------------|
| <b>D_OK</b>     | Input is valid, proceed.              |
| <b>D_RNGERR</b> | Value not in range.                   |
| <b>D_VALERR</b> | Invalid numeric digit.                |
| <b>D_LSTERR</b> | Not an allowed entry.                 |
| <b>D_REQERR</b> | Non-zero or non-blank value required. |
| <b>D_DATERR</b> | Invalid date.                         |
| <b>D_NEGERR</b> | Negative value not allowed.           |
| <b>D_OVFERR</b> | Too many digits.                      |
| <b>D_TIMERR</b> | Invalid time.                         |

**D\_NEGOERR** Negative value only allowed.

**D\_EMITTEDERR** Invalid entry, but error message already emitted.

*a\_inpinfo*

The structure of input information. (**a**)

*a\_inprec*

(optional) The *data\_area* argument (or the *data\_location* argument for I\_INPFLD on Windows) passed to the calling input routine. This is *not* passed if the calling routine is L\_INPFLD. And, on UNIX and OpenVMS, this is *not* passed if the calling routine is I\_INPFLD. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

%ICHANGE\_METHOD is a function you write and name when you want your program to perform extra actions after a specific input field is validated. By default, a field is not validated until focus is lost. Immediate validation can be specified for check boxes, radio buttons, and combo boxes by using the D\_VALSTCHG option in E\_STATE. %ICHANGE\_METHOD must be declared as a ^VAL function.

This function is called by I\_INPUT, I\_INPFLD, L\_INPUT, and L\_INPFLD when a change method is specified for the field being processed. You can specify a change method for the field by using the CHANGE\_METHOD qualifier in a .FIELD script command or the D\_FLD\_CHANGE option in I\_FLDMOD or IB\_FIELD.

%ICHANGE\_METHOD is called only after the new field contents have been subjected to all of the specified Toolkit validation tests. %ICHANGE\_METHOD has the “last chance” opportunity to override or add to the Toolkit’s functionality.

When %ICHANGE\_METHOD is called, *a\_data\_stored* contains the storage form of the new data as validated by the Toolkit. If you wish to override the storage form of valid input, you may store the desired information in this argument prior to returning from the method. The following table shows the expected contents of *a\_data\_entered* based on field type.

| Field type                                                     | Contents of <i>a_data_entered</i>                                                                                                                 |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Editable (including enumerated allow list)                     | Data as entered                                                                                                                                   |
| Selection list/window (including enumerated and radio buttons) | Text of selected entry                                                                                                                            |
| Check box                                                      | Blank (for non-checked) or the contents of <b>g_chk_char</b> (for checked). See “ <a href="#">g_chk_char</a> ” on page 18-2 for more information. |

Note that the length of the text passed in *a\_data\_entered* is defined by the input length for the field. It is not limited by either the display length or the view length.

If *a\_pending\_status* is one of the D\_XXXERR values when %ICHANGE\_METHOD is called, the contents of *a\_data\_stored* are undefined.

*A\_pending\_status* contains the result of Toolkit's validations. %ICHANGE\_METHOD can simply return this value or return a different value (as the return value of the function) if you want to override Toolkit's validation of the field.

If %CHANGE\_METHOD returns D\_OK, the entry is accepted. Any other return value will revert the entry and storage to its original contents and force re-entry. (You do *not* need to revert the data in *a\_data\_entered*.) If %ICHANGE\_METHOD returns any of the values D\_RNGERR through D\_NEGOERR, the appropriate error message is also displayed. D\_EMITTEDERR should be returned when %ICHANGE\_METHOD displays its own error message. (This implies that, on Windows, a change of focus within the change method is acceptable and is actually expected when returning D\_EMITTEDERR.)

The include file **inpinf.def** defines *a\_inpinf*. See [IARRIVE\\_METHOD on page 8-118](#) for more information, but note that you must include **inpinf.def** as the *fourth* argument within your change method.

*A\_inprec* is the same record passed to the *data\_area* argument for I\_INPUT and L\_INPUT and, on Windows, the *data\_location* argument for I\_INPFLD. (On UNIX and OpenVMS, this argument is not passed if I\_INPFLD is the calling routine.) Note that the area of the record occupied by the current field does *not* yet contain the data being validated.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to I\_INPUT, I\_INPFLD, or L\_INPUT. They are passed, in turn, directly to %ICHANGE\_METHOD. This enables you to communicate additional information to %ICHANGE\_METHOD.

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this function.
- ▶ [“Appendix D: Methods”](#) for important information about method limitations.

## Examples

In this example, if the user enters a non-zero value in the field, all fields in the set named “rest” are cleared and disabled. Otherwise, these fields are enabled.

```
function check_full      , ^val
    a_data_entered      ,n
    a_data_stored       ,n
    a_pending_status    ,n
    .include 'WND:inpinf.def'
    a_record            ,a
```

```
.include 'WND:tools.def'

proc
  if (g_select)
    freturn D_OK      ;Menu entry signaled, don't do anything special.

    if (a_data_entered) then ;The value entered is non-zero.
      begin
        xcall i_init(inp_wndid, 'rest', a_record) ;Clear fields in set
        xcall i_disable(D_SET, inp_wndid, 'rest') ; 'rest' and disable
                                                    ; them.
      end
    else
      ;A non-zero value
      xcall i_enable(D_SET, inp_wndid, 'rest')      ;Enable the fields
                                                    ; in 'rest'.
    end

    freturn D_OK      ;Accept the input for this field
  end
```

## %IDISPLAY\_METHOD – Perform input field display processing



```
function IDISPLAY_METHOD, ^val
    a_data_stored      , a
    a_data_displayed   , a
    a_inpinfo          , a
    a_inprec           , a
    a_attributes       , n
    a_color            , n
    a_methoddata1      , any
    .
    .
    a_methoddata20     , any
```

### Return value

%IDISPLAY\_METHOD returns true to display and false to not display the contents of *a\_data\_displayed* into the field. **(n)**

### Arguments

*a\_data\_stored*

A buffer for the final storage of the data that's about to be displayed. **(a)**

*a\_data\_displayed*

A buffer for the display form of the data. **(a)**

*a\_inpinfo*

The structure of input information. **(a)**

*a\_inprec*

(optional) The *data\_area* argument (or the *data\_location* argument for I\_INPFLD on Windows) passed to the calling input routine. This is *not* passed if the calling routine is I\_DSPFLD. And on UNIX and OpenVMS, it is *not* passed if the calling routine is I\_INPFLD. **(a)**

*a\_attributes*

The attribute to apply to the data displayed. One of the following flags defined in **WND:tools.def**: **(n)**

**A\_NONE**                      No attributes.

**A\_U**                          Underlined.

**A\_R**                          Reverse.

|                  |                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>A_RU</b>      | Reverse, underlined.                                                                                                       |
| <b>A_B   A_I</b> | Blinking (on UNIX and OpenVMS) or italic (on Windows). “I” can be substituted whenever “B” appears in the following flags. |
| <b>A_BU</b>      | Blinking, underlined.                                                                                                      |
| <b>A_BR</b>      | Blinking, reverse.                                                                                                         |
| <b>A_BRU</b>     | Blinking, reverse, underlined.                                                                                             |
| <b>A_H</b>       | Highlighted.                                                                                                               |
| <b>A_HU</b>      | Highlighted, underlined.                                                                                                   |
| <b>A_HR</b>      | Highlighted, reverse.                                                                                                      |
| <b>A_HRU</b>     | Highlighted, reverse, underlined.                                                                                          |
| <b>A_BH</b>      | Blinking, highlighted.                                                                                                     |
| <b>A_BHU</b>     | Blinking, highlighted, underlined.                                                                                         |
| <b>A_BHR</b>     | Blinking, highlighted, reverse.                                                                                            |
| <b>A_BHRU</b>    | Blinking, highlighted, reverse, underlined.                                                                                |
| <b>A_ALL</b>     | All attributes (same as A_BHRU).                                                                                           |

#### *a\_color*

The color to apply to the data displayed, where *a\_color* is a palette number in the range 1 to 16. **(n)**

#### *a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

## Discussion

%IDISPLAY\_METHOD is a function you write and name when you want your program to display data differently from how Toolkit will display it. This method is called after Toolkit has formatted the display according to its rules, thus overriding or adding to Toolkit’s functionality.

This function is called by I\_INPUT, I\_INPFLD, I\_DISPLAY, and I\_DSPFLD when a display method is specified for the field being processed. You can specify a display method for the field by using the DISPLAY\_METHOD qualifier in a .FIELD script command or the D\_FLD\_DISPLAY option in I\_FLDMOD or IB\_FIELD.

%IDISPLAY\_METHOD is called only after the new field contents have been subjected to all of the specified Toolkit display logic. %IDISPLAY\_METHOD has the “last chance” opportunity to override or add to the Toolkit’s functionality.



If a view length has been specified for a field, make sure your display method allows Toolkit to perform the final display—rather than displaying the data within your display method and returning false to prevent Toolkit from displaying it. The display method should only format the data for Toolkit to display and then return true.

---

The **inpinf.def** file defines *a\_inpinfo*. See [page 8-118](#) for information.

Toolkit ignores any changes made to the *a\_data\_stored* argument. If the current field is a multi-line text field, the *a\_data\_stored* argument is the first element in the array containing the storage data for each line of the field.

Changes made to *a\_data\_displayed* are reflected in the input field if %IDISPLAY\_METHOD returns true. If the current field is a multi-line text field, the *a\_data\_displayed* argument is the first element in the array containing the display data for each line of the field. Note that the text returned in *a\_data\_display* is not limited by the display length or the view length.

If the calling routine is either I\_DISPLAY, I\_INPUT, or I\_INPFLD (on Windows), the *a\_inprec* argument contains the data area that was passed to that routine. (On UNIX and OpenVMS, this argument is not passed if I\_INPFLD is the calling routine.)

Changes made to the *a\_attributes* and *a\_color* arguments are applied to the input field’s display if %IDISPLAY\_METHOD returns true. These renditions will override those otherwise specified, specifically the default renditions (bold, 3), renditions set by U\_REND and U\_RSTREND, and field level renditions.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments passed from I\_INPUT, I\_INPFLD, I\_DISPLAY, or I\_DSPFLD.

Any field with a user-defined data type will not invoke the %IDISPLAY\_METHOD. Instead, the EDSPFLD\_METHOD routine should be used to display directly into the field.

Toolkit will format *a\_data\_display* prior to calling %IDISPLAY\_METHOD, but the data is not actually displayed until after the method returns.

## See also

- ▶ “Renditions” on [page 2-46](#) for information and notes on setting field-level renditions.
- ▶ “Overloading a Toolkit routine” on [page 18-8](#) for more information on creating this function.
- ▶ “Appendix D: Methods” for important information on using methods.



## IDRILL\_METHOD – Perform drilldown button processing



```
subroutine IDRILL_METHOD
  a_inpinfo      , a
  a_inprec       , a
  a_methoddata1  , any
  .
  .
  a_methoddata20 , any
```

### Arguments

*a\_inpinfo*

The structure of input information. (**a**)

*a\_inprec*

The *data\_area* argument (or *data\_location* argument for I\_INPFLD on Windows) passed to the calling input routine. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

### Discussion

IDRILL\_METHOD is a subroutine you write and name when you want your program to perform extra actions when a drilldown button is pressed (on Windows) or the I\_DRILL menu entry is signaled for a specific input field.

This subroutine is called by I\_INPUT, I\_INPFLD, and L\_INPUT when a drill method is specified for the current field being processed. You can specify a drill method for the current field by using the DRILL\_METHOD qualifier in a .FIELD script command or the D\_FLD\_DRILL option in I\_FLDMOD or IB\_FIELD.

---

#### WIN

On Windows, if a drill method is specified for a field, a drilldown (“...”) button is placed to the right of the field. If the user left-mouse clicks on the drilldown button, the associated drill method is invoked.

---

If a menu entry I\_DRILL is placed on a menu column and the user selects the menu entry while processing a field that has an associated drill method, the drill method is invoked.

Your drill method can be used for a number of things. Primarily, it is used for some form of lookup or presentation of additional information. Your subroutine can use `I_FORCE` or `I_DSPFLD` to return data back into the field being processed. If the default type for the field is `COPY`, any change you make to the data area will affect the default value for the field.

The **inpinf.def** file defines *a\_inpinfo*. See [page 8-118](#) for information.

*A\_inprec* is the record passed to the *data\_area* argument for `I_INPUT` and `L_INPUT` and, on Windows, the *data\_location* argument for `I_INPFLD`. (On UNIX and OpenVMS, this argument is not passed if `I_INPFLD` is the calling routine.)

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to `I_INPUT`, `I_INPFLD`, or `L_INPUT`. They are passed, in turn, directly to `IDRILL_METHOD`. This enables you to communicate additional information to `IDRILL_METHOD`.

Invocation of a drill method behaves just like selecting a menu entry. Therefore, any leave method for the current field will be invoked first. To determine if a leave method is being invoked due to a drilldown, test **g\_select** for true (non-zero) and **g\_entnam** for “`I_DRILL`” in the leave method.

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#) for important information on using methods.

## Examples

```
.field name, a30, pos(1, 2), prompt("Name"), fpos(1, 15), -  
    drill_method("mydrill")
```

Given the above field definition, the following drill method, `mydrill`, displays data to the **name** field.

```
subroutine mydrill  
;  
; Description: Display data to a field when the drilldown button is  
;             pressed. This drill method will display the field name for  
;             the field that had its drilldown button pressed.  
;  
; Arguments:  
.include "WND:inpinf.def"          ;Input information  
    a_inprec      ,a              ;Input record  
  
.include "WND:tools.def"  
record  
    fldnam      ,a30
```

```
proc
    fldnam = %i_getstring(inp_wndid, inp_fldnam)
    xcall i_next(inp_wndid, "*CURR*", fldnam)
    xcall i_force(fldnam)
    xreturn
endsubroutine
```

## %IEDITFMT\_METHOD – Perform input field “edit format” processing



```
function IEDITFMT_METHOD, ^val
    a_data_stored      , a
    a_data_edit        , a
    a_inpinfo          , a
    a_inprec           , a
    a_attributes       , n
    a_color            , n
    a_methoddata1      , any
    .
    .
    a_methoddata20     , any
```

### Return value

%IEDITFMT\_METHOD should always return true. (**n**)

### Arguments

*a\_data\_stored*

A buffer for the final storage of the data that’s about to be displayed. (**a**)

*a\_data\_edit*

A buffer for the edit display form of the data. (**a**)

*a\_inpinfo*

The structure of input information. (**a**)

*a\_inprec*

(optional) The *data\_area* argument (or the *data\_location* argument for I\_INPFLLD on Windows) passed to the calling input routine. (**a**)

*a\_attributes*

The attribute to apply to the data displayed. One of the following flags defined in **WND:tools.def**: (**n**)

**A\_NONE**                      No attributes.

**A\_U**                          Underlined.

**A\_R**                          Reverse.

**A\_RU**                        Reverse, underlined.

|                  |                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>A_B   A_I</b> | Blinking (on UNIX and OpenVMS) or italic (on Windows). “I” can be substituted whenever “B” appears in the following flags. |
| <b>A_BU</b>      | Blinking, underlined.                                                                                                      |
| <b>A_BR</b>      | Blinking, reverse.                                                                                                         |
| <b>A_BRU</b>     | Blinking, reverse, underlined.                                                                                             |
| <b>A_H</b>       | Highlighted.                                                                                                               |
| <b>A_HU</b>      | Highlighted, underlined.                                                                                                   |
| <b>A_HR</b>      | Highlighted, reverse.                                                                                                      |
| <b>A_HRU</b>     | Highlighted, reverse, underlined.                                                                                          |
| <b>A_BH</b>      | Blinking, highlighted.                                                                                                     |
| <b>A_BHU</b>     | Blinking, highlighted, underlined.                                                                                         |
| <b>A_BHR</b>     | Blinking, highlighted, reverse.                                                                                            |
| <b>A_BHRU</b>    | Blinking, highlighted, reverse, underlined.                                                                                |
| <b>A_ALL</b>     | All attributes (same as A_BHRU).                                                                                           |

*a\_color*

The color to apply to the data displayed, where *a\_color* is a palette number in the range 1 to 16. **(n)**

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

## Discussion

%IEDITFMT\_METHOD is a function you write and name when you want your program to format editable data differently from how Toolkit will format it. This method is called after the Toolkit has formatted the data according to its rules, thus overriding or adding to the Toolkit’s functionality.

This function is called by I\_INPUT and I\_INPFLD when an edit format method is specified for the field being processed. You can specify an edit format method for the field by using the EDITFMT\_METHOD qualifier in a .FIELD script command or the D\_FLD\_ EDITFMT option in I\_FLDMOD or IB\_FIELD.

%IEDITFMT\_METHOD has the “last chance” opportunity to override or add to the Toolkit’s functionality. %IEDITFMT\_METHOD is called only after the new field contents have been subjected to all of the specified Toolkit display logic. In addition, this method isn’t called until Toolkit is in edit mode. On Windows, Toolkit enters edit mode as soon as a field gains focus. On UNIX and OpenVMS, however, Toolkit doesn’t enter edit mode until the user starts typing or selects a reserved menu entry that starts with E\_. (See [“Appendix B: Reserved Menu Entries”](#) for a list of these menu entries.)

Toolkit ignores any changes made to the *a\_data\_stored* argument. If the current field is a multi-line text field, the *a\_data\_stored* argument is the first element in the array containing the storage data for each line of the field.

Changes made to the *a\_data\_edit* argument are reflected in the input field. If the current field is a multi-line text field, the *a\_data\_edit* argument is the first element in the array containing the edit display data for each line of the field. Note that the text returned in *a\_data\_edit* is not limited by the display length or the view length; its size is determined by the input length for the field.

The **inpinf.def** file defines *a\_inpinfo*. See [page 8-118](#) for information.

If the calling routine is I\_INPUT or I\_INPFLD (on Windows), the *a\_inprec* argument contains the data area that was passed to that routine. (On UNIX and OpenVMS, this argument is not passed if I\_INPFLD is the calling routine.)

Changes made to the *a\_attributes* and *a\_color* arguments are applied to the input field's display after %IEDITFMT\_METHOD returns. These renditions will override those otherwise specified, specifically the default renditions (bold, 3), renditions set by U\_REND and U\_RSTREND, and field level renditions.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments passed from I\_INPUT or I\_INPFLD.

Toolkit will invoke the EEDTDSP\_METHOD prior to calling the %IEDITFMT\_METHOD for any field with a user-defined data type.

Toolkit will format *a\_data\_edit* prior to calling %IEDITFMT\_METHOD, but the data is not actually displayed until after the method returns.

## See also

- ▶ [“Renditions” on page 2-46](#) for information and notes on setting field-level renditions.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this function.
- ▶ [“Appendix D: Methods”](#) for important information on using methods.

## IHYPER\_METHOD – Perform hyperlink prompt processing



```
subroutine IHYPER_METHOD
  a_inpinfo      , a
  a_inprec       , a
  a_methoddata1  , any
  .
  .
  a_methoddata20 , any
```

### Arguments

*a\_inpinfo*

The structure of input information. (**a**)

*a\_inprec*

The *data\_area* argument (or *data\_location* argument for I\_INPFLD on Windows) passed to the calling input routine. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

### Discussion

IHYPER\_METHOD is a subroutine you write and name when you want your program to perform extra actions when a hyperlink prompt is clicked (on Windows) or the I\_HYPER menu entry is signaled for a specific input field.

This subroutine is called by I\_INPUT, I\_INPFLD, and L\_INPUT when a hyperlink method is specified for the current field being processed. You can specify a hyperlink method for the current field by using the HYPERLINK\_METHOD qualifier in a .FIELD script command or the D\_FLD\_HYPERLINK option in I\_FLDMOD or IB\_FIELD.

#### WIN

On Windows, if a hyperlink method is specified for a field, and the user left-mouse clicks on the field's prompt, the associated hyperlink method is invoked.

If a menu entry I\_HYPER is placed on a menu column and the user selects the menu entry while processing a field that has an associated hyperlink method, the hyperlink method is involved.

Your hyperlink method can be used for a number of things. Primarily, it is used for some form of lookup or presentation of additional information. Your subroutine can use `I_FORCE` or `I_DSPFLD` to return data back into the field being processed. If the default type for the field is `COPY`, any change you make to the data area will affect the default value for the field.

The `inpinf.def` file defines `a_inpinfo`. See [page 8-118](#) for information.

`A_inprec` is the record passed to the `data_area` argument for `I_INPUT` and `L_INPUT` and, on Windows, the `data_location` argument for `I_INPFLD`. (On UNIX and OpenVMS, this argument is not passed if `I_INPFLD` is the calling routine.)

`A_methoddata1` through `a_methoddata20` are up to 20 additional optional arguments that can be passed to `I_INPUT`, `I_INPFLD`, or `L_INPUT`. They are passed, in turn, directly to `IHYPER_METHOD`. This enables you to communicate additional information to `IHYPER_METHOD`.

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#) for important information on using methods.

## Examples

```
.field department, a30, pos(2, 2), prompt("Department"), fpos(2, 15), -  
    help("h_department"), hyperlink_method("myhyper")
```

Given the above field definition, the following hyperlink method, “myhyper,” displays additional help for the **department** field.

```
subroutine myhyper  
;  
; Description: Hyperlink prompt method for additional help  
;  
; Arguments  
.include "WND:inpinf.def"                ;Input information  
    a_inprec      ,a                    ;Input record  
;  
;Notes:  
; This routine assumes that a window exists in the default window  
; library with the name "dh_" + field_name. If it does not exist,  
; display an error message.  
.include "WND:tools.def"  
.align quad  
record  
    err      ,i4  
    fldnam   ,a30
```



```
proc
    fldnam = %i_getstring(inp_wndid, inp_fldnam)
    xcall u_popup (g_utlib, "dh_" + fldnam,, D_NOBELL, D_ALERT, err)
    if (err)
        xcall u_message("More detailed help not available for this field.")
    xreturn
endsubroutine
```

## ILEAVE\_METHOD – Perform input field leave processing



```
subroutine ILEAVE_METHOD
  a_inpinfo          , a
  a_inprec           , a
  a_methoddata1      , any
  .
  .
  a_methoddata20     , any
```

### Arguments

*a\_inpinfo*

The structure of input information. (**a**)

*a\_inprec*

The *data\_area* argument (or *data\_location* argument for I\_INPFLD on Windows) passed to the calling input routine. (**a**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

### Discussion

ILEAVE\_METHOD is a subroutine you write and name when you want your program to perform extra actions after a specific input field is processed.

This subroutine is called by I\_INPUT, I\_INPFLD (Windows only), and L\_INPUT when a leave method is specified for the current field being processed. You can specify a leave method for the current field by using the LEAVE\_METHOD qualifier in a .FIELD script command or the D\_FLD\_LEAVE option in I\_FLDMOD or IB\_FIELD.

The ILEAVE\_METHOD is called whenever a field is deaccessed by

- ▶ focus change to a different field.
- ▶ TAB/SHIFT+TAB keys (Windows).
- ▶ mouse action (Windows).
- ▶ ENTER key.
- ▶ menu entry selection.

Note that the leave method is called prior to any break processing or any menu entry dispatching.

When the leave method is called, **g\_select** is true if a menu entry caused the leave. In this case, **g\_entnam** contains the name of that menu entry. Note that the menu entry has not yet been dispatched at this point, and that its action is still pending.

The **inpinf.def** file defines *a\_inpinf*. See [page 8-118](#) for information.

*A\_inprec* is the record passed to the *data\_area* argument for **I\_INPUT** and **L\_INPUT** and, on Windows, the *data\_location* argument for **I\_INPFLD**. (On UNIX and OpenVMS, this argument is not passed if **I\_INPFLD** is the calling routine.)

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to **I\_INPUT**, **I\_INPFLD**, or **L\_INPUT**. They are passed, in turn, directly to **ILEAVE\_METHOD**. This enables you to communicate additional information to **ILEAVE\_METHOD**.

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#) for important information on using methods.

## Examples

```
.field access_code, a30, pos(3, 2), prompt ("Access code"), fpos(3, 15), -
    leave_method("myleave")
```

Given the above field definition, the following leave method, “myleave,” validates the **access\_code** field.

```
subroutine myleave
;
;Description: Field leave method for validation access code.
;
; Arguments
;       .include "WND:inpinf.def"           ;Input information
;       a_inprec           ,a           ;Input record
;
; Note:
;       There are up to 20 additional optional arguments that you can pass
;       into i_input, which will be passed into the field leave
;       method.
;
;       The field arrive method has the same arguments as the field leave
;       method and can be used to set up anything that needs to be set up
;       when a field is arrived on.
;
;       This field leave method validates that the access code does
;       not have any spaces and is at least 7 characters long.
;
```

```
.include "WND:tools.def"
.align quad
record
    length,i4      ;Length of input field
    fldnam,a30     ;Field name
record data
    ,a30
    ,a30
    acc      ,a30
proc
    data = a_inprec
    length = %trim(acc)
    if ((length .lt. 7) .or. (%instr(1, acc(1:length), " ")))
        begin
            xcall u_message("Invalid access code")

            ; We get the field name from the input string associated to
            ; the field (its pointer is inp_fldnam). We need to do this
            ; because g_fldnam is NOT set at this point.

            fldnam = %i_getstring(inp_wndid, inp_fldnam)

            ; Initialize the field in the current data set

            xcall i_init(inp_wndid,, data, fldnam)
            a_inprec = data      ;Return the updated data area

            ; Reset the context back to the field
            xcall i_next(inp_wndid, "*CURR*", fldnam)
        end
    xreturn
endsubroutine
```

# 9

## List Routines

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Describes how to specify the general appearance of a list, the appearance of individual list items, how to associate methods with lists, and how to use non-window data.

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## Using Lists in Toolkit Applications

A list is a collection of similar data elements that can be used for selection processing, input processing, or just paging through large amounts of data. Lists can be static or dynamic.

A single list element or item can consist of one field or an entire record. For example, a simple, one-field list might be a one-column selection window. A more complex list might be one that contains multi-line, multi-field transaction entries.

There are several ways to include lists in your Toolkit application.

- ▶ Add a Toolkit list.
- ▶ Add our ActiveX implementation of a Toolkit list (an ActiveX Toolkit list).
- ▶ Add an ActiveX list control of your choosing.
- ▶ Add the Synergy<sup>TM</sup>-supplied Spread control (an ActiveX control).

This chapter discusses the first two options listed above (using a Toolkit list and using an ActiveX Toolkit list). For information on the second two options, see [“Options for ActiveX” on page 4-3](#).

To create a list that’s portable between UNIX, OpenVMS, and all supported Windows platforms, use a Toolkit list. For a more Windows-like list, use an ActiveX Toolkit list (see [“Specifying and determining the list type” on page 9-5](#)). ActiveX Toolkit lists wrap some of the functionality of the Spread control, creating ActiveX lists that you can control with Toolkit list routines. These work as ActiveX Toolkit lists on Windows platforms and as standard Toolkit lists on UNIX and OpenVMS. The following are some of the additional features available with ActiveX Toolkit lists:

- ▶ Grid lines drawn between rows and columns
- ▶ Multi-line list entries (available with Toolkit lists on UNIX and OpenVMS, but not Windows)
- ▶ Resizable columns
- ▶ Ability to focus on any cell
- ▶ True proportional font support (columns line up when proportional fonts are used)
- ▶ Ability to move between columns with TAB and SHIFT+TAB
- ▶ Ability to specify column widths
- ▶ Ability to specify alternating row colors
- ▶ Ability to specify font and color for all cells or on a per-cell basis
- ▶ Access to published properties and methods

See [“Notes and Tips for ActiveX Toolkit Lists” on page 9-15](#) for more information on ActiveX Toolkit lists.

See [“Appendix C: Keyboard Navigation for Lists on Windows”](#) for information on keyboard navigation in Windows environments (what keys and key combinations do in their default state, which keys are privatized, and which keys can never be used as shortcuts).



## Defining Lists

To set up a list, you must first define what kind of list it will be (Toolkit list or ActiveX Toolkit list), define how the list will look, and specify any methods you will write for the list. To do this, you must define a list class (or accept default list characteristics), and you must create a special input window for the list.

- ▶ The *list class* defines the general appearance of the list, enables you to associate the list with any methods you'll write for the list, and can define the list type. For information, see [“The list class: specifying general list characteristics”](#) below.
- ▶ The *input window* enables you to define the appearance of individual list items. For information, see [“The input window: specifying the list title and the appearance of individual list items”](#) below.

In addition to the data that's displayed in a list (display data), you can add buttons to a list (using L\_BUTTON and L\_BUTTONSET), and you can associate a data buffer with each item in a list. The data in such a buffer is called *non-window data*. Non-window data doesn't appear in the list, but it's stored and retrieved with the display data.

## Specifying and determining the list type

By default, lists are created as Toolkit lists. If you want an ActiveX Toolkit list, do one of the following:

- ▶ Set the ACTIVEX\_LIST environment variable. (See [ACTIVEX\\_LIST](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.)
- ▶ Specify the ACTIVEX option when you define the list class. (See [.LISTCLASS](#) on page 2-96.)
- ▶ Set **g\_ActiveX\_list** to true. (You will need to include **tkctl.def** from the synergyde/toolkit directory.)

To find out if a list is actually instantiated as an ActiveX Toolkit list, call L\_STATUS with D\_LACTIVEX or D\_LAXCTRL. Both options return a value of 0 unless the list is currently instantiated as an ActiveX list. Based on this information, you can then alter column headings, avoid invoking methods and properties when they don't apply to the list type, and so forth.

## The list class: specifying general list characteristics

By defining a list class, you can specify the following characteristics of your list:

- ▶ Row and column position
- ▶ Number of visible lines
- ▶ Header and footer sections
- ▶ Scroll bars
- ▶ Whether a null list is allowed

- ▶ Whether the list will maintain input window control information for each item in the list
- ▶ Whether the list will be a Toolkit list or an ActiveX Toolkit list

You can also associate methods with a list. You can specify

- ▶ a load method. This is a subroutine that supplies the items for the list.
- ▶ an arrive method and a leave method. These are subroutines that perform additional processing when a list item is accessed or deaccessed.
- ▶ a double-click method. This is a subroutine that performs additional processing when the user double-clicks on a list item.

## Creating a list class

There are two ways you can define a list class: in a script file or at runtime. To define a list in a script file, use the `.LISTCLASS` command. To define a list class at runtime, use the `L_CLASS` subroutine.

When you create the list, you'll pass the name of the list class to `L_CREATE`. (If you don't pass the list class name, which is optional, the list will have the default characteristics documented in [.LISTCLASS on page 2-96](#) and [L\\_CLASS on page 9-69](#).) Once you've defined a list class, you can use it as the basis for one or more lists in your application. List classes can help standardize your user interface and simplify global changes to your lists.

Note the following:

- ▶ Although the list class defines the characteristics of the header and footer, you must use the `L_SECT` subroutine to place text in the header or footer, and you must use the `L_SECTDRAW` subroutine to draw lines in the header or footer.
- ▶ You can overload (replace) methods specified in the list class. To do this, use the `L_METHOD` subroutine.

## The input window: specifying the list title and the appearance of individual list items

To specify the appearance and layout of individual list items, you must create an input window that defines the layout of one list item. For example, the following input window definition specifies three fields, which will result in a list with three columns:

```
.input detlstimp, 1, 49
.repository_structure ORDER_DETAIL
.field OD_PRODUCT, noprompt, fpos(1, 5), nodrill_method
.field OD_ORD_QTY, noprompt, fpos(1, 20)
.field OD_PRICE, noprompt, fpos(1, 35)
.end
```

Note that the example above specifies only one row. This example would result in a list in which each list item takes up only one row, which is the most common scenario. List items can, however, take up more than one row. (On Windows, multi-row list items are supported only for ActiveX lists.) To create a list with multi-row items, define an input window with one line for each list item row. For example, if you want each list item to take up three rows (to hold an entire record, for example), define three lines in the input window.

Note that there's no need to specify borders, and column headings usually replace individual field prompts. The input window title is also optional; if you specify it, it will become the list title.



Never explicitly remove the input window associated with a list. Doing so will corrupt the placement order. If you want to use the same input window for other input, you will need to load a separate copy of the window.

---

## Creating the input window

You can create the input window in a script file or at runtime. To create it in a script file, use the `.INPUT` command. To create the input window at runtime, use the input build (`IB_`) subroutines. Then, once you've created the list, pass the input window ID to `L_CREATE`. Note that an input window can be associated with only one list.

## The input window's other role: processing input

You'll use the input window to pass display data between the list processor and your application. When the list processor asks your application for data for a list item, you simply place the data in the input window. The list processor uses that data to display the current item in the list. When list processing is complete, the input window is returned to your application with the data for the new current item along with any non-window data that has been associated with this item. Your application can also use this input window to edit list items.

## Using non-window data

In addition to the data that's displayed in a list (display data), you can associate a data buffer with a list. The data in this buffer is called *non-window data*. Non-window data doesn't appear in the list, but it's stored and retrieved with the display data and may duplicate the display data.

To use non-window data, pass the initial non-window data item as the *data* argument to `L_CREATE` when you create the list. When you call a list processing routine, place non-window data for the current item by passing it as the *data* argument. When processing is complete, the list processing routine will return the non-window data for the new current item as the *data* argument.

Unlike display data, which is stored and retrieved as displayed, non-window data is stored and retrieved in the form passed to `L_CREATE` and the list processing routines. For more information on non-window data, see the Discussion for `L_CREATE` on [page 9-77](#).

## Defining Behavior for Lists

List processing methods enable you to define the behavior of a list. Methods are routines you write; they are a modularized way to determine how lists are loaded and any additional processing that you want to happen when an item is accessed, de-accessed, or double-clicked.

The `.LISTCLASS` script command and `L_CLASS` subroutine have arguments that enable you to specify the method names when you define the list class. You can use the `L_METHOD` subroutine to overload methods that you've previously specified with the list class or to register methods not specified in the list class.

---

### WIN

Applications that run on Windows *must* use method subroutines (as opposed to inline code).

---

See [“Appendix D: Methods”](#) for information on issues that are common to different types of method.

## List arrive method and leave method

Arrive and leave methods enable your program to perform additional processing when arriving at or leaving a list item. This is especially useful in Windows environments, where users can change the current list item during a call to a Toolkit subroutine, such as `L_PROCESS`. In this situation your program may not be in control (the user may use the mouse, for instance), so you must create an arrive or leave method if you want additional processing. Arrive and leave methods are also supported in non-graphical (UNIX and OpenVMS) environments.

In addition to writing an arrive or leave method, you must also associate the arrive or leave method with the list. To do this, do one of the following:

- ▶ Pass the name of the arrive or leave method as the *arrive\_method* or *leave\_method* argument to the `L_CLASS` subroutine.
- ▶ Specify the name of the arrive or leave method after the `ARRIVE_METHOD` or `LEAVE_METHOD` option in a `.LISTCLASS` script command.
- ▶ Pass the name of the arrive or leave method after the `D_LARRIVE` or `D_LLEAVE` option in a call to the `L_METHOD` subroutine.

See [LARRIVE\\_METHOD/LLEAVE\\_METHOD](#) on page 9-152 for more information.

## List double-click method

By default, Toolkit simulates an ENTER when the user double-clicks on a list item. If you want something different to occur for a double-click, you can write an `LDBLCLICK_METHOD` subroutine and either pass the *dblclick\_method* argument to `L_CLASS` or specify `DOUBLE_CLICK_METHOD` in your `.LISTCLASS` script.

In addition to writing a double-click method, you must also associate the double-click method with the list. To do this, do one of the following:

- ▶ Pass the name of the double-click method as the *dblclick\_method* argument to the `L_CLASS` subroutine.
- ▶ Specify the name of the double-click method after the `DOUBLE_CLICK_METHOD` option in a `.LISTCLASS` script command.
- ▶ Pass the name of the double-click method after the `D_LDBLCLICK` option in a call to the `L_METHOD` subroutine.

See [LDBLCLICK\\_METHOD on page 9-155](#) for more information.

## List load method

The list load method is an external subroutine you write. This subroutine is called by the list processing routines (`L_PROCESS`, `L_SELECT`, or `L_INPUT`) when an item needs to be loaded into the list (when the user scrolls down the list, for example). The load method must be written to load a single list item at a time. In other words, it should retrieve a single item from your data file (using `READS`, for example), and then, using `I_DISPLAY`, display that item in the input window associated with the list.

If you are developing an application for Windows, you must use a load method. If you are writing code for UNIX or OpenVMS only, it isn't required, but is recommended. If you don't use a load method for UNIX or OpenVMS systems, the list processing routines will use their default processing, which is to return to the calling routine when new items are needed. Load methods free your application from having to satisfy load requests whenever a list processing routine is called, and they encapsulate your item-loading code.

In addition to writing the load method subroutine, you must also associate the load method with the list. To do this, do one of the following:

- ▶ Pass the name of the load method as the *load\_method* argument to the `L_CLASS` subroutine.
- ▶ Specify the name of the load method after the `LOAD_METHOD` option in a `.LISTCLASS` script command.
- ▶ Pass the name of the load method after the `D_LLOAD` option in a call to the `L_METHOD` subroutine.

See [LLOAD\\_METHOD on page 9-158](#) for more information on creating a load method.

## Processing and Maintaining Lists

The following are the basic steps you'll follow to process a Toolkit or ActiveX Toolkit list:

1. In your program, use `L_LDINP` to load the input window you created for the list. But *don't* place the window. (Be sure to pass `D_NOPLC` as the *no\_placement* argument.) See [L\\_LDINP on page 8-64](#) for information.
2. Use `L_CREATE` to create the list. In this step, you'll pass the name of the list class and input window, and you'll determine how the list will be loaded (top to bottom, bottom to top, or from the middle). See [L\\_CREATE on page 9-76](#) for more information.
3. (optional) Use `L_SECT` to add text to the header, footer, or title.
4. (optional) Place the list with `L_PLACE`, and enable the list with `L_ENABLE` if necessary.
5. Process the list with `L_SELECT`, `L_PROCESS`, or one of the list input routines. These routines should be called from a loop. See [“Performing list processing”](#) below.
6. Delete the list either explicitly, with `L_DELETE` (see [page 9-87](#)), or implicitly by exiting the environment in which the list was created.

Note that there are other routines that enable you to maintain lists. There are routines that enable you to remove a list, enable a list, disable a list, queue requests for a list, promote a list to global status, and so forth. See [“The List Subroutines and Functions” on page 9-53](#) for information.

### Performing list processing

The three primary list processing routines are `L_INPUT`, `L_PROCESS`, and `L_SELECT`. Both `L_PROCESS` and `L_SELECT` support the processing functions that are generic to all Toolkit and ActiveX Toolkit lists:

- ▶ Load initial set of items into the list
- ▶ Insert in and delete items from the list
- ▶ Update the current item
- ▶ Cancel changes to the current item
- ▶ Move through the list one item or page at a time
- ▶ Move to the top or bottom of the list
- ▶ Move an item in the list one row at a time
- ▶ Move the display area of the list to the left or to the right
- ▶ Call list load method when new list items are needed for the display

Neither `L_PROCESS` nor `L_SELECT` performs any input. (Use one of the list input routines, such as `L_INPUT`, to do this.) `L_PROCESS` performs any requests to the list (such as to insert an item, delete an item, and so forth) and returns to the calling program. `L_SELECT` also performs requests,

but it returns only when the user has selected an item from the list or has selected an unknown menu entry. See [L\\_PROCESS on page 9-114](#), [L\\_SELECT on page 9-131](#), and [L\\_INPUT on page 9-103](#) for more information.

Call `L_INPUT` or `L_SELECT` from a loop in your application, as you would `I_INPUT` or `M_PROCESS`. Use an `L_INPUT` loop when you want to perform input into the list. Use an `L_SELECT` loop for making a selection from a list of existing items. One of the arguments to `L_PROCESS` and `L_SELECT` is a request flag, which is used by the calling routine to request action from `L_PROCESS` or `L_SELECT` and by these routines to request action from the calling routine. Note that `L_INPUT` does not have a request flag argument. Use calls to `L_PROCESS` within your `L_INPUT` loop to handle requests.

## How list items are loaded

Toolkit lists and ActiveX Toolkit lists are empty when they are first created, but the first call to a list processing routine loads the list with the list items needed for the initial display. List items are loaded only as they are needed for display. The first time an item is needed, the list processing routine requests the item from the list load method (or the calling routine if you don't have a load method) and loads the item into the list. Once an item is loaded, UI Toolkit continues to use it when necessary. It doesn't need to be loaded again. Because the list processor maintains loaded items in a linked list on the file stack, the calling routine does not need to supply loaded items a second time, which improves processing speed. (Refer to [“Appendix E: File-Stack Processing”](#) and [“Appendix F: Linked-List Processing”](#) for more information about the file-stack and linked-list subroutines.)



We strongly recommend that you use a load method to load items into a list. For Windows applications, you *must* write and use a list load method to enable scrolling.

---

For information on list load methods, see [“List load method” on page 9-9](#).

## List processing examples

### A selection list

The following example creates and processes a simple look-up list. The attributes of the list are defined by the list class `lst_lookup`. The items for the list are provided by the load method `listload_method`, which is automatically called by `L_SELECT`. (See [“Load method for the examples” on page 9-13](#).) The list enables a selected item to be deleted. Choosing delete sets the request flag to `D_LDELITEM`, which instructs the next call to `L_SELECT` in the loop to process the request. Note that an item is deleted only from the visible list, not from the file from which the list was loaded.

```
xcall i_ldinp(inpidx, g_utlib, "inp_lookup")
xcall l_create(listid, inpidx, data, g_utlib, "lst_lookup")
xcall l_button(listid, "O_EXIT", DSB_TEXT, "Exit")
xcall l_button(listid, "O_DELETE", DSB_TEXT, "Delete")
xcall l_method(listid, D_LLOAD, "listload_method")
```

## List Routines

### Processing and Maintaining Lists

```
request = D_LNOP
repeat
  begin
    xcall l_select(listid, request, data)
    if (g_select) then                                ;Unknown menu entry
      begin
        using g_entnam select
          ('O_EXIT'), exitloop
          ('DELETE'), request = D_LDELITEM
        endusing
      end
    else
      xcall u_msgbox (data)                            ;Display chosen entry
    end
  end
```

### An input list

The following example creates and processes a simple input list. The attributes of the list are defined by the list class **lst\_process**. The items for the list are provided by the list load method **listload\_method**, which is automatically called by L\_INPUT. (See [“Load method for the examples” on page 9-13.](#)) The list enables existing items to be deleted and new ones to be inserted. Choosing insert or delete calls L\_PROCESS with the request flag set to the appropriate value. Note that an item is deleted only from the visible list, not from the file from which the list was loaded.



Direct input into an ActiveX Toolkit list may cause repainting problems. See [“Notes and Tips for ActiveX Toolkit Lists” on page 9-15](#) for information.

---

```
xcall i_ldinp(inpid, g_utlib, "inp_process")
xcall l_create(listid, inpid, data, g_utlib, "lst_process")
xcall l_button(listid, "O_EXIT", DSB_TEXT, "Exit")
xcall l_button(listid, "O_DELETE", DSB_TEXT, "Delete")
xcall l_button(listid, "O_INSERT", DSB_TEXT, "Insert")
xcall l_method(listid, D_LLOAD, "listload_method")
request = D_LNOP
repeat
  begin
    xcall i_next(inpid,, "*FRST*")
    xcall i_input(listid,, data, data)
    if (g_select) then                                ;Unknown menu entry
      begin
        using g_entnam select
          ('O_EXIT'), exitloop
          ('O_DELETE'), xcall l_process(listid, request=D_LDELITEM,
&                                                                    data)
          ('O_INSERT'), xcall l_process(listid, request=D_LINSERT,
&                                                                    data)
        endusing
      end
    end
```



```

        else
            ;process new entry
        end
    
```

### Load method for the examples

The load method for the above list examples would look like this:

```

subroutine listload_method
;
; Description: Load method for lookup and input lists
;
; Arguments:
;
    a_listid      ,n      ;ID of the list
    a_req         ,n      ;Request
    a_data        ,a      ;Data
    a_inpid       ,n      ;Input window ID
    a_disabled    ,n      ;(Optional) disabled item flag
    a_itemindex   ,n      ;Request item number

static record
    chn           ,i4      ;Channel for loading

proc
    if (a_itemindex .eq. 1)                ;First item?
        xcall u_open(chn, "I:I", "customer") ;Open file
        reads(chn, a_data) [eof=nomore]      ;Read next record
        xcall i_display(a_inpid, "customer_set", a_data) ;Display the data
        xreturn

nomore,
    a_req = D_LEOF                ;Signal no more
    xreturn
endsubroutine
    
```

## Enabling users to search a list

Depending on the subroutine you use to process your list (L\_INPUT or L\_SELECT), there are two ways to provide a search for your list.

- ▶ If you use L\_INPUT, use L\_FINDSPEC to specify the parameters the search, and then use the D\_LFIND request with L\_PROCESS to execute the search. For more information, see [L\\_FINDSPEC on page 9-90](#) and [L\\_PROCESS on page 9-114](#).
- ▶ If you use L\_SELECT, use the find options that are part of the L\_SELECT subroutine. For information, see [L\\_SELECT on page 9-131](#). You can also use the L\_FINDSPEC routine to provide more search functionality.

You can search the display data or the non-window data. See [L\\_FINDSPEC on page 9-90](#) for more information on how to specify which type of data will be searched.

## IDs for list windows

There are two types of window ID for a list: the ID for the input window used to define the list and the ID for the list window, which is the window that contains the list when the list is placed. When you create a list with `L_CREATE`, you supply the first type of window ID. If, however, you want to use other Toolkit routines that require a window ID (for example, `%U_WINMETRICS`), you must supply the ID for the list window. To get the list window ID, use the `D_LCTRID` subfunction for `L_STATUS`.

## Notes and Tips for ActiveX Toolkit Lists

The following is a list of issues you should keep in mind when using our ActiveX implementation of a Toolkit list. For additional notes, see [“Using Lists in Toolkit Applications” on page 9-4](#). For information on setting options that cause lists to be ActiveX lists, see [“Specifying and determining the list type” on page 9-5](#).

- ▶ To retrieve the ActiveX control ID for an ActiveX Toolkit list, use `L_STATUS`.
- ▶ Prompts and fields create columns in an ActiveX Toolkit list. (Other text residing in the window does not.) When using multi-line list entries, the widest entry in a column determines the width of the column. For selection fields, the width of the column is set to the width of the widest selection list entry, regardless of the size of the field, unless the selection field is enumerated, in which case the enumerated display length is used instead.
- ▶ Prompts and fields are aligned within their corresponding columns without changing their content. Although this preserves leading spaces within a prompt, it does not preserve leading spaces before a prompt.
- ▶ To create an empty cell for alignment purposes, create a field that is not part of the input set.
- ▶ If the input window used for an ActiveX list contains fields that have display or view lengths that are different than their field lengths, don't use windowing display routines (e.g., `W_DISP`) to populate these fields. The data won't display correctly. Use `I_DISPLAY`, `I_DSPFLD`, or `I_PUTFLD`.
- ▶ Unlike Toolkit lists, ActiveX Toolkit lists enable users to scroll the current item out of view without causing focus to move to another item. This is mostly for performance, but it is also a common behavior for Windows applications. There are times, however, when the internal list control snaps the currently focused item into view when `L_INPUT` or `L_INPFLD` is being used (as opposed to `L_SELECT`). This usually occurs when the user expects it (when focus moves to a new cell that is also not currently in view, for example), but it can occur at unexpected times. For example, this can happen when the initial and/or last item parameters passed to `L_CREATE` (or the default estimates if these parameters are not passed) prove incorrect by the responses from the load method. At that point, the internal list must be reorganized for the new list dimensions, which often causes the focused cell to snap back into the viewable area. For instance, if you have a list that's longer than twice the viewable area, you don't pass the *last* argument to `L_CREATE`, and the user uses the scroll bar to scroll all the way down, the list may suddenly snap back to the focused item when the item loaded exceeds the initially estimated last item. Note that this only occurs in `L_INPUT` or `L_INPFLD` (not in `L_SELECT`), and does not occur if a correct estimate of the dimensions of the list is given to `L_CREATE`.
- ▶ When entering input into the list, the first field in the list will be selected even if it is not in the current input set.
- ▶ Dragging the scroll bar doesn't update the list until the mouse button is released.
- ▶ Dragging the scroll bar all the way down may or may not go to the bottom of the list. For the scroll bar to work properly, you need to provide an accurate number (or overestimate the number) of list items for `L_CREATE`.

- ▶ If the width of a column is narrower than its header or footer text, that text will be truncated unless vertical bars (|) are used within the text to designate the initial width of the column. See [page 9-128](#) for more information on `L_SECT`.
- ▶ The order of items loaded is different when two-way loading is enabled. The specific order we have chosen to implement achieves the best performance for each type of list: Toolkit lists load as needed for display, and ActiveX Toolkit lists load ahead further in each direction to minimize self-correction when the initial estimates are incorrect. (See [“L\\_CREATE” on page 9-76](#) for information on loading methods for lists.)
- ▶ There may be repainting issues if users input directly into an ActiveX Toolkit list. As an alternative, you can set up the list as a selection list (using `L_SELECT`) and then create a separate input window for adding and updating list items. To see an example of this method, open *S/DE Repository* and select *Modify > Structures*. This opens the *Structures Definitions* list (which isn't an ActiveX Toolkit list, but illustrates the method). Note that you can highlight list entries, but you can't make any changes in this window. To make a change, you must highlight a list entry and press `ENTER`. This opens a separate input window, which enables you to add and update list items.
- ▶ By default, the size of a list container is based on the display area of the associated input window. However, if you don't specify this display area for the input window, the runtime calculates the size by adding the columns using the larger of the input or display format to determine the size of each column. If any column has a header or footer that's larger than the column's input or display format, however, the container won't be large enough to show all the columns. To correct this, set the display area for the input window by doing the following:
  1. For each column, find the largest of the following: the header, the footer, the display format, or the input format.
  2. Add the numbers from step 1. (There should be a number for each column.) Then add an additional one or two characters for each column.
  3. Test the window by compiling the window and looking at the list. If the column header, footer, or data is truncated, increase the display area until everything displays properly.

For example, if your list has two columns (one whose largest element is the header, which has 13 characters, and a second whose largest element is the footer, which has 15 characters), add these two numbers. The sum is 28. Then add four to the total, which makes 32. (In this case, we're adding two characters for each column in the list.) The `display_area` line of the list definition is

```
display_area 1, 1, 1, 32
```

Set the window width larger than the sum calculated in [step 2](#) above. For example, if you calculate that the display area needs to be 32 characters, set the window size to at least 33:

```
.input table_list, 1, 33
```

## Published Properties for ActiveX Toolkit Lists

A *published property* is a named attribute that is associated with a given ActiveX control. The following published properties are supported for the ActiveX Toolkit list control in Traditional Synergy. (They are not supported in Synergy .NET.) All of these can be read (using `AX_GET` or `%AX_GETINT`), and most can be modified (using `AX_SET`).

| Published Properties for ActiveX Toolkit Lists |      |            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------|------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                           | Type | Write?     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ActiveCellHighlightStyle                       | n    | Read/write | <p>A value that determines whether the focus rectangle is visible. By default, the ActiveCellHighlightStyle property is set to 0, which makes the focus rectangle invisible. If you want the cell focus rectangle to be visible (whether or not the list has focus), set ActiveCellHighlightStyle to 1.</p> <p>Note that Toolkit sets this property to 1 when starting <code>L_INPUT</code> or <code>L_SELECT</code> processing, and that it sets it to 0 when exiting <code>L_INPUT</code> or <code>L_SELECT</code> processing. You will need to reset it to 1 if you want the focus rectangle to remain visible after <code>L_INPUT</code> or <code>L_SELECT</code> processing.</p> |
| ArrowKeyAction                                 | n    | Read/write | <p>A value that determines how <code>UP ARROW</code>, <code>DOWN ARROW</code>, and other navigation keys work. For example, when set to 0 (the default), <code>UP ARROW</code> and <code>DOWN ARROW</code> move highlighting up and down one row at a time. When set to 1, <code>UP ARROW</code> and <code>DOWN ARROW</code> move highlighting up and down one item at a time. (An item can have more than one row.) See <a href="#">“Appendix C: Keyboard Navigation for Lists on Windows”</a> for details.</p>                                                                                                                                                                      |
| BackColor                                      | n    | Read/write | The RGB value of the background color for all cells. See the Discussion for <code>GetCellColor</code> on <a href="#">page 9-24</a> for information on RGB values.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Border                                         | n    | Read/write | A value that determines whether the border for an ActiveX Toolkit list is visible. By default, this property is set to 1, which makes the border visible. If you want the border to be invisible, set this to 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ColumnsPerRow                                  | n    | Read-only  | The number of columns in the list.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## List Routines

### Published Properties for ActiveX Toolkit Lists

| Published Properties for ActiveX Toolkit Lists (Continued) |      |                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------|------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                                       | Type | Write?         | Description                                                                                                                                                                                                                                                                                                                                                                                                                               |
| CurrentColumn                                              | n    | Read/<br>write | The horizontal column number of the currently highlighted cell.<br>Note that modifying CurrentColumn from a method that is called from L_INPUT can have unpredictable results. If this happens, L_INPUT both modifies and depends on the value of CurrentColumn. Also note that setting RowMode won't affect the CurrentColumn setting. But if RowMode is on, a CurrentColumn setting won't affect the way highlighting works in a table. |
| DarkItemColor                                              | n    | Read/<br>write | The RGB value for the background color of the second alternating item. See the Discussion for GetCellColor on <a href="#">page 9-24</a> for information on RGB values.<br>If DarkItemColor is modified, L_RESTART must be called before the color change will take effect.                                                                                                                                                                |
| Enabled                                                    | n    | Read/<br>write | A value that determines if the control is enabled for input. This property should be set and is read as a true or false value.<br>Note that if Enabled is set to false (0) and the window subsequently receives focus (by calling L_SELECT, L_INPUT, etc.), a fatal error will occur.                                                                                                                                                     |
| Ext_hWnd                                                   | n    | Read-<br>only  | The window handle of the control.                                                                                                                                                                                                                                                                                                                                                                                                         |
| Ext_Visible                                                | n    | Read/<br>write | A value that determines whether the control is visible. This property should be set and is read as true or false value.<br>Note that if Ext_Visible is set to false (0) and the window subsequently receives focus (by calling L_SELECT, L_INPUT, etc.), a fatal error will occur.                                                                                                                                                        |
| FontName                                                   | a    | Read/<br>write | The typeface of the font for all cells.                                                                                                                                                                                                                                                                                                                                                                                                   |
| FontSize                                                   | n    | Read/<br>write | The point size of the font for all cells.                                                                                                                                                                                                                                                                                                                                                                                                 |
| FooterFontName                                             | a    | Read/<br>write | The typeface of the font for all footers.                                                                                                                                                                                                                                                                                                                                                                                                 |
| FooterFontSize                                             | n    | Read/<br>write | The point size of the font for all footers.                                                                                                                                                                                                                                                                                                                                                                                               |

| Published Properties for ActiveX Toolkit Lists (Continued) |      |                |                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------|------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                                       | Type | Write?         | Description                                                                                                                                                                                                                                                                                                                                                                            |
| HeaderFontName                                             | a    | Read/<br>write | The typeface of the font for all headers.                                                                                                                                                                                                                                                                                                                                              |
| HeaderFontSize                                             | n    | Read/<br>write | The point size of the font for all headers.                                                                                                                                                                                                                                                                                                                                            |
| HorizontalScrollBar                                        | n    | Read/<br>write | A value that determines whether the horizontal scroll bar will be shown when the list is too wide to be fully visible. This property should be set and is read as a true or false value.                                                                                                                                                                                               |
| LightItemColor                                             | n    | Read/<br>write | The RGB value for the background color of the first alternating item. See the Discussion for GetCellColor on <a href="#">page 9-24</a> for information on RGB values.<br><br>If LightItemColor is modified, L_RESTART must be called before the color change will take effect.                                                                                                         |
| OriginColumn                                               | n    | Read/<br>write | The leftmost column that is currently visible.                                                                                                                                                                                                                                                                                                                                         |
| NonGridBackColor                                           | n    | Read/<br>write | The RGB value for the color of the background area that is outside the bounds of data columns but inside the ActiveX control. See the Discussion for GetCellColor on <a href="#">page 9-24</a> for information on RGB values.                                                                                                                                                          |
| RowMode                                                    | n    | Read/<br>write | A value that determines whether the list will have cell highlighting or row highlighting when used with L_SELECT. If RowMode is set to a non-zero value, an entire row is highlighted when a user selects a cell in the row. If RowMode is set to zero, just the selected cell is highlighted (which is the default).<br><br>Note that RowMode has no effect with L_INPUT or L_INPFLD. |
| SelBackColor                                               | n    | Read/<br>write | The RGB value for the background color for cells in a selected row. This is applicable only when RowMode is set to a non-zero value. See the Discussion for GetCellColor on <a href="#">page 9-24</a> for information on RGB values.                                                                                                                                                   |

## List Routines

### Published Properties for ActiveX Toolkit Lists

| Published Properties for ActiveX Toolkit Lists (Continued) |      |                |                                                                                                                                                                                                                                |
|------------------------------------------------------------|------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                                                       | Type | Write?         | Description                                                                                                                                                                                                                    |
| SelForeColor                                               | n    | Read/<br>write | The RGB value for the text color for cells in a selected row. This is applicable only when RowMode is set to a non-zero value. See the Discussion for GetCellColor on <a href="#">page 9-24</a> for information on RGB values. |
| TextColor                                                  | n    | Read/<br>write | The RGB value of the text color for all cells. See the Discussion for GetCellColor on <a href="#">page 9-24</a> for information on RGB values.                                                                                 |
| VerticalScrollBar                                          | n    | Read/<br>write | A value that determines if the vertical scroll bar is shown when the list is too long to be fully visible. This property should be set and read as a true or false value.                                                      |

Note the following:

- ▶ Property names are case sensitive.
- ▶ Changing a property using AX\_SET will change the object's visual representation if necessary.
- ▶ Settings that specify invalid values are ignored.
- ▶ Color for ActiveX Toolkit lists is applied in the following order:
  1. Color specified for the cell (if selected and RowMode is set) by the SelBackColor and the SelForeColor properties
  2. Color specified for the list by the BackColor and TextColor properties
  3. Color specified for the list by the DarkItemColor and LightItemColor properties
  4. Color specified for the field in a script file or by IB\_FIELD
  5. Color specified for the field by I\_FLDMOD
  6. Color specified for the cell by the SetCellColor method

Setting a color that is higher in the hierarchy list above will not override a color that is at a lower level. For instance, setting the BackColor property will not have any effect on cells that have had the SetCellColor method applied.

- ▶ Fonts for ActiveX Toolkit lists are applied in the following order:
  1. Font specified for the list's input window
  2. Font specified for this list by the FontName and FontSize properties
  3. Font specified for this cell by the SetCellFont method

Similar to color, setting a font that is higher in the hierarchy list above will not override a font that is at a lower level. For instance, setting the FontName property will not have any effect on cells that have had the SetCellFont method applied.



## Examples

The following example sets the background color of a list to a light teal.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_set(axctrl, "BackColor", RGB_VALUE(204,255,255))
```

The following example sets the default text color for a list to a dark blue, specifies row highlighting when a cell is selected, and sets the background and text colors for selected cells to different shades of green.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_set(axctrl, "TextColor", RGB_VALUE(0,0,102))
xcall ax_set(axctrl, "RowMode", 1)
xcall ax_set(axctrl, "SelBackColor", RGB_VALUE(153, 204, 153))
xcall ax_set(axctrl, "SelForeColor", RGB_VALUE(102, 102, 0))
```

The following example simulates the look of green-bar paper by changing colors for alternating items.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_set(axctrl, "DarkItemColor", RGB_VALUE(153,204,153))
xcall ax_set(axctrl, "LightItemColor", RGB_VALUE(227,255,227))
xcall l_restart(listid) ;Restart required to paint the colors.
```

The following example sets the font typeface and point size to match a Synergy font named “ActiveXListFont.”

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall u_wndfont(D_GETFONT, "ActiveXListFont", fontname, ptsize)
xcall ax_set(axctrl, "FontName", fontname)
xcall ax_set(axctrl, "FontSize", ptsize)
```

The following example creates a Synergy font named “HeaderFont” that matches the header font used by the list.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_get(axctrl, "HeaderFontName", fontname)
xcall u_wndfont(D_SETFONT, "HeaderFont", fontname,
& %ax_getint(axctrl, "HeaderFontSize"))
```

The following example changes the footer font to Times New Roman, 12 point.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_set(axctrl, "FooterFontName", "Times New Roman")
xcall ax_set(axctrl, "FooterFontSize", 12)
```

The following example prevents scroll bars from being displayed.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_set(axctrl, "HorizontalScrollBar", FALSE)
xcall ax_set(axctrl, "VerticalScrollBar", FALSE)
```

## List Routines

### Published Properties for ActiveX Toolkit Lists

The following example scrolls the list horizontally so that the third column is to the left of the visible area.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_set(axctrl, "OriginColumn", 3)
```

## Published Methods for ActiveX Toolkit Lists

A *published method* is a named routine that can be called for a given ActiveX control. Method names are case sensitive. Methods are manipulated using the %AX\_CALL function.

For our ActiveX control, the following published methods are supported:

- ▶ GetCellColor – Retrieve the color of an individual cell.
- ▶ GetCellFont – Retrieve the font of an individual cell.
- ▶ GetColumnWidth – Retrieve the width of a column.
- ▶ GetFooterCell – Retrieve the text in an individual cell of a footer.
- ▶ GetFooterCellAlignment – Retrieve the alignment of a footer cell.
- ▶ GetFooterCellFont – Retrieve the font of an individual footer row.
- ▶ GetHeaderCell – Retrieve the text in an individual cell of a header.
- ▶ GetHeaderCellAlignment – Retrieve the alignment of a header cell.
- ▶ GetHeaderCellFont – Retrieve the font of an individual header row.
- ▶ GridRepaint – Force a full repaint.
- ▶ SetCellColor – Change the color of an individual cell.
- ▶ SetCellFont – Change the font of an individual cell.
- ▶ SetColumnWidth – Change the width of a column.
- ▶ SetFooterCell – Change the text in an individual cell of a footer.
- ▶ SetFooterCellAlignment – Change the alignment of a footer cell.
- ▶ SetFooterCellFont – Change the font of an individual footer row.
- ▶ SetHeaderCell – Change the text in an individual cell of a header.
- ▶ SetHeaderCellAlignment – Change the alignment of a header cell.
- ▶ SetHeaderCellFont – Change the font of an individual header row.

You can retrieve the ActiveX control ID for an ActiveX Toolkit list by using L\_STATUS.

## GetCellColor – Retrieve the color of an individual cell

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "GetCellColor", row, column, foreground_color,
&                                background_color)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*row*

The row number of the cell whose color is being retrieved. **(n)**

*column*

The column number of the cell whose color is being retrieved. **(n)**

*foreground\_color*

The returned text color (RGB value) of the cell. **(n)**

*background\_color*

The returned background color (RGB value) of the cell. **(n)**

### Discussion

The GetCellColor method retrieves the foreground (text) and background color for a specified cell as RGB values.

An RGB value is a four-byte integer value that includes the red, green, and blue components of a color:

`^X(00bbggrr)`

where *bb*, *gg*, and *rr* are intensity values in the decimal range 0 through 255 (00 through FF in hexadecimal) for the blue, green, and red color components. This value can be stored in other numeric types (decimal, for instance), but the variable must be large enough to hold at least a value of `^X(FFFFFF)` or truncation may occur.

Note that UI Toolkit includes macros (**defined in DBLDIR:activex.def**) that make it easier to use these values:

- ▶ `RGB_VALUE(rr,gg,bb)`—enables you to construct an RGB value from decimal values for red, green, and blue.
- ▶ `RED_PART(rgb_value)`, `GREEN_PART(rgb_value)`, and `BLUE_PART(rgb_value)`—enable you to extract the decimal value for blue, green, or red from an RGB value.

There's no reason to use the `RGB_VALUE` macro with this method, but the `RED_PART`, `GREEN_PART`, and `BLUE_PART` macros are convenient for extracting red, green, and blue values from *foreground\_color* and *background\_color*.

## See also

- ▶ [SetCellColor on page 9-38](#).
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

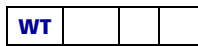
## Examples

The following example brightens the background color of the fourth column in the currently selected row by approximately 50%.

```
xcall l_status(listid, D_LAXCTRL, axctrl, D_LCURITM, curr)
xcall ax_call(axctrl, "GetCellColor", curr, 4, fgcolor, bgcolor)
red = RED_PART(bgcolor)
green = GREEN_PART(bgcolor)
blue = BLUE_PART(bgcolor)

;Compute average distance from brightest possible
avgdelta = ^x(FF) - ((red + green + blue) / 3)
avgdelta /= 2 ;Multiply by 50%
red += avgdelta ;Brighten each color by that amount
if (red .gt. ^x(FF) ; or as bright as possible
    red = ^x(FF)
green += avgdelta
if (green .gt. ^x(FF))
    green = ^x(FF)
blue += avgdelta
if (blue .gt. ^x(FF))
    blue = ^x(FF)
xcall ax_call(axctrl, "SetCellColor", curr, 4,
& RGB_VALUE(red,green,blue), 1)
```

## GetCellFont – Retrieve the font of an individual cell



```
status = %AX_CALL (axlist_id, "GetCellFont", row, column, face_name,
&                      point_size, rendition)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*row*

The row number of the cell whose font is being retrieved. **(n)**

*column*

The column number of the cell whose font is being retrieved. **(n)**

*face\_name*

The returned name of the Windows font. **(a)**

*point\_size*

The returned size of the Windows font in points. **(n)**

*rendition*

The returned rendition. This is zero if no renditions are applied, or one or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator: **(n)**

**D\_CELL\_BOLD**                      Bold.

**D\_CELL\_ITALIC**                    Italic.

**D\_CELL\_UNDER**                    Underlined.

### Discussion

The GetCellFont method retrieves the font and rendition for a specified cell.

## Examples

In the following example, the text in the fourth column of the current item is set to underline and bold. This does not affect any other font settings.

```
xcall l_status(listid, D_LAXCTRL, axctrl, D_LCURITM, curr)
xcall ax_call(axctrl, "GetCellFont", curr, 4, fontname, ptsize, style)
xcall ax_call(axctrl, "SetCellFont", curr, 4, fontname, ptsize,
&                (style .bor. D_CELL_BOLD .bor. D_CELL_UNDER))
```

The following example turns off italic for the text in the second column of the current item without affecting any other font settings.

```
xcall l_status(listid, D_LAXCTRL, axctrl, D_LCURITM, curr)
xcall ax_call(axctrl, "GetCellFont", curr, 4, fontname, ptsize, style)
xcall ax_call(axctrl, "SetCellFont", curr, 4, fontname, ptsize,
&                (style .band. (.bnot. D_CELL_ITALIC)))
```

## See also

- ▶ [SetCellFont on page 9-40.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## GetColumnWidth – Retrieve the width of a column

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "GetColumnWidth", column, width)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*column*

The column number of the cell whose width is being retrieved. **(n)**

*width*

The returned width of the column (in pixels). **(n)**

### Discussion

The GetColumnWidth method retrieves the width, in pixels, for a specified column.

All cells in the same physical column must have the same width, so *column* is limited to the number of columns across, even for multi-line list items.

### See also

- ▶ [SetColumnWidth on page 9-42.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following example increases the width of the third column by 7%.

```
xcall l_status(listid, D_LAXCTRL, axctrl) ;Get control ID
xcall ax_call(axctrl, "GetColumnWidth", 3, width)
xcall ax_call(axctrl, "SetColumnWidth", 3, (width * 107)#2)
```



## GetFooterCell – Retrieve the text in an individual cell of a footer

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "GetFooterCell", column, text)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*column*

The column number of the footer whose text is being retrieved. **(n)**

*text*

The returned footer text. **(a)**

### Discussion

The GetFooterCell method retrieves the text in the footer for a specified column.

### See also

- ▶ [SetFooterCell on page 9-43.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following increments a right-justified numeric value displayed in the second footer cell.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetFooterCell", 2, text)
onerror ($ERR_DIGIT) not_a_number
number = text
if (FALSE)
  begin
    not_a_number,
      clear number
    end
  offererror
xcall ax_call(axctrl, "SetFooterCell", 2, %string(number+1))
xcall ax_call(axctrl, "SetFooterCellAlignment", 2, 3)
```

## GetFooterCellAlignment – Retrieve the alignment of a footer cell

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "GetFooterCellAlignment", column, justification)
```

### Return value

*status*

The return value is true if successful, otherwise false. (n)

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. (n)

*column*

The column number of the footer whose justification is being retrieved. (n)

*justification*

One of the following: (n)

- 1 Left-justified.
- 2 Centered.
- 3 Right-justified.

### Discussion

The GetFooterCellAlignment method retrieves the justification of the footer specified by *column*.

### See also

- ▶ [SetFooterCellAlignment on page 9-44.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## GetFooterCellFont – Retrieve the font of an individual footer row



```
status = %AX_CALL(axlist_id, "GetFooterCellFont", row, face_name, point_size,
&                      rendition)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*row*

The row number of the footer whose font is being retrieved. **(n)**

*face\_name*

The returned name of the Windows font. **(a)**

*point\_size*

The returned size of the Windows font in points. **(n)**

*rendition*

The returned rendition. This is zero if no renditions are applied, or one or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator: **(n)**

|                      |             |
|----------------------|-------------|
| <b>D_CELL_BOLD</b>   | Bold.       |
| <b>D_CELL_ITALIC</b> | Italic.     |
| <b>D_CELL_UNDER</b>  | Underlined. |

### Discussion

The GetFooterCellFont method retrieves the font and rendition for a specified row of the footer.

### See also

- ▶ [SetFooterCellFont on page 9-45.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## List Routines

### GetFooterCellFont

## Examples

The following example sets the font for the third row of footers to bold. This does not affect other font parameters.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetFooterCellFont", 3, face, ptsize, style)
xcall ax_call(axctrl, "SetFooterCellFont", 3, %atrim(face), ptsize,
&                style .bor. D_CELL_BOLD)
```

## GetHeaderCell – Retrieve the text in an individual cell of a header

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "GetHeaderCell", column, text)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*column*

The column number of the header whose text is being retrieved. **(n)**

*text*

The returned header text. **(a)**

### Discussion

The GetHeaderCell method retrieves the text in the header for a specified column.

### See also

- ▶ [SetHeaderCell on page 9-47.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following example appends the string “ - Audited” to the text of the third header cell and ensures that the text is left justified.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetHeaderCell", 3, text)
text = %atrim(text) + " - Audited"
xcall ax_call(axctrl, "SetHeaderCell", 3, %atrim(text))
xcall ax_call(axctrl, "SetHeaderCellAlignment", 3, 1)
```

## GetHeaderCellAlignment – Retrieve the alignment of a header cell

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "GetHeaderCellAlignment", column, justification)
```

### Return value

*status*

The return value is true if successful, otherwise false. (n)

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. (n)

*column*

The column number of the header whose justification is being retrieved. (n)

*justification*

One of the following: (n)

- 1 Left-justified.
- 2 Centered.
- 3 Right-justified.

### Discussion

The GetHeaderCellAlignment method retrieves the justification of the header specified by *column*.

### See also

- [SetHeaderCellAlignment on page 9-48.](#)
- [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## GetHeaderCellFont – Retrieve the font of an individual header row

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "GetHeaderCellFont", row, face_name, point_size,
&rendition)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*row*

The row number of the header whose font is being retrieved. **(n)**

*face\_name*

The returned name of the Windows font. **(a)**

*point\_size*

The returned size of the Windows font in points. **(n)**

*rendition*

The returned rendition. This is zero if no renditions are applied, or one or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator: **(n)**

|                      |             |
|----------------------|-------------|
| <b>D_CELL_BOLD</b>   | Bold.       |
| <b>D_CELL_ITALIC</b> | Italic.     |
| <b>D_CELL_UNDER</b>  | Underlined. |

### Discussion

The GetHeaderCellFont method retrieves the font and rendition for a specified row of the header.

### See also

- ▶ [SetHeaderCellFont](#) on page 9-49.
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## List Routines

### GetHeaderCellFont

## Examples

The following example sets the font of the second row of headers to Times New Roman, increases the current font size by 1, and leaves the style unchanged.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetHeaderCellFont", 2, face, ptsize, style)
xcall ax_call(axctrl, "SetHeaderCellFont", 2,
&                "Times New Roman", ptsize+1, style)
```



## GridRepaint – Force a full repaint



```
xcall AX_CALL(axlist_id, "GridRepaint")
```

### Return value

*status*

The return value is always zero. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

### Discussion

The GridRepaint method forces a full repaint of the ActiveX Toolkit list.

### See also

[%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following example forces the list to be repainted.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GridRepaint")
```

## SetCellColor – Change the color of an individual cell

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "SetCellColor", row, column, color, background_flag)
```

### Return value

*status*

The return value is true if successful, otherwise false. (n)

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. (n)

*row*

The row number of the cell whose color is being modified. (n)

*column*

The column number of the cell whose color is being modified. (n)

*color*

The color (RGB value) to apply to the cell. (n)

*background\_flag*

One of the following: (n)

- 0**      Change text color.
- 1**      Change background color.

### Discussion

The SetCellColor method sets either the text or background color for a specified cell. The specified color overrides any color settings specified by the BackColor, DarkItemColor, or LightItemColor properties, or any field color specified in the window script or by the I\_FLDMOD subroutine. See the Discussion for GetCellColor on [page 9-24](#) for information on RGB values.

### See also

- ▶ [GetCellColor on page 9-24.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## Examples

The following example sets the text color of the third column in the currently selected row to red.

```
xcall l_status(listid, D_LAXCTRL, axctrl, D_LCURITM, curr)
xcall ax_call(axctrl, "SetCellColor", curr, 3, RGB_VALUE(255,0,0), 0)
```

For another example, see [page 9-24](#).

## SetCellFont – Change the font of an individual cell



```
status = %AX_CALL (axlist_id, "SetCellFont", row, column, face_name, point_size,
&                      rendition)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*row*

The row number of the cell whose font is being modified. **(n)**

*column*

The column number of the cell whose font is being modified. **(n)**

*face\_name*

The name of the Windows font. **(a)**

*point\_size*

The size of the Windows font in points. **(n)**

*rendition*

Zero to turn off all renditions, or one or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator: **(n)**

**D\_CELL\_BOLD**                      Bold.

**D\_CELL\_ITALIC**                    Italic.

**D\_CELL\_UNDER**                    Underlined.

### Discussion

The SetCellFont method sets the font and rendition for a specified cell. The specified font overrides any font and point size specified by the FontName and FontSize properties, and any font and renditions specified in the window script. It does not override font and renditions specified by I\_FLDMOD.

## See also

- ▶ [GetCellFont](#) on page 9-26.
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## Examples

In the following example, the text in the fourth column of the current item is set to underline and bold. This does not affect any other font settings.

```
xcall l_status(listid, D_LAXCTRL, axctrl, D_LCURITM, curr)
xcall ax_call(axctrl, "GetCellFont", curr, 4, fontname, ptsize, style)
xcall ax_call(axctrl, "SetCellFont", curr, 4, %atrim(fontname), ptsize,
&          (style .bor. D_CELL_BOLD .bor. D_CELL_UNDER))
```

The following example turns off italic for the text in the second column of the current item without affecting any other font settings.

```
xcall l_status(listid, D_LAXCTRL, axctrl, D_LCURITM, curr)
xcall ax_call(axctrl, "GetCellFont", curr, 2, fontname, ptsize, style)
xcall ax_call(axctrl, "SetCellFont", curr, 2, %atrim(fontname), ptsize,
&          (style .band. (.bnot. D_CELL_ITALIC)))
```

## SetColumnWidth – Change the width of a column

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "SetColumnWidth", column, width)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*column*

The column number of the cell whose width is being modified. **(n)**

*width*

The new width of the column (in pixels). **(n)**

### Discussion

The SetColumnWidth method sets the width, in pixels, for a specified column.

All cells in the same physical column must have the same width, so *column* is limited to the number of columns across, even for lists with multi-line items.

### See also

- ▶ [GetColumnWidth on page 9-28.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following example increases the width of the third column by 7%.

```
xcall l_status(listid, D_LAXCTRL, axctrl) ;Get control ID
xcall ax_call(axctrl, "GetColumnWidth", 3, width)
xcall ax_call(axctrl, "SetColumnWidth", 3, (width * 107)#2)
```

## SetFooterCell – Change the text in an individual cell of a footer

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "SetFooterCell", column, text)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*column*

The column number of the footer whose text is being modified. **(n)**

*text*

The new footer text. **(a)**

### Discussion

The SetFooterCell method sets the text in the footer for a specified column.

### See also

- ▶ [GetFooterCell](#) on [page 9-29](#).
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

See Examples on [page 9-29](#).

## SetFooterCellAlignment – Change the alignment of a footer cell

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "SetFooterCellAlignment", column, justification)
```

### Return value

*status*

The return value is true if successful, otherwise false. (n)

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. (n)

*column*

The column number of the footer whose justification is being modified. (n)

*justification*

One of the following: (n)

- 1 Left-justified.
- 2 Centered.
- 3 Right-justified.

### Discussion

The SetFooterCellAlignment method sets the justification of the footer specified by column.

### See also

- ▶ [GetFooterCellAlignment](#) on page 9-30.
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

See Examples on [page 9-29](#).



## SetFooterCellFont – Change the font of an individual footer row



```
status = %AX_CALL (axlist_id, "SetFooterCellFont", row, face_name, point_size,
&                      rendition)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*row*

The row number of the footer whose font is being modified. **(n)**

*face\_name*

The name of the Windows font. **(a)**

*point\_size*

The size of the Windows font in points. **(n)**

*rendition*

Zero to turn off all renditions, or one or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator: **(n)**

|                      |             |
|----------------------|-------------|
| <b>D_CELL_BOLD</b>   | Bold.       |
| <b>D_CELL_ITALIC</b> | Italic.     |
| <b>D_CELL_UNDER</b>  | Underlined. |

### Discussion

The SetFooterCellFont method sets the font and rendition for a specified row of the footer. The specified font overrides any font and point size specified by the FooterFontName and FooterFontSize properties.

### See also

- ▶ [GetFooterCellFont](#) on page 9-31.
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## List Routines

### SetFooterCellFont

## Examples

The following example sets the font for the third row of footers to bold. This does not affect other font parameters.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetFooterCellFont", 3, face, ptsize, style)
xcall ax_call(axctrl, "SetFooterCellFont", 3, %atrim(face), ptsize,
&                style .bor. D_CELL_BOLD)
```

## SetHeaderCell – Change the text in an individual cell of a header

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "SetHeaderCell", column, text)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*column*

The column number of the header whose text is being modified. **(n)**

*text*

The new header text. **(a)**

### Discussion

The SetHeaderCell method sets the text in the header for a specified column.

### See also

- ▶ [GetHeaderCell on page 9-33.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following example appends the string “ - Audited” to the text of the third header cell and ensures that the text is left justified.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetHeaderCell", 3, text)
text = %atrim(text) + " - Audited"
xcall ax_call(axctrl, "SetHeaderCell", 3, %atrim(text))
xcall ax_call(axctrl, "SetHeaderCellAlignment", 3, 1)
```

## SetHeaderCellAlignment – Change the alignment of a header cell

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %AX_CALL(axlist_id, "SetHeaderCellAlignment", column, justification)
```

### Return value

*status*

The return value is true if successful, otherwise false. (n)

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. (n)

*column*

The column number of the header whose justification is being modified. (n)

*justification*

One of the following: (n)

- 1 Left-justified.
- 2 Centered.
- 3 Right-justified.

### Discussion

The SetHeaderCellAlignment method sets the justification of the header specified by column.

### See also

- ▶ [GetHeaderCellAlignment on page 9-34.](#)
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

### Examples

The following example appends the string “ - Audited” to the text of the third header cell and ensures that the text is left justified.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetHeaderCell", 3, text)
text = %atrim(text) + " - Audited"
xcall ax_call(axctrl, "SetHeaderCell", 3, %atrim(text))
xcall ax_call(axctrl, "SetHeaderCellAlignment", 3, 1)
```

## SetHeaderCellFont – Change the font of an individual header row



```
status = %AX_CALL (axlist_id, "SetHeaderCellFont", row, face_name, point_size,
&                      rendition)
```

### Return value

*status*

The return value is true if successful, otherwise false. **(n)**

### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*row*

The row number of the header whose font is being modified. **(n)**

*face\_name*

The name of the Windows font. **(a)**

*point\_size*

The size of the Windows font in points. **(n)**

*rendition*

Zero to turn off all renditions, or one or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator: **(n)**

|                      |             |
|----------------------|-------------|
| <b>D_CELL_BOLD</b>   | Bold.       |
| <b>D_CELL_ITALIC</b> | Italic.     |
| <b>D_CELL_UNDER</b>  | Underlined. |

### Discussion

The SetHeaderCellFont method sets the font and rendition for a specified row of the header. The specified font overrides any font and point size specified by the HeaderFontName and HeaderFontSize properties.

### See also

- ▶ [GetHeaderCellFont](#) on page 9-35.
- ▶ [%AX\\_CALL](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual*.

## List Routines

### SetHeaderCellFont

## Examples

The following example sets the font of the second row of headers to Times New Roman, increases the current font size by 1, and leaves the style unchanged.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_call(axctrl, "GetHeaderCellFont", 2, face, ptsize, style)
face = "Times New Roman"
xcall ax_call(axctrl, "SetHeaderCellFont", 2,
&               %atrim(face), ptsize+1, style)
```

## Published Event for ActiveX Toolkit Lists

A published event is a named event that can be signaled from the list. Event names are case sensitive. All events are bound to Synergy subroutines using the AX\_BIND subroutine and the list ID retrieved from L\_STATUS. The OnOriginChange published even is supported.

### OnOriginChange – The origin (upper left cell) has changed

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
xcall AX_BIND(axlist_id, "OnOriginChange"[,function])
```

#### Arguments

*axlist\_id*

The ID for the ActiveX Toolkit list. This ID can be retrieved with L\_STATUS. **(n)**

*function*

(optional) A string that contains the name of the function to call when the event occurs. **(a)**

#### Discussion

The OnOriginChange event is signaled when the origin (upper left cell) of the list is changed. When this happens, the specified Synergy function is called with five arguments passed: the ActiveX control ID, the previous top row, the previous left column, the new top row, and the new left column. See the function prototype example below:

```
function OnOriginChange, ^val, reentrant
    a_ctlid      ,n          ;ActiveX control ID
    a_oldrow     ,n          ;Previous top row
    a_oldcol     ,n          ;Previous left column
    a_newrow     ,n          ;New top row
    a_newcol     ,n          ;New left column
```

If the *function* argument is not passed, the bind to OnOriginChange is cleared.

*Function* is a function you name and write. The origin of the list can be modified by calling the AX\_NEWVAL function and passing the argument you want to modify and its value, either by the new top or the new left. For example, the following modifies the declared **a\_newrow** argument to the value 10.

```
xcall ax_newval(a_newrow, 10)
```

Any value returned from *function* is ignored.

## List Routines

### OnOriginChange

## See also

[AX\\_BIND](#) in the “Synergy ActiveX API” chapter of the *Synergy DBL Language Reference Manual* for information on AX\_BIND.

## Examples

The following example prevents the first column in the list from being scrolled into view.

```
xcall l_status(listid, D_LAXCTRL, axctrl)
xcall ax_set(axctrl, "OriginColumn", 2)
xcall ax_bind(axctrl, "OnOriginChange", "my_origin_change")
.
.
.
function my_origin_change ,^val, reentrant
;
; Description:  Origin change event routine to prevent visibility
;              of column 1.
; Arguments:
;
;       a_ctlid      ,n      ;ID of the control
;       a_prevrow    ,n      ;Previous origin row
;       a_prevcol    ,n      ;Previous origin column
;       a_newrow     ,n      ;New origin row
;       a_newcol     ,n      ;New origin column
;
; Return value:      TRUE
;
proc
    if (a_newcol .le. 1)
        xcall ax_newval(a_newcol, 2)
    freturn TRUE
endfunction
```



# The List Subroutines and Functions

This section discusses the syntax and arguments for each of the list subroutines and functions.

## L\_BORDER – Add or remove the border and drag bar on a list



```
xcall L_BORDER(list_id[, option, ...])
```

### Arguments

*list\_id*

The ID of the list to modify. **(n)**

*option*

(optional) One or more of the following list options: **(n)**

|                  |                    |
|------------------|--------------------|
| <b>D_ON</b>      | Turn border on.    |
| <b>D_OFF</b>     | Turn border off.   |
| <b>D_DRAGON</b>  | Turn drag bar on.  |
| <b>D_DRAGOFF</b> | Turn drag bar off. |

### Discussion

The L\_BORDER subroutine allows the border and drag bar to be turned on or off for an ActiveX or Toolkit list.

*List\_id* must contain the ID of a valid list, otherwise a fatal error will occur.

If a list's border is off, its drag bar (caption bar) will not be visible, even if it is turned on.

D\_DRAGON and D\_DRAGOFF have no visible effect on UNIX or OpenVMS.

If multiple, conflicting options are specified, the option specified last has precedence.

### See also

[.LISTCLASS](#) on page 2-96 for defining a list class.

### Examples

The following example turns off the list's border and drag bar.

```
xcall l_border(cust_lst, D_OFF, D_DRAGOFF)
```

## L\_BUTTON – Add, delete, or modify a button on a list



```
xcall L_BUTTON(list_id, [subfunction,] args)
```

### Arguments

*list\_id*

The ID of the list that contains or will contain the button. **(n)**

*subfunction*

(optional) One of the following: **(n)**

**DSB\_ADD**            Add a button to the list. See [page 9-56](#). (default)

**DSB\_DELETE**        Delete a button from the list. See [page 9-58](#).

**DSB\_MODIFY**        Modify a button on the list. See [page 9-59](#).

*args*

One or more arguments, depending on *subfunction*.

### Discussion

The L\_BUTTON subroutine creates, deletes, or modifies a Windows-style button on a list.

Note that on UNIX and OpenVMS, this routine is ignored.

### See also

“Using the Button Subroutines” on [page 5-2](#) for general information on buttons and button sets on windows, tab sets, and lists.

## L\_BUTTON (continued)

### DSB\_ADD

```
xcall L_BUTTON (list_id, [DSB_ADD,] name, [type], [type_data], [method], [elb],
& [select_char], [position][, tooltip])
```

### Arguments

*list\_id*

The ID of the list you want to add the button to. **(n)**

*name*

The name of the button to add (a maximum of 30 characters). **(a)**

*type*

(optional) The button face type: **(n)**

**DSB\_TEXT**           Text. (default)

**DSB\_BITMAP**       Graphic.

*type\_data*

(optional) Text for the button face if *type* is DSB\_TEXT. The filename for a graphic if *type* is DSB\_BITMAP. **(a)**

*method*

(optional) The name of the method subroutine to invoke. **(a)**

*elb*

(optional) The name of the executable library (**.elb**) that contains *method*. **(a)**

*select\_char*

(optional) The quick-select character. **(a)**

*position*

(optional) The position the button will be inserted in the button set. **(a or n)**

*tooltip*

(optional) The text of a ToolTip to be displayed when the mouse pointer rests over the button. **(a)**

## Discussion

The DSB\_ADD subfunction of L\_BUTTON enables you to add a button to a list. If there are no existing buttons, a default button set is created. By default, button sets are placed at the bottom of the list, are left-justified, and can have as many buttons on a row as will fit before the row wraps. You can change these defaults with L\_BUTTONSET.

Buttons are *not* included in the list's tabbing order. In order to select a button, it must either be clicked or invoked using its quick-select character.

For information on the arguments for this subroutine, see the Discussion for DSB\_ADD on [page 5-7](#). All of the comments in that section (which discuss arguments for windows and tab sets), apply to lists as well.

## Examples

The following example adds an OK button named "I\_OK." When the button is pressed, standard termination processing occurs. The OK button has the quick-select character "K", so when ALT+K is pressed, a click of the OK button is simulated. If there are other buttons on the list, this button will be added to the end of the button set. Note that we didn't include "DSB\_ADD". You can omit DSB\_ADD when you add a button because DSB\_ADD is the default.

```
xcall l_button(listid, "I_OK", DSB_TEXT, "OK",,, "K")
```

The next example creates a button named "lookup" with a graphic, **lookup.gif**, on its face. Clicking this button will invoke the **lookup** subroutine located in the **button.elb** library. This button will be added to the beginning of the button set and will have the ToolTip "Enter a customer number."

```
xcall l_button(listid, DSB_ADD, "lookup", DSB_BITMAP, "lookup.gif",  
& "lookup", "button.elb", 1, "Enter a customer number")
```

## L\_BUTTON (continued)

### DSB\_DELETE

```
xcall L_BUTTON(list_id, DSB_DELETE, name)
```

### Arguments

*list\_id*

The ID of the list that contains the button you want to delete. (**n**)

*name*

The name of the button to delete. (**a**)

### Discussion

The DSB\_DELETE subfunction of L\_BUTTON deletes a button from a list. Remaining buttons are repositioned as if the deleted button had never existed. For example, if the button is the second button of three in a button set, the third button will be moved to the second button position.

Note that *name* is not case sensitive and that if no button with that name exists, Toolkit generates a fatal error.

### Examples

The following example deletes a button named **lookup**.

```
xcall l_button(wndid, DSB_DELETE, "lookup")
```

## L\_BUTTON (continued)

### DSB\_MODIFY

```
xcall L_BUTTON(list_id, DSB_MODIFY, name, [type], [type_data], [method], [elb],  
&                [select_char], [position][, tooltip])
```

### Arguments

*list\_id*

The ID of the list that contains the button you want to modify. **(n)**

*name*

The name of the button to modify. **(a)**

*type*

(optional) The new type of button face. (If you don't pass this argument, the previous value is the default.) **(n)**

**DSB\_TEXT**           Text.

**DSB\_BITMAP**       Graphic.

*type\_data*

(optional) New text for the button if *type* is DSB\_TEXT. If *type* is DSB\_BITMAP, this is the filename for the graphic. **(a)**

*method*

(optional) The name of a new method subroutine to invoke. **(a)**

*elb*

(optional) The name of the library to find *method* in. **(a)**

*select\_char*

(optional) A new quick-select character. **(a)**

*position*

(optional) A position you want the button moved to in the button set. **(a or n)**

*tooltip*

(optional) The text of a ToolTip to be displayed when the mouse pointer rests over the button. **(a)**

## Discussion

The DSB\_MODIFY subfunction of L\_BUTTON modifies a button in a list.

For information on the arguments for this subroutine, see the Discussion for DSB\_MODIFY on [page 5-12](#). All the comments in that section (which apply to windows and tab sets), apply to lists as well.

## Examples

The following example specifies that the button face for the **lookup** button will display a new graphic named **lookup2.jpg**. (We're assuming that the button previously had a graphic displayed on the button face. If it instead had text on the button face, this example would need to pass DSB\_BITMAP as the *type* argument to prevent "lookup2.jpg" from being interpreted as a text string rather than a filename.)

```
xcall l_button(listid, DSB_MODIFY, "lookup",, "lookup2.jpg")
```

The following example changes the button face for the **lookup** button to the text "Search All".

```
xcall l_button(listid, DSB_MODIFY, "lookup", DSB_TEXT, "Search All")
```

The following example changes the method name and the ELB for the **lookup** button.

```
xcall l_button(listid, DSB_MODIFY, "lookup",,, "search_all",  
& "button2.elb")
```

The following example changes the button so that it no longer calls a method when clicked. Instead, Toolkit will use the first ten characters of the button name to signal a menu entry.

```
xcall l_button(listid, DSB_MODIFY, "lookup",,, "")
```

The following example changes the button so that Toolkit no longer looks in a specific ELB for the method.

```
xcall l_button(listid, DSB_MODIFY, "lookup",,,, "")
```

The following example changes the quick-select character for the button to "S". When the user presses ALT+S, the button will be activated.

```
xcall l_button(listid, DSB_MODIFY, "lookup",,,,, "S")
```

The following example moves the **lookup** button to the beginning of the button set. (This will be the far left of top depending the orientation of the button set.)

```
xcall l_button(listid, DSB_MODIFY, "lookup",,,,,, 1)
```

The following example moves the **lookup** button to the position that precedes the I\_CANCEL button. Depending on the button set orientation, it will be above or to the left of the I\_CANCEL button.

```
xcall l_button(listid, DSB_MODIFY, "lookup",,,,,, "I_CANCEL")
```



The following example moves the **lookup** button to the third position in the button set. Depending on the orientation of the button set, it will be either the third button from the top or the third button from the left.

```
xcall l_button(listid, DSB_MODIFY, "lookup",,,,,, 3)
```

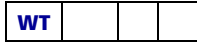
The following example moves the **lookup** button to the end of the button set. Depending on the orientation of the button set, it will either be at the far right or the bottom of the button set.

```
xcall l_button(listid, DSB_MODIFY, "lookup",,,,,, "")
```

The following example sets the ToolTip text to “Enter a vendor number”:

```
xcall l_button(listid, DSB_MODIFY, "lookup",,,,,,  
& "Enter a vendor number")
```

## L\_BUTTONSET – Define the placement of a set of buttons on a list



```
xcall L_BUTTONSET (list_id, [placement], [per_row_col], [justification][, button_name])
```

### Arguments

*list\_id*

The ID of the list. **(n)**

*placement*

(optional) One of the following: **(n)**

**DSB\_BOTTOM** The set of buttons will be placed horizontally along the bottom of the container with a maximum of *per\_row\_col* buttons per row. (default)

**DSB\_RIGHT** The set of buttons will be placed vertically along the right side of the container with a maximum of *per\_row\_col* buttons per column.

*per\_row\_col*

(optional) The maximum number of buttons to place on a row if DSB\_BOTTOM is specified, or on a column if DSB\_RIGHT is specified. The default behavior is to display as many buttons as will fit and wrap to the next row or column. **(n)**

*justification*

(optional) One of the following: **(n)**

**DSB\_BEGIN** The buttons will be left-justified if DSB\_BOTTOM is specified, or positioned towards the top if DSB\_RIGHT is specified. (default)

**DSB\_CENTER** The buttons will be centered along the designated side.

**DSB\_END** The buttons will be right-justified if DSB\_BOTTOM is specified, or positioned towards the bottom if DSB\_RIGHT is specified.

*button\_name*

(optional) The name of the default button. **(a)**

## Discussion

L\_BUTTONSET defines the placement of a set of buttons for a list. Every button is contained within a set and only one button set is allowed per list; therefore, calling L\_BUTTONSET will affect all buttons for the list.

The background rendition of the button area is defined by the background rendition of the input window at the time that L\_CREATE is called.

Note that on UNIX and OpenVMS, this routine is ignored.

## See also

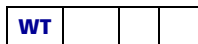
[“Using the Button Subroutines”](#) on page 5-2 for general information on buttons and button sets on windows, tab sets, and lists.

## Examples

The following example places the list's buttons on the right side, centered, with three buttons per column (at most).

```
xcall l_buttonset(list_id, DSB_RIGHT, 3, DSB_CENTER)
```

## %L\_BUTTONSTATE – Enable or disable a button on a list



```
prev_state = %L_BUTTONSTATE (list_id, name[, new_state])
```

or

```
xcall L_BUTTONSTATE (list_id, name[, new_state])
```

### Return value

*prev\_state*

On Windows, this function returns the previous state of the button: (^VAL)

**D\_DISABLED**      Disabled.

**D\_ENABLED**      Enabled.

**D\_INPUTONLY**    Enabled only within input.

On UNIX, this function returns the previously specified state (though it has no meaning on UNIX platforms). On OpenVMS, this function returns true.

### Arguments

*list\_id*

The ID of the list. (**n**)

*name*

The name of the button. (**a**)

*new\_state*

(optional) One of the following: (**n**)

**D\_DISABLED**      Disabled.

**D\_ENABLED**      Enabled.

**D\_INPUTONLY**    Enabled only within input.

### Discussion

L\_BUTTONSTATE enables or disables a button within a list.

If *new\_state* is not specified, the previous state remains unchanged.

You can XCALL this function if you don't need to know the previous state of the button. Note that



If a button is enabled and the user clicks on it while not in a Toolkit input processing routine, one of two things occurs. Either the click is ignored, or the event will be signaled at the invocation of the next Toolkit input processing routine, depending upon timing. To ensure that the button cannot be pressed when input is not being done to the list, set *new\_state* to D\_INPUTONLY.

---

Note that on UNIX and OpenVMS, this routine is ignored.

## See also

[“Using the Button Subroutines” on page 5-2](#) for general information on buttons and button sets on windows, tab sets, and lists.

## Examples

The following example enables the I\_OK button whenever we're performing input on the list.

```
xcall l_buttonstate(listid, I_OK, D_INPUTONLY)
```

## L\_CHR – Perform single-keystroke input to a list



```
xcall L_CHR (character, list_id, [data], [disabled], [row], [column], [help_id], [wait_time]
&          [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*character*

Returned with the character typed. **(a)**

*list\_id*

The ID of the list. **(n)**

*data*

(optional) The non-window data for the current item. **(a)**

*disabled*

(optional) The disabled item status. **(n)**

*row*

(optional) The row within the input window (within an item). **(n)**

*column*

(optional) The column within an item. **(n)**

*help\_id*

(optional) The help identifier. **(a)**

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. **(n)**

**D\_FOREVER** or **-1**                      Never time out.

**D\_GLOBAL** or **-2**                      Use the global value (see “[g\\_wait\\_time](#)” on page 18-6).  
(default)

**D\_IMMEDIATE** or **0**                      Time out immediately.

*n*                                          Wait up to *n* seconds (where *n* is a positive value) for I/O  
processing to be complete.

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

## Discussion

This subroutine performs single-keystroke input on a list. It performs essentially the same function in a list as U\_CHR does in a window.

This subroutine does not return until a character is typed by the user or a menu entry (other than those listed below for Windows) is selected.

---

### WIN

L\_CHR recognizes the following reserved menu entries. E\_PASTE pastes a single character. The others do nothing when L\_CHR is being processed.

- E\_CLEAR
- E\_COPY
- E\_CUT
- E\_MARK
- E\_PASTE

---

Whether or not the *data* argument is passed must correspond to whether it was passed in the L\_CREATE subroutine when the list was created. *Data* is required here if it was also passed to L\_CREATE. If *data* is passed here but was *not* passed to L\_CREATE, a fatal error occurs.

*Disabled* is a true/false flag that indicates whether the current item is disabled. Whether or not the *disabled* argument is passed must correspond to whether it was passed to other list routines such as L\_DATA, L\_INPFLD, L\_INPUT, L\_PROCESS, and L\_SELECT. See [L\\_PROCESS on page 9-114](#) for information about the disabled item status.

If the operation times out, **g\_select** is set to true and **g\_entnam** set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See [“g\\_time\\_entry” on page 18-5](#).

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to L\_CHR. L\_CHR, in turn, passes them directly to each field’s methods. This allows you to communicate additional information to your input field methods.

---

### WIN

In Windows environments, the user can change the current item in the list with the mouse or the PAGE UP, PAGE DOWN, HOME, END, and arrow keys before this subroutine returns. Therefore, if you want any special processing to be done when arriving at or leaving a list item, you will have to write and use an arrive or leave method. (In Windows environments, these keys are “privatized” and unavailable to calling routines unless you use L\_RETURNKEY to return the key out of the list. “Privatized” means that they are reserved for the private use of the graphical control, which in this case would be the list.)

---

If you are using L\_SELECT you do not need to call this subroutine because L\_SELECT handles list input.

## List Routines

L\_CHR

### See also

- ▶ [U\\_CHR on page 16-16](#) for more information on single-keystroke input processing.
- ▶ [L\\_RETURNKEY on page 9-126](#) for more information on returning keys out of the list.



## L\_CLASS – Create a list class at runtime



```
xcall L_CLASS (class_id, class_name, [placemt_row], [placemt_col], [num_items],  
& [num_headers], [header_static], [num_footers], [footer_static], [no_null],  
& [snapshot], [load_method], [options], [error], [arrive_method],  
& [leave_method][, dblclick_method])
```

### Arguments

*class\_id*

The returned class ID. **(n)**

*class\_name*

The name of the class to create (a maximum of 15 characters). **(a)**

*placemt\_row*

(optional) The placement row for the list. **(n)**

*placemt\_col*

(optional) The placement column for the list. **(n)**

*num\_items*

(optional) The number of items to be visible at one time. **(n)**

*num\_headers*

(optional) The number of header lines to reserve. **(n)**

*header\_static*

(optional) The true/false flag that indicates whether the header is to remain static. **(n)**

*num\_footers*

(optional) The number of footer lines to reserve. **(n)**

*footer\_static*

(optional) The true/false flag that indicates whether the footer is to remain static. **(n)**

*no\_null*

(optional) The true/false flag that indicates whether null lists are prohibited. **(n)**

*snapshot*

(optional) The true/false flag that indicates whether to take input set information snapshots. **(n)**

## List Routines

### L\_CLASS

#### *load\_method*

(optional) The name of an LLOAD\_METHOD subroutine you have written. (a)

#### *options*

(optional) One or more of the *option\_string* options for .LISTCLASS. See “[option\\_string](#)” on [page 2-98](#) and “[OPTIONS\(option\\_string\)](#)” on [page 2-101](#). (a)

#### *error*

(optional) The returned Toolkit error number, or 0 if the list class is successfully created. (n)

#### *arrive\_method*

(optional) The name of an LARRIVE\_METHOD subroutine you have written. (a)

#### *leave\_method*

(optional) The name of an LLEAVE\_METHOD subroutine you have written. (a)

#### *dblclick\_method*

(optional) The name of an LDBLCLICK\_METHOD subroutine you have written. (a)

## Discussion

The L\_CLASS subroutine defines a list class at runtime, as opposed to defining one through the .LISTCLASS script command. The class name is then used when creating a list with L\_CREATE.

The returned *class\_id* is not needed for subsequent list creation or processing (since L\_CREATE identifies the class by name), but you can pass the ID to the U\_SAVE subroutine to store the list class in a window library.

*Class\_name* must be unique within the set of windows.

If *placemt\_row* and *placemt\_col* are passed, but the list is not placed when created, these coordinates will be retained and used when the list is placed.

For more information about the *snapshot* argument, see the Discussion for .LISTCLASS on [page 2-98](#).

If passed, *load\_method* is the name of an LLOAD\_METHOD subroutine that you have written. L\_PROCESS or L\_SELECT will call this subroutine to load new items into the list. (See [LLOAD\\_METHOD on page 9-158](#).) Using a load method avoids the necessity of satisfying load requests (D\_LLOADBOT, D\_LLOADTOP) whenever L\_PROCESS is called, and also encapsulates your item-loading code.

If any method subroutines are specified, they must be available. In other words, they must either be contained within the current program image, or in an executable library (ELB) that was either linked to or opened with OPENELB. The default behavior, if no *load\_method* is specified for the list, is for L\_PROCESS and L\_SELECT to return to the caller when new items are needed.

If *error* is passed, it is returned as 0 if the list class is successfully created. If the list class cannot be created, *error* is returned with the Toolkit error number. If *error* is not passed, all errors are fatal.

The following are the errors that can be returned in *error*. Note that you can use `%U_GETWNDERR` to get the text of *error* (see [%U\\_GETWNDERR](#) on page 16-71).

519 (DTK\_DUPCLASS) “List class *class* already defined”

A list class with the name passed in *class\_name* already exists.

520 (DTK\_CLSCREAT) “Cannot create list class *class*”

The list class could not be created (e.g., because the system ran out of available resources).

---

## WIN

When using the `L_INPUT` subroutine, be aware that the user can change the current list item without control returning to your program first. This means that the state of the input fields and the input set context can be propagated across list items. For example, if your program uses `I_INIT` to initialize fields in the input set, and the user moves to a different item in the list, the fields are still considered empty. This results in a different redisplay of the data, and validation occurs unexpectedly. There are two ways to solve this problem. Use the `INPUT_SNAPSHOT` option to preserve input context and field states. If, however, you don’t want the context preserved for each item, you can use a list item arrive method to either initialize or display the data in the associated input window (depending on the content of the list item), and then use `I_NEXT` to establish the correct context.

In Windows environments, the current list item can be interactively changed within a call to a Toolkit subroutine (such as `L_SELECT` or `L_INPUT`). To enable you to support change “events,” you can pass the *arrive\_method* and *leave\_method* arguments so the specified subroutines can be called to perform any additional processing required. These method subroutines are also supported in UNIX and OpenVMS environments.

*Dblclick\_method* specifies the name of a double-click subroutine that you have written. If specified, the list processor will call the double-click method subroutine whenever the user double-clicks on an item within the list. You can overload this method at runtime using the `L_METHOD` subroutine. (See [page 9-107](#) for more information.) If *dblclick\_method* is not specified and the user double-clicks on the current item, the list processor will assume that the item is being selected.

---

## See also

- ▶ [LLOAD\\_METHOD](#) on page 9-158 for more information on writing your load method.
- ▶ [LARRIVE\\_METHOD/LLEAVE\\_METHOD](#) on page 9-152 for more information on writing your arrive and leave methods.
- ▶ [LDBLCLICK\\_METHOD](#) on page 9-155 for more information on writing your double-click method.
- ▶ [.LISTCLASS](#) on page 2-96 for more information on the usage, meaning, and defaults of `L_CLASS`’s optional arguments. (All of the optional arguments correspond to qualifiers of the `.LISTCLASS` script command.)

## List Routines

### L\_CLASS

## Examples

The following example creates a list class named “lookup,” whose placement will be determined when L\_CREATE is called. The list will have one header and one footer line, will display 10 items at a time, and will invoke the “lookup\_load\_method” subroutine when a new item is needed for the list.

```
xcall l_class(lstid, "lookup",,,10,1,,1,,, "lookup_load_method",,error)
```

## %L\_CLASSINFO – Return information about a list class



*result* = %L\_CLASSINFO (*listclass\_id*, *info\_type*)

or

xcall L\_CLASSINFO (*listclass\_id*, *info\_type*)

### Return value

*result*

A value that is specific to *info\_type*. (^VAL)

### Arguments

*listclass\_id*

The ID of a list class window. (n)

*info\_type*

One of the following (defined in **tools.def**): (n)

**D\_LNAME**[, *name*]

Returns in *result* the trimmed length of the list class name.

*name*

(optional) Returned name of the list class. (a)

**D\_LPROW**

Returns the placement row specified for the list class. Returns zero if no placement row was specified.

**D\_LPCOL**

Returns the placement column specified for the list class. Returns zero if no placement column was specified.

**D\_LHEIGHT**

Returns the list class setting for the number of items to be displayed at one time. Returns zero if this was not specified.

**D\_LHDLNS**

Returns the number of header lines specified for the list class. Returns zero if the number of headers was not specified.

**D\_LFTRLNS**

Returns the number of footer lines specified for the list class. Returns zero if the number of footers was not specified.

**D\_LHDRSTATIC**

Returns true if headers for the list class are set to static. Otherwise, returns false.

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_LFTRSTATIC</b>                                     | Returns true if footers for the list class are set to static. Otherwise, returns false.                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>D_LNONULL</b>                                        | Returns true if the list class is set to prevent an empty list. Otherwise, returns false.                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>D_LSNAPSHOT</b>                                      | Returns true if the list class is set to maintain input window control information for list items. Otherwise, returns false.                                                                                                                                                                                                                                                                                                                                              |
| <b>D_LMETHOD</b> , <i>methodtype</i> [, <i>method</i> ] | Returns in <i>result</i> the trimmed length of the method specified by type. Returns zero if no method was specified for the list class when it was created.                                                                                                                                                                                                                                                                                                              |
| <i>methodtype</i>                                       | One of the following (defined in <b>tools.def</b> ): ( <b>n</b> )                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>D_LLOAD</b>                                          | Returns the load method.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>D_LARRIVE</b>                                        | Returns the arrive method for list items.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>D_LLEAVE</b>                                         | Returns the leave method for list items.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>D_LDBLCLK</b>                                        | Returns the double-click method for list items.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>method</i>                                           | (optional) The name or address of the method. If you pass an alpha variable as <i>method</i> , the name of the method is returned in <i>method</i> . If you pass a numeric variable as <i>method</i> , the address of the method is returned in <i>method</i> . (If <i>method</i> is numeric and the method is not available—e.g., the routine doesn't exist or the ELB hasn't been opened yet—Toolkit will generate a trappable runtime error.) ( <b>a</b> or <b>n</b> ) |
| <b>D_LOPTIONS</b> [, <i>options</i> ]                   | Returns in <i>result</i> the trimmed length of the options string defined for the list class. Returns zero if no option string was defined for the list class.                                                                                                                                                                                                                                                                                                            |
| <i>options</i>                                          | (optional) The options string for the list class. If no options string was defined for the list class, <i>options</i> is cleared to all spaces. ( <b>a</b> )                                                                                                                                                                                                                                                                                                              |

## Discussion

The %L\_CLASSINFO function returns information about a list class (a window created by the .LISTCLASS script command or the L\_CLASS routine).

## See also

[.LISTCLASS on page 2-96](#) and [L\\_CLASS on page 9-69](#) for details on information returned by this function.

## Examples

The following example returns the length of the list class's name in **length**, and it returns the name of the list class in **lc\_name**:

```
length = %L_CLASSINFO(lc_id, D_LNAME, lc_name)
```

The next example returns the length of the name of the load method for the list class, and it returns the method name in **meth\_name**:

```
length = %L_CLASSINFO(lc_id, D_LMETHOD, D_LLOAD, meth_name)
```

## L\_CREATE – Create a list



```
xcall L_CREATE (list_id, window_id, [data], [channel], [class], [row], [column],
&               [no_placement], [disabled], [initial], [last][, error])
```

### Arguments

*list\_id*

Returned with the ID of the list created. **(n)**

*window\_id*

The ID of the input window to associate with the list. **(n)**

*data*

(optional) The initial contents of the associated non-window data to store or retrieve for each list item. See the Discussion below for more information. **(a)**

*channel*

(optional) The window library channel to load the list class from if it's not already loaded. **(n)**

*class*

(optional) The name of the list class. **(a)**

*row*

(optional) The row position of the list. **(n)**

*column*

(optional) The column position of the list. **(n)**

*no\_placement*

(optional) The flag that causes the list not to be placed: **(n)**

**D\_NOPLC**

Don't place list.

*disabled*

(optional) The true/false flag that indicates whether the list is disabled. **(n)**

*initial*

(optional) The item number of the initial item to load. **(n)**



*last*

(optional) The estimated number of items that will be loaded. (n)

*error*

(optional) The returned Toolkit error number, or 0 if the list is successfully created. (n)

## Discussion

The L\_CREATE subroutine creates a new list, associating it with the specified input window. Only one list can be associated with the input window (*window\_id*).

Since UI Toolkit appends the “\_LST” to the end of the input window name, the maximum size of this name is 11.

The title of the list, if any, and its position (if not passed in the *row* and *column* arguments, nor specified in the list class) are inherited from the input window. If the input window has a border, the list also inherits that. (When the list is deleted, the input window’s border is reset to its state prior to list creation.)

You should never explicitly remove the input window associated with a list, because doing so will corrupt the placement order.

Non-window *data* is additional information that you don’t want displayed, but that you want to be maintained with the list. There are two pieces of data associated with every item in a list: an image of the input window’s display (sometimes referred to as “window data,” and the contents of the “a\_itemdata” record (often referred to as “non-window data.”) The latter can be confusing, because it almost always includes a storage representation of the former in order to be useful. Non-window data is not required at all, but lists are most often useful if the data for each item can be stored or retrieved in a record form (as opposed to merely a display form).

The data record passed to L\_CREATE establishes the default value for non-window data for each item. This is the value that is assigned to the record before the load method is called. It is also assigned to any new item created with D\_LAPPEND or D\_LINSERT. The same thing happens for window data; in this case, the image of the input window when L\_CREATE was called is used.

Both window and non-window data can

- ▶ be modified by the load method when loading an item.
- ▶ be modified by passing a new value into L\_PROCESS or L\_SELECT for the current item, as long as the request flag is not D\_LRESTORE (or D\_LCANCEL, a synonym).
- ▶ be modified by calling L\_DATA with D\_LWRITE.
- ▶ be modified in the list item arrive, leave, or double-click method.
- ▶ be searched with a D\_LFIND request in the L\_PROCESS subroutine—L\_FINDSPEC specifies which will be searched.

The “initial data” is stored only once. When new items are created, they are initially set to this value. It is expected that the item will be modified by the load method or subsequent processing. It is really only intended to ensure that the initial state of the data is valid. For instance, you might want integer fields in the record initialized to integer 0, as opposed to blanks.

To change the data for each item in the list, you would need to use `L_DATA` or `L_PROCESS` to access each item, or you would need to restart the list (`L_RESTART`) and provide the modified data in the load method.

If *class* is passed and it is loaded from *channel*, it will remain loaded when this subroutine returns. If *channel* is not passed and the class specified in *class* is not already loaded, an error will occur. (`L_CREATE` will *not* use `g_utlib` by default.) If *class* is not passed or if it is blank, the default class will be used. The default list class has the following characteristics:

- ▶ The row and column placement of the list is inherited from the input window.
- ▶ The number of items visible at once is the maximum number that will fit without causing the list to occlude the information bar.
- ▶ The list is allowed to be null.
- ▶ The list contains vertical (and horizontal, if appropriate) scroll bars. (On Windows, these scroll bars take up slightly more screen area.)
- ▶ The input window set context and field display is not maintained for each list item.
- ▶ No methods are specified for the class.

You can override the row and column placement, whether from the specified class or the default class, by specifying *row* and *column*. You can override the default placement by passing a non-zero *no\_placement* value. The coordinates that you set when *no\_placement* is passed are now retained and used when the list is placed. You can also create the list in a disabled state by passing a non-zero *disabled* value.

By default, lists are loaded by the `L_PROCESS` subroutine beginning with the first, or topmost, item displayed, and proceeding down the list either until no more items exist or until the display area of the list is full. When more display items are required (for example, when the user moves down from the last item in the list), additional items are requested from the calling routine (or are obtained by calling the specified `LLOAD_METHOD`) until no more are available. Because each new requested item is loaded at the bottom of the known list and follows the last item requested, we refer to this method as “loading at the bottom of the list, forward.”

Sometimes, however, you'll want to load the last window of items first, as for a transaction entry subroutine that displays a history of previous transactions but allows new transactions at the bottom. If several previous transactions exist, a significant pause would occur if the first set of items had to be loaded first, followed by all of the other items as the list was traversed to get to the end.

An alternative method of loading items begins with the last item in the list, loads items in reverse order until the display is full, and then requests additional items as needed as the user moves up through the list. Because each new requested item is loaded at the top of the known list and precedes the last item requested, we refer to this method as "loading at the top of the list, backward."

A third method of loading combines the previous two. This method (sometimes known as two-way or bi-directional loading) begins anywhere in the list, loads the first window of items in a forward direction, and requests additional items as needed at either end of the list. Items requested at the top of the known list are expected to be retrieved backwards, while items at the bottom of the list are retrieved forwards. You might use this combination method for lists with a known starting point that is preceded and followed by a potentially large number of items (for example, a "search" function in a transaction history file).

The *initial* argument determines how list items will be loaded into the list on subsequent calls to L\_PROCESS:

- ▶ If *initial* has a value of 1, existing items will only be loaded at the bottom of the list, forward.
- ▶ If *initial* is greater than 1 and equal to *last*, existing items will only be loaded at the top of the list, backward.
- ▶ If *initial* is greater than 1 but less than *last*, existing items may be loaded at either end, but loading will begin at the bottom, forward.
- ▶ If *initial* is greater than 1 but inaccurate, the list allows items to be loaded before the logical item 1. On Windows, you should never allow a "Page Up" operation to load an entire page previous to logical item 1.

If *initial* is not passed, the default initial item is 1.

If *last* is not passed or if it has a value of zero, the calling routine is unable to determine the number of list items. This number will be determined internally by UI Toolkit. In such a case, Toolkit assumes that *last* is greater than *initial*.

If *error* is passed, it is returned as 0 if the list is successfully created. If the list cannot be created, *error* is returned with the number for the Toolkit error. If *error* is not passed, all errors are fatal.

*Error* can be one of the following Synergy runtime errors, Synergy window errors, or Toolkit errors. Note that you can use `%U_GETWNDERR` to retrieve error text. (See [%U\\_GETWNDERR](#) on page 16-71.)

- ▶ Synergy runtime errors, which are defined in **rdeferr.h** and documented in “[Runtime error messages](#)” in the “Error Messages” chapter of *Synergy Tools*:
  - 421 (E\_AXERR) “Error while processing an ActiveX control”
 

An ActiveX error occurred as the ActiveX list was loaded. This is often caused by dependencies on a missing file.
  - 422 (E\_AXNOLOAD) “Could not load ActiveX control”
 

The runtime was not able to load the ActiveX list because the ActiveX list control was not registered and could not be automatically registered. This is often caused by a missing file.
- ▶ Synergy window errors, which are documented in “[Window error messages](#)” in the “Error Messages” chapter of *Synergy Tools*:
  - 4 (WE\_OUTOFMEM) “Not enough memory (needed *n*, had *n*)”
 

There isn’t enough memory to create the supporting windows for the list.
  - 9 (WE\_DUPWNDNAME) “Window name already defined”
 

A window already exists with the name of one of the generated supporting windows (which are *inputWindowName\_LST* on all platforms and on UNIX and OpenVMS, *inputWindowName\_HDR* for headers and *inputWindowName\_FTR* for footers).
  - 10 (WE\_TOOMANYWND) “Too many windows (max of 1024)”
 

The supporting windows created for the list exceed the number allowed by Toolkit, which is 1024.
  - 18 (WE\_OUTOFRES) “Windows resource error”
 

There aren’t enough system resources to create the list.
- ▶ UI Toolkit errors:
  - 521 (DTK\_NOCLASS) “List class *class* not found”
 

The name passed as *class* is not a valid list class.
  - 522 (DTK\_NOCLSLIB) “List class *class* not loaded - no library supplied”
 

The number passed as *channel* is not the channel number for the window library that contains the list class *class*.

523 (DTK\_NOCLSWND) “Id *n* is not a list class”

The name passed as *class* is not a valid list class.

530 (DTK\_INPINUSE) “Input window *n* is already associated with a list”

The ID passed in *window\_id* is for an input window that is already associated with a list.  
An input window can be associated with only one list.

## See also

“List load method” on page 9-9 and LLOAD\_METHOD on page 9-158 for more information about using load methods.

## Examples

The following example creates a list from the class “lst\_lookup” defined in the library opened on **g\_utlib**. **Inpid** is the associated input window, and **lookup\_data** contains the initial contents of the associated data to store or retrieve for each list item.

```
xcall l_create(lstid, inpid, lookup_data, g_utlib, "lst_lookup")
```

The next example creates a list from the list class “lst\_trans” defined in the library opened on **g\_utlib**. The ID of the associated input window is contained in **item\_id**, and **trans\_data** contains the initial contents of the associated data to store or retrieve for each list item. The list is initially disabled and not placed on the screen. However, its placement is specified as row 5, column 20, which is where it will be placed if L\_PLACE is called without re-specifying these parameters. Presuming that **nmitems** is greater than 1, loading of items into the list will be in reverse order, starting with the last item. Any error that occurs while attempting to create the list will be returned in **error**.

```
xcall l_create(trans_lst, item_id, trans_data, g_utilib, "lst_trans", 5,  
& 20, D_NOPLC, TRUE, nmitems, nmitems, error)
```

## L\_CTRCONTEXT – Establish focus within a child list window



```
xcall L_CTRCONTEXT (list_id, reason)
```

### Arguments

*list\_id*

The ID of the child list. (**n**)

*reason*

The reason the list window was activated (which determines what L\_CTRCONTEXT will move focus to). This argument can be passed as blank (which indicates that the list was already activated), a program-supplied reason passed because it was activated programmatically, or one of the following: (**a**)

**C\_FIRST** Focus moved in attempt to reach the first child in the composite window. This instructs L\_CTRCONTEXT to move focus to the list (rather than a button on the list window).

**C\_LAST** Focus moved in attempt to reach the last child in the composite window. This instructs L\_CTRCONTEXT to move focus to the last active button on the tab set (if the list is on a tab). If there is no such button, it moves focus to the last active button for the list window. If there's no active button for the window, it moves focus to the list itself.

**C\_NEXT** Focus moved from the previous child in the composite window—e.g., by pressing TAB. This instructs L\_CTRCONTEXT to move focus to the list (rather than a button on the list window).

**C\_PREV** Focus moved from the next child in the composite window—e.g., by pressing SHIFT+TAB. This instructs L\_CTRCONTEXT to move focus to the last active button on the tab set (if the list is on a tab). If there is no such button, it moves focus to the last active button for the list window. If there's no active button for the list window, it moves focus to the list itself.

**C\_SET** List or button explicitly activated. For example, this could be the result of a mouse click, or it could be that the list or button was activated programmatically without a specified reason. With this reason, L\_CTRCONTEXT does not change focus.

If *reason* is blank or any value other than the above, L\_CTRCONTEXT does not change focus.

## Discussion

The `L_CTRCONTEXT` subroutine sets focus for a child list window to either the list or a button on the list window. (On UNIX and OpenVMS and in Synergy .NET, this routine is ignored.)

`L_CTRCONTEXT` uses *reason* to determine where to establish focus, and is designed for use in child list methods (`C_METHLST` by default), where it's likely that you want focus to initially reflect the reason the list window was activated. For example, if you have a composite window with a list and an input window, and the user presses `SHIFT+TAB` to move from the input window back to the list, you may want the last button in the list to receive focus.

To use in a child method, pass the reason passed to the child method (by `C_PROCESS`) as the *reason* argument for `L_CTRCONTEXT`. See the `ctrmeths.dbl` file included in your UI Toolkit distribution for an example. This file includes code for the `C_METHLST` method, which uses `L_CTRCONTEXT`.

## See also

- ▶ [C\\_METHLST](#) on page 6-58.
- ▶ [“Controlling tabbing, focus, and input context”](#) on page 6-4 for information on tabbing indices.
- ▶ [DC\\_CTRCONTEXT](#) on page 6-35 for information on moving focus to a specific child window.

## L\_DATA – Manipulate the data in a list



```
xcall L_DATA(list_id, request, window_id, [data], [disabled], no_find
&           [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*list\_id*

The ID of the list to manipulate. **(n)**

*request*

The requested operation: **(n)**

**D\_LCURRENT**      Retrieve L\_PROCESS's current item.

**D\_LFIRST**        Retrieve the first loaded item.

**D\_LLAST**         Retrieve the last loaded item.

**D\_LNEXT**         Retrieve the next loaded item.

**D\_LPREV**         Retrieve the previous loaded item.

**D\_LWRITE**        Rewrite an item.

*window\_id*

The ID of the associated input window. **(n)**

*data*

(optional) The associated non-window data. **(a)**

*disabled*

(optional) The disabled item status. **(n)**

*no\_find*

A true/false flag that indicates whether the operation failed. **(n)**

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional arguments for field methods. **(any)**



## Discussion

The L\_DATA subroutine enables you to read or write items that have already been loaded into the list without modifying the context for the next call to L\_PROCESS.

L\_DATA retrieves and rewrites the input window display, reading and writing data for items in the list that the L\_PROCESS subroutine has already loaded. It can also retrieve and rewrite the associated non-window data, the disabled flag, and the input set controls.

*Disabled* is a true/false flag that indicates whether the current item is disabled. Whether or not the *disabled* argument is passed must correspond to whether it was passed to other list routines such as L\_CHR, L\_INPFLD, L\_INPUT, L\_PROCESS, and L\_SELECT. See [L\\_PROCESS on page 9-114](#) for more information about the disabled item status. It is both passed (with D\_LWRITE) and returned.

If the display of any visible item is modified by D\_LWRITE, that change is reflected in the list. The context of L\_PROCESS, however, is not modified. The purpose of this subroutine is to enable the calling routine to peruse and/or modify data in other items of the list without changing the list's context.

We recommend that you use a different input window and data area for this subroutine than for L\_PROCESS. Another option is to issue the request D\_LRESTORE before attempting any other operation when you are ready to proceed with L\_PROCESS.



For ActiveX Toolkit lists, the display of each field in the input window is mapped to the associated column in the list. So if the input window whose ID you pass to L\_DATA has different field definitions than the input window used to create the list, you may get unexpected field/column mappings, and some fields may not be mapped at all. (Each column in the list maps to the Toolkit field number used to create that column initially, and if that field number is greater than the number of fields in the input window passed to L\_DATA, the field won't be mapped.)

---

Unlike L\_PROCESS, the L\_DATA subroutine only records information in the list when the D\_LWRITE flag is specified.

The D\_LCURRENT flag retrieves the current item being used by L\_PROCESS. This item is not necessarily the same as the item retrieved by the most recent call to L\_DATA. If the current item has not been loaded (as in the case of a null list), *no\_find* will be returned with a value of true.

The D\_LFIRST flag retrieves the first item currently loaded into the list. If the list permits item loading at the top and a D\_LEOF has not yet been signaled, D\_LFIRST retrieves the uppermost item loaded and does not cause a load request to be issued. If the list doesn't contain any items, the *no\_find* argument is returned with a value of true.

The D\_LLAST flag retrieves the last item currently loaded into the list. If the list permits item loading at the bottom and a D\_LEOF has not yet been signaled, D\_LLAST will retrieve the lowermost item loaded and will not cause a load request to be issued. If the list doesn't contain any items, the *no\_find* argument will be returned with a value of true.

## List Routines

### L\_DATA

The `D_LNEXT` flag retrieves the item that follows the last item retrieved by this subroutine. If `L_DATA` has not retrieved any items, or if no item follows the last item retrieved, the *no\_find* argument will be returned with a value of true, and no item will be retrieved. `D_LNEXT` will only retrieve an item that has already been loaded.

The `D_LPREV` flag retrieves the item that precedes the last item retrieved by this subroutine. If `L_DATA` has not retrieved any items, or if no item precedes the last item retrieved, the *no\_find* argument will be returned with a value of true, and no item will be retrieved. `D_LPREV` will only retrieve an item that has already been loaded.

The `D_LWRITE` flag rewrites the last item that was retrieved by `L_DATA`. (If `L_DATA` has not retrieved an item, *no\_find* is returned with the value of true, and no rewrite occurs.) `D_LWRITE` updates both the display and non-window data for the list, but the display will reflect changes only if `I_DSPFLD` or `I_DISPLAY` is called with the window that's passed to `L_DATA` and if that call occurs before the call to `L_DATA`. Non-window data is updated with changes in any case.

If `L_PROCESS` deletes the last item that was retrieved, no context exists for `D_LNEXT`, `D_LPREV`, or `D_LWRITE`. You can use `D_LCURRENT`, `D_LFIRST`, or `D_LLAST` to re-establish a context for this subroutine.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional (and optional) arguments. These arguments are used only if the `INPUT_SNAPSHOT` qualifier was specified in the list class when the list was created and you specify a request that updates the input window (`D_LCURRENT`, `D_LFIRST`, `D_LNEXT`, or `D_LPREV`—not `D_LWRITE`). When `L_DATA` updates the input window by calling `I_SNAPSHOT`, it redisplay the data into the input window, which requires it to use any display methods for the fields. The method data arguments are passed to those display methods.

## Examples

In this example, the only associated data in the list is a number, which is renumbered beginning with the current item in the list and starting with the current item's value for the number plus one. For example, starting with the current item, if the items in the list were numbered 5 through 20, the items would be renumbered 6 through 21 after the code below was executed. Any visible item would reflect that change.

```
xcall l_data(mylist, D_LCURRENT, inpid, number,, eof)
while (.not. eof)
  begin
    incr number
    xcall i_dspfld(inpid, "number", number)
    xcall l_data(mylist, D_LWRITE, inpid, number,, eof)
    xcall l_data(mylist, D_LNEXT, inpid, number,, eof)
  end
```

## L\_DELETE – Delete a list



```
xcall L_DELETE(list_id)
```

### Arguments

*list\_id*

The ID of the list to delete. (**n**)

### Discussion

The L\_DELETE subroutine deletes a list.

A list is automatically deleted when the user exits the environment in which the list was created (unless the list is promoted to global status). The L\_DELETE subroutine enables you to delete a list explicitly. If you try to delete a list that is placed at a prior environment level, a fatal error occurs.

### Examples

The following example deletes the list whose ID is stored in **mylst**.

```
xcall l_delete(mylst)
```

## L\_DISABLE – Disable a list



```
xcall L_DISABLE(list_id)
```

### Arguments

*list\_id*

The ID of the list to disable. (n)

### Discussion

The L\_DISABLE subroutine disables a list.

The current rendition for the scroll bars remains in effect whether the list is enabled or disabled.

#### WIN

---

There is no visual difference between enabled and disabled lists. Both use the same Windows Control Panel setting for background and foreground colors. List renditions are not used on Windows except for the header (D\_RND\_LST\_HDR) and footer (D\_RND\_LST\_FTR) on Toolkit (non-ActiveX) lists.

#### UNIX, VMS

---

A disabled list is distinguished from an enabled list by a change in renditions. When an enabled list is disabled, its body, border, title, and selected item take on new renditions. The following renditions apply:

|                        |                                       |
|------------------------|---------------------------------------|
| <b>D_RND_LST_DSA</b>   | Disabled list body, border, and title |
| <b>D_RND_LST_DSA_S</b> | Selected item in disabled list        |
| <b>D_RND_LST_FTR</b>   | Footer                                |
| <b>D_RND_LST_HDR</b>   | Header                                |

---

### Examples

The following example disables the list whose ID is stored in **order\_lst**.

```
xcall l_disable(order_lst)
```

## L\_ENABLE – Enable a list



```
xcall L_ENABLE(list_id)
```

### Arguments

*list\_id*

The ID of the list to enable. (**n**)

### Discussion

The L\_ENABLE subroutine enables a list.

The current rendition for the scroll bars remains in effect whether the list is enabled or disabled.

---

#### WIN

There is no visual difference between enabled and disabled lists. Both use the same Windows Control Panel setting for background and foreground colors. List renditions are not used on Windows except for the header (D\_RND\_LST\_HDR) and footer (D\_RND\_LST\_FTR) on Toolkit (non-ActiveX) lists.

---

---

#### UNIX, VMS

An enabled list is distinguished from a disabled list by a change in renditions. When a disabled list is enabled, its body, border, title, and selected item take on new renditions. The following renditions apply:

|                        |                                  |
|------------------------|----------------------------------|
| <b>D_RND_LST_ENA</b>   | Enabled list's body              |
| <b>D_RND_LST_ENA_B</b> | Border                           |
| <b>D_RND_LST_ENA_T</b> | Title                            |
| <b>D_RND_LST_FTR</b>   | Footer                           |
| <b>D_RND_LST_HDR</b>   | Header                           |
| <b>D_RND_LST_SEL</b>   | Selected item in an enabled list |

---

### Examples

The following example enables the list whose ID is stored in **file\_lst**.

```
xcall l_enable(file_lst)
```

# L\_FINDSPEC – Specify parameters for a find operation



```
xcall L_FINDSPEC (list_id, [string], [column], [length], [direction], [case], [type], [current],
&                  [wrap][, find_source])
```

## Arguments

*list\_id*

The ID of the list to search. **(n)**

*string*

(optional) The string for which to search. **(a)**

*column*

(optional) The first column to search. **(n)**

*length*

(optional) The length of the search area (a maximum of 256 characters). **(n)**

*direction*

(optional) The direction of the search: **(n)**

**D\_LFND\_FRWD**                      Forward. (default)

**D\_LFND\_RVRS**                      Reverse.

*case*

(optional) The case-sensitivity flag: **(n)**

**D\_LFND\_CASE**                      Case sensitive. (default)

**D\_LFND\_NOCASE**                    Case insensitive.

*type*

(optional) The flag that indicates what type of search will occur: **(n)**

**D\_LFND\_CONTAIN**                    Search for a literal string. (default)

**D\_LFND\_PATTERN**                    Search for a wild card match.

**D\_LFND\_EQ**                          Search for equality.

**D\_LFND\_NE**                          Search for inequality.

**D\_LFND\_GT**                          Search for a string greater than.

**D\_LFND\_LT**                          Search for a string less than.

**D\_LFND\_GE** Search for a string greater than or equal to.

**D\_LFND\_LE** Search for a string less than or equal to.

*current*

(optional) The flag that indicates whether the current item is checked as part of the search: **(n)**

**D\_LFND\_NOCURR** Do not test current item. (default)

**D\_LFND\_CURR** Test current item.

*wrap*

(optional) The wrap-around find flag: **(n)**

**D\_LFND\_WRAP** Search to end of list and then wrap around to start at beginning of list until search string is found or original item is re-encountered.

**D\_LFND\_NOWRAP** Search only from the original item to the end of the list. (default)

*find\_source*

(optional) If passed and non-zero, the flag that indicates whether the non-window data or the associated input window (display data) will be searched: **(n)**

**D\_LFND\_DATA** Search non-window data. (default)

**D\_LFND\_DISPLAY** Search display data.

## Discussion

The L\_FINDSPEC subroutine specifies the parameters for subsequent find operations performed by a D\_LFIND request in the L\_PROCESS subroutine. This subroutine does not perform a search; it merely sets the parameters for subsequent find operations that will occur. If L\_FINDSPEC is called more than once, the parameters that it sets are combined. If any of these parameters contradict one another, the parameter that is set last overrides the others.

For example, if you make the following calls to L\_FINDSPEC:

```
xcall l_findspec(trans_lst, find_string,,D_LFND_RVRS,,D_LFND_NE,,
&                                D_LFND_DATA)
```

```
xcall l_findspec(trans_lst, find_string,,,D_LFND_NOCASE,D_LFND_EQ,,
&                                D_LFND_DISPLAY)
```

the following search parameters are defined:

- ▶ Reverse direction
- ▶ Case insensitivity
- ▶ Search for equality
- ▶ Search display data

If *string* is not passed, the previous find string is used. If none exists, a blank string is used.

If *find\_source* is D\_LFND\_DATA,

- ▶ the *column* argument specifies the position to start the search in the non-window data. If *column* is not passed or is zero, the previously specified value for *column* is used—even if this was specified in conjunction with D\_LFND\_DISPLAY. If there is no previous value for *column*, it is assumed to be 1. The value of the *column* argument is limited to the length of the non-window data. So, for example, if the non-window data has 60 columns, but *column* is passed as 61, only 60 are used.
- ▶ the *length* argument specifies the length of the area to search. This area begins at the position specified by *column*. If *length* is not passed or is zero, the previously specified value for *length* is used—even if this was specified in conjunction with D\_LFND\_DISPLAY. If there is no previous value for *length* and
  - ▶ a *data* argument was passed to L\_CREATE, the length of that argument is used as the initial value for *length*.
  - ▶ no *data* argument was passed to L\_CREATE, the total number of characters in the associated input window is used as the initial value for *length*.

The *length* argument is limited to the number of characters from *column* to the end of the non-window data. So, for example, if *length* is passed as 17 and there are 15 characters from *column* to the end of the non-window data, only 15 characters are used.

If *find\_source* is D\_LFND\_DISPLAY,

- ▶ the *column* argument specifies the position to start the search in the associated input window. A value of 1 specifies the first column in the first row. A value of 2 specifies the second column in the first row, and so forth. If *column* is greater than the number of columns in the input window, the position wraps to subsequent rows. If *column* is not passed or is zero, the previously specified value for *column* is used—even if this was specified in conjunction with D\_LFND\_DATA. If there is no previous value for *column*, it is assumed to be 1. The *column* argument cannot be greater than the number of rows multiplied by the number of columns in the input window. So, for example, if the number of rows multiplied by the number of columns equals 60, but *column* is passed as 61, only 60 are used.
- ▶ the *length* argument specifies the length of the area to search. This area begins at the position specified by *column* and continues by column, wrapping to subsequent rows if necessary. If *length* is not passed or is zero, the previously specified value for *length* is used—even if this was specified in conjunction with D\_LFND\_DATA. If there is no previous value for *length* and
  - ▶ a *data* argument was passed to L\_CREATE, the length of that argument is used as the initial value for *length*.
  - ▶ no *data* argument was passed to L\_CREATE, the total number of characters in the associated input window is used as the initial value for *length*.

The *length* argument is limited to the number of characters from *column* to the last column and row of the input window. So, for example, if *length* is passed as 17 and there are 15 characters from *column* to the last column and row of the input window, only 15 characters are used.



If *find\_source* is not passed or is zero, the previously specified value for *find\_source* is used. If there is no previous value for *find\_source*, the value is assumed to be

- ▶ D\_LFND\_DATA if a *data* argument was passed to L\_CREATE.
- ▶ D\_LFND\_DISPLAY if no data argument was passed to L\_CREATE.

If *direction* is not passed, the previous direction value will be used. If no previous direction exists, the search will go forward.

You can pass the %I\_FLDSTRPOS (page 8-42), %I\_FLDSIZE (page 8-41), and/or %I\_FLDDIM (page 8-23) field information functions in place of passing *column* and *length*. An example of these functions used with the L\_FINDSPEC subroutine is on page 8-42.

If *case* is not passed, the previous case value will be used. If no previous case value exists, the search will be case sensitive.

If *type* is not passed, the previous find type is used. If no previous find type exists, D\_LFIND searches for a literal string (D\_LFND\_CONTAIN). The following rules apply to the *type* flags:

- ▶ If D\_LFND\_PATTERN is passed, the Synergy DBL S\_MATCH subroutine is used to compare the search string with the designated area of the *data* argument passed to L\_PROCESS.
- ▶ If D\_LFND\_CONTAIN is passed, the intrinsic function %INSTR is used instead of S\_MATCH.
- ▶ If D\_LFND\_EQ, D\_LFND\_NE, D\_LFND\_GT, D\_LFND\_LT, D\_LFND\_GE, or D\_LFND\_LE is passed, the corresponding Synergy DBL comparison operator is used.

If *current* is not passed, the previous testing value will be used. If no previous value exists, D\_LFIND won't test the current item. The following rules apply to the *current* flags:

- ▶ If D\_LFND\_CURR is passed, the search for a matching item during the next find begins with the current item.
- ▶ If D\_LFND\_NOCURR is passed, the search begins with the next item in the specified direction.

## Examples

The following example defines search parameters for the list identified by **order\_lst**. If this is the first and only call to L\_FINDSPEC, the L\_PROCESS subroutine will search the list for a case-sensitive match for **find\_string** (a literal string). The search will start with the item that follows the current one and search forward through the list. The entire data area passed to L\_PROCESS will be searched. If needed, L\_PROCESS will call the load method for this list to retrieve additional items.

```
xcall l_findspec(order_lst, find_string,,,,,D_LFIND_DATA)
req = D_LFIND
xcall l_process(order_lst, req, order_rec)
```

## %L\_FINDWND – Construct a find window for L\_SELECT



```

window_id = %L_FINDWND (list_id, window_name, field_name, [prompt], [search]
&                        [, nofindspec])

```

### Return value

*window\_id*

The %L\_FINDWND function returns the ID of the created window or zero if an error occurred. (**^VAL**)

### Arguments

*list\_id*

The ID of the list. (**n**)

*window\_name*

A unique name for the window to be constructed (a maximum of 15 characters). (**a**)

*field\_name*

The name of the field on which to base the find. (**a**)

*prompt*

(optional) The prompt for input. (**a**)

*search*

(optional) The true/false flag that, when returned, will indicate whether an existing *window\_name* was found. (**n**)

*nofindspec*

(optional) The true/false flag that indicates whether this function should perform without calling L\_FINDSPEC. (**n**)

### Discussion

The %L\_FINDWND function creates an input window for a find string, based on a field within the input window associated with a list. The resulting input window is designed to be passed to L\_SELECT as the *find\_window* argument.

By using this function, you assure that the data storage format of the input find string will match that of the target field, including length, type, and enumeration. This function also optionally calls L\_FINDSPEC to establish the position and length of the target field for the find. The assumption

here is that the optional data passed to `L_SELECT` matches the input window data structure containing the target field. Even if this is not a correct assumption, however, you can call `L_FINDSPEC` subsequently to adjust.

*Window\_name* must be a unique window name. If *search* is passed and a window with *window\_name* already exists, *search* is returned true and no construction of the window occurs (`L_FINDSPEC` can still be called). *Search* is returned false if the window did not already exist. If *search* is not passed and the window already exists, a fatal error occurs.

*Field\_name* must be the name of an input field within the input window associated with the list indicated by *list\_id*. If not, a fatal error occurs.

If *prompt* is passed, it will be used as the prompt for the input field in the constructed window. Otherwise, the default find prompt will be used, which is defined in the message file (**`syntxt.ism`**), facility DTK, mnemonic `FINDPRMPT`. *Prompt* is positioned at row 2, column 2 of the constructed window, and the field immediately follows (one space is added to the trimmed value of the default prompt, if used—if *prompt* is passed, it must contain any trailing spaces desired).

The window is sized to have one empty row and one empty column before and after the input field (including prompt).

The input field inherits all attributes of the target field, except for the following:

- ▶ Prompt position
- ▶ Prompt
- ▶ Field position
- ▶ Break (always false)
- ▶ Auto (always false)
- ▶ Allow (unless enumerated)
- ▶ Range

The constructed window only contains an input field for the find string itself. It does not provide access to the other find parameters. (See the information on the *find\_window*, *find\_init*, and *find\_column* arguments in [L\\_SELECT on page 9-131](#).)

By default, this function calls `L_FINDSPEC` to establish the position and length of the target field for the find. If *nofindspec* is passed and true, this will not occur.

You do not need to declare this function to use it. It is defined in **`tools.def`**.

## Examples

In the following example, %L\_FINDWND is called to construct an input window named “i\_findacct” for entering an account number to find. If a window by that name already exists, the existing window will be used instead and **srch** will be returned true.

```
findid = %l_findwnd(acct_list, "i_findacct", "account_num",
    &
    "Find account ", srch)
xcall u_window(D_PLACE, findid, 12, 40, D_REMOVE, findid)
xcall l_select(acct_list, req, acct_rec,,,,,,,, findid)
```

The account number field will inherit attributes from the “account\_num” field in the input window associated with the list whose ID is **acct\_lst**. The prompt for the field will be “Find account.”

L\_FINDSPEC will be called by %L\_FINDWND to establish the position and length of the find data as the position and length of the “account\_num” field within a structure in the list’s input window.

Next, U\_WINDOW is called to establish the placement of the resulting window. Then the window is removed so that it will not be visible until needed. The ID is passed to L\_SELECT so that the window can be “popped up” when the user selects the S\_FIND menu entry.

## L\_GLOBAL – Promote a list to global status



```
xcall L_GLOBAL(list_id)
```

### Arguments

*list\_id*

The ID of the list to be promoted. (**n**)

### Discussion

The L\_GLOBAL subroutine promotes the list's associated input window to global status, along with any other window (header, footer, and so forth) that may be associated with the list.

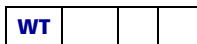
If *list\_id* is already global, this subroutine will be ignored. Otherwise, if *list\_id* is not local to the current environment, a fatal error occurs.

### Examples

In the following example, L\_CREATE returns the variable **lstid** with the list ID, and the L\_GLOBAL subroutine promotes that list to global status.

```
xcall l_create(lstid, inpid)  
xcall l_global(lstid)
```

## %L\_ICON – Set a list icon



```
status = %L_ICON(list_id, filename[, index])
```

or

```
xcall L_ICON(list_id, filename[, index])
```

### Return value

*status*

On Windows, %L\_ICON returns true if the icon was loaded, and false otherwise. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*list\_id*

The ID of the list. (n)

*filename*

The name of the icon file to use. (a)

*index*

(optional) The index within *filename* of the icon to load (1-based). (n)

### Discussion

%L\_ICON sets an icon for a Toolkit list or ActiveX Toolkit list control.

The icon is used for the system menu, which is displayed if a close, move, size, minimize, or maximize method is associated with the window. See [%U\\_WNDEVENTS on page 16-214](#) for the circumstances under which a system menu is displayed. The L\_METHOD subroutine must also be called to associate a %U\_WNDEVENTS method set with the list.

You must either include **WND:tools.def** or use the **-X** compiler option. Otherwise, a compilation error will occur.

If *list\_id* is not the ID of an active list, an error is generated.

*Filename* can be an **.ico** file, a DLL, an executable program (**.exe**), or a bitmap image (**.bmp**). You can use environment variables in *filename*. If *filename* is invalid, no error is generated, however the return value will be false and the list's icon will remain unmodified.

A file can contain multiple icons. Setting *index* specifies which icon to use. The default is 1, and a value of 0 sets the icon to the default Windows system icon. Note that for an **.ico** file, *index* must be set to 1.

## See also

[%U\\_ICON on page 16-90](#) for more information on setting a window icon.

## Examples

The following example sets the list icon to the third icon in the **iconfil.dll** file. If the icon could not be found, an error is displayed.

```
if (.not.(%l_icon(list, "iconfil.dll", 3)))  
  xcall u_message("Could not set icon")
```

## L\_INPFLD – Perform single-field input within a list



```
xcall L_INPFLD (list_id, field_name, data_location, [data], [disabled], [input_column],
&               [select_column], [text_column], [init_char]
&               [, a_methoddata1, ..., a_methoddata20], {reserved})
```

### Arguments

*list\_id*

The ID of the list. **(n)**

*field\_name*

The field to process. **(a)**

*data\_location*

Where to place the input data. **(a or n)**

*data*

(optional) The non-window list item data. **(a)**

*disabled*

(optional) The disabled item status. **(n)**

*input\_column*

(optional) The input column ID. **(n)**

*select\_column*

(optional) The selection column ID. **(n)**

*text\_column*

(optional) The text column ID. **(n)**

*init\_char*

(optional) The first character to input (specified as a decimal value). **(n)**

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. **(any)**

*{reserved}*

Reserved for internal use. **(n)**



## Discussion

This subroutine performs the same function as the input subroutine `I_INPFLD`, except `L_INPFLD` performs the function for a field contained within a list. See [L\\_INPFLD on page 8-53](#) for information on the arguments you can pass to `L_INPFLD` and the menu entries recognized by `L_INPFLD`.

Whether or not the *data* argument is passed must correspond to whether it was passed in the `L_CREATE` subroutine when the list was created. *Data* is required here if it was also passed to `L_CREATE`. If *data* is passed here but was *not* passed to `L_CREATE`, a fatal error occurs.

Note that by default, Toolkit does not ensure that the size of *data\_location* matches the size of *field\_name* or that it is even large enough for *field\_name*. However, bounds checking can check for the following conditions. (See “[g\\_dtkbounds](#)” on [page 18-3](#) for more information.)

- ▶ If **g\_dtkbounds** is set to 1, Toolkit generates a fatal error if *data\_location* is not large enough for *field\_name*.
- ▶ If **g\_dtkbounds** is set to 2 or greater, Toolkit generates a fatal error if *data\_location* is not large enough for *field\_name* (as it does if *g\_dtkbounds* is set to 1), and it generates a non-fatal error if *data\_location* is large enough, but isn't the exact size of *field\_name*.

*Disabled* is a true/false flag that indicates whether the current item is disabled. Whether or not the *disabled* argument is passed must correspond to whether it was passed to other list routines such as `L_CHR`, `L_DATA`, `L_INPUT`, `L_PROCESS` and `L_SELECT`. See [L\\_PROCESS on page 9-114](#) for more information about the disabled item status.

---

## UNIX, VMS

If passed, *init\_char* is converted to its alpha (ASCII) equivalent and placed into the field as if it were the first character entered by the user. *Init\_char* is ignored on Windows.

---

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to `L_INPFLD`. `L_INPFLD`, in turn, passes them directly to each field's methods. This allows you to communicate additional information to your input field methods.

When this subroutine returns, either field entry has been completed or a menu entry has been selected.

If you are using `L_SELECT` you do not need to call this subroutine because `L_SELECT` handles list input.

---

## WIN

In Windows environments, the user can change the current item in the list with the mouse or the PAGE UP, PAGE DOWN, HOME, END, and arrow keys before this subroutine returns. Therefore, if you want any special processing to be done when arriving at or leaving a list item, you must write and use an arrive or leave method. (In Windows environments, these keys are “privatized” and

unavailable to calling routines unless you use L\_RETURNKEY to return the key out of the list. “Privatized” means that they are reserved for the private use of the graphical control, which in this case would be the list.)

---

### See also

- ▶ [L\\_INPFLD on page 8-53](#) for more information about the arguments you can pass and for information about handling the input processing.
- ▶ [LARRIVE\\_METHOD/LLEAVE\\_METHOD on page 9-152](#) for more information on writing an arrive or leave method subroutine.
- ▶ [“Using Lists in Toolkit Applications” on page 9-4](#) for information on the differences between Toolkit lists and ActiveX Toolkit lists.

## L\_INPUT – Perform input to a set within a list



```
xcall L_INPUT (list_id, [set_name], record, [data], [disabled], [input_column],
&               [select_column], [edit_column], [no_termination], [init_char], {reserved}
&               [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*list\_id*

The ID of the list. **(n)**

*set\_name*

(optional) The name of the input set. **(a)**

*record*

The input set's record. **(a)**

*data*

(optional) The non-window list item data. **(a)**

*disabled*

(optional) The disabled item status. **(n)**

*input\_column*

(optional) The input column ID. **(n)**

*select\_column*

(optional) The selection column ID. **(n)**

*edit\_column*

(optional) The edit column ID. **(n)**

*no\_termination*

(optional) The flag that tells L\_INPUT to skip set termination processing: **(n)**

**D\_NOTERM**

Disable termination processing.

*init\_char*

(optional) The first character to input (specified as a decimal value). **(n)**

*{reserved}*

A reserved placeholder for a future UI Toolkit argument. You do not specify any argument here, but *do* add the additional comma.

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

L\_INPUT performs essentially the same function as the input subroutine I\_INPUT, but targeted to an input set contained within a list. See [L\\_INPUT on page 8-57](#) for information on the arguments you can pass to L\_INPUT and the menu entries recognized by L\_INPUT, and note that if you are using L\_SELECT, you do not need to call this subroutine because L\_SELECT handles list input.

When this subroutine returns, one of the following has occurred:

- ▶ Input to the set has been completed.
- ▶ A break field has been entered.
- ▶ A menu entry has been selected.
- ▶ TAB from the last field of an item in L\_INPUT when the list is part of a composite window. This signals “C\_NEXT”.
- ▶ SHIFT+TAB from the first field of an item in L\_INPUT when the list is part of a composite window. This signals “C\_PREV”.

L\_INPUT calls L\_PROCESS to update the current item before performing input. This means that you should include the fourth argument (*data*) in order to preserve the list item data.

Whether or not the *data* argument is passed must correspond to whether it was passed in the L\_CREATE subroutine when the list was created. Note the following:

- ▶ *Data* is required here if it was also passed to L\_CREATE. If *data* is passed here but was *not* passed to L\_CREATE, a fatal error occurs.
- ▶ We highly recommended that the list *data* also contain the input data for the set. Otherwise, confusion may result over the contents of the input set data as list items are changed interactively.
- ▶ By default, Toolkit does not ensure that *data* is large enough. If it isn't, Toolkit generates an error only if **g\_dtkbounds** is set to 1 or greater. See “[g\\_dtkbounds](#)” on page 18-3.

*Disabled* is a true/false flag that indicates whether the current item is disabled. Whether or not the *disabled* argument is passed depends on whether it was passed to L\_CREATE. See [L\\_PROCESS on page 9-114](#) for information about the disabled item status.

---

**WIN**

The *no\_termination* argument is ignored on Windows. The input window is always treated as if D\_NOTERM were specified. This is necessary to support item-to-item movement within the list during input.

In Windows environments, the user can change the current item in the list with the mouse or the PAGE UP, PAGE DOWN, HOME, END, and arrow keys before this subroutine returns. Therefore, if you want any special processing to be done when arriving at or leaving a list item, you will have to write and use an arrive or leave method. (In Windows environments, these keys are “privatized” and unavailable to calling routines unless you use L\_RETURNKEY to return the key out of the list. “Privatized” means that they are reserved for the private use of the graphical control, which in this case would be the list.)

L\_INPUT has the following limitations:

- ▶ Multi-line text fields are not supported within Toolkit lists or ActiveX Toolkit lists.
- ▶ Selection fields (SELECT or SELWND) are not supported within Toolkit lists.
- ▶ Radio button fields are not supported within Toolkit lists. Within ActiveX Toolkit lists, radio buttons are rendered as if they were selection fields.
- ▶ Check box fields are not supported within Toolkit lists.
- ▶ Drill methods are supported by the menu entry I\_DRILL, but no drilldown button is displayed.
- ▶ Hyperlink methods are supported by the menu entry I\_HYPER, but the prompt cannot be clicked on to launch I\_HYPER, nor is the prompt rendered green.
- ▶ Noecho fields do not work properly in Toolkit lists. For ActiveX Toolkit lists, asterisks (\*) are displayed.
- ▶ When using ActiveX Toolkit lists, the first field in the list will be selected regardless of whether or not that field is in the current input set.
- ▶ We recommend that you use a fixed font for Toolkit lists; columns may not line up as expected when a proportional font is used.
- ▶ If you do use a proportional font for Toolkit lists, note that bold proportional fonts use an actual bold font, rather than rendering bold as a color change the way fixed fonts do. Consequently, bold characters are more likely to be truncated because Toolkit determines the width of the field or prompt using a non-bold (normal) font.

---

**UNIX, VMS**

If passed, *init\_char* is converted to its alpha (ASCII) equivalent and placed into the field as if it were the first character entered by the user. *Init\_char* is ignored on Windows.

---

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to L\_INPUT. L\_INPUT, in turn, passes them directly to each field's methods. This allows you to communicate additional information to your input field methods.



Toolkit passes the method data arguments to the current list processing routine (L\_PROCESS, L\_INPUT, or L\_SELECT) and to the list methods. Thus, if you pass data arguments to one list processing routine, to ensure these arguments are always available, you must pass them to *all* of the list processing routines.

---

### See also

- ▶ [L\\_INPUT on page 8-57](#) for more information about the arguments you can pass and for information about handling the input processing.
- ▶ [L\\_METHOD on page 9-107](#) for more information on registering a method with the list processor.
- ▶ [“Using Lists in Toolkit Applications” on page 9-4](#) for information on the differences between Toolkit lists and ActiveX Toolkit lists.

## L\_METHOD – Register a list method



```
xcall L_METHOD(list_id, event_method_pair[, ...])
```

### Arguments

*list\_id*

The ID of the list. (n)

*event\_method\_pair*

Has the following format:

*method\_option[, method\_routine | method\_set\_id]*

*method\_option*

One of the following:

**D\_LARRIVE**

Set or clear the arrive method. To specify an arrive method, pass this with *method\_routine*. To clear any arrive method associated with the list, pass D\_LARRIVE, but omit *method\_routine*. (Do not use *method\_set\_id* with this option.)

**D\_LDBLCLK**

Set or clear the double-click method. To specify a double-click method, pass this with *method\_routine*. To clear any double-click method associated with the list, pass D\_LDBLCLK, but omit *method\_routine*. (Do not use *method\_set\_id* with this option.)

**D\_LLEAVE**

Set or clear the leave method. To specify a leave method, pass this with *method\_routine*. To clear any leave method associated with the list, pass D\_LLEAVE, but omit *method\_routine*. (Do not use *method\_set\_id* with this option.)

**D\_LLOAD**

Set or clear the load method. To specify a load method, pass this with *method\_routine*. To clear any load method associated with the list, pass D\_LLOAD, but omit *method\_routine*. (Do not use *method\_set\_id* with this option.)

**D\_LWNDEVENT**

Set or clear an event method set. To specify an event method set for the list, pass this with *method\_set\_id*. To clear any events method set associated with the list, pass D\_LWNDEVENT, but omit *method\_set\_id*. (Do not use *method\_routine* with this option.)

## List Routines

### L\_METHOD

#### *method\_routine*

The name of a method that L\_PROCESS or L\_SELECT will call to load new items onto the list, perform arrive or leave processing for a list item, or process double-click events.

*Method\_routine* must either be contained within the current program image or in an executable library (ELB) that was either linked to or opened with OPENELB. (a)

#### *method\_set\_id*

The ID for a method set that will process mouse events for the list. This must be an ID returned from a D\_CREATE call to %U\_WNDEVENTS. (n)

## Discussion

The L\_METHOD subroutine registers method routine names with the list processor. Use L\_METHOD if you want to do additional processing when the user initiates the specified event. When that event occurs, UI Toolkit will call the method you specify. (You write your own *method\_routines*.) L\_METHOD settings override L\_CLASS and .LISTCLASS method settings.

You may specify more than one method in a single L\_METHOD call. However, if you omit a *method\_routine* or *method\_set\_id* argument, you must include a comma placeholder if further method specifications follow. For example, the following specifies a load method and an arrive method and clears any leave method associated with the list. (Note the comma placeholder after D\_LLEAVE.)

```
xcall l_method(lstid, D_LLOAD, "loadmethod", D_LLEAVE,, D_LARRIVE,  
& "arrivemethod")
```

---

## WIN

If you don't populate the list with the L\_PROCESS requests D\_LAPPEND or D\_LINSERT, you must write load method (and use D\_LLOAD to specify that method) if you want scrolling enabled. Additionally, if you are changing the load method and restarting the list (using L\_RESTART), you must call L\_METHOD first. Unlike UNIX and OpenVMS environments, your load method will be called immediately, rather than on the next call to L\_PROCESS, and calling L\_METHOD first will not affect the way applications on UNIX or OpenVMS perform.

---



## See also

- ▶ [LLOAD\\_METHOD](#) on page 9-158 for more information on writing load methods.
- ▶ [LARRIVE\\_METHOD/LLEAVE\\_METHOD](#) on page 9-152 for more information on writing arrive and leave processing methods.
- ▶ [LDBLCLICK\\_METHOD](#) on page 9-155 for more information on writing double-click processing methods.
- ▶ [%UWNDEVENTS\\_METHOD](#) on page 16-249 for more information on writing window events methods.
- ▶ “Appendix D: Methods”.

## L\_NEXT – Set selected item by number



```
xcall L_NEXT(list_id, itemno)
```

### Return value

*status*

This function always returns true. (i)

### Arguments

*list\_id*

The ID of the list. (n)

*itemno*

The row number of the list item you want selected. (n)

### Discussion

The L\_NEXT subroutine enables you to specify which list item will be selected when a list is next processed. It queues a request to set the selected item for a list to the *n*th item where *n* is the value passed as *itemno*. As with L\_QUEUE, the selection is queued so that actions queued before the call to L\_NEXT occur before the selection, and actions queued after the call to L\_NEXT occur after the selection. Note the following:

- ▶ Call L\_NEXT before calling L\_PROCESS or a routine that calls L\_PROCESS (such as L\_SELECT or L\_INPUT). L\_NEXT queues a request, but an L\_PROCESS call is required to actually set the specified item.
- ▶ If the selection is successful, the found status of the list (the L\_STATUS flag D\_LFOUND) is set to 1.
- ▶ If the requested item cannot be accessed (in other words, if *itemno* is less than 1 or greater than the number of items in the list), the list selection remains unchanged, and the found status of the list is set to zero.
- ▶ If item numbering within the list is changed (by loading more or fewer items at the top than expected), the item is selected according to the most recent numbering scheme. This means that item 1 always selects the top item in the list. However, this also means that using the L\_STATUS subfunction D\_LCURITM to retrieve the current item number and then using L\_NEXT in an attempt to return to that item after loading items may cause L\_NEXT to access a different item.

## Examples

In the following example, the `D_LCURITM` subfunction of `L_STATUS` is used to save the current item number. The example then navigates to the end of the list to ensure that all items have been loaded, enabling `D_LLASTITM` to get the total number of items. Finally, `L_NEXT` returns the list to the previously selected item.

```
xcall l_status(listid, D_LCURITM, itmno)           ;Fetch current item.  
xcall l_process(listid, request=D_LBOTTOM, data)   ;Go to the end to load  
                                                    ; all items.  
xcall l_status(listid, D_LLASTITM, numitems)       ;Get number of items.  
xcall l_next(listid, itmno)                        ;Specify where to go.  
xcall l_process(listid, request=D_LNOP, data)      ;This actually does it.
```

## L\_PLACE – Place a list



```
xcall L_PLACE(list_id, [row][, column])
```

### Arguments

*list\_id*

The ID of the list to place. (**n**)

*row*

(optional) The row position for the list. (**n**)

*column*

(optional) The column position for the list. (**n**)

### Discussion

The L\_PLACE subroutine places a list. After you have placed the list, if you remove it at a subsequent environment level, the list will automatically be placed again when you call E\_EXIT to exit that later environment.

If *row* and/or *column* is not passed, the default position is the previous row and/or column placement position. If no previous position exists, the list will be placed at the row and/or column position that was specified when the list was created.

### See also

[L\\_REMOVE on page 9-123](#) for information on removing a list.

### Examples

The following example moves the list, whose ID is stored in **order\_lst**, vertically to row 5. The horizontal position will be the same as the previous placement, if it's valid, or the original placement.

```
xcall l_place(order_lst, 5)
```

The next example removes the list whose ID is stored in **trans\_lst**, and then processes the menu. If the user selects the menu entry whose name is "PRCTRNS," the list will be placed at its previous location.

```
xcall l_remove(trans_lst)
xcall m_process
case g_entnam of
```

```
begincase
    .
    .
    .
"PRCTRNS": begin                                ;Place the list at
    xcall l_place(trans_lst)                    ; previous position
    call process                                ;Process the list
end
endcase
```

## L\_PROCESS – Process a list



```
xcall L_PROCESS (list_id, request, [data], [disabled]
&                [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*list\_id*

The ID of the list to process. (**n**)

*request*

One of the following requests (which must be passed as a variable). (**n**)

Passed requests that L\_PROCESS can accept are

|                   |                                                   |
|-------------------|---------------------------------------------------|
| <b>D_LNOP</b>     | No request, but update the current item.          |
| <b>D_LLOADBOT</b> | Request to load at the bottom has been satisfied. |
| <b>D_LLOADTOP</b> | Request to load at the top has been satisfied.    |
| <b>D_LEOF</b>     | No more items to load at this end.                |
| <b>D_LUP</b>      | Position up one item.                             |
| <b>D_LDOWN</b>    | Position down one item.                           |
| <b>D_LLEFT</b>    | Scroll left.                                      |
| <b>D_LRIGHT</b>   | Scroll right.                                     |
| <b>D_LTOP</b>     | Position to the first item.                       |
| <b>D_LBOTTOM</b>  | Position to the last item.                        |
| <b>D_LPGUP</b>    | Position up one page.                             |
| <b>D_LPGDN</b>    | Position down one page.                           |
| <b>D_LPGTOP</b>   | Position to the top of the page.                  |
| <b>D_LPGBOT</b>   | Position to the bottom of the page.               |
| <b>D_LINSERT</b>  | Insert a new item before the current item.        |

|                                                   |                                                                                                    |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>D_LAPPEND</b>                                  | Insert a new item after the current item.                                                          |
| <b>D_LDELITEM</b>                                 | Delete the current item.                                                                           |
| <b>D_LMOVEUP</b>                                  | Move the current item up one place.                                                                |
| <b>D_LMOVEDN</b>                                  | Move the current item down one place.                                                              |
| <b>D_LFIND</b>                                    | Find an item between 1 and 256 characters.                                                         |
| <b>D_LCANCEL</b> or <b>D_LRESTORE</b>             | Don't update the current item; instead, restore the previous contents of the window and data area. |
| <b>D_LEXTENDBOT</b>                               | Reopen the bottom of the list.                                                                     |
| <b>D_LEXTENDTOP</b>                               | Reopen the top of the list.                                                                        |
| Returned requests that L_PROCESS can generate are |                                                                                                    |
| <b>D_LNOP</b>                                     | No request.                                                                                        |
| <b>D_LLOADBOT</b>                                 | Load a new item at the bottom.                                                                     |
| <b>D_LLOADTOP</b>                                 | Load a new item at the top.                                                                        |
| <b>D_LABORT</b>                                   | Fatal list error.                                                                                  |

*data*

(optional) The associated non-window data. (**a**)

*disabled*

(optional) The disabled item status. (**n**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

The L\_PROCESS subroutine processes a list.

*Request* must be passed as a variable. See “[Requests](#)” below for more information on the values that can be passed and values that are returned.

Whether or not the *data* argument is passed must correspond to whether it was passed in the L\_CREATE subroutine when the list was created. *Data* is required here if it was also passed to L\_CREATE. If *data* is passed here but was *not* passed to L\_CREATE, a fatal error occurs. (Non-window data is additional information that you don't want displayed, but that you want to be maintained with the list.)

*Disabled* is a true/false flag that indicates whether the current item is disabled. Whether or not the *disabled* argument is passed must correspond to whether it was passed to other list routines such as L\_CHR, L\_DATA, L\_INPFLD, L\_INPUT and L\_SELECT.

If *disabled* is present and non-zero, the current item will be disabled. Otherwise, the current item will be disabled only if the entire list is disabled.

The *disabled* argument will be returned with the enabled/disabled status of the item. On return, *disabled* will be false (0) if the item inherited the entire list's enabled/disabled status, regardless of whether the list is actually enabled or disabled.

A disabled list item is designated by the "Disabled list" rendition. (See the **tools.def** file.) While a list item's appearance may be affected by the disabled flag, Toolkit processing is *not* affected by the fact that an item is disabled. Your calling routine is solely responsible for assigning significance to the disabled state of an item: you can leave the item as is, make it uneditable, or process it some other way. For example, the L\_SELECT subroutine (which calls L\_PROCESS) does not allow the user to select a disabled item, and you can make it skip over disabled items completely by passing a non-zero value in the *skip\_disabled* argument.

---

## WIN

Disabled list entries have no meaning in a Windows environment.

---

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to L\_PROCESS. L\_PROCESS, in turn, passes them directly to each field's methods. This allows you to communicate additional information to your input field methods.

---



Toolkit passes the method data arguments to the current list processing routine (L\_PROCESS, L\_INPUT, or L\_SELECT) and to the list methods. Thus, if you pass data arguments to one list processing routine, to ensure these arguments are always available, you must pass them to *all* of the list processing routines.

---

The first time this subroutine is called after the list is created, it initiates the loading of the first window full of items.

Unlike many of the processing routines in UI Toolkit, L\_PROCESS doesn't perform input. The calling routine must perform any input and interpret any menu entry selections.

A list does not have to be placed to be processed.

If you are currently processing more than one list, you must call L\_PROCESS or L\_SELECT with *request* set to D\_LRESTORE before calling any list processing routine when changing context from one list to the other.



## Requests

D\_LNOP, D\_LLOADBOT, and D\_LLOADTOP are the only requests that can be both passed to and returned from the L\_PROCESS subroutine. The D\_LABORT flag should *not* be passed to L\_PROCESS.

If an LLOAD\_METHOD subroutine has been specified, L\_PROCESS will call it every time a new list item is needed. LLOAD\_METHOD can be specified with the .LISTCLASS script command, or with the L\_CLASS or L\_METHOD subroutines.

---

## WIN

In a Windows environment, you must use a load method to support scrolling.

---

If no load method is specified for the list, L\_PROCESS returns to the calling routine with *request* set to D\_LLOADBOT or D\_LLOADTOP, depending on which kind of loading is to be done initially. (See [L\\_CREATE](#) on page 9-76.)

Always set *request* to D\_LEOF for a load request that you don't support. For example, if you support D\_LLOADBOT but not D\_LLOADTOP, you'd set *request* to D\_LEOF if D\_LLOADTOP was returned.

Before requesting a load, L\_PROCESS sets both the data in the input window and the optional *data* argument to whatever they contained when the list was created. This state of the data is called the "initial" state for an item, and it can be useful when you're loading prompts or other static or default data.

The load method (or calling routine, if no load method exists) should honor requests from L\_PROCESS immediately. When loading is requested, you must do the following:

- ▶ Obtain the necessary data.
- ▶ Display any appropriate information in the associated input window.
- ▶ Load the optional *data* argument with the associated non-window data.
- ▶ Set the optional *disabled* flag to indicate the disabled state of the item.
- ▶ Return to L\_PROCESS again with *request* still set to the load request (which acknowledges the request).

Between the time you get a load bottom or load top request and the time you return to L\_PROCESS again, do not do any screen I/O (for example, M\_PROCESS or U\_UPDATE).

If no more items are available for the requested load, the load method (or calling routine) must return to L\_PROCESS with *request* set to D\_LEOF, to signal this state to the list processor. If no items have been loaded into the list, the processor will leave only one null item in the list, unless the NONULL option was specified for this list's class. In the latter case, the D\_LABORT flag will be returned to indicate a fatal error.

This loop continues until you either send a D\_LEOF flag or load the first window full of items. When one of these events occurs, the list processor repositions the list to the first item loaded.

If D\_LABORT is returned, a fatal list error has occurred and you will need to delete the list. You can call L\_STATUS to get the reason for the error.

The D\_LEOF request tells the processor that no more items are available for loading at the requested end of the list.

D\_LUP and D\_LDOWN tell the processor to move the list's positional indicator to the previous or next item in the list and to make that item the current one. You cannot move to a previously deleted item. If the indicator is already positioned at the end of the list, the keyboard will beep. If the indicator is already positioned at the end of a page, the list will be scrolled one item in the desired direction.

The horizontal display can change in one of three ways:

- ▶ You call L\_VIEW.
- ▶ UI Toolkit adjusts the input window display automatically if the user moves to a field that was previously off the screen.
- ▶ You send a D\_LLEFT or D\_LRIGHT request to the L\_PROCESS subroutine.

The D\_LLEFT and D\_LRIGHT requests only have an effect if the display area is narrower than the full window. They tell the processor to move the display area of the list to the left or to the right. The display area of the associated input window moves as well. The number of characters that move at one time is half the width of the display area.

Movement can only occur within the display area boundaries. If the current position is on the left or right boundary, no movement occurs in that direction.

The D\_LTOP and D\_LBOTTOM requests tell the processor to position to the first or last item in the list, respectively. If the indicator is already positioned at the specified end of the list, nothing will happen.

The D\_LPGUP and D\_LPGDN requests tell the processor to position up or down one page, respectively. A page is defined as the number of visible items. If the top or bottom of the list is encountered before the appropriate number of items has been reached, the first or last item in the list will become the current item.

The D\_LPGTOP and D\_LPGBOT requests tell the processor to position to the first or last item that is currently visible. If the indicator is already on that item, nothing will happen.

The D\_LINSERT and D\_LAPPEND requests tell the processor to open a new item before or after the current item, respectively, and make the new item the current item. If you want to insert or append an item somewhere other than adjacent to the current item, you must first move to that location and then use D\_LAPPEND or D\_LINSERT.

The `D_LDELITEM` flag tells the processor to delete the current item from the list. The next item, if one exists, becomes the current item. If no next item exists, the previous item becomes the current item. If the only remaining item in a list is deleted, the processor will leave only one null item in the list, unless the `NONULL` option was specified for this list's class. In the latter case, the `D_LABORT` flag will be returned to request that the list be deleted.

The `D_LMOVEUP` and `D_LMOVEDN` requests switch the position of the current item with the previous or next item in the list, respectively. If either the beginning or end of a page is encountered, the current item remains at the page boundary, and the new, previously concealed item with which it is being swapped appears below or above that item, with all other visible items scrolled appropriately.

The `D_LFIND` flag tells the processor to find the next item that matches the criteria set up by any previous calls to the `L_FINDSPEC` subroutine. (See [L\\_FINDSPEC on page 9-90](#) for more information.) If a matching item is not found, the current item remains the same. You can find out whether `D_LFIND` was successful by calling the `L_STATUS` subroutine.

The `D_LCANCEL` (or `D_LRESTORE`) flag tells the processor not to update the list from the input window and the *data* argument. Instead, the input window and *data* are loaded with the previous contents of the current item. (The list will display the same current item that was there before, instead of the data that was just passed.) Any optional disabled flag and input window controls will be updated if you specified the `INPUT_SNAPSHOT` option when you created the list class. (See [.LISTCLASS on page 2-96](#) for information about `INPUT_SNAPSHOT`.)

`D_LEXTENDBOT` and `D_LEXTENDTOP` tell the processor to reopen the previously closed bottom or top of the list, respectively. Even if `D_LEOF` was passed back to `L_PROCESS` on a previous load request for the bottom or top of the list, the processor can now request that more items be loaded at that end of the list.

## See also

[L\\_CHR on page 9-66](#), [L\\_INPFLD on page 9-100](#), [L\\_INPUT on page 9-103](#), and [L\\_SELECT on page 9-131](#) for more information on processing input within a list.

## Examples

The following example processes the list identified by **lstid**. On entry, **req** contains the request to be processed by `L_PROCESS`. On return, it contains any request to be processed by the calling routine. By default, it is enabled.

```
xcall l_process(lstid, req, lst_data)
```

The next example processes the list identified by **lstid**. On entry, **req** contains the request to be processed by `L_PROCESS`. In this example, no initial action has been requested. The paragraph **satisfy\_request** will perform the request returned from `L_PROCESS`. This could be either to load data into the list (if no load method was specified) or to abort the list. **Satisfy\_request** will set **req**

to indicate the result of the performed action. The paragraph **do\_input** is called only when all requests from the list processor are satisfied. It may generate requests to the list processor based on menu entries selected by the user.

```
do
  begin
    xcall l_process(lstrd, req=D_LNOP, journal_rec)
    if (req) then
      call satisfy_request ;List processing requests
                           ;must be handled first
    else
      call do_input        ;Then we can do input
    end
  until (g_select)        ;Unrecognized menu entry
```

## L\_QUEUE – Queue commands for a list



```
xcall L_QUEUE (list_id [, request, ...])
```

### Arguments

*list\_id*

The ID of the list. (n)

*request*

(optional) One or more of the possible requests passed to L\_PROCESS. (See the list of requests for the L\_PROCESS subroutine, beginning on [page 9-114](#).) (n)

### Discussion

The L\_QUEUE subroutine queues requests for the L\_PROCESS subroutine. When queued requests are executed, note the following rules:

- ▶ Requests are executed in the sequence in which they are passed. This rule applies not only to the sequence of calls to this subroutine, but also to the request flag arguments that are passed to L\_PROCESS.
- ▶ If L\_PROCESS cannot execute one of the queued requests, all subsequent pending requests are cancelled. For example, if you request D\_LUP when positioned on the first item in the list (and no more items are available to load at the top), any request that was queued after the D\_LUP request will be cancelled.
- ▶ A maximum of 20 requests may be pending at one time. If a 21st request is queued, a fatal error occurs.
- ▶ While requests are being executed, L\_PROCESS may require that more items be loaded. Such requests must be honored exactly as they are during normal list processing.
- ▶ Except for loading new items when no load method is supplied, L\_PROCESS won't return to the calling routine until either all queued requests have been performed or one of the requests could not be performed. For this reason, no "queue cancel" functionality is provided.

### Examples

The following example will move to the bottom of the list before processing the append request passed directly to L\_PROCESS. This example does not use a load method, so it must honor load requests.

```
xcall l_queue(list_id, D_LBOTTOM) ;Queue a bottom request
req = D_LAPPEND                  ;Insert at the end
call process                     ;Process the requests
```

## List Routines

### L\_QUEUE

```
process,
do
  begin
    xcall l_process(list_id, req, list_rec)
    case req of
      begin
        ;D_LLOADBOT:
          call load      ;Load requested item
        ;D_LLOADTOP:
          req = D_LEOF   ;Tell L_PROCESS "none available"
        ;D_LABORT:
          req = D_LNOP   ;Force exit from this loop
        endcase
      end
    until (req.eq.D_LNOP)
  return
```

The routine would be simplified by using a load method:

```
xcall l_queue(list_id, D_LBOTTOM)
req = D_LAPPEND
xcall l_process(list_id, req, list_rec)
return
```

## L\_REMOVE – Remove a list



```
xcall L_REMOVE(list_id)
```

### Arguments

*list\_id*

The ID of the list to remove. (**n**)

### Discussion

The L\_REMOVE subroutine removes a list.

If you remove a list that was placed at a prior environment level, a call to E\_EXIT will automatically place the list again.

### See also

[L\\_PLACE](#) on page 9-112 for more information on placing a list.

### Examples

This example removes the list whose ID is stored in **file\_lst**.

```
xcall l_remove(file_lst)
```

## L\_RESIZE – Resize a list



```
xcall L_RESIZE(list_id, [items][, columns], {reserved})
```

### Arguments

*list\_id*

The ID of the list to resize. **(n)**

*items*

(optional) The number of items visible at a time. **(n)**

*columns*

(optional) The number of columns visible at a time. **(n)**

*{reserved}*

Reserved for internal use. **(n)**

### Discussion

The L\_RESIZE subroutine resizes a list, even if the list is on a tab.

If *items* and/or *columns* is not passed, that current value for the list is not affected.

If *columns* exceeds the number of columns in the input window associated with the list, *columns* is automatically limited.

### See also

The *Migrating Your Application to Windows* guide, available in the [Synergex website](#).

### Examples

The following example resizes the list, whose ID is stored in **order\_lst**, to have 5 items and the first 7 columns visible.

```
xcall l_resize(order_lst, 5, 7)
```



## L\_RESTART – Restart a list



```
xcall L_RESTART (list_id, [initial][, last])
```

### Arguments

*list\_id*

The ID of the list. (**n**)

*initial*

(optional) The number of the initial item to load. (**n**)

*last*

(optional) The estimated number of items that will be loaded. (**n**)

### Discussion

The L\_RESTART subroutine “restarts” a list by erasing all existing items and setting up the list to start loading the first window of items. It also cancels any pending requests for L\_PROCESS and for ActiveX controls, resets individual cell overrides for color and font.

The *initial* argument determines how list items are loaded into the list. If *initial* has a value of 1, existing items will only be loaded at the bottom of the list, forward. If *initial* is greater than 1 and equal to *last*, existing items will only be loaded at the top of the list, backward. If *initial* is greater than 1 but less than *last*, existing items can be loaded at either end, but loading will begin at the bottom, forward.

If *initial* is not passed, the item-loading method defaults to the method that was specified on the previous call to L\_CREATE or L\_RESTART.

If *last* is not passed, or if it has a value of zero, the calling routine cannot determine the number of list items. Instead, Toolkit assumes *last* is greater than *initial* and determines this number internally.

No other features of the list are modified by L\_RESTART; the title, headers, footers, enabled state, find specification, and definition of the initial state of an item all remain the same.

### Examples

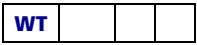
The following restarts the list whose ID is **mylist**. The item-loading method will be the one used when the list was last restarted or created. The number of items to be loaded is unknown.

```
xcall l_restart(mylist)
```

The next example restarts the list whose ID is **mylist**. The items will be loaded in reverse order. The approximate number of items to be loaded is contained in **nmitms**.

```
xcall l_restart(mylist, nmitms, nmitms)
```

## L\_RETURNKEY – Set the return state of privatized keys



`xcall L_RETURNKEY (list_id, [key_code, return][, ...])`

### Arguments

*list\_id*

The ID of the list. (n)

*key\_code*

(optional) One or more of the virtual key codes (defined in **tools.def**): (n)

**D\_VKUP** UP arrow key.

**D\_VKDOWN** DOWN arrow key.

**D\_VKLEFT** LEFT arrow key.

**D\_VKRIGHT** RIGHT arrow key.

**D\_VKPRIOR** PAGE UP key.

**D\_VKNEXT** PAGE DOWN key.

**D\_VKHOME** HOME key.

**D\_VKEND** END key.

*return*

(optional) One of the following flags: (n)

**TRUE** The key should be returned out of the list.

**FALSE** The key should be private to the list. (default)

### Discussion

The `L_RETURNKEY` subroutine enables you to use keys that are privatized for lists as menu entry shortcuts. (On UNIX and OpenVMS, this routine is ignored because all keys are returned and can potentially be used as shortcuts to menu entries.)

By default, privatized keys, which correspond to the key codes listed above, will not signal menu entries when in a list on Windows, but will instead perform their privatized functions for the list. (See [“Appendix C: Keyboard Navigation for Lists on Windows”](#) for details.) To circumvent the privatized behavior of a key and make the key available as a menu entry shortcut, set *return* to `TRUE` for the key.

To use one of the reserved privatized keys as a menu entry shortcut, call `L_RETURNKEY` before testing `g_entnam` for the menu. In the `L_RETURNKEY` call, pass the corresponding key code followed by `TRUE`. For example:

```
xcall l_returnkey(listid, D_VKUP, TRUE)
```

To reset a key's behavior to its privatized function (and let the list handle the key), pass the key code followed by `FALSE`. For example:

```
xcall l_returnkey(listid, D_VKUP, FALSE)
```

You can call this subroutine multiple times for the same list and/or key, contextually altering the behavior of a key within your application.

## Examples

The following example specifies that for `listid`, the `HOME` and `END` keys are available to the application and may be mapped to menu entries. The up arrow and down arrow keys, on the other hand, have their usual behavior of being interpreted immediately by the list control. The other unspecified virtual keys will have their behavior unchanged.

```
xcall l_returnkey(listid, D_VKHOME, TRUE, D_VKEND, TRUE, D_VKUP, FALSE,  
& D_VKDOWN, FALSE)
```

## L\_SECT – Place text in a list header, footer, or title



```
xcall L_SECT(list_id, [text][, text_flag, ...])
```

### Arguments

*list\_id*

The ID of the list in which to place text. (**n**)

*text*

(optional) The text to display. (**a**)

*text\_flag*

(optional) One or more of the following text flags: (**n**)

**D\_HEADER** Display text in the header section. (default)

**D\_FOOTER** Display text in the footer section.

**D\_TITLE** Display text in the title.

**D\_POSITION**, *row*, *col* The text's position.

*row* The row position.

*col* The column position.

**D\_CLEAR** Clear the entire line of text. (default)

**D\_CLRBOL** Clear to the beginning of the line.

**D\_CLREOL** Clear to the end of the line.

**D\_NOCLEAR** Don't clear the line of text.

**D\_COLRESIZE** Resize ActiveX list columns if the user hasn't manually resized them. (default)

**D\_COLNORESIZE** Don't resize ActiveX list columns.

**D\_COLFORCESIZE** Resize ActiveX list columns even if the user has manually resized them.

**D\_DISPLAY** Display text at the current position. (default)

**D\_LEFT** Left-justify the text.

**D\_CENTER** Center the text.

**D\_RIGHT** Right-justify the text.

|                  |                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>D_VLINE</b>   | Convert “ ” characters to vertical lines for ActiveX lists or vertical bar line-drawing characters on UNIX or OpenVMS. (default) |
| <b>D_NOVLINE</b> | Don’t convert “ ” characters to vertical lines for ActiveX lists or vertical bar line-drawing characters on UNIX or OpenVMS.     |

## Discussion

The L\_SECT subroutine clears text from and/or places text into a list header, footer, or title. Note that by default,

- ▶ text is displayed at the current position (D\_DISPLAY), which is generally left-justified, unless a previous call to L\_SECT has changed the current position.
- ▶ L\_SECT clears the entire affected row (D\_CLEAR) unless you specify one of the other clearing flags (D\_CLRBOL, D\_CLREOL, D\_NOCLEAR).

The D\_POSITION flag positions the text by specifying the row and column on which the text should begin. Note that Toolkit positions the text before it clears or justifies text, so justification nullifies a *col* setting. Additionally, if you pass D\_POSITION, you must pass both *row* and *col*.

---

### WIN

The Windows theme in use determines the location of the title; D\_TITLE, has no effect.

When using D\_HEADER or D\_FOOTER with an ActiveX Toolkit list,

- ▶ use vertical bars (|) to explicitly divide column headings or footers and to set the minimum column width. If you don’t use vertical bars (or if you pass D\_NOVLINE), Toolkit will divide the text in ways that may not make sense.
- ▶ don’t use D\_CENTER or D\_RIGHT, which aren’t designed to be used in this situation.

By default, ActiveX Toolkit list columns resize automatically when a column header or footer is changed, unless the user has manually resized a column. You can change this behavior by passing D\_COLNORESIZE to prevent resizing or D\_COLFORCESIZE to force resizing even when a user has resized a column.

---



---

### UNIX, VMS

For D\_TITLE, only the D\_LEFT, D\_CENTER, and D\_RIGHT flags have any effect, and the text is centered by default.

---

## Examples

The following clears the list header by specified by **mylst** and then centers the message within it.

```
xcall l_sect(mylst, "No available items", D_HEADER, D_CLEAR, D_CENTER)
```

## L\_SECTDRAW – Draw a line in a list header or footer



```
xcall L_SECTDRAW (list_id, section, [direction], row, column, length)
```

### Arguments

*list\_id*

The ID of the list. (**n**)

*section*

The section of the list in which to draw the line: (**n**)

**D\_HEADER** Header section.

**D\_FOOTER** Footer section.

*direction*

(optional) The direction of the line: (**n**)

**D\_VERTICAL** Vertical line. (default)

**D\_HORIZONTAL** Horizontal line.

*row*

The starting row position. (**n**)

*column*

The starting column position. (**n**)

*length*

The length of the line to draw. (**n**)

### Discussion

On UNIX and OpenVMS, the L\_SECTDRAW subroutine draws a horizontal or vertical line in a list header or footer. On Windows, L\_SECTDRAW either adds unexpected characters to the header or footer or is ignored. For standard (non-ActiveX) lists, L\_SECTDRAW may add unexpected characters if it is followed by an L\_SECT call that doesn't erase existing text. L\_SECTDRAW is ignored for ActiveX Toolkit lists.

### Examples

The following example draws a vertical line in the footer of the list identified by **lstid**. The line starts at row 1, column 5 of the footer and is two characters long.

```
xcall l_sectdraw(lstid, D_FOOTER,, 1,5,2)
```

## L\_SELECT – Do list selection processing



```
xcall L_SELECT (list_id, request, [data], [disabled], [skip_disabled], [find_prompt],
&               [find_length], [character], [select_column], [help_id], [pre_input_routine],
&               [find_window], [find_init], [find_column], [wait_time]
&               [, a_methoddata1, ..., a_methoddata20])
```

### Arguments

*list\_id*

The ID of the list. **(n)**

*request*

The request flag. **(n)**

Passed requests that L\_SELECT can accept are the same requests honored by L\_PROCESS. (See [page 9-114](#) for more information on these requests.) Returned requests that L\_SELECT can generate are

|                   |                                                        |
|-------------------|--------------------------------------------------------|
| <b>D_LNOP</b>     | Item was selected, or unknown menu entry was selected. |
| <b>D_LLOADBOT</b> | Need an item at the bottom.                            |
| <b>D_LLOADTOP</b> | Need an item at the top.                               |
| <b>D_LABORT</b>   | Cannot proceed; please delete the list.                |

*data*

(optional) The associated non-window data. **(a)**

*disabled*

(optional) The disabled item status. **(n)**

*skip\_disabled*

(optional) The true/false flag that indicates whether disabled items will be skipped. **(n)**

*find\_prompt*

(optional) The prompt to the user to enter a string for which to search. **(a)**

*find\_length*

(optional) The maximum length (between 1 and 256 characters) allowed for a search string. **(n)**

*character*

(optional) The ASCII value of the character the user typed. **(n)**

## List Routines

### L\_SELECT

*select\_column*

(optional) The selection column ID. **(n)**

*help\_id*

(optional) The help identifier. **(a)**

*pre\_input\_routine*

(optional) The name of a subroutine to call before character input is performed. **(a)**

*find\_window*

(optional) The ID of the input window for find. **(n)**

*find\_init*

(optional) The true/false flag that indicates whether L\_SELECT will initialize the find window. **(n)**

*find\_column*

(optional) The input column for find. **(n)**

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. **(n)**

**D\_FOREVER** or **-1**                      Never time out.

**D\_GLOBAL** or **-2**                      Use the global value (see [“g\\_wait\\_time” on page 18-6](#)).  
(default)

**D\_IMMEDIATE** or **0**                      Time out immediately.

*n*                                              Wait up to *n* seconds (where *n* is a positive value) for I/O  
processing to be complete.

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments that can be passed to L\_SELECT. L\_SELECT, in turn, passes them directly to each field's methods. This allows you to communicate additional information to your input field methods. **(any)**

## Discussion

The L\_SELECT subroutine provides selection processing similar to S\_SELECT, except using a list. The list (or some part of it) is presented to the user, and the user can move around in the list, find specific values, and finally, select an item. The advantage to using a list is that the list can be virtually any length, but only the necessary items are loaded.



---

**WIN**

If the list is an ActiveX list, when a user selects a cell in the list, by default only the cell is highlighted. You can, however, instruct Toolkit to highlight the entire row by setting the RowMode property to any non-zero value. For more information, see [“Published Properties for ActiveX Toolkit Lists”](#) on page 9-17.

---

*List\_id* is the ID of a list that was previously created with the L\_CREATE subroutine. (Refer to the [L\\_CREATE](#) on page 9-76 for a description of the options available.)

*Request* is the request flag for the L\_PROCESS subroutine. The L\_SELECT subroutine translates menu entries into request flag values, but the calling routine must either specify the name of the LLOAD\_METHOD subroutine for loading list items or provide the items to load into the window itself. LLOAD\_METHOD can be specified using the .LISTCLASS script command, or the L\_CLASS or L\_METHOD subroutines.

*Request* should be set to D\_LNOP (0) the first time L\_SELECT is called. L\_SELECT will call the load method, or return with *request* set to either D\_LLOADBOT or D\_LLOADTOP (depending on the options set when the list was created) until no more items are currently needed. The load method or the calling routine must do either one of the following:

- ▶ Retrieve another item, display the data in the associated input window, fill in data appropriately, set the optional disabled flag, and call L\_SELECT again with *request* still set to the load request value.
- ▶ If no more items are available at the requested end of the list, set *request* to D\_LEOF and call L\_SELECT again.

Between the time you get a load bottom or load top request and the time you return to L\_SELECT, do not do any screen I/O (for example, M\_PROCESS or U\_UPDATE).

If a load method has been specified, L\_SELECT calls it every time a new list item is needed, and does *not* return to the calling routine.

If L\_SELECT returns *request* set to D\_LABORT, an unsupportable situation has occurred, and the calling routine should delete the list.

L\_SELECT honors the following menu entries and translates them into list requests:

| L_SELECT Menu Translations |              |
|----------------------------|--------------|
| Menu entry                 | List request |
| S_UP                       | D_LUP        |
| S_DOWN                     | D_LDOWN      |
| S_LEFT <sup>a</sup>        | D_LLEFT      |

## List Routines

### L\_SELECT

| L_SELECT Menu Translations (Continued) |                                                                    |
|----------------------------------------|--------------------------------------------------------------------|
| Menu entry                             | List request                                                       |
| S_RIGHT <sup>a</sup>                   | D_LRIGHT                                                           |
| S_TOP                                  | D_LTOP                                                             |
| S_BOTTOM                               | D_LBOTTOM                                                          |
| S_PGUP                                 | D_LPGUP                                                            |
| S_PGDN                                 | D_LPGDN                                                            |
| S_PGTOP                                | D_LPGTOP                                                           |
| S_PGBOT                                | D_LPGBOT                                                           |
| S_FIND                                 | D_LFIND (after prompting for a find string and calling L_FINDSPEC) |
| S_FINDNEXT                             | D_LFIND                                                            |
| S_FINDDIR                              | (Toggle find direction)                                            |

- a. Must first be activated using L\_RETURNKEY.

Note that you can also translate menu entries yourself. If the user selects a menu entry that L\_SELECT does not recognize, the calling routine can map it to any request code recognized by L\_PROCESS.

As shown in the above table, both the S\_FIND and S\_FINDNEXT menu entries use D\_LFIND, but S\_FIND's operation does some additional processing. S\_FIND first pops up an input window for the user to input specifications for the find operation, then it calls L\_FINDSPEC to set the characteristics, and lastly it calls L\_PROCESS. See [L\\_PROCESS on page 9-114](#) and [L\\_FINDSPEC on page 9-90](#) for more details. You can call L\_FINDSPEC before calling L\_SELECT to establish "find" defaults.

When either an S\_FIND or an S\_FINDNEXT is being performed, L\_SELECT will display a message on the information line. This message is contained in the **syntxt** file under the facility DTK, mnemonic FIND\_MSG.

If L\_SELECT will be displaying a find window (honoring S\_FIND), you have three options:

- ▶ Use L\_SELECT's default find window, which has the prompt "Find:", accepts 80 characters or the number of characters passed as *data* (whichever is less), and on Windows has OK and Cancel buttons.
- ▶ Create your own find window in a script file (or with the IB\_xxx routines) and pass that window's ID in *find\_window*.
- ▶ Create your own find window by using the %L\_FINDWND function as the *find\_window* argument.

The first option is the default if you omit the *find\_window* argument. The default find window will display centered within the current display area.

If you would prefer either of the last two options (creating your own find window), see the information on *find\_window* on [page 9-137](#).

Whether or not the *data* argument is passed must correspond to whether it was passed in the L\_CREATE subroutine when the list was created. *Data* is required here if it was also passed to L\_CREATE. If *data* is passed here but was *not* passed to L\_CREATE, a fatal error occurs.

*Data* is the optional associated non-window data for the list. (Non-window data is additional information that you don't want displayed, but that you want to be maintained with the list.) Whenever this subroutine returns, the data for the current item is loaded in *data*, and the list's associated input window contains the display data for that item.

*Disabled* is a true/false flag that indicates whether the current item is disabled. Whether or not the *disabled* argument is passed must correspond to whether it was passed to other list routines such as L\_CHR, L\_DATA, L\_INPFLD, L\_INPUT and L\_PROCESS. See [L\\_PROCESS on page 9-114](#) for more information about the disabled item status.

If *disabled* is passed and has a value of true, the current item is disabled and cannot be selected. If *skip\_disabled* is passed and has a value of true, the positional indicator cannot move to a disabled item after it is loaded; the indicator will move past the item automatically. The *disabled* argument is returned with the disabled status for the current item.

If the user presses enter, TAB, or SHIFT+TAB, or if an unknown menu entry is selected, L\_SELECT returns, setting *request* to D\_LNOP. The *data* argument will contain the associated data for the item, and the list's input window will contain the display data for the item. Note the following:

- ▶ On Windows, if the selection list is part of a composite window, TAB signals "C\_NEXT" and SHIFT+TAB signals "C\_PREV".
- ▶ If an unknown menu entry is selected, **g\_select** is returned with a value of true and **g\_entnam** will contain the menu entry name. Note that you must clear **g\_select** after you satisfy the event.

*Character* helps you determine whether the user typed a printable character while positioned on an enabled item. If *character* is not passed and the user enters any key other than ENTER or a menu shortcut, the terminal bell will ring and processing will continue.

If *character* is passed, one of the following may occur:

- ▶ If the user types a printable character while positioned on an enabled item, the ASCII value of that character will be returned.
- ▶ If the user selects a menu entry or presses ENTER while positioned on an enabled item, *character* will be returned with a value of 0.
- ▶ If the user is positioned on a disabled item (which means *skip\_disabled* either is not passed or has a value of false) and types a printable character or presses ENTER, the terminal bell will ring and processing will continue.

The user can select a menu entry while on a disabled item if *skip\_disabled* is not passed or has a value of false, in which case the optional *character* argument will be returned with a value of zero.

---

#### WIN

In Windows environments, *select\_column* and *find\_column* are, by default, ignored if passed. These columns usually contain reserved menu entries that are automatically supported by the Windows environments.

---

---

#### UNIX, VMS

In UNIX and OpenVMS environments, if *select\_column* is passed, the specified selection column will be placed before selection processing occurs, and it will be removed on exit. If *find\_column* is passed, the menu column with that ID is placed before performing input to *find\_window*, and removed afterwards.

---

The default behavior for each environment's handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. See [“g\\_plc\\_col\\_args” on page 18-4](#) for information.

If the operation times out, **g\_select** is set to true and **g\_entnam** set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See [“g\\_time\\_entry” on page 18-5](#).

If *pre\_input\_routine* is passed, L\_SELECT will pass the specified pre-input routine the list ID. If a menu entry is selected while in the pre-input routine, L\_SELECT will honor the menu name if L\_SELECT recognizes it. If L\_SELECT doesn't recognize the name, L\_SELECT will return the name to the calling routine.

If specified, the *pre\_input\_routine* must be available. In other words, it must either be contained within the current program image, or in an executable library (ELB) that was either linked to or opened with OPENELB. The default state, if no *pre\_input\_routine* is specified anywhere, is for L\_SELECT to return to the caller when input is ready to be performed.

The L\_SELECT subroutine turns both echo and cursor off. You may want to call E\_ENTER and E\_EXIT around the call to this subroutine, because L\_SELECT doesn't call E\_ENTER, nor does it reset the echo and cursor parameters when it's done.

You can pass *find\_window* to replace L\_SELECT's default find window. *Find\_window* must be either the ID of an input window you have created in a script file, with the IB\_xxx subroutines, or with %L\_FINDWND. (See %L\_FINDWND on page 9-94 for more information.)



If D\_RETURNBTN will be enabled and the list will be part of a composite window that on Windows has buttons, you will need to add a default button to the find window. This will enable users to close the find window normally. The default find window, for example, has OK and Cancel buttons, with OK as the default.

---

L\_SELECT places and displays the find window within the current display area when the user selects the menu entry "S\_FIND". If you create your own find window with a script, placement of the find window can be specified within your script. If you create the window with the IB\_xxx subroutines, you can use U\_WINDOW to specify placement. If you use the %L\_FINDWND function, the find window will be centered within the current display area by default. To change the placement of the %L\_FINDWND window, place and remove the window (without updating the screen) *before* calling L\_SELECT. When L\_SELECT calls the %L\_FINDWND window, it will place it at the last placement position.

When *find\_window* is specified, L\_SELECT calls a UI Toolkit input routine to perform the input in the *find\_window*. L\_SELECT passes the input routine the D\_NOTERM option (to suppress the input termination message) and passes the **finddata** data structure:

```
record finddata
    finddir      ,i4      ;Find direction
    findcase     ,i4      ;Find case
    findtype     ,i4      ;Find type
    findcurr     ,i4      ;Find current item
    findpos      ,i4      ;Search area position
    findlen      ,i4      ;Search area length
    findstrng    ,a80     ;Find string
```

See the **tools.def** file for the values associated with **finddata**'s first four variables (**finddir**, **findcase**, **findtype**, and **findcurr**). **Finddata** is preloaded with the current values, as previously specified by a call to L\_FINDSPEC (or the default values).

Note that even though **findstrng** is declared as **a80**, only positions **1** through **findlen** will be considered, and only the trimmed input within these bounds will be used for find matching.

*Find\_window* does not have to provide input for or display all of **finddata**'s options. For example, if you only wanted to allow the user to input the find string, the .STRUCTURE script command for the input window would look something like:

```
.structure find, <24>, findstrng
```

If *find\_init* is passed and true, the default set for the window is initialized with I\_INIT. Otherwise, the previous find data is displayed into the default set using I\_DISPLAY, and I\_NEXT is used to position the context of that set to the first field.

## See also

WAIT on [page 2-84](#) for more information on input time-outs. WAIT is a qualifier for the .FIELD command.

## Examples

The following example processes the selection list identified by **lstid**. On entry, **req** contains the request to be processed by L\_SELECT. In this example, no initial action has been requested. The paragraph **satisfy\_request** will perform the request returned from L\_SELECT. This could be either to load data into the list (assuming no load method is defined for the list) or to abort the list.

**Satisfy\_request** will set **req** to indicate the result of the performed action. The paragraph **process\_selection** is called only when all requests from the list processor are satisfied, and in this case either a menu entry (unrecognized by L\_SELECT) has been selected or the user has pressed ENTER on an item in the list.

```
req = D_LNOP
do
  begin
    xcall l_select(lstid, req, lst_data)
    if (req) then
      call satisfy_request      ;Process list requests first
    else
      call process_selection    ;Process a selection
    end
  until (g_select)             ;Unrecognized menu entry
  satisfy_request,
    case req of
      begincase
;D_LLOADBOT
        call load              ;Load requested item
;D_LLOADTOP
        req = D_LEOF           ;Tell L_SELECT "none available"
;D_LABORT
        g_select = TRUE        ;Force exit from L_SELECT loop
      endcase
    return

  process_selection,
    if (g_select) then
      case g_entnam of         ;Process a menu entry
        begincase
          .
          .
          .
        endcase
      else                     ;An item was selected
        g_select = TRUE        ;Force exit from L_SELECT loop
      return
```

The following call to L\_SELECT passes the data associated with the selection list in **lst\_data** and the current disabled status of the item in **disabled**. Disabled selections will be skipped and the new disabled status returned in **disabled**.

```
xcall l_select(lstid, req, lst_data, disabled, TRUE)
```

## %L\_SELSTYLE – Retrieve/change the selection style for a list



```
oldstyle = %L_SELSTYLE (list_id [, newstyle])
```

or

```
xcall L_SELSTYLE (list_id [, newstyle])
```

### Return value

*oldstyle*

The previous setting for the selection style. (^VAL)

### Arguments

*list\_id*

The ID of the list whose selection style you want to change. (n)

*newstyle*

(optional) The new selection style to apply to the list. One of the following (defined in

**WND:tools.def**): (n)

**D\_OFF**

Do not change appearance of selected item.

**D\_ON**

Highlight selected item. (default)

**D\_OUTLINE**

Outline selected item.

### Discussion

The %L\_SELSTYLE function retrieves and/or changes the style for the selected item in a standard Toolkit list. (ActiveX lists ignore %L\_SELSTYLE settings, but automatically have a bold frame when active.) Unless the list is part of a composite window, the default selection style, which is highlighting, is generally sufficient. However, if the list is part of a composite window, it's difficult for users to tell when the list has focus. There's no visual indication unless you change the selection style. The default method for child lists (C\_METHLIST), for example, sets the selection style to D\_ON (highlighting) when the method is first invoked, and then sets it to D\_OUTLINE right before returning.

Note that changes made with %L\_SELSTYLE remain in effect, regardless of changes in focus, until a subsequent %L\_SELSTYLE call changes the selection style again.

The *oldstyle* argument enables you to retrieve the current style for the list. If you also pass *newstyle*, the *oldstyle* argument retrieves the style that the list had before this function changed it.

If *newstyle* is omitted, no change is made to the selection style.



---

## UNIX, VMS

On UNIX and OpenVMS, D\_OUTLINE has the same effect as D\_ON (because outlining an item can occlude other items, headers, footers, and possibly other windows). Consider using L\_ENABLE and L\_DISABLE on these platforms instead of %L\_SELSTYLE.

---

### See also

- ▶ [C\\_METHLST](#) – Process a child list on page 6-58.
- ▶ [L\\_DISABLE](#) – Disable a list on page 9-88.
- ▶ [L\\_ENABLE](#) – Enable a list on page 9-89.

### Examples

See the **ctrmeths.dbl** file included in your UI Toolkit distribution. It includes code for the C\_METHLST method, which uses %L\_SELSTYLE.

## L\_STATE – Modify a list’s state



```
xcall L_STATE(list_id, state)
```

### Arguments

*list\_id*

The ID of the list to resize. (**n**)

*state*

One of the following list states: (**n**)

**D\_LNORMAL**                      Restored.

**D\_LMAXIMIZED**                  Maximized.

**D\_LMINIMIZED**                  Minimized.

**D\_LHIDDEN**                      Hidden.

### Discussion

The L\_STATE subroutine modifies the state of a list.

### See also

- ▶ [L\\_STATUS on page 9-143](#) for retrieving the state of a list.
- ▶ The *Migrating Your Application to Windows* guide, available in the [Synergex website](#).

### Examples

The following example maximizes the list.

```
xcall l_state(order_lst, D_LMAXIMIZED)
```

## L\_STATUS – Retrieve the status of a list



```
xcall L_STATUS (list_id[, flags, ...])
```

### Arguments

*list\_id*

The ID of the list to retrieve information for. **(n)**

*flags*

(optional) One or more information request flags and return values: **(n)**

**D\_LABTRSN**, *reason*

Returns the code that indicates the reason for aborting. See the **tools.def** file. **(n)**

**D\_LACTIVEX**, *list\_typ*

Returns true (1) if the list is an ActiveX Toolkit list; otherwise, returns false (0). **(n)**

**D\_LATBOTTOM**, *bottom\_flag*

Returns true (1) if the user is at the bottom of the list (with no more to load at the bottom); otherwise, returns false (0). **(n)**

**D\_LATPGBOT**, *pgbot\_flag*

Returns true (1) if the user is at the bottom of the page; otherwise, returns false (0). **(n)**

**D\_LATPGTOP**, *pgtop\_flag*

Returns true (1) if the user is at the top of the page; otherwise, returns false (0). **(n)**

**D\_LATTOP**, *top\_flag*

Returns true (1) if the user is at the top of the list (with no more to load at the top); otherwise, returns false (0). **(n)**

**D\_LAXCTRL**, *axlist\_id*

Returns the ID of the ActiveX control used for a list if the list is an ActiveX Toolkit list; otherwise, returns false (0). **(n)**

**D\_LCOLSIZED**, *resized*

Returns true (1) if one or more columns in the list have been resized by the user and the list is an ActiveX list; otherwise returns false (0). **(n)**

**D\_LCTRID**, *container\_id*

Returns the list container window ID. **(n)**

**D\_LCURITM**, *current\_item*

Returns the current item number. **(n)**

**D\_LDATALEN**, *data\_len*

Returns the length of the data area passed to L\_CREATE, or 0 if no data area was passed. **(n)**

|                                           |                                                                                                             |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>D_LDISITEM</b> , <i>disable_flag</i>   | Returns true (1) if the current item in the list is disabled; otherwise, returns false (0). (n)             |
| <b>D_LENABLED</b> , <i>enabled_flag</i>   | Returns true (1) if the list is enabled; otherwise, returns false (0). (n)                                  |
| <b>D_LFINDCASE</b> , <i>case</i>          | Indicates whether the search is case sensitive or case insensitive. See the <b>tools.def</b> file. (n)      |
| <b>D_LFINDCURR</b> , <i>test_current</i>  | Indicates whether the current item will be tested as part of the search. See the <b>tools.def</b> file. (n) |
| <b>D_LFINDDIR</b> , <i>direction</i>      | Returns the current direction in which to search. See the <b>tools.def</b> file. (n)                        |
| <b>D_LFINDLEN</b> , <i>data_length</i>    | Returns the length of the area to search. (n)                                                               |
| <b>D_LFINDPOS</b> , <i>data_position</i>  | Returns the current position of the area to search. (n)                                                     |
| <b>D_LFINDSOURCE</b> , <i>find_source</i> | Indicates area to search: non-window data or associated input window (display data).                        |
| <i>find_source</i>                        | One of the following (defined in <b>tools.def</b> ): (n)                                                    |
| <b>D_LFND_DATA</b>                        | Search is for non-window data.                                                                              |
| <b>D_LFND_DISPLAY</b>                     | Search is for display data.                                                                                 |
| <b>D_LFINDSTR</b> , <i>data_string</i>    | Returns search string last supplied to L_FINDSPEC. (a)                                                      |
| <b>D_LFINDSTRLEN</b> , <i>string_len</i>  | Returns length of last search string supplied to L_FINDSPEC. (n)                                            |
| <b>D_LFINDTYPE</b> , <i>find_type</i>     | Returns current type of search for a find operation. See the <b>tools.def</b> file. (n)                     |
| <b>D_LFOUND</b> , <i>found_flag</i>       | Returns true (1) if the last D_LFIND request was successful; otherwise, false (0). (n)                      |
| <b>D_LFTRID</b> , <i>fttr_win_id</i>      | Returns the ID of the window used internally by Toolkit for the list footer. (n)                            |
| <b>D_LFTRLNS</b> , <i>#fttr_lns</i>       | Returns the number of footer lines in the list. (n)                                                         |
| <b>D_LFTRSTATIC</b> , <i>fttr_static</i>  | Returns true (1) if footers are static; otherwise returns false (0). (n)                                    |
| <b>D_LGETEVENTS</b> , <i>method_set</i>   | Returns the method set ID for a list or a value of 0 if there is no method set for the list. (n)            |
| <b>D_LHDRID</b> , <i>hdr_win_id</i>       | Returns the ID of the window used internally by Toolkit for the list header. (n)                            |

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_LHDLNS</b> , <i>#hdr_lns</i>            | Returns the number of header lines in the list. (n)                                                                                                                                                                                                                                                                                                                                                |
| <b>D_LHDRSTATIC</b> , <i>hdr_static</i>      | Returns true (1) if headers are static; otherwise returns false (0). (n)                                                                                                                                                                                                                                                                                                                           |
| <b>D_LHEIGHT</b> , <i>height</i>             | Returns the height of the list as the number of visible items. See the <b>tools.def</b> file. (n)                                                                                                                                                                                                                                                                                                  |
| <b>D_LINPID</b> , <i>input_id</i>            | Returns the ID of the input window. (n)                                                                                                                                                                                                                                                                                                                                                            |
| <b>D_LLASTITM</b> , <i>last_item</i>         | Returns the highest item number loaded. (n)                                                                                                                                                                                                                                                                                                                                                        |
| <b>D_LLOADSTATE</b> , <i>end, state</i>      | Returns the load state for an end (top or bottom) of the list.                                                                                                                                                                                                                                                                                                                                     |
| <i>end</i>                                   | One of the following (defined in <b>tools.def</b> ): (n)                                                                                                                                                                                                                                                                                                                                           |
| <b>D_LLOADBOT</b>                            | Return the load state for the bottom of the list.                                                                                                                                                                                                                                                                                                                                                  |
| <b>D_LLOADTOP</b>                            | Return the load state for the top of the list.                                                                                                                                                                                                                                                                                                                                                     |
| <i>state</i>                                 | Returned as one of the following (defined in <b>tools.def</b> ): (n)                                                                                                                                                                                                                                                                                                                               |
| <b>DLS_BEGIN</b>                             | Loading has not begun.                                                                                                                                                                                                                                                                                                                                                                             |
| <b>DLS_DONE</b>                              | Received D_LEOF at the specified end.                                                                                                                                                                                                                                                                                                                                                              |
| <b>DLS_FULL</b>                              | No more items are needed at this time.                                                                                                                                                                                                                                                                                                                                                             |
| <b>DLS_LOAD</b>                              | Loading is in progress.                                                                                                                                                                                                                                                                                                                                                                            |
| <b>D_LMETHOD</b> , <i>methodtype, method</i> | Returns the name or address for a list method, or the ID for the %UWNDEVENTS_METHOD set.                                                                                                                                                                                                                                                                                                           |
| <i>methodtype</i>                            | One of the following (defined in <b>tools.def</b> ): (n)                                                                                                                                                                                                                                                                                                                                           |
| <b>D_ARRIVE</b>                              | Return the arrive method name or address.                                                                                                                                                                                                                                                                                                                                                          |
| <b>D_LDBLCLK</b>                             | Return the double-click method name or address.                                                                                                                                                                                                                                                                                                                                                    |
| <b>D_LLEAVE</b>                              | Return the leave method name or address.                                                                                                                                                                                                                                                                                                                                                           |
| <b>D_LLOAD</b>                               | Return the load method name or address.                                                                                                                                                                                                                                                                                                                                                            |
| <b>D_LWNDEVENT</b>                           | Return the %UWNDEVENTS_METHOD set ID.                                                                                                                                                                                                                                                                                                                                                              |
| <i>method</i>                                | For D_LWNDEVENT, this returns the ID of the %UWNDEVENTS_METHOD set. Note that <i>method</i> is treated as numeric for D_LWNDEVENT, so if this is alphanumeric, the ID is returned as a decimal value.<br><br>For other <i>methodtype</i> options, this returns the name of the method if <i>method</i> is alphanumeric. It returns the address of the method if <i>method</i> is numeric. (a or n) |

|                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_LNULL</b> , <i>null_flag</i>                   | Returns true (1) if the current item is null; otherwise, returns false (0). (n)                                                                                                                                                                                                                                                                                                                                           |
| <b>D_LONENABLED</b> , <i>onenable_flag</i>          | Indicates whether the current item as well as the list as a whole, are enabled. See the <b>tools.def</b> file. (n)                                                                                                                                                                                                                                                                                                        |
| <b>D_LPLACED</b> , <i>placed_flag</i>               | Returns true (1) if the list is placed; otherwise, returns false (0). (n)                                                                                                                                                                                                                                                                                                                                                 |
| <b>D_LPLACEMENT</b> , <i>row</i> , <i>col</i>       | Returns the list row and column placement.                                                                                                                                                                                                                                                                                                                                                                                |
| <i>row</i>                                          | The row, relative to the screen body, where the list is placed. (n)                                                                                                                                                                                                                                                                                                                                                       |
| <i>col</i>                                          | The column where the list is placed. (n)                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>D_LPRISTINE</b> , <i>data</i> , <i>pris_flag</i> | Indicates whether the input window and data buffer are in their initial state, the state they were in when L_CREATE was called.                                                                                                                                                                                                                                                                                           |
| <i>data</i>                                         | The data buffer. (See the Discussion below.) (a)                                                                                                                                                                                                                                                                                                                                                                          |
| <i>pris_flag</i>                                    | True (1) if the data buffer and input window are in their initial state; otherwise, false (0). (n)                                                                                                                                                                                                                                                                                                                        |
| <b>D_LQAVAIL</b> , <i>requests</i>                  | Returns the number of requests that can be added to the request queue via L_QUEUE before the limit of 20 requests is exceeded. Note that <i>requests</i> will be one less than the number of requests that can be submitted (because L_PROCESS/L_SELECT use one entry). In other words, if there are three requests in the queue, <i>requests</i> will be returned as 16, though you can actually submit 17 requests. (n) |
| <b>D_LROW</b> , <i>item_row</i>                     | Returns the current item's row number, which specifies the item's position in the currently visible set of rows. (n)                                                                                                                                                                                                                                                                                                      |
| <b>D_LSTATE</b> , <i>state</i>                      | Returns the state of the list.                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>state</i>                                        | One of the following (defined in <b>tools.def</b> ): (n)                                                                                                                                                                                                                                                                                                                                                                  |
| <b>D_LNORMAL</b>                                    | List is in normal state.                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>D_LMAXIMIZED</b>                                 | List is maximized.                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>D_LMINIMIZED</b>                                 | List is minimized.                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>D_LHIDDEN</b>                                    | List is hidden.                                                                                                                                                                                                                                                                                                                                                                                                           |

## Discussion

The L\_STATUS subroutine retrieves information about the current status of a list.

Each information request flag must be followed by its argument field(s). You can specify a maximum of 40 information request flags and return value fields in one call to L\_STATUS.

Note that the *data* argument required by the D\_LPRISTINE flag is supplied by the calling routine rather than returned to it. Whether or not the *data* argument is passed must correspond to whether it was passed in the L\_CREATE subroutine when the list was created. *Data* is required here if it was also passed to L\_CREATE. If *data* is passed here but was not passed to L\_CREATE, a fatal error occurs.

The L\_STATUS subroutine provides the only reliable means of obtaining information about the current state of a list. Attempts to retrieve or infer such information by other means may have unpredictable results. For instance, you might think that the placement of an associated input window could help you obtain the current item's location within the visible list. However, this assumption might not always be true. (To keep the input window's movement to a minimum, the window may not always be synchronized with the current item.)

## Examples

The following example retrieves the placement values and placement status of the list whose ID is stored in **order\_lst**.

```
xcall l_status(order_lst, D_LPLACEMENT, row, column, D_LPLACED, placed)
```

The next example returns the reason for the abort flag, returned from a previous call to L\_PROCESS, on the list whose ID is stored in **mylst**.

```
xcall l_status(mylst, D_LABTRSN, abort_code)
```

The next example submits a FIND request to the list processor and then calls L\_STATUS to determine whether the FIND was successful. The find status is returned in **found**.

```
xcall l_findspec(lstid, fname)
req = D_LFIND                                ;Submit a FIND request
xcall l_process(lstid, req, data)             ;Process the request
xcall l_status(lstid, D_LFOUND, found)        ;Was it found?
if(.not.found)
    xcall u_message("Item not found")
```

## %L\_USER – Set/retrieve user data associated with a list



```
status = %L_USER(list_id, function, data)
```

or

```
xcall L_USER(list_id, function, data)
```

### Return value

*status*

The %L\_USER function returns true if successful, false if not. (^VAL)

### Arguments

*list\_id*

The ID of the list for which to set/retrieve user data. (n)

*function*

One of the following: (n)

**D\_LOAD**                               Set the user data.

**D\_COPY**                               Get the user data.

*data*

The user data to store with the list on D\_LOAD, or the user data retrieved from the list on D\_COPY. (a)

### Discussion

The %L\_USER function enables you to set or retrieve user data associated with a list. This data could be used, for example, by the list load method.

D\_LOAD overwrites any previous user data.

D\_COPY returns false if there is no data associated with the list.

Data can be from 1 to 65,535 characters.



## Examples

The following example associates the user data in **lstdata** with the list stored in **lstid**.

```
record lstdata
    itemnum    ,d3
    nmflds     ,d4

proc
    clear itemnum, nmflds
    xcall l_user(lstid, D_LOAD, lstdata)
```

The next example shows code from the list load method, which retrieves the user data associated with the list **a\_lstid** (passed as an argument to the load method) and puts it into **lstdata**.

```
record lstdata
    itemnum    ,d3
    nmflds     ,d4
record
    sts        ,i4

proc
    sts = %L_USER(a_lstid, D_COPY, lstdata)
    if (sts) .or. (itemnum.eq.nmflds)
        a_req = D_LEOF
```

## L\_VIEW – Shift the horizontal display area of a list



```
xcall L_VIEW(list_id, column)
```

### Arguments

*list\_id*

The ID of the list. (n)

*column*

The column position of the new display area. (n)

### Discussion

The L\_VIEW subroutine shifts the horizontal display area of a list.

The horizontal display can change in one of three ways:

- ▶ You call L\_VIEW.
- ▶ UI Toolkit adjusts the input window display automatically if the user moves to a field that was previously off the screen.
- ▶ You send a D\_LLEFT or D\_LRIGHT request to the L\_PROCESS subroutine.

L\_VIEW is only used to shift the contents of the display area to the left or to the right, not to change its size. The display width of a list is fixed once the list is created. If *column* is less than 1, a column position of 1 will be used. If *column* is greater than the result of the following equation, the result of the equation will be used instead:

$$\text{window\_width} - \text{display\_area\_width} + 1$$

In other words, the column in which the display area begins is automatically limited to boundaries that do not require changing the display area's width.

### Examples

The following example adjusts the column position of the list whose ID is stored in **desc\_lst** to 20.

```
xcall l_view(desc_lst, 20)
```

## The List Methods

This section contains specification pages for list method subroutines. These method subroutines are written by you and their names specified as arguments to UI Toolkit subroutines (such as `L_CLASS` or `L_METHOD`) or as qualifiers to the `.LISTCLASS` script command. Toolkit will then call them at the appropriate time.

Method subroutines are important in applications that will run in Windows environments, and they are also supported in UNIX and OpenVMS environments.

## LARRIVE\_METHOD/LLEAVE\_METHOD – Perform list item arrive or leave processing



```
subroutine LARRIVE_METHOD | LLEAVE_METHOD
```

```

  a_status           , n
  a_listid           , n
  a_win_event        , n
  a_itemdata         , a
  a_inpid            , n
  a_disabled         , n
  a_index            , n
  a_row              , n
  a_methoddata1      , any
  .
  .
  a_methoddata20     , any

```

### Arguments

*a\_status*

The returned status of the item. This argument is ignored and reserved for future use. **(n)**

*a\_listid*

The ID of the list. **(n)**

*a\_win\_event*

The windows-event flag, with the following possible values: **(n)**

**TRUE**                      If called in response to a Windows list box control event.

**FALSE**                    If called in response to a program request to L\_PROCESS.

*a\_itemdata*

(optional) The item data for the list. **(a)**

*a\_inpid*

The ID of the list's associated input window. **(n)**

*a\_disabled*

(optional) The true/false flag that indicates whether to disable the list item. **(n)**

*a\_index*

The index of the list item (1-based). **(n)**

*a\_row*

The item's row number within the currently visible set of rows. (**n**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

LARRIVE\_METHOD and LLEAVE\_METHOD are subroutines that you write and name when you want your program to perform extra actions before a specific list item is highlighted or before the user leaves a specific list item, respectively.

You register the LARRIVE\_METHOD and/or LLEAVE\_METHOD subroutines using the .LISTCLASS script command, or the L\_CLASS or L\_METHOD subroutines.

If registered, LARRIVE\_METHOD and/or LLEAVE\_METHOD must either

- ▶ be contained within the current program image.
- ▶ reside in an executable library (ELB) that was either linked to or opened with OPENELB.

When you specify LARRIVE\_METHOD or LLEAVE\_METHOD qualifiers, the above arguments will be passed to the LARRIVE\_METHOD and/or LLEAVE\_METHOD subroutines.

For the arrive method, *a\_itemdata*, *a\_disabled*, *a\_index*, *a\_row*, and the display in the input window correspond to the item being accessed. For the leave method, they correspond to the item being left.

The *a\_index* argument starts at one (1), rather than zero (0).

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to L\_INPUT or L\_SELECT. They are passed, in turn, directly to LARRIVE\_METHOD and/or LLEAVE\_METHOD. This enables you to communicate additional information to LARRIVE\_METHOD and LLEAVE\_METHOD.



Toolkit passes the method data arguments to the current list processing routine (L\_PROCESS, L\_INPUT, or L\_SELECT) and to the list methods. Thus, if you pass data arguments to one list processing routine, to ensure these arguments are always available, you must pass them to *all* of the list processing routines.

---

The arrive and leave methods for a list are called only once, when the selected item changes. If no change is effected, neither method is called. Special cases include D\_LINSERT (which leaves and arrives, even though the new item is at the same logical index), and D\_LDELITEM (which does not leave the item being deleted, but arrives at the new item that took its place). D\_LMOVEUP and D\_LMOVEDN do not call the arrive or leave methods, because the item is the same although its index has changed.

An attempt to move to a nonexistent item will generate a leave and arrive at the same time. Requests that are queued with L\_QUEUE and processed together in a single call to L\_PROCESS or L\_SELECT are treated as one movement. For instance, if you queue a D\_LFIND and process a

## List Routines

### LARRIVE\_METHOD/LLEAVE\_METHOD

D\_LDOWN, there will only be one leave (from the original item) and one arrive (to the item resulting from the D\_LDOWN). If you need to arrive at the intervening points, call L\_PROCESS for each operation.

---

#### WIN

The arrive and leave method subroutines are required for applications that will run in Windows environments. Windows applications can interactively change the current item in the list *within* a call to a UI Toolkit subroutine. Therefore, you must write these subroutines to support event procedures for arriving at and leaving from a list item. These method subroutines (also called “event procedures”) enable your program to perform any additional processing required.

---

If no arrive or leave methods are specified, the default behavior is to do nothing.

#### See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating these routines.
- ▶ [“Appendix D: Methods”](#).

## LDBLCLICK\_METHOD – Perform list item double-click processing

|           |  |  |  |
|-----------|--|--|--|
| <b>WT</b> |  |  |  |
|-----------|--|--|--|

```
subroutine LDBLCLICK_METHOD
  a_status                , n
  a_listid                , n
  a_data                  , a
  a_inpid                 , n
  a_disabled              , n
  a_itemindex             , n
  a_row                   , n
  a_methoddata1           , any
      .
      .
  a_methoddata20          , any
```

### Arguments

*a\_status*

Returned with one of the following status flags: **(n)**

**TRUE**                      Condition handled; proceed.

**FALSE**                     Simulate an ENTER.

*a\_listid*

The ID of the list. **(n)**

*a\_data*

(optional) The data associated with the list item. **(a)**

*a\_inpid*

The ID of the associated input window. **(n)**

*a\_disabled*

(optional) The true/false flag that indicates whether to disable the list item. **(n)**

*a\_itemindex*

The ordinal index of the list item. **(n)**

*a\_row*

The item's row number within the currently visible set of rows. (**n**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

LDBLCLICK\_METHOD is a subroutine that you write and name. L\_PROCESS calls it to handle the event of double-clicking on a list item.

You can register the LDBLCLICK\_METHOD using the .LISTCLASS script command, or the L\_METHOD or L\_CLASS subroutines.

---

### UNIX, VMS

In UNIX and OpenVMS environments, the LDBLCLICK\_METHOD is allowed to be registered, but it will never be called.

---

If this subroutine returns *a\_status* as false, an ENTER is simulated as if no method were registered.

On entry to this subroutine, **g\_select** will be false. If **g\_select** is true when it returns to the current routine, the menu entry contained in **g\_entnam** will be resigned and if the current routine (L\_SELECT or L\_PROCESS) recognizes that menu entry, the menu entry will be honored by that routine. Otherwise, it will be returned to the caller. Therefore, you can allow your LDBLCLICK\_METHOD to perform any standard list function (such as S\_UP or S\_DOWN) or cause a full return to the caller.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to L\_INPUT or L\_INPUT. They are passed, in turn, directly to LDBLCLICK\_METHOD. This enables you to communicate additional information to LDBLCLICK\_METHOD.

---



Toolkit passes the method data arguments to the current list processing routine (L\_PROCESS, L\_INPUT, or L\_SELECT) and to the list methods. Thus, if you pass data arguments to one list processing routine, to ensure these arguments are always available, you must pass them to *all* of the list processing routines.

---

## See also

- ▶ [.LISTCLASS on page 2-96](#) for specifying the LDBLCLICK\_METHOD in your script file.
- ▶ [L\\_CLASS on page 9-69](#) and [L\\_METHOD on page 9-107](#), for specifying the LDBLCLICK\_METHOD at runtime.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).



## Examples

```

subroutine mydblclk
;
; Description: Double-click method for a list
;
; Arguments:
;
;         a_sts          ,n          ;Return status
;         a_listid       ,n          ;List ID
;         a_data         ,n          ;Data of item
;         a_inpid        ,n          ;Input window ID
;         a_disabled     ,n          ;Disabled?
;         a_itmindx      ,n          ;Item's index
;         a_row          ,n          ;Item's visible row

; Notes:
;
; This double-click method enables the user to select the
; desired action. It is assumed that the list is being
; processed with L_SELECT.
;
; If the user double-clicks an item in the list, a
; message box is popped up giving the user the option of:
;
; 1. Going to the end of the list (press "Yes")
; 2. Simulating a RETURN          (press "No")
; 3. Doing nothing                (press "Cancel")

.include "WND:tools.def"

proc
    a_sts = TRUE                                ;Success by default

    case %u_msgbox("Double-click encountered -- select:\n"+
&                "      Yes    = goto last\n"+
&                "      No     = simulate RETURN\n"+
&                "      Cancel = do nothing", D_MYESNOCANCEL) of
        begincase
            D_MIDYES: begin                    ;"Yes" selected, go to last item
                g_select = TRUE
                g_entnam = "S_BOTTOM"
            end
            D_MIDNO: a_sts = FALSE ;"No" select, simulate RETURN
            D_MIDCANCEL: nop              ;"Cancel" just returns TRUE
        endcase
    xreturn
endsubroutine

```

## LLOAD\_METHOD – Perform list item “load” processing



```
subroutine LLOAD_METHOD
  a_listid      , n
  a_request     , n
  a_data        , a
  a_inpid       , n
  a_disabled    , n
  a_itemindex   , n
  a_methoddata1 , any
  .
  .
  a_methoddata20 , any
```

### Arguments

*a\_listid*

The ID of the list. (n)

*a\_request*

The load request: (n)

Flags that LLOAD\_METHOD can accept are

**D\_LLOADBOT**      Load next item at end.

**D\_LLOADTOP**      Load next item at beginning.

Flags that LLOAD\_METHOD can return are

(unchanged)      Load request satisfied.

**D\_LEOF**            No more items.

*a\_data*

(optional) The data associated with the item. (a)

*a\_inpid*

The ID of the associated input window. (n)

*a\_disabled*

(optional) The true/false flag that indicates whether to disable the item. (n)

*a\_itemindex*

The index of the item desired. (**n**)

*a\_methoddata1* through *a\_methoddata20*

(optional) Up to 20 additional data arguments. (**any**)

## Discussion

LLOAD\_METHOD is a subroutine that you write and name. L\_PROCESS calls it when it needs to load new items into the list.

You can register the LLOAD\_METHOD using the .LISTCLASS script command, or the L\_CLASS or L\_METHOD subroutines.

If registered, LLOAD\_METHOD must either

- ▶ be contained within the current program image.
- ▶ reside in an executable library (ELB) that was either linked to or opened with OPENELB.

Your LLOAD\_METHOD subroutine cannot contain any calls, direct or indirect, to L\_PROCESS, L\_RESTART, or L\_DATA.

If a load method is not specified, L\_PROCESS will use the default method, which is to return to the caller when new items are needed.

At minimum, your LLOAD\_METHOD subroutine should do the following:

1. If there are any more items to be retrieved at the indicated end of the known list, then do all of the following:
  - ▶ Display the item into the input window whose ID is *a\_inpid*.
  - ▶ If passed, load *a\_data* with the corresponding list item data.
  - ▶ If passed, set the *a\_disabled* flag to true if the item should be disabled. It is always false upon entry.
  - ▶ Leave *a\_request* unchanged.
2. If there are no more items to be loaded, set *a\_request* to D\_LEOF.
3. Return.

Note that the *a\_data* and *a\_disabled* arguments are not necessarily the same variables originally passed to L\_PROCESS or L\_SELECT. These arguments may be a copy. Thus, always set the argument, rather than any global you may be using.

The argument *a\_itemindex* is provided as a reference. It contains the ordinal index of the next item to be loaded for a list. If your program loads the list from the bottom only, this index will be accurate. If your program allows loading from the top, the accuracy of *a\_itemindex* depends on the accuracy of the value passed as the *last* argument for L\_CREATE. Note the following:

- ▶ If you are using an ActiveX Toolkit list, Toolkit must pre-fetch list items for the Spread control (which is the ActiveX control used for ActiveX Toolkit lists).
- ▶ Your program should never depend on the timing of load method invocations for specific items. If that level of control is needed, change the load method to load no items, and use D\_LAPPEND option for L\_PROCESS to add items as needed.
- ▶ Do not change the value of *a\_itemindex*.

*A\_methoddata1* through *a\_methoddata20* are up to 20 additional optional arguments that can be passed to L\_INPUT or L\_INPUT. They are passed, in turn, directly to LLOAD\_METHOD. This enables you to communicate additional information to LLOAD\_METHOD.



Note the following:

- ▶ Toolkit passes the method data arguments to the current list processing routine (L\_PROCESS, L\_INPUT, or L\_SELECT) and to the list methods. Thus, if you pass data arguments to one list processing routine, to ensure these arguments are always available, you must pass them to *all* of the list processing routines.
  - ▶ We don't recommend using %M\_SIGNAL in list load methods. Because of the way Toolkit synchronizes menu entry signaling, Toolkit may not execute %M\_SIGNAL calls in list load methods.
- 

## WIN

---

When using an ActiveX Toolkit list, it's possible for the list load method to be called without the 20 additional data arguments being passed (*a\_methoddata1* to *a\_methoddata20*). This can happen immediately after the list is created if the next update occurs prior to entering a list input routine. The update causes the load method to be called, and because Toolkit doesn't have access to the method data arguments, it can't pass them.

---

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.
- ▶ [“Appendix D: Methods”](#).

## Examples

The following load method filters out unwanted records before displaying one into the list.

```

subroutine load_method
    a_listid      ,n
    a_request     ,n
    a_data        ,a
    a_inpid       ,n
    a_disabled    ,n
    a_itemindex   ,n
    .align
    static record
        filchn      ,i4          ;Channel of file being loaded into list

    record data          ;Input data record
        group all_fields ,a
            tag_field    ,a5
            other_fields ,a100
        endgroup

    .define TAGVAL      , "ABC"          ;Example tag value

    proc
        if (.not. filchn)
            xcall u_open(filchn, "i:i", "filename")

            ;Perform tag processing
            ;Read until we get a record we want to display

            while (tag_field .ne. TAGVAL) do
                reads(filchn, data, eof) [err=eof]

                a_data = data
                xcall i_display(a_inpid, "**CURR*", data)
                xreturn

            eof,

            ;This is the last piece of data.

            a_request = D_LEOF

            ;We want to re-load the list from scratch next time.

            clear filchn
            xreturn
    endsubroutine

```



# 10

## Menu Routines

### Introduction to Menus 10-2

Covers the appearance of menus, as well as how to make menu selections, process menus, and generate menu columns at runtime.

### The Menu Subroutines and Functions 10-10

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| M_COLUMN – Place, remove, and delete menu columns .....        | 10-11 |
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| M_DISABLE – Disable an item .....                              | 10-15 |
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| M_RESET – Reset to a disabled menu bar .....                   | 10-51 |
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| MB_BLANK – Add a blank row to a new column .....               | 10-63 |
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| MB_TEXT – Add a row of text to a new column .....              | 10-74 |

## Introduction to Menus

Menus are composed of primary and submenu columns, which are either maintained as windows in a window library file (if you define them with a script file) or are generated at runtime (if you define them with the MB\_ subroutines).

The menu column name, entry names, column and entry text, and shortcut associations (key sequences that automatically select particular menu entries) are stored with the menu column. If you define them in a script, this information won't be hard-coded into your program, so it can be modified easily at any time.

The menu processing utilities in UI Toolkit enable you to load, remove, and delete columns; enable and disable menu entries and sets of entries (menu lists); and process a menu directly.

## General appearance of menus

Primary menus and submenus appear either as standard drop-down menus or pop-up menus. Pop-up menus can appear at any location on the screen (see [%M\\_POPUP on page 10-43](#) for information). Standard drop-down menus drop down from the menu bar.

For standard drop-down menus, a single menu bar is present on the screen when a menu is not being processed. This menu bar contains the headings for each column in the menu. When the menu is processed, the menu bar is highlighted, and the user can drop down a column and select an entry from the column.

Selections in a column are aligned on the left side, aligned on the right side, or centered within the column. And drop-down primary menu columns are either left-justified, right-justified, or centered beneath the header for that column.

If an entry in a menu column is associated with a submenu column, a right arrow (→) is displayed as the column's shortcut. (You can modify the character used to indicate a submenu. It is shortcut function 99 on your key map.) The user can select that entry and drop down a submenu column. Any entry in a primary menu or submenu can have a submenu column associated with it. Descending into submenu columns gives the screen a "cascading" menu appearance. (See [figure 10-1](#).)



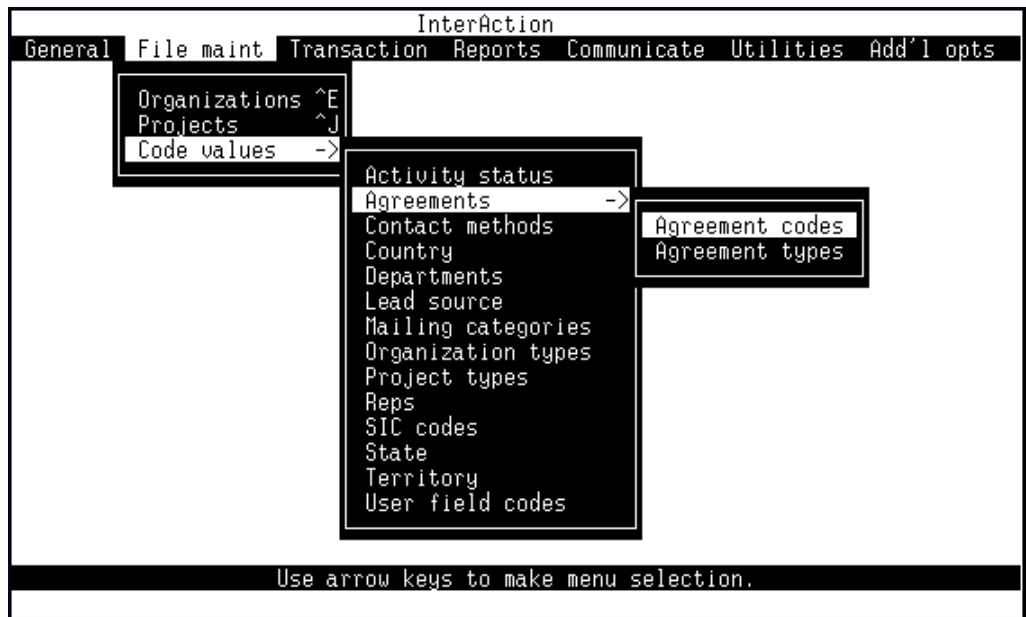


*Figure 10-1. Cascading menus.*

## Menu columns and entries

A menu column can be global (available for deletion from any display level) or local (only the display level that created the column can delete it). Global columns are loaded to the left side of the menu bar, while local columns are loaded to the right of the global columns. See [“What Is an Environment?” on page 7-2](#) for more information about global and local and [“Customizing the way environments place and remove columns” on page 10-9](#) for information on setting an option that changes the way local menu columns are placed and removed.

If a column entry has a shortcut, the display consists of two parts: the text of the entry and the shortcut. Shortcuts are displayed in a “column” to the right of the longest text entry. The text of a menu’s shortcut can be retrieved with M\_KEYTXT.

You can link one or more column entries into a list of entries. This allows you to enable or disable multiple menu entries at once. (See [.LIST on page 2-95](#) for more information on the window building command.)

## Display renditions

Five rendition states are associated with a menu:

- ▶ Enabled
- ▶ Disabled
- ▶ Selected
- ▶ Column quick-select
- ▶ Entry quick-select

When a menu is being processed, all accessible column headers and entries are displayed in the enabled rendition. The column headers and entries that you cannot access are displayed in the disabled rendition. When the menu is not being processed, the menu bar is displayed in the disabled rendition.

As you move among the columns and the entries within the columns, the currently accessed column or entry is displayed in the selected rendition.

By default, an enabled item appears in bold and reverse type, a disabled item appears in reverse type, and a selected item appears in bold type. All are color palette 2 by default.

If you want to change any of the menu renditions, use the `U_REND` subroutine, the `U_EDITREND` subroutine, or the “Renditions” function in Proto. (The Synergy UI Toolkit Control Panel also has a “Renditions” function that you can use. See [“Customizing the Look of Your Application” on page 18-27.](#))

### Disabled selections

You can disable (and re-enable) entries, lists of entries, and even entire columns within a given menu. When you do so, the disabled entries or columns have a different display rendition (attribute and color) and cannot be selected.

The subroutines used to disable and enable menu items are `M_ENABLE` and `M_DISABLE`.

On Windows, disabled menu entries can be highlighted, but the user will not be able to select them.

## Making a menu selection

The user has three ways to make a menu selection: arrow keys, quick-select characters, and shortcuts. (The first two options only work when the menu bar is enabled or being processed.) A menu selection can also be simulated using the `%M_SIGNAL` subroutine.

## Enabling the menu bar

To initiate menu processing during terminal input, the user must press a special “process-menu” key. When this occurs, the menu is activated, the first column or the column set by the `M_DEFCOL` subroutine is automatically dropped down (unless you specified an input string on the `M_PROCESS` subroutine), and the user can select an entry. As distributed, the process-menu key for most platforms is `CTRL+P`; for Windows it is the `ALT` key. (On Windows, the user can also use the mouse to select or drop down menus and select menu entries.) You can modify this key by supplying an `EFKEY_METHOD` subroutine.

The menu bar is disabled when an entry is selected or if the user presses the process-menu key a second time, without making a selection.

---

### UNIX, VMS

In UNIX and OpenVMS environments, you can remove the menu bar from the display screen using the `U_BAR` subroutine. If you call `U_BAR`, the menu bar will only be placed when the process-menu key is pressed, and it will be removed again when an entry is selected.

---

## Selection by arrow keys

The most common way to make a menu selection is to use the arrow keys. Once the menu bar is enabled, the left and right arrow keys enable the user to move through the menu, between the various menu columns. When a column is selected (which means that the “cursor” passes over it), the possible selections for that column are dropped down in a vertical list of entries below the heading. The first entry in the column is automatically selected. The user can either press `ENTER` to enter this selection or use the up and down arrow keys to select a different entry within the column.

The arrow keys can be used in any combination, and they will wrap around within the menu and columns. Wrapping means that when the user is on the last entry in a column and presses the `DOWN` arrow key, the next entry highlighted will be the top one. Likewise, if you are viewing the rightmost menu column and you press the `RIGHT` arrow key, it will wrap to the leftmost menu column. Once the user has chosen an entry with the arrow keys, the user must press the `ENTER` key to enter the selection.

If the user selects an entry that has a submenu associated with it, the possible selections for that submenu column are dropped down in a vertical list of entries that are adjacent to the parent menu entry. The first entry in the submenu column is automatically selected. The user can press the up and down arrow keys to move among the entries of a submenu column just as in a primary menu column. After descending into submenu columns, the user can press either the `RIGHT` or `LEFT` arrow key to go to the previous menu. The user can also press the process-menu key to go to the primary menu column. (See the previous section for information on the process-menu keys available in various environments.) After returning to the parent (primary) column, the submenu column is removed from the screen.

## Selection by quick-select characters

Each menu column and menu entry is associated with a quick-select character. A quick-select character is a single character that will access that entry while the menu is being processed. Usually it is related to the name or text of the entry (for example, the first letter or number of the entry).

Quick-select characters are not case sensitive.

When a primary menu or submenu column is dropped down, the user can type the quick-select character to not only highlight the menu entry but also select it. If the quick-select character is not unique in the column, it simply highlights it.

If the menu bar is enabled (being processed), but no column is currently dropped down, the user can drop down a menu by typing the column's quick-select character.

Quick-select character associations are made in your menu column scripts or with the `MB_ENTRY` subroutine. See [MB\\_ENTRY on page 10-70](#) for more information.

In UNIX and OpenVMS environments, if a user presses an invalid quick-select character, a beep is generated.

### Re-using quick-select characters

The quick-select character for a menu entry need not be unique.

If a character is duplicated within the entries of a column, the system accesses the next entry that matches, going from top to bottom and wrapping to the top after reaching the bottom.

### Applying renditions to quick-select characters

The quick-select characters have their own renditions, which can be modified using `U_REND`, `U_EDITREND`, or the "Renditions" function in Proto.

There is one rendition for column quick-select characters and another for entry quick-select characters. Both are set to reverse, bold, underline and color 10 by default.

On Windows, quick-select characters are always designated by an underscore ("\_").

### Adopting conventions

Although the quick-select character has no real constraints, we recommend that you adopt some conventions regarding the character and its associated text. For example, you can

- ▶ require that the quick-select character be contained within the text, and then uppercase that character (for example, "o" for "Option," "x" for "neXt," and so forth).
- ▶ label your entries with numbers or letters and use those labels as quick-select characters (for example, "1. Calculate," "E - Exit").
- ▶ flag the quick-select character by applying the same rendition (such as underlining) to it.
- ▶ always use the first character of the text as the quick-select character.

Regardless of the method you choose, it is important that your convention be logical, easy to use, and consistent across all of your applications.

For consistency with other Synergy applications, we specifically recommend that you

- ▶ use the default rendition (underline, color 10).
- ▶ make sure the quick-select character is contained in the entry or header text.
- ▶ select quick-select characters that are unique among entries in a column or among headers of placed columns.

Following these conventions for quick-select characters will help ensure that all of your Synergy applications look the same.

## Shortcuts

A shortcut is a key or key sequence that automatically accesses a particular menu entry. You can use a shortcut even when the menu is not being processed.

To associate a shortcut such as a control character, function key, or arrow key with a given option, you must make an entry for that option in the current menu and assign the desired key to that entry in the menu column script.

The display codes ^, v, <, and > represent the up, down, left, and right arrow keys, respectively, in the menu entry. Arrow keys are disabled as shortcuts during menu processing and are temporarily redefined for movement within the menu.

When the user presses a shortcut, the associated menu entry is immediately selected. Pressing a shortcut is exactly equivalent to pressing the process-menu key, selecting the corresponding column, selecting the corresponding entry, and pressing the ENTER key.

The following constraints apply to shortcuts:

- ▶ Shortcuts can be used in primary menus only.
- ▶ Duplicate shortcuts are allowed, but if more than one column has the same shortcut, the entry in the rightmost column gets processed when the shortcut is pressed.
- ▶ On Windows, some keys and key combinations are *privatized* for lists. That is, they are reserved for the list and cannot be assigned as menu shortcuts without calling `L_RETURNKEY` and setting their return states to true. See “[Appendix C: Keyboard Navigation for Lists on Windows](#)” and `L_RETURNKEY` on page 9-126 for information.
- ▶ `CTRL+M` is not valid as a shortcut because it is a carriage return. We recommend that you also do not define any other control characters that already have a function on the system as shortcuts (for example, `CTRL+S` is a screen hold on many systems). Refer to [chapter 2, “Script,”](#) for more information about building menu columns.

---

### WIN

On Windows, the PAGE UP, PAGE DOWN, HOME, END, and arrow keys are privatized for lists. That is, they are available for functions internal to the list, but aren’t available as menu shortcuts unless you call the `L_RETURNKEY` subroutine and set their return states. See `L_RETURNKEY` on page 9-126 for more information.

---

## Simulating a menu entry or canceling a signaled menu entry

`%M_SIGNAL` enables you to either signal a menu entry programmatically or cancel a menu entry that's been signaled programmatically or by the user. Note the following:

- ▶ If you want to invoke a menu entry from a method subroutine, we recommend using the `D_SIGNAL` operation for `%M_SIGNAL`—especially on Windows, where method subroutines are direct callbacks.
- ▶ If you signal a menu entry from a callback routine and process the menu entry in the same callback routine, use the `D_REMOVE` operation for `%M_SIGNAL` to cancel the menu entry *after* you've processed it. If you don't, the menu entry will be resignaled when processing returns to the calling routine.
- ▶ We *don't* recommend using `%M_SIGNAL` to signal a menu entry from a list load method. Because of the way Toolkit synchronizes menu entry signaling, Toolkit may not execute the menu entry.

For more information, see [%M\\_SIGNAL on page 10-56](#).

## Processing menus

Before processing a menu column, you must load it from the window library with `M_LDCOL` or create it with the “`MB_xxx`” subroutines. If you want to have a default menu entry or have this new column be the one that is dropped down when the menu is processed, call `M_DEFCOL`.

To process a pop-up menu, use `%M_POPUP` (see [%M\\_POPUP on page 10-43](#)). For standard drop-down menus, you can explicitly process the menu by calling `M_PROCESS` (see [M\\_PROCESS on page 10-47](#)). However, you will find that you rarely need to do this because menu processing happens implicitly during input. Either way, the following global variables enable your application to determine whether a menu entry was selected, what the selection was, and if there is any user text associated with the selection.

These variables are defined in the **tools.def** file.

| Check this variable... | To determine...                                                                     |
|------------------------|-------------------------------------------------------------------------------------|
| <code>g_select</code>  | Was a menu entry selected?                                                          |
| <code>g_entnam</code>  | If <code>g_select</code> is true, which menu entry was selected?                    |
| <code>g_entuser</code> | If <code>g_select</code> is true, what user text is associated with the menu entry? |

Additional menu support subroutines include `M_COLUMN`, which places, removes, or deletes a column; `M_RESET`, which disables the menu bar; `M_SCINFO`, which returns menu and shortcut entry information; `M_TEXT`, which modifies and retrieves menu entry text; and `M_USER`, which retrieves the user text string associated with a particular menu entry.

## Runtime generation of menu columns

If your application needs to generate a menu column at runtime, use the “MB\_xxx” subroutines. They provide an alternative to defining your menu columns in script files.

We recommend that you use these subroutines only when you cannot determine the contents of the menu until runtime. Loading columns from window libraries is faster and more modular than generating columns at runtime.

There is an almost one-to-one correspondence between the “MB\_xxx” subroutines and the window script commands that build a column: MB\_COLUMN provides essentially the same functionality as the .COLUMN window building command, MB\_ENTRY provides the same functionality as the .ENTRY window building command, and so forth. (The only functionality difference is that you cannot specify user text with the “MB\_xxx” routines.)

These subroutines are also called in the same order as the column window building commands. For example:

```
xcall mb_column
xcall mb_entry
.
.
.
xcall mb_end
```

Each routine has a *control* argument, which is the data area required by the menu build subroutines. *Control* must be an alpha field and may have to vary in size, depending on how many menu entries you put in your column.

If you run out of space in the *control* argument, you will get the following fatal error: “Overflow of column build control array.” This error indicates that you must increase the data area of the *control* argument.

## Customizing the way environments place and remove columns

The default behavior for each environment’s handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. In UNIX and OpenVMS environments, U\_START sets **g\_plc\_col\_args** to true which tells the subroutine to place and remove the columns as needed. In Windows environments, U\_START sets this flag to false which tells the subroutine to ignore any passed column arguments typically needed for input. In any environment, you can alter the value of **g\_plc\_col\_args** after U\_START is called. (Altering **g\_plc\_col\_args** is not advisable in UNIX or OpenVMS environments because columns containing functions must be placed to make those functions available to the user.)

# The Menu Subroutines and Functions

This section discusses the syntax and arguments for each of the menu subroutines and functions. The subroutines that begin with MB\_ (for “menu build”) enable you to define menu columns and subcolumns at runtime.



## M\_COLUMN – Place, remove, and delete menu columns



```
xcall M_COLUMN([col_operation,] col_id[, ...])
```

### Arguments

*col\_operation*

(optional) One of the following column operations to perform: **(n)**

|                 |                              |
|-----------------|------------------------------|
| <b>D_PLACE</b>  | Place menu column. (default) |
| <b>D_REMOVE</b> | Remove menu column.          |
| <b>D_DELETE</b> | Delete menu column.          |

*col\_id*

One or more column IDs on which to operate. It can also be one of the following: **(n)**

|                 |                            |
|-----------------|----------------------------|
| <b>D_ALL</b>    | All placed columns.        |
| <b>D_GLOBAL</b> | All placed global columns. |
| <b>D_LOCAL</b>  | All placed local columns.  |

### Discussion

The M\_COLUMN subroutine adds, removes, or deletes a menu column.

You can specify more than one *col\_operation* in the same M\_COLUMN call by specifying multiple *col\_operation*, *col\_id* pairs. See Examples below.

The maximum number of placed primary menu columns is nine.

*Col\_id* can either be a column ID (returned by M\_LDCOL or MB\_END) or one of the qualifiers listed above. Note the following:

- ▶ When using D\_PLACE, you must specify an actual column ID. You cannot use D\_ALL, D\_GLOBAL, or D\_LOCAL with D\_PLACE.
- ▶ *Col\_id* must be the ID of a loaded column—no matter what the *col\_operation*—or a fatal Toolkit error will occur.

D\_REMOVE cannot remove an unplaced column. If you use D\_REMOVE, you must make sure the columns you want to remove have been placed. If the column isn't placed, Toolkit will do nothing, and there will be no indication that the remove operation failed for this reason.

D\_REMOVE used with D\_LOCAL removes all columns that are not global (including those belonging to any previous environment level).

D\_DELETE can delete any local columns or it can delete any global columns that are unplaced in a prior environment level. If the column is placed at a prior environment level and you use D\_DELETE to try to delete it, UI Toolkit will issue a fatal error: “Cannot delete window; window placed at environment level *n*.”



The maximum available memory for all loaded columns (including columns created with MB\_COLUMN) is 65,565 bytes. If your application exceeds this, Toolkit will generate an error. Note that this limit includes all information about the columns: information you’ve specified and internal information. If you get this error, you must reduce the amount of information in the columns. For example, you might be able to reduce user text or shortcuts associated with the menu entries. (If you’ve defined your menu columns in a script file and there’s a lot of column information, test your program by accessing *all* of the column menus, including subcolumns.)

---

## Examples

The following example places the column whose ID is stored in **util**.

```
xcall m_column(D_PLACE, util)
```

The next example removes all local columns and deletes the column whose ID is stored in **main**.

```
xcall m_column(D_REMOVE, D_LOCAL, D_DELETE, main)
```

## M\_DEFCOL – Set default drop-down menu column or entry



```
xcall M_DEFCOL ([default][, current])
```

### Arguments

*default*

(optional) The default new column number or menu entry. (**a** or **n**)

*current*

(optional) Returned with the current default column number or menu entry. (**a** or **n**)

### Discussion

The M\_DEFCOL subroutine specifies which menu column will be dropped down automatically or which menu entry will be enabled when the menu is processed.

This subroutine determines the number of the column that will be dropped down or the menu entry that will be activated when the user presses the “process-menu” key or your program calls M\_PROCESS with no arguments. (See [“Enabling the menu bar” on page 10-5](#) for available process-menu keys.)

If numeric arguments are passed, a default column is dropped down when the menu is processed. If alpha arguments are passed, a default entry is selected when the menu is processed.

You can set a default menu column or menu entry but not both; setting one disables the other.

To set the default column, use the number 1 for the leftmost column, and so on, up to the number 9 for the rightmost column. (Specifying 9 always references the rightmost column even if fewer than 9 columns are placed.) If you specify a *default* value of 0, no column will be dropped down automatically by M\_PROCESS or the process-menu key. If you specify 0, the quick-select feature will be enabled for columns as well as menu entries. Specifying a *default* value of 0 has the same effect as setting the environment variable DTK\_MENU\_UP.

To set the default menu entry, simply pass the entry name in *default*.

You should call M\_DEFCOL immediately after loading the columns. If you don’t call M\_DEFCOL, the first menu column is dropped down by default.

### See also

[DTK\\_MENU\\_UP](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for disabling automatic drop-down menus.

## Menu Routines

### M\_DEFCOL

## Examples

In the following example, the second column from the left is the default column that is dropped down when the menu is processed.

```
xcall m_defcol(2)
```

## M\_DISABLE – Disable an item



```
xcall M_DISABLE ([D_ENTRY,] col_id, ent_name[, ...])
```

```
xcall M_DISABLE (D_LIST, col_id, list_name[, ...])
```

```
xcall M_DISABLE (D_COLUMN, col_id[, ...])
```

```
xcall M_DISABLE (D_SUB, sub_name, ent_name[, ...])
```

### Arguments

#### D\_ENTRY

(optional) Disables a menu entry on a placed menu column. (default)

#### D\_LIST

Disables a list of menu entries on a placed menu column.

#### D\_COLUMN

Disables a placed primary column.

#### D\_SUB

Disables a submenu entry, pop-up menu entry, or entry in a submenu to a pop-up menu on a loaded menu column.

#### *col\_id*

The ID of the column to be disabled or the column in which the entry or list is located. *Col\_id* is returned by the M\_LDCOL and MB\_END subroutines. **(n)**

#### *ent\_name*

The name of the entry to disable. *Ent\_name* is an entry name from the .ENTRY script command or MB\_ENTRY. **(a)**

#### *list\_name*

The name of the list of entries to disable. *List\_name* is a list name from the .LIST script command or MB\_LIST. **(a)**

#### *sub\_name*

The name of the submenu, pop-up menu column, or submenu to a pop-up menu that contains the menu entries or submenu columns to disable. **(a)**

## Discussion

The `M_DISABLE` subroutine disables menu entries, lists of menu entries, menu columns or subcolumns, entries in pop-up menu columns, or entries in submenus to pop-up menu columns. It has four forms, which are listed above.

You can specify more than one *ent\_name* or more than one *list\_name*. You can also specify more than one *col\_id* if the qualifier is `D_COLUMN`. But `M_DISABLE` can have no more than nine arguments.

Note the following:

- ▶ *Col\_id* must be the ID of a loaded and placed column. An unloaded column will cause a fatal Toolkit error.
- ▶ *Sub\_name* must be a valid menu column name. (*Sub\_name* can be the name of an unplaced column or an unloaded column created using `MB_COLUMN` with the `D_NOLOAD` option.)
- ▶ If you're using `D_SUB` to enable a pop-up menu entry or a submenu to a pop-up menu, placing the column on the menu bar will cause the entry or submenu to be reset to its default state. An entry in a submenu to a pop-up menu, however, will remain enabled when the column that references the submenu is placed on the menu bar.

While your application is running, if the user selects a disabled entry in a primary column or submenu column, or if the user selects a submenu column, `M_PROCESS` will stay active but will return to the menu bar. If the user selects a disabled pop-up menu entry, `M_PROCESS` will no longer be active; control will return to the calling routine. In this case, `g_select` will be false and `g_entnam` will be blank.

On Windows, disabled menu entries can be highlighted, but the user will not be able to select them.

## Examples

In the following example, the entries “ar” and “ap,” located in the column whose ID is stored in `colid(i)`, are disabled.

```
xcall m_disable(colid(i), "ar", "ap")
```

In the next example, the entries in the list `sysmgr` in the column stored in `colid(i)` are disabled.

```
xcall m_disable(D_LIST, colid(i), "sysmgr")
```

In the following example, the column whose ID is stored in `colid(i)` is disabled.

```
xcall m_disable(D_COLUMN, colid(i))
```

In the following example, the submenu entry “o\_owner” is disabled in the submenu named “admin.”

```
xcall m_disable(D_SUB, "admin", "o_owner")
```

## M\_ENABLE – Enable an item



```
xcall M_ENABLE ([D_ENTRY,] col_id, ent_name[, ...])
```

```
xcall M_ENABLE (D_LIST, col_id, list_name[, ...])
```

```
xcall M_ENABLE (D_COLUMN, col_id[, ...])
```

```
xcall M_ENABLE (D_SUB, sub_name, ent_name[, ...])
```

### Arguments

#### D\_ENTRY

(optional) Enables a menu entry on a placed menu column. (default)

#### D\_LIST

Enables a list of menu entries on a placed menu column.

#### D\_COLUMN

Enables a placed primary column.

#### D\_SUB

Enables a submenu entry, pop-up menu entry, or entry in a submenu to a pop-up menu on a loaded menu column.

#### *col\_id*

The ID of the column to be enabled or the column in which the entry or list is located. *Col\_id* is returned by the M\_LDCOL and MB\_END subroutines. **(n)**

#### *ent\_name*

The name of the entry to enable. *Ent\_name* is an entry name from the .ENTRY script command or MB\_ENTRY. **(a)**

#### *list\_name*

The name of the list of entries to enable. *List\_name* is a list name from the .LIST script command or MB\_LIST. **(a)**

#### *sub\_name*

The name of the submenu, pop-up menu column, or submenu to a pop-up menu that contains the menu entries or submenu columns to enable. **(a)**

## Discussion

The `M_ENABLE` subroutine enables menu entries, lists of menu entries, menu columns or subcolumns, entries in pop-up menu columns, or entries in submenus to pop-up menu columns. It has the four forms listed above.

You can specify more than one *ent\_name* or more than one *list\_name*. You can also specify more than one *col\_id* if the qualifier is `D_COLUMN`. But `M_ENABLE` can have no more than nine arguments.

Note the following:

- ▶ *Col\_id* must be the ID of a loaded and placed column. An unloaded column will cause a fatal Toolkit error.
- ▶ *Sub\_name* must be a valid menu column name. (*Sub\_name* can be the name of an unplaced column or an unloaded column created using `MB_COLUMN` with the `D_NOLOAD` option.)
- ▶ If you're using `D_SUB` to enable a pop-up menu entry or a submenu to a pop-up menu, placing the column on the menu bar will cause the entry or submenu to be reset to its default state. An entry in a submenu to a pop-up menu, however, will remain enabled when the column that references the submenu is placed on the menu bar.

## Examples

The first example enables the entry “gl” located in the column whose ID is stored in **colid(i)**.

```
xcall m_enable(colid(i), "gl")
```

In the second example, the entries in the list **sysmgr** in the column stored in **colid(i)** are enabled.

```
xcall m_enable(D_LIST, colid(i), "sysmgr")
```

In the third example, the columns whose IDs are stored in **col1** and **col2** are enabled.

```
xcall m_enable(D_COLUMN, col1, col2)
```

In the last example, the submenu entry “o\_owner” is enabled in the submenu named “admin.”

```
xcall m_enable(D_SUB, "admin", "o_owner")
```



## %M\_INFO – Get menu system information



```
status = %M_INFO(subfunction, args)
```

or

```
xcall M_INFO(subfunction, args)
```

### Return value

*status*

This function returns an integer value specific to *subfunction*. See [page 10-21](#) through [page 10-37](#) for the specific return values. (^VAL)

### Arguments

*subfunction*

One of the following: (n)

|                        |                                                                                      |
|------------------------|--------------------------------------------------------------------------------------|
| <b>D_MENU_COLUMNS</b>  | Retrieve loaded columns. See <a href="#">page 10-21</a> .                            |
| <b>D_MENU_ENABLED</b>  | Determine whether a column or entry is enabled. See <a href="#">page 10-24</a> .     |
| <b>D_MENU_ENTRIES</b>  | Retrieve the entries in a column. See <a href="#">page 10-26</a> .                   |
| <b>D_MENU_ENTRY</b>    | Retrieve information about a menu entry. See <a href="#">page 10-28</a> .            |
| <b>D_MENU_HEADER</b>   | Retrieve information about a column's header. See <a href="#">page 10-31</a> .       |
| <b>D_MENU_LISTS</b>    | Retrieve the entry lists in a column. See <a href="#">page 10-33</a> .               |
| <b>D_MENU_LIST</b>     | Retrieve the entries in a list. See <a href="#">page 10-35</a> .                     |
| <b>D_MENU_SHORTCUT</b> | Determine the entry that corresponds to a shortcut. See <a href="#">page 10-37</a> . |

*args*

Arguments specific to *subfunction*.

### Discussion

The %M\_INFO routine enables you to get information about the menu system. See [page 10-21](#) through [page 10-38](#) for details.

#### See also

- ▶ [M\\_KEYTXT on page 10-39](#) for information on getting shortcut text.
- ▶ [M\\_SCINFO on page 10-54](#) for information on getting menu and shortcut entry information.
- ▶ [%M\\_TEXT on page 10-60](#) for information on modifying and retrieving menu entry text.

## %M\_INFO (continued)

### D\_MENU\_COLUMNS

*numcols* = %M\_INFO (D\_MENU\_COLUMNS, [*max*], [*array*], [*env*][, *placed*])

or

xcall M\_INFO (D\_MENU\_COLUMNS, [*max*], [*array*], [*env*][, *placed*])

### Return value

*numcols*

This function returns the number of columns that match the default criteria or the criteria specified by the *env* or *placed* arguments. (^VAL)

### Arguments

*max*

(optional) The maximum number of column IDs to be returned in the array specified by *array*. (n)

*array*

(optional) The first element of an array that will accept the returned column IDs. (n)

*env*

(optional) One of the following: (n)

**D\_ALL**                      Include loaded columns for all environment levels.

**D\_GLOBAL**                  Include loaded columns for the global environment level.

**D\_LOCAL**                   Include loaded columns for the current environment level. (default)

*env\_level*                  Include loaded columns for the specified environment level (1 through the number for the current environment level).

*placed*

(optional) One of the following: (n)

**TRUE**                      Return placed columns.

**FALSE**                     Return placed and unplaced columns. (default)

## Discussion

The `D_MENU_COLUMNS` subfunction of `%M_INFO` returns the following information about loaded columns:

- ▶ the number of columns that match the default criteria or the criteria you specify. This is returned in the *numcols* return value.
- ▶ column IDs for columns that match the criteria. This is returned in the array specified by the *array* argument. Note that you must pass both *array* and *max* to get this information. (Passing one without the other, however, does not generate an error.) The *array* argument specifies the first element in an array that will accept the column IDs. The *max* argument limits the number of column IDs that will be written to the array.

By default, `D_MENU_COLUMNS` reports the number of loaded columns (placed or not placed) at the local environment level. You can, however, change this. By passing the

- ▶ *env* argument, you can instruct the subroutine to return information on loaded columns for the global level, for the local level, for a specific level, or for all environment levels. To specify an environment level by number, pass the environment level number as *env\_level*.
- ▶ *placed* argument, you can instruct the subroutine to return information on all loaded columns or just on placed columns. If you don't pass *placed*, this defaults to false.



Submenu columns are included only if they have been separately loaded with `M_LDCOL`. In addition, if *placed* is passed as true, submenus won't be included unless they are also placed as primary columns.

---

## Examples

The following example returns the number of loaded columns (placed and not placed) at the local level. (It doesn't return any column ID's because we didn't pass the *array* argument.)

```
columns = %m_info(D_MENU_COLUMNS)
```

The following example returns the number of loaded columns (placed or not placed) at the local level. It returns this number in the **columns** variable. Because we passed *array* (**col\_ids**) and *max* (**max\_cols**), it also returns the column IDs. (**Max\_cols** limits the number of returned IDs.)

```
columns = %m_info(D_MENU_COLUMNS, max_cols, col_ids)
```

The following example returns the number of loaded columns and the IDs for the loaded columns (placed or not placed) at the previous environment level.

```
prev_env = %e_info(D_ENV_LEVEL) ;Get level number for current environment
prev_env = environment - 1      ;Decrement to get previous environment
columns = %m_info(D_MENU_COLUMNS, max_cols, col_ids, prev_env)
```

The following example returns the number of loaded columns (in **columns**) and the IDs for loaded columns that are placed at the local environment level. It returns the IDs in the array specified by **col\_ids**.

```
columns = %m_info(D_MENU_COLUMNS, max_cols, col_ids,, TRUE)
```

The following example returns the number of loaded columns (in **columns**) and the IDs for loaded columns that are placed at all environment levels. It returns the IDs in the array specified by **col\_ids**.

```
columns = %m_info(D_MENU_COLUMNS, max_cols, col_ids, D_ALL, TRUE)
```

## %M\_INFO (continued)

### D\_MENU\_ENABLED

*enabled* = %M\_INFO (D\_MENU\_ENABLED, *colid*, [*entry*][, *env*])

or

xcall M\_INFO (D\_MENU\_ENABLED, *colid*, [*entry*][, *env*])

### Return value

*enabled*

This function returns one of the following: (^VAL)

|              |                                  |
|--------------|----------------------------------|
| <b>TRUE</b>  | The column or entry is enabled.  |
| <b>FALSE</b> | The column or entry is disabled. |

### Arguments

*colid*

The ID of a currently loaded column. (**n**)

*entry*

(optional) The name of the menu entry to report on. (**a**)

*env*

(optional) One of the following: (**n**)

|                 |                                                                                  |
|-----------------|----------------------------------------------------------------------------------|
| <b>D_GLOBAL</b> | Return the initial state of the column or entry.                                 |
| <b>D_LOCAL</b>  | Return the state of the column or entry in the current environment.<br>(default) |

*env\_level*

Return the state of the column or entry at a specified environment level  
(1 through the number of the current environment level).

### Discussion

The D\_MENU\_ENABLED subfunction of %M\_INFO enables you to get the state (enabled or disabled) of a menu column or menu entry at a given environment level. To get the state of

- ▶ an entry, pass *entry* with the name of the menu entry. (If there is no menu entry with the name passed as *entry*, a fatal Toolkit error is generated.)
- ▶ a column, omit *entry* or pass it as blank.

In either case, you must pass a valid column ID as *colid*. (Otherwise a fatal Toolkit error is generated.) The column doesn't have to be a primary column. It can be a submenu column. But if it's a submenu column from a window library, it must first be loaded using M\_LDCOL with the

D\_NOPLC parameter. (Submenus are not loaded as menu columns during normal processing.) Note that you can pass the ID of any column created using MB\_COLUMN with the D\_NOLOAD option—even if it is a subcolumn.

You can also select which environment level you want the state returned for. You can use the *env* argument to instruct D\_MENU\_ENABLED to return the state at the global level (D\_GLOBAL), the local level (D\_LOCAL, which is the default), or a specific level (by passing the number of the level as *env\_level*). Note, however, that if the column isn't placed in the specified environment (or default environment if you don't pass *env*), this function returns the initial state, the state specified when the column or entry was created.

## Examples

The following example returns the current state of the column whose ID is passed as **col\_id**—if the column has been placed, that is. (If the column hasn't been placed, it returns the initial state, the state specified when the column was created.) Because we don't pass the *env* argument, this example returns the column's state for the local environment.

```
state = %m_info(D_MENU_ENABLED, col_id)
```

The following example returns the current state of the N\_FINDCUST menu entry if the **col\_id** column has been placed. Note that it returns the state for the local environment because we didn't pass *env*.

```
state = %m_info(D_MENU_ENABLED, col_id, "N_FINDCUST")
```

The next example returns the initial state of the **col\_id** column. It returns the initial state because we passed D\_GLOBAL as the *env* argument.

```
state = %m_info(D_MENU_ENABLED, col_id,, D_GLOBAL)
```

The following example returns the state of the N\_FINDCUST menu entry in the previous environment. (Assume that **prev\_env** is set to the number of the previous environment level.) If **col\_id** hasn't been placed in the previous environment level, however, this example returns the initial state of N\_FINDCUST, the state specified when the column was created.

```
state = %m_info(D_MENU_ENABLED, col_id, "N_FINDCUST", prev_env)
```

## %M\_INFO (continued)

### D\_MENU\_ENTRIES

*num\_entries* = %M\_INFO(D\_MENU\_ENTRIES, *colid*, [*max*][, *array*])

or

xcall M\_INFO(D\_MENU\_ENTRIES, *colid*, [*max*][, *array*])

### Return value

*num\_entries*

This function returns the number of entries in the menu column specified by *colid*. (^VAL)

### Arguments

*colid*

The ID of a currently loaded column. (n)

*max*

(optional) The maximum number of entries to return in *array*. (n)

*array*

(optional) The first element of an array that will receive the menu entry names (up to ten characters each). (n)

### Discussion

The D\_MENU\_ENTRIES subfunction of %M\_INFO returns the number of menu entries in the menu column or submenu column specified by *colid*. If you pass *max* and *array*, it also returns the names of the menu entries in the column. (To get this information, you must pass both of these arguments. However, if you pass one without the other, you won't get an error.)

- ▶ The *array* argument specifies the first element in an array that will accept the menu entry names.
- ▶ The *max* argument specifies the maximum number of menu entry names that will be written to the array.

Note that you must pass a valid column ID as *colid*. (Otherwise a fatal Toolkit error is generated.) The column doesn't have to be a primary column. It can be a submenu column. But if it's a submenu column from a window library, it must first be loaded using M\_LDCOL with the D\_NOPLC parameter. (Submenus are not loaded as menu columns during normal processing.) Note that you can pass the ID of any column created using MB\_COLUMN with the D\_NOLOAD option—even if it is a subcolumn.



## Examples

The following example returns the number of menu entries in the column whose ID was passed as **col\_id**. This number is returned in **menu\_entries**.

```
menu_entries = %m_info(D_MENU_ENTRIES, col_id)
```

The following example returns the number of menu entries in the column specified by **col\_id**. It also returns the names of the menu entries in the column. These names are returned in the array whose first element is **entry\_array**. The **max\_entries** variable sets a limit to the number of names that can be returned.

```
menu_entries = %m_info(D_MENU_ENTRIES, col_id, max_entries, entry_array)
```

## %M\_INFO (continued)

### D\_MENU\_ENTRY

```
found = %M_INFO (D_MENU_ENTRY, colid, [entry], [index], [text], [quick_select], [shortcut],  
& [user][, noreset])
```

or

```
xcall M_INFO (D_MENU_ENTRY, colid, [entry], [index], [text], [quick_select], [shortcut],  
& [user][, noreset])
```

### Return value

*found*

This function returns one of the following: (^VAL)

**TRUE**                      The menu entry has been found.

**FALSE**                    The menu entry does not exist in the column.

### Arguments

*colid*

The ID of a currently loaded menu column. (**n**)

*entry*

(optional) The name of the menu entry. (**a**)

*index*

(optional) The numeric position (base 1) of the menu entry. (**n**)

*text*

(optional) Returned with the text of the menu entry. (**a**)

*quick\_select*

(optional) Returned with the uppercased quick-select character for the entry. (**a**)

*shortcut*

(optional) Returned with the function code (as defined in **inpctl.def**) associated with the keyboard shortcut for the menu entry, or 0 if the entry has no shortcut. (**n**)

*user*

(optional) Returned with the user text associated with the menu entry, or blank if no user text is associated with the entry. (**a**)

*noreset*

(optional) One of the following: (**n**)

**TRUE**                      The menu entry is set to NORESET.

**FALSE**                     The menu entry is *not* set to NORESET.

## Discussion

The D\_MENU\_ENTRY subfunction of %M\_INFO returns information about a menu entry. You must specify the menu column by passing the column ID as *colid*. And you must specify the menu entry by passing the *entry* or *index* argument.

- ▶ To use the menu entry name to specify the menu entry, pass the name as the *entry* argument (case-insensitive). If you also pass *index*, it is returned with a numeric position indicator (base 1) of the specified menu entry.
- ▶ To use a column position to specify the menu entry, pass the position number (base-1) in the *index* argument. (For example, pass 1 for the top entry in the column, pass 2 for the next entry, etc.) If you want the name of the menu entry returned in *entry*, pass *entry* as a variable that's set to blank.

In addition to retrieving the menu entry name by passing the entry's position and vice versa, you can also get

- ▶ the text for the entry by passing the *text* argument.
- ▶ the quick-select character for the entry by passing the *quick\_select* argument. (The quick-select character is returned as an uppercased character.)
- ▶ the numeric identifier for the entry's keyboard shortcut (as defined in **inpctl.def**) by passing the *shortcut* argument. This argument is returned as 0 if there is no shortcut for the entry or D\_SUBMENU if a submenu is attached to the entry.
- ▶ the user text associated with the menu entry by passing the *user* argument. This argument is returned as 0 if there is no user text for the menu entry. (The M\_USER subroutine also returns the user text for a menu entry, but M\_USER works only with primary columns.)
- ▶ a value that indicates whether or not the menu column will be reset if the entry is selected. You can get this information by passing the *noreset* argument. (See [.ENTRY on page 2-29](#) for information on the NORESET qualifier that specifies this.)

Note that you must pass a valid column ID as *colid*. (Otherwise a fatal Toolkit error is generated.) The column doesn't have to be a primary column. It can be a submenu column. But if it's a submenu column from a window library, it must first be loaded using M\_LDCOL with the D\_NOPLC parameter. (Submenus are not loaded as menu columns during normal processing.) Note that you can pass the ID of any column created using MB\_COLUMN with the D\_NOLOAD option—even if it is a subcolumn.

## Examples

The following example returns a value in **col\_found** that indicates whether the O\_CANCEL menu entry exists on the menu column specified by **col\_id**.

```
col_found = %m_info(D_MENU_ENTRY, col_id, "O_CANCEL")
```

As with the previous example, the following example returns a value in **col\_found** that indicates whether the O\_CANCEL menu entry exists on the menu column specified by **col\_id**. However, it also returns the position of the entry in the column. Because *entry* is passed ("O\_CANCEL") and isn't blank, the position is returned in **entry\_num**.

```
col_found = %m_info(D_MENU_ENTRY, col_id, "O_CANCEL", entry_num)
```

Assuming **entry\_name** is blank, the following example returns a value in **col\_found** that indicates whether a menu entry exists at the position specified by **entry\_num**. If an entry does exist at the specified position, it also returns the name of the menu entry (in **entry\_name**) in the position specified by **entry\_num**.

```
entry_name = ""  
col_found = %m_info(D_MENU_ENTRY, col_id, entry_name, entry_num)
```

The next example also returns a value in **col\_found** that indicates whether a menu entry exists at the position specified by **entry\_num**. In addition it returns the text of the entry, the uppcased quick-select character for the entry, the function number for the keyboard shortcut, any user text associated with the entry, and a value that indicates whether the column will be reset when the entry is selected. Note, however, that it doesn't return the name of the entry because we didn't pass the *entry* argument.

```
col_found = %m_info(D_MENU_ENTRY, col_id,, entry_num, entry_text,  
& q_select, short_num, user_text, col_reset)
```

## %M\_INFO (continued)

### D\_MENU\_HEADER

```
header_length = %M_INFO (D_MENU_HEADER, colid, [header], [quick_select], [justification]  
&                                     [, column_width])
```

or

```
xcall M_INFO (D_MENU_HEADER, colid, [header], [quick_select], [justification]  
&                                     [, column_width])
```

### Return value

*header\_length*

This function returns the number of characters in the header text for the menu column specified by *colid*. (^VAL)

### Arguments

*colid*

The ID of a currently loaded column. (n)

*header*

(optional) Returned with the text of the column's header. (a)

*quick\_select*

(optional) Returned with the uppercased quick-select character for the column header. (a)

*justification*

(optional) Returned with the justification for the column on UNIX and OpenVMS.  
(On Windows, the column is positioned automatically.) (n)

**D\_JST\_LEFT**      Menu column is left-aligned with the header.

**D\_JST\_RIGHT**     Menu column is right-aligned with the header.

**D\_JST\_CENTER**    Menu column is centered beneath the header.

*column\_width*

(optional) Returned with the overall width (in characters) of the column. (n)

## Discussion

The `D_MENU_HEADER` subroutine of `%M_INFO` returns the following information about a column's header:

- ▶ The number of characters in the header text (including the leading and trailing space in the header) for the column. This is returned in the *header\_length* return value.
- ▶ The text of the column's header (including the leading and trailing space). This is returned in the optional *header* argument.
- ▶ The quick-select character for the column header. This is returned as an uppercased character in the optional *quick\_select* argument.
- ▶ The justification of the column on UNIX and OpenVMS. This is returned in the optional *justification* argument. (On Windows, this has no effect; the column is automatically left-justified under the header.)
- ▶ The overall width, in characters, of the column. This is returned in the optional *column\_width* argument. If an entry has a shortcut, five characters of this width are reserved for the shortcut text.

Note that you must pass a valid column ID as *colid*. (Otherwise a fatal Toolkit error is generated.) The column doesn't have to be a primary column. It can be a submenu column. But if it's a submenu column from a window library, it must first be loaded using `M_LDCOL` with the `D_NOPLC` parameter. (Submenus are not loaded as menu columns during normal processing.) Note that you can pass the ID of any column created using `MB_COLUMN` with the `D_NOLOAD` option—even if it is a subcolumn.

## Examples

The following example returns the number of characters in the header text for the **col\_id** column.

```
h_length = %m_info(D_MENU_HEADER, col_id)
```

The next example returns the following information about the header for the **col\_id** column: the number of characters in the header text (**h\_length**), the text for the column's header (**h\_text**), the uppercased quick-select character for the column (**q\_select**), the justification of the column (**just**), and the overall width, in characters, of the column (**col\_width**).

```
h_length = %m_info(D_MENU_HEADER, col_id, h_text, q_select, just,  
& col_width)
```

## %M\_INFO (continued)

### D\_MENU\_LISTS

*num\_entries* = %M\_INFO(D\_MENU\_LISTS, *colid*, [*max*][, *array*])

or

xcall M\_INFO(D\_MENU\_LISTS, *colid*, [*max*][, *array*])

### Return value

*num\_entries*

This function returns the number of menu lists defined in the menu column specified by *colid*. (^VAL)

### Arguments

*colid*

The ID of a currently loaded column. (n)

*max*

(optional) The maximum number of list names returned in *array*. (n)

*array*

(optional) The first element of an array that will receive the list names (up to ten characters each). (n)

### Discussion

The D\_MENU\_LISTS subfunction of %M\_INFO returns the number of menu lists defined in a menu column or submenu column specified by *colid*. If you pass the *max* and *array* arguments, it also returns the names of the lists in the column. (To get this information, you must pass both of these arguments. However, if you pass one without the other, you won't get an error.)

- ▶ The *array* argument specifies the first element in an array that will accept the list names.
- ▶ The *max* argument specifies the maximum number of list names that will be written to the array.

Note that you must pass a valid column ID as *colid*. (Otherwise a fatal Toolkit error is generated.) The column doesn't have to be a primary column. It can be a submenu column. But if it's a submenu column from a window library, it must first be loaded using M\_LDCOL with the D\_NOPLC parameter. (Submenus are not loaded as menu columns during normal processing.) Note that you can pass the ID of any column created using MB\_COLUMN with the D\_NOLOAD option—even if it is a subcolumn.

## See also

[.LIST on page 2-95](#) for information on menu lists.

## Examples

The following example returns the number of menu lists defined in the column specified by **col\_id**. Because we didn't pass the *max* and *array* arguments, this example won't return the names of the lists.

```
num_lists = %m_info(D_MENU_LISTS, col_id)
```

The following example returns the number of lists and the names of the lists in the column specified by **col\_id**. **List\_name\_array** points to the first element of the array that will receive the list names, and **max\_lists** specifies the maximum number of lists names that will be returned.

```
num_lists = %m_info(D_MENU_LISTS, col_id, max_lists, list_name_array)
```



## %M\_INFO (continued)

### D\_MENU\_LIST

```
num_entries = %M_INFO(D_MENU_LIST, colid, list, [max][, array])
```

or

```
xcall M_INFO(D_MENU_LIST, colid, list, [max][, array])
```

### Return value

*num\_entries*

This function returns the number of menu entries in the specified menu list or 0 if the list doesn't exist in the menu column specified by *colid*. (^VAL)

### Arguments

*colid*

The ID of a currently loaded column. (n)

*list*

The name of a menu list (case-insensitive). (a)

*max*

(optional) The maximum number of menu entry names returned in *array*. (n)

*array*

(optional) The first element of an array that will receive the names of menu entries in the list (up to ten characters each). (n)

### Discussion

The D\_MENU\_LIST subfunction of %M\_INFO returns the number of menu entries in a list or 0 if the menu list specified by the *list* argument is not in the column specified by *colid*. If you pass *max* and *array*, this function also returns the names of the menu entries in the list. (To get this information, you must pass both *max* and *array*. However, if you pass one without the other, you won't get an error.)

- ▶ The *array* argument specifies the first element in an array that will accept the entry names.
- ▶ The *max* argument specifies the maximum number of entry names that will be written to the array.

Note that you must pass a valid column ID as *colid*. (Otherwise a fatal Toolkit error is generated.) The column doesn't have to be a primary column. It can be a submenu column. But if it's a submenu column from a window library, it must first be loaded using M\_LDCOL with the

D\_NOPLC parameter. (Submenus are not loaded as menu columns during normal processing.) Note that you can pass the ID of any column created using MB\_COLUMN with the D\_NOLOAD option—even if it is a subcolumn.

## Examples

The following example returns the number of menu entries that belong to the list **list\_name**. If **list\_name** isn't part of the column **col\_id**, the example will return 0. (Because we didn't pass *max* and *array*, this example won't return the names of the entries.)

```
num_lists = %m_info(D_MENU_LIST, col_id, list_name)
```

The following example returns the number of entries and the names of the entries that belong to the list specified by **list\_name**. **List\_name\_array** is the first element of the array that will receive the menu entry names, and **max\_lists** specifies the maximum number of entry names that will be returned.

```
num_lists = %m_info(D_MENU_LIST, col_id, list_name, max_lists,  
&list_name_array)
```

## %M\_INFO (continued)

### D\_MENU\_SHORTCUT

*colid* = %M\_INFO (D\_MENU\_SHORTCUT, *keycode*, [*entry*][, *env*])

or

xcall M\_INFO (D\_MENU\_SHORTCUT, *keycode*, [*entry*][, *env*])

### Return value

*colid*

This function returns the ID of the menu column that contains the menu entry for the specified shortcut code or 0 if the shortcut code isn't assigned to an entry. (^VAL)

### Arguments

*keycode*

The shortcut code to look for. This must be one of the \_KEY values defined in **inpctl.def**. (n)

*entry*

(optional) Returned with the name of the menu entry that the shortcut code is assigned to. (a)

*env*

(optional) One of the following: (n)

**D\_LOCAL**

The current environment level. (default)

*env\_level*

The number of an environment level (1 through the number of the current environment level).

### Discussion

The D\_MENU\_SHORTCUT subfunction of %M\_INFO returns the ID of the menu column that contains an entry for the specified shortcut code as defined in **inpctl.def**, or it returns 0 if the shortcut code isn't assigned to an entry. If you pass the *entry* argument, it also returns the name of the entry or blank if there's no entry for the shortcut.

---

### WIN

Note that for F11 and F12, you can't use the shortcut codes (F11\_KEY and F12\_KEY) defined in **inpctl.def**. To get information for F11, pass *keycode* as F33\_KEY(68). To get information for F12, pass *keycode* as F34\_KEY(69). See the distributed **keymap.msw** file and MSWINDOWS keymap.

---

By default, `D_MENU_SHORTCUT` searches the local environment for the entry, but you can specify another environment level by passing the number for that environment level as the *env* argument. If entries on more than one placed column have the same shortcut, the entry from the column that was placed last will be returned. This corresponds to the entry that would be signaled if the user pressed the key.

## Examples

The following example returns the ID of the menu column that contains an entry whose shortcut code is mapped to the `F18_KEY` entry in **inpctl.def**. If there is no menu entry assigned to this shortcut code, the example will return 0.

```
col_id = %m_info(D_MENU_SHORTCUT, F18_KEY)
```

In the following example, the `D_MENU_SHORTCUT` subfunction returns not only a column ID but also the name of the menu entry whose shortcut code is mapped to the `F18_KEY` entry in **inpctl.def**. This information is returned for the previous environment level.

```
env_num = %e_info(D_ENV_LEVEL)      ;Get level number for current environment  
env_num = environment - 1           ;Decrement to get previous environment  
col_id = %m_info(D_MENU_SHORTCUT, F18_KEY, menu_entry, env_num)
```

## M\_KEYTXT – Get shortcut text



```
xcall M_KEYTXT (function_code, text[, length])
```

### Arguments

*function\_code*

The function code number for the shortcut key. **(n)**

*text*

Returned with the shortcut text. **(a)**

*length*

(optional) Returned with the length of the shortcut text. **(n)**

### Discussion

The M\_KEYTXT subroutine returns the shortcut text associated with a function code number for the current terminal key map. The **inpctl.def** file defines the associated function code numbers. Key function codes are in the range 1 to 98 (CTRL\_A\_KEY through F63\_KEY).

*Text* is loaded left-justified with trailing blanks. If *text* is too small for the shortcut text, only the leftmost portion is loaded and no warning is given. The shortcut text may be from one to five characters in length.

You may want to create an include file to define mnemonics for the function codes that you use in your key maps (F1\_KEY through F63\_KEY) that indicate their function (for example, HELP\_KEY, EXIT\_KEY), and use these mnemonics when calling this routine directly.

### Examples

The following subroutine obtains the shortcut text for the “Help” shortcut and then displays it on the information line.

```
subroutine info_bar
  record msg
    ,a*      , "Press "
    key      ,a5
    ,a*      , " for help"
  .include "codes.def"      ;User written file

  proc
    xcall m_keytxt(HELP_KEY, key)
    xcall e_sect(D_INFO, msg)
    xreturn
  endsubroutine
```

## M\_LDCOL – Load a menu column



```
xcall M_LDCOL (col_id, [channel], column_name, [no_placement], [search], [error],
&                [global][, saved_name])
```

### Arguments

*col\_id*

Returned with the created column ID. **(n)**

*channel*

(optional) The channel of the window library. **(n)**

*column\_name*

The name of the column to load. **(a)**

*no\_placement*

(optional) The no-placement flag: **(n)**

**D\_NOPLC**                Don't place column.

*search*

(optional) The true/false flag that indicates whether a search for a loaded column with the name *column\_name* should be performed. **(n)**

*error*

(optional) Returned with the status of the operation. **(n)**

*global*

(optional) The global column flag: **(n)**

**D\_GLOBAL**                Column is global.

*saved\_name*

(optional) The name of the column when it was originally saved. **(a)**

### Discussion

The M\_LDCOL subroutine loads a menu column into an internal menu structure, which enables the column to be used with M\_COLUMN for menu processing. You can use M\_LDCOL to load a column from a menu library, or you can use it to load a column created using MB\_COLUMN with the D\_NOLOAD flag (in which case you must also pass the *search* argument).

If *channel* is not passed, **g\_utlib** is used, unless the column was created with MB\_COLUMN.

If you pass a null string (“”) for *column\_name*, Toolkit assigns a unique column name in the form *\_W\_nnn*, where *nnn* is the column ID. You must pass *saved\_name* in this case.

If you pass *D\_NOPLC*, the loaded column will not be placed on the menu.

If you want to create multiple instances of the same column, you can call *M\_LDCOL* as many times as you need using *column\_name* to give each succeeding column a new unique name. You must also pass *saved\_name* if different.

The maximum number of placed menu columns is nine.

The maximum available memory for all loaded columns (including columns created with *MB\_COLUMN*) is 65,565 bytes. If your application exceeds this, Toolkit will generate an error. Note that this limit includes all information about the columns: information you’ve specified and internal information. If you get this error, you must reduce the amount of information in the columns. For example, you might be able to reduce user text or shortcuts associated with the menu entries. (If you’ve defined your menu columns in a script file and there’s a lot of column information, test your program by accessing *all* of the column menus, including subcolumns.)

If you pass *search*, *M\_LDCOL* searches for a loaded column with the specified *column\_name* before attempting to load the column. If the column is found, a successful load is simulated, *col\_id* is set to the ID of the column that was found, and the *search* variable is set to true. If the column is not loaded, the *search* variable is cleared and the load continues normally.

If *error* is present, it will be returned with a value of false (0) if the requested column was found, or a value of true (1) if the column was not found. If *error* is not present and the window cannot be found, a fatal error occurs.

If *D\_GLOBAL* is present and the column is loaded from the library (rather than through the search and find operation), the column is classified as global rather than local.

## Examples

The following example loads the global menu column “util” from the window library that is opened on **chnl**. The loaded column will be placed on the menu, its ID will be stored in **utilid**, and the result of the operation will be placed in **sts**. If “util” is already loaded, an error will occur.

```
xcall m_ldcol(utilid, chnl, "util",,, sts, D_GLOBAL)
```

Because the next example omits the *channel* argument, it loads a menu column named “util” that was either created with *MB\_COLUMN* or that is in the **g\_utilib** library. If it was created with *MB\_COLUMN* and the *D\_NOLOAD* flag was passed, the column will be loaded. If *D\_NOLOAD* was not passed, *M\_LDCOL* just returns the column ID.

```
xcall m_ldcol(utilid,, "util",, search, sts)
```

## Menu Routines

### M\_LDCOL

The next example loads the menu column whose name is stored in **billing** from the library opened on **chnl** and returns its ID in **colid(i)**. The column will not be placed on the menu. The subroutine looks for an existing column of that name before loading. Again, the result of the operation will be returned in **sts**.

```
xcall m_ldcol(colid(i), chnl, billing, D_NOPLC, search, sts)
```



## %M\_POPUP – Process a pop-up menu



```
status = %M_POPUP (col_id, [coordinate_flags], [coordinate_1, coordinate_2],
& [window_id][, input_string])
```

or

```
xcall M_POPUP (col_id, [coordinate_flags], [coordinate_1, coordinate_2], [window_id]
& [, input_string])
```

### Return value

*status*

%M\_POPUP returns true if a pop-up menu entry was selected, otherwise false. (^VAL)

### Arguments

*col\_id*

The ID of the menu column to pop up. (n)

*coordinate\_flags*

(optional) One or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator: (n)

Coordinate units:

**D\_POPUP\_PIXEL** *Coordinate\_1* and *coordinate\_2* are pixels. (default)

**D\_POPUP\_ROWCOL** *Coordinate\_1* and *coordinate\_2* are the ordinal row and column.

Horizontal alignment:

**D\_POPUP\_LEFT** Align the left side of the pop-up menu with the coordinates specified or with a default location. (default)

**D\_POPUP\_HCENTER** Center the pop-up menu horizontally over the coordinates specified or the default location.

**D\_POPUP\_RIGHT** Align the right side of the pop-up menu with the coordinates specified or the default location.

Vertical alignment:

|                        |                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------|
| <b>D_POPUP_TOP</b>     | Align the top of the pop-up menu with the coordinates specified or with a default location. (default) |
| <b>D_POPUP_VCENTER</b> | Center the pop-up menu vertically over the coordinates specified or with a default location.          |
| <b>D_POPUP_BOTTOM</b>  | Align the bottom of the pop-up menu with the coordinates specified or with a default location.        |

*coordinate\_1*

(optional) The coordinate that determines the row or X position of the pop-up menu. If the **D\_POPUP\_PIXEL** flag is specified, the value of this argument is interpreted in pixels. Otherwise, the value is interpreted to be the row number. **(n)**

*coordinate\_2*

(optional) The coordinate that determines the column of Y position of the pop-up menu. If the **D\_POPUP\_PIXEL** flag is specified, the value of this argument is interpreted in pixels. Otherwise, the value is interpreted to be the column number. **(n)**

*window\_id*

(optional) The window ID used in the positioning of the pop-up menu, or one of the following: **(n)**

|                      |                                                                                      |
|----------------------|--------------------------------------------------------------------------------------|
| <b>WID_APP</b>       | The application window (excluding the border and caption).                           |
| <b>WID_CONTAINER</b> | The container window for the Synergy application (including the border and caption). |

*input\_string*

(optional) The “path” to follow to get to a specific pop-up menu entry. **(a)**

## Discussion

The **%M\_POPUP** function enables applications to display and process pop-up menus. The menu column you specify with *col\_id* does not need to be loaded or placed.

The optional set of bit flags used by the *coordinate\_flags* argument is grouped into three categories: coordinate units, and horizontal and vertical alignment. The bit values within each of these categories are mutually exclusive. If no bit flag is set or more than one bit flag is set in a category, then the default bit flag for that category is presumed.

If **D\_POPUP\_PIXEL** is specified, the *coordinate\_1* argument is the horizontal (X) coordinate, and the *coordinate\_2* argument is the vertical (Y) coordinate. If *window\_id* is not passed, the pixel coordinates are used to determine the location of the top left corner of the pop-up menu. On Windows platforms, if both the pixel coordinates are not passed, the current position of the mouse

pointer is used to determine the position of the pop-up menu. On UNIX and OpenVMS platforms, if the pixel coordinates are not passed, the center of the screen is used to determine the position of the pop-up menu.

If `D_POPUP_ROWCOL` is specified, the *coordinate\_1* argument is the vertical (row) coordinate, and the *coordinate\_2* argument is the horizontal (column) coordinate. If *window\_id* is not passed, the row and column coordinates are used to determine the location of the top, left corner of the pop-up menu. If both row and column coordinates are not passed, the pop-up menu is positioned in the center of the screen. When the row and column coordinate system is used on a Windows platform, the actual pixel position used for the pop-up menu is the center of the specified character cell.

If *window\_id* is specified, the coordinates passed are interpreted to be relative to *window\_id*. If *window\_id* is not passed, the screen is the presumed value. If *window\_id* refers to a Synergy window that is not placed, a fatal error occurs.

The format of *input\_string* is identical to the *input\_string* optional parameter used by `M_PROCESS`. See [M\\_PROCESS on page 10-47](#) for more information on the *input\_string* argument. For cross-platform compatibility, an initial “<D>” in the string will always highlight the first item in the pop-up menu.

The pop-up menu is able to extend beyond the boundaries of the application window; however, it is limited to the boundaries of the screen.

---

## WIN

Shortcuts are not available on Windows, and `%M_POPUP` recognizes the following reserved menu entries (which are documented in [“Appendix B: Reserved Menu Entries”](#)).

- E\_CLEAR
- E\_COPY
- E\_CUT
- E\_MARK
- E\_PASTE

---

## UNIX, VMS

On UNIX and OpenVMS, shortcuts are available while the pop-up menu is displayed.

If a menu entry (other than one of those listed above for Windows) is selected from the pop-up menu, `g_select` will be true and `g_entnam` will be the name of the menu entry selected. A menu entry can be selected by pressing ENTER when the entry is highlighted; pressing the entry’s quick-select character (if unique); on Windows platforms, clicking the left or right mouse buttons; or on UNIX and OpenVMS platforms, pressing the entry’s shortcut.

## Menu Routines

### %M\_POPUP

If the user cancels the pop-up menu, **g\_select** will be false. On Windows platforms, the pop-up menu can be cancelled by clicking the mouse outside the pop-up menu or by pressing ESC or ALT. On UNIX and OpenVMS platforms, pressing the key mapped to the drop-down menu function (usually CTRL+P) will cancel the pop-up menu.

If %M\_POPUP is used in a direct callback function (such as a right-click method for a window) and the user wants to return the menu entry out of that function, M\_SIGNAL should be used to resignal the menu entry so that the current input loop will be interrupted. For example:

```
if (%m_popup(colid))  
    xcall m_signal(g_entnam)
```

You can disable or enable an entry in a pop-up menu by using the D\_SUB qualifier for M\_DISABLE or M\_ENABLE. See [M\\_DISABLE on page 10-15](#) and [M\\_ENABLE on page 10-17](#) for information.

## Examples

The following example pops up a menu centered over the application space.

```
xcall m_popup(colid, D_POPUP_ROWCOL .bor. D_POPUP_HCENTER .bor.  
& D_POPUP_VCENTER, , , WID_APP)
```

The following example pops up a menu outside (just to the right of) a Synergy window, centered vertically relative to the window's center.

```
xcall m_popup(colid, D_POPUP_ROWCOL .bor. D_POPUP_VCENTER, ,  
& %w_info(WIF_DCOLSIZ, wndid) + 2, wndid)
```

## M\_PROCESS – Process a menu



```
xcall M_PROCESS ([input_string], [help_id][, wait_time])
```

### Arguments

*input\_string*

(optional) The “path” to follow to get to a specific menu column entry. **(a)**

*help\_id*

(optional) The help identifier. **(a)**

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. **(n)**

**D\_FOREVER** or **-1**

Never time out.

**D\_GLOBAL** or **-2**

Use the global value (see “[g\\_wait\\_time](#)” on page 18-6).  
(default)

**D\_IMMEDIATE** or **0**

Time out immediately.

*n*

Wait up to *n* seconds (where *n* is a positive value) for I/O processing to be complete.

### Discussion

The M\_PROCESS subroutine explicitly processes a menu.

You rarely need to call M\_PROCESS, because menu processing is normally done implicitly during input. However, you may need to use this subroutine at initial program entry, to explicitly process the menu when you’re not doing any input.

If you call M\_PROCESS while no columns are loaded, UI Toolkit issues a “No columns placed” error (using U\_MESSAGE, error-style) and return to the calling routine with **g\_select** false.

Calling M\_PROCESS with no arguments is the same as typing the process-menu key when doing input. You will return from M\_PROCESS when an entry is selected or when the user presses the process-menu key to deactivate the menu bar.

The *input\_string* is a simulation of what you would type in order to move to a specific position on the menu (for example, what would happen after you pressed the process-menu key). The following characters are valid:

|                               |                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------|
| <code>[entry_name]</code>     | Name of the entry—note that the brackets are part of the syntax and must be present |
| <code>&lt;L&gt;</code>        | LEFT arrow key                                                                      |
| <code>&lt;R&gt;</code>        | RIGHT arrow key                                                                     |
| <code>&lt;U&gt;</code>        | UP arrow key                                                                        |
| <code>&lt;D&gt;</code>        | DOWN arrow key                                                                      |
| <code>&lt;E&gt;</code>        | “Enter” key—this is needed to activate a submenu                                    |
| <i>quick-select_character</i> | Any valid quick-select character                                                    |

None of the qualifiers are case sensitive (for example, `<L>` is the same as `<l>`).

Assuming that *input\_string* does not begin with an entry name, the sequence of characters begins as if no menu column is dropped down (in other words, as if `M_DEFCOL` had been called with a 0 argument). Thus, an initial `<R>` drops down the first column.

---

## WIN

The number of arrow movements required does not match the actual keystrokes pressed after the ALT key in Windows environments. (Specifically, one more `<R>` and one less `<D>` are required.) For compatibility with other platforms, *input\_string* must match the keystrokes for a UNIX or OpenVMS environment.

On Windows, *input\_string* can only specify a submenu entry if it follows a valid menu entry. For example, the following is allowed:

```
xcall m_process ( " [menu_entry] <E> [submenu_entry] ")
```

The following is not allowed:

```
xcall m_process ( "<R><D><D><E> [submenu_entry] ")
```

---

*Input\_string* overrides the effect of any previous call to `M_DEFCOL`, though the default column or entry remains in effect for future calls to `M_PROCESS` without *input\_string*.

The following example is equivalent to pressing the RIGHT arrow key twice and typing the “m” key. In other words, it selects the entry in the second column whose quick-select character is **m**. (The user must press ENTER to complete the selection if the quick-select character is non-unique within the column.)

```
"<r><r>m"
```

---

## WIN

On Windows, M\_PROCESS recognizes the following menu entries (though they generally don't have a purpose):

```
E_CLEAR  
E_COPY  
E_CUT  
E_MARK  
E_PASTE
```

---

If a menu entry (other than one of those listed above for Windows) is selected from the menu, **g\_select** is returned with a value of true. **G\_entnam** will contain the uppercased name of the entry the user was on when the user pressed ENTER. If the selected menu entry begins with "U\_" the EUTILS\_METHOD subroutine is called and the menu is reprocessed. If the selected menu entry is "O\_HELP" the EHELP\_METHOD subroutine is called, with *help\_id* as its argument.

You will need to clear **g\_select** after you satisfy the event.

Additionally, when a menu entry is selected, **g\_mnustring** will contain the *input\_string* which, in turn, could be passed to the next call to M\_PROCESS to get back to the same menu entry.

If the operation times out, **g\_select** is set to true and **g\_entnam** set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See "[g\\_time\\_entry](#)" on page 18-5. Note that the time-out is reset after each keystroke. Additionally, in Windows environments, if a menu column is dropped down no time-out will occur.

## See also

- ▶ [M\\_LDCOL](#) on page 10-40 to load a menu from a library.
- ▶ [MB\\_COLUMN](#) on page 10-65 to create (and load) a column at runtime.

## Examples

The following example enables menu processing (exactly as if you had pressed the process-menu key at an input).

```
xcall m_process
```

The next example processes a menu and selects an entry that is in the third column, one entry down from the top. It passes the argument "menuhelp" to the EHELP\_METHOD subroutine if the selected menu entry is "O\_HELP."

```
xcall m_process("<r><r><r><d>", "menuhelp")
```

The following example initializes to the entry below the entry whose name is **ap**, no matter which column contains **ap**.

```
xcall m_process(" [ap]<d>")
```

The following example selects the entry “o\_lock” on the submenu accessed by the entry “o\_admin.”

```
xcall m_process(" [o_admin]<e>[o_lock]")
```

The following code fragment illustrates one way to use M\_PROCESS.

```
do
  begin
    xcall m_process
    if(g_select)
      case g_entnam of
        begincase
          "ENTRY1" : xcall entry1
          "ENTRY2" : xcall entry2
          "ENTRY3" : xcall entry3
          "EXIT"   : done=TRUE
        endcase
      end
    until(done)
```



## M\_RESET – Reset to a disabled menu bar



```
xcall M_RESET
```

### Discussion

The M\_RESET subroutine resets the menu to a disabled bar (with no menu columns dropped down).

If column entries are defined with the .ENTRY command's NORESET option, you will need to call M\_RESET when you want the menu column reset (dropped up).

On Windows, M\_RESET has no other effect than to rebuild menu columns if you have made a change to them but haven't done input since the change.

## M\_RPLENT – Replace menu entry names with their shortcuts



```
xcall M_RPLENT (string, [length][, not_found])
```

### Arguments

*string*

The field to be modified. **(a)**

*length*

(optional) Returned with the trimmed length. **(n)**

*not\_found*

(optional) Returned with the number of menu entries that weren't found. **(n)**

### Discussion

The M\_RPLENT subroutine scans a string for menu entry names to be replaced by their corresponding shortcut key text.

This subroutine searches for entry names enclosed in square brackets ([ ]) within the string and replaces the brackets and entry name with the shortcut text currently assigned to that entry name. If any entry name is not found, it is replaced by a single space. The text that follows the entry name may shift due to the differing lengths of the entry name and its shortcut text.

You can escape the leading bracket with a back slash (\). Any leading bracket that is preceded by a “\” will not be considered as delimiting a menu entry name, and the string “\[” will be replaced by “[”. If there is no ending bracket for a beginning bracket, all further replacement ceases. A set of brackets ([ ]) with no entry name is treated as an entry not found.

When *not\_found* is passed, it is returned with a value of 0 if all menu entries are found and they all have shortcut text. Otherwise, *not\_found* is returned with the number of menu entries that were either not on a placed column or had no associated shortcut text.

This subroutine is especially useful for creating messages and information lines that contain the names of keys to be pressed. Since different keys may be mapped with runtime terminal binding to the same function for different users or terminal types, you can use this subroutine to insert the correct key name at runtime. (See [“Customizing Key Mapping for Menu Shortcuts” on page 18-11](#) for information about runtime terminal binding.)

## Examples

This example scans all currently placed columns for the entry name “O\_HELP.” If found, and a shortcut key has been assigned to the entry, “[O\_HELP]” in the string is replaced by the shortcut text and **nohelp** is returned with a value of zero. If the entry is not found or does not have a shortcut, “[O\_HELP]” is replaced by a single space and **nohelp** is returned with a value of 1. For example, if the F1 key is assigned to the entry “O\_HELP,” the resulting contents of **info** would be “Press F1 for Help.”

```
info = "Press [O_HELP] for Help"  
xcall m_rplent(info,, nohelp)
```

## M\_SCINFO – Get menu and shortcut entry information



```
xcall M_SCINFO (function, shortcut, entry, [number][, text])
```

### Arguments

#### *function*

Identifies which menu entries will be processed. **(n)**

|                     |                                  |
|---------------------|----------------------------------|
| <b>D_ENTS</b>       | All entries. (default)           |
| <b>D_ENAB_ENTS</b>  | Enabled entries.                 |
| <b>D_DSAB_ENTS</b>  | Disabled entries.                |
| <b>D_SCS</b>        | Entries with shortcuts.          |
| <b>D_ENAB_SCS</b>   | Enabled entries with shortcuts.  |
| <b>D_DSAB_SCS</b>   | Disabled entries with shortcuts. |
| <b>D_SINGLE_ENT</b> | A specific entry.                |

#### *shortcut*

An array returned with the shortcut text for the menu entries specified by *function*. **(a)**

#### *entry*

An array returned with the entry names of the menu entries specified by *function*. **(a)**

#### *number*

(optional) The maximum number of elements to load in the *shortcut* and *entry* arrays. It is returned with the number of items found. **(n)**

#### *text*

(optional) An array returned with the text of the entries specified by *function*. **(a)**

### Discussion

The M\_SCINFO subroutine retrieves information about placed menu entries and their shortcuts and returns it in an array of entry names and an array of shortcut names.

If D\_SINGLE\_ENT is specified, the menu entry name for which to search must be passed as the first element in *entry*.

If *number* is not passed, it defaults to 1.

If *text* is passed, it is loaded with the corresponding menu text, minus the shortcut key names. The elements in *shortcut*, *entry*, and *text* will directly correspond with each other. Shortcut entries are blank if the corresponding menu entry does not have a shortcut defined.

## Examples

The following example loads the shortcut text, entry names, and menu entry text for the first 98 enabled menu column entries. This information could be passed to a help routine to create a window that lists the available shortcuts.

```
count ,i4
scuts ,98a5
name ,98a20
text ,98a30

count=98
xcall m_scinfo(D_ENAB_ENTS, scuts, name, count, text)
```

## %M\_SIGNAL – Signal a menu entry



```
status = %M_SIGNAL (entry_name, [operation], {reserved})
```

or

```
xcall M_SIGNAL (entry_name, [operation], {reserved})
```

### Return value

*status*

If you pass D\_SIGNAL (or if you omit *operation*), %M\_SIGNAL returns true (1) if *entry\_name* is non-blank or false (0) if it is blank. If you specify D\_REMOVE, %M\_SIGNAL returns true if an entry is returned or false if there is no menu entry to cancel. (^VAL)

### Arguments

*entry\_name*

The menu entry name to signal or the returned name of the cancelled menu entry. (a)

*operation*

(optional) One of the following: (n)

**D\_REMOVE** Cancel the previously signaled menu entry.

**D\_SIGNAL** Signal a menu entry for future processing. (default)

*{reserved}*

Reserved for internal use. (n)

### Discussion

The %M\_SIGNAL function provides a standardized way of signaling or canceling a signaled menu entry. See “[Simulating a menu entry or canceling a signaled menu entry](#)” on page 10-8 for recommendations on when to use %M\_SIGNAL, and note the following:

- ▶ For D\_SIGNAL, %M\_SIGNAL sets **g\_select** and **g\_entnam**. If you specify D\_REMOVE, %M\_SIGNAL clears **g\_select** and sets **g\_entnam** to the name of the cancelled entry.
- ▶ The D\_SIGNAL operation does *not* call the routine that handles the signaled menu entry. It merely sets up the event to be “seen” by subsequent processing. Think of the D\_SIGNAL operation as simply setting **g\_select** and **g\_entnam**. No other routine is called. Thus, code that follows the call to %M\_SIGNAL will be executed before the code that responds to the event signaled. In the Synergy debugger, set the breakpoint in the code that responds to the event. If you break before the %M\_SIGNAL call and then step over, the action signaled by the event will not have occurred yet. (If you have Windows API programming experience, the D\_SIGNAL operation is more like a PostMessage than a SendMessage.)

- ▶ The D\_SIGNAL operation does not look at the current menu, so *entry\_name* does not have to be on a placed menu column, and it doesn't have to be enabled. Thus, disabling the menu entry does not prevent %M\_SIGNAL from generating the associated event. The application must avoid signaling or processing the event if it is not appropriate.
- ▶ As with all menu entry handling in Toolkit, the menu entry name is converted to uppercase to simplify subsequent conditional tests. However, the name passed to %M\_SIGNAL is not validated as an identifier, so you can include characters that would not be legal for a menu entry, such as "@" and "#". The usefulness of these non-menu characters is left to the creativity of the developer.
- ▶ We don't recommend calling %M\_SIGNAL in list load methods. Because of the way Toolkit synchronizes menu entry signaling, Toolkit may not execute such calls.
- ▶ If you signal a menu entry from and process the menu entry in a callback routine, use the D\_REMOVE operation to cancel the menu entry after you've processed it. If you don't, the menu entry will be resignaled when processing returns from the callback routine.
- ▶ The menu entries E\_CLEAR, E\_COPY, E\_CUT, E\_MARK, and E\_PASTE immediately perform their associated actions. %M\_SIGNAL honors and dispatches these entries and sets **g\_select** to 0, though *status* is returned as true.
- ▶ We recommend that you do not pass **g\_entnam** as *entry\_name*. **G\_entnam** may be modified within this routine.
- ▶ As of version 8.3.1a, the Synergy DBL ACCEPT statement and the WD\_ACCEPT subfunction to W\_DISP no longer drop characters that are rapidly typed ahead by the user. If you create a custom ActiveX control, be sure not to call %M\_SIGNAL in an event triggered by a "key down" (WM\_KEYDOWN) message for a key that will be translated into a character. Instead, do this in response to a "key press" (WM\_CHAR) message, to avoid duplicating the keystroke in type-ahead.

## Examples

The following example, which is a change method, uses the "CUST\_OK" menu entry to indicate whether a customer account could be found. The first call to %M\_SIGNAL, which is in the read\_customer subroutine, signals "CUST\_OK" if it can read the account. The next call attempts to cancel the last signaled menu entry. If there's no menu entry to cancel, the method informs the user that the record cannot be found ("Invalid customer code"). If the call is able to cancel a menu entry, the method then checks the value returned in **g\_entnam**. If this is "CUST\_OK", the method proceeds to determine if there's a credit hold on the account or if the account is closed. If **g\_entnam** is set to any other value, the method informs the user that the record cannot be found and then resignals the cancelled entry.

```
; Customer Change Method
function cust_change ,^val ,reentrant
    a_data_entered      ,a      ; A buffer containing the field data as
                                ; entered by the user.
    a_data_stored       ,a      ; A buffer for the final storage of the
                                ; data.
```

## Menu Routines

### %M\_SIGNAL

```
        a_pending_status      ,n      ; The result of Toolkit's field
                                      ;   validations.
.include "WND:inpinf.def"           ; Group argument of input info
.include 'INPUT_DATA' REPOSITORY , group='input'
                                      ; The data_area argument passed to the
                                      ;   calling input routine.
        ; a_method_data      ,a      ; Optional method data argument.

.include "WND:tools.def"

.include 'CUSTOMER_MASTER' REPOSITORY ,record='cusmas'

proc
    clear cusmas
    cusmas.customer = input.customer
    xcall read_customer(cusmas)

    clear g_entnam
    ;Is there a menu signal waiting to be processed?
    if (%m_signal(g_entnam, D_REMOVE)) then
        begin
            ;Is the menu signal a "customer record read OK"?
            if (g_entnam.eq.'CUST_OK') then
                begin
                    using cusmas.status select
                    ('CH '),
                        begin ; CREDIT HOLD status
                            xcall u_message("Customer on credit hold")
                            a_pending_status = D_EMITTEDERR
                        end
                    ('C '),
                        begin ; CLOSED status
                            xcall u_message("Customer account has been closed")
                            a_pending_status = D_EMITTEDERR
                        end
                    endusing
                end
            else
                begin
                    xcall u_message("Invalid customer code")
                    a_pending_status = D_EMITTEDERR

                    ;Resignal the menu entry cancelled above
                    xcall m_signal(g_entnam, D_SIGNAL)
                end
            end
        end
    end
```



```
        else
            begin
                xcall u_message("Invalid customer code")
                a_pending_status = D_EMITTEDERR
            end

        freturn a_pending_status
    endfunction

subroutine read_customer
    .include 'CUSTOMER_MASTER' REPOSITORY ,group='a_cusmas'
proc

    read(chan, a_cusmas, a_cusmas.customer, LOCK=Q_NO_LOCK) [ERR=nocust]

    ;Signal that customer record was read OK.
    xcall m_signal('CUST_OK', D_SIGNAL)

nocust,
    xreturn

endsubroutine
```

## %M\_TEXT – Modify and retrieve menu entry text



```
status = %M_TEXT (col_id, entry, [new_text], [old_text][, quick_select])
```

or

```
xcall M_TEXT (col_id, entry, [new_text], [old_text][, quick_select])
```

### Return value

*status*

%M\_TEXT returns true (1) if successful, and false (0) if unsuccessful. (^VAL)

### Arguments

*col\_id*

The ID of the column in which the entry is located. (**n**)

*entry*

The name or row number of the entry to modify. (**a** or **n**)

*new\_text*

(optional) The new menu entry text. (**a**)

*old\_text*

(optional) Returned with the previous menu entry text. (**a**)

*quick\_select*

(optional) The new quick-select character. (**a**)

### Discussion

The %M\_TEXT function enables you to retrieve and modify entry text for a menu or submenu. The entry can be a selectable entry, unselectable text, or blank. If the entry is selectable, you can also modify the quick-select character. Lines in a menu column, however, cannot be modified.

To modify a submenu, load *col\_id* by calling M\_LDCOL prior to calling %M\_TEXT. Note the following:

- ▶ *Col\_id* must be the ID of a loaded column or a fatal Toolkit error will occur.
- ▶ If the column becomes unloaded after calling %M\_TEXT, the menu entry text will revert to its initial state when it is reloaded.

If *entry* is alphanumeric, it is presumed to be the entry name (**g\_entnam**) associated with the entry to query and/or modify. If *entry* is numeric, it is presumed to be the row number of the entry, which enables you to access text, blank, and selectable entries by ordinal position. When determining ordinal position, all text, blank, line, and selectable entries must be counted.

If the specified entry doesn't exist or is a line, %M\_TEXT returns false.

If *new\_text* is passed, the menu entry text will be modified to contain *new\_text*. Any shortcut text will remain unchanged. If *new\_text* is shorter than the original text, the remainder will be filled with blanks. If *new\_text* is wider than the widest entry in the column, *new\_text* will be truncated.

If *old\_text* is passed, it is returned with the text of the entry prior to being modified.

If *quick\_select* is passed, the quick-select character will be modified to be the first occurrence (case insensitive) of the specified character. If *quick\_select* is not passed and *new\_text* is passed, the first non-blank character in *new\_text* will be used to denote the quick-select character. If neither *quick\_select* nor *new\_text* is passed, the quick-select character is not modified.

## Examples

The following example changes the menu text for the menu entry “entry1” of column **col\_id** to be “New entry text.”

```
xcall m_text(col_id, "entry1", "New entry text")
```

The following example changes the menu text of the third menu entry of column **col\_id** to be “Quick-select changed,” returns the previous menu text in **old\_text**, and underlines the ‘s’ for the new quick-select character.

```
if (.not. %m_text(col_id, 3, "Quick-select changed", old_text, 's'))  
    xcall u_message ("Unable to modify menu text")
```

## M\_USER – Retrieve a user text string for a menu entry



```
xcall M_USER (entry, text)
```

### Arguments

*entry*

A menu entry name on a placed column. (a)

*text*

Returned with the text of the menu entry's user-defined string. (a)

### Discussion

The M\_USER subroutine retrieves the user-defined string for the first menu entry that matches the entry name specified by the USER qualifier of the .ENTRY command. The menu columns are searched from left to right.

*Entry* is not case sensitive. If *entry* isn't found on any placed column or if it doesn't have a user-defined string, *text* remains unchanged.

You cannot retrieve user-defined text for submenu entries. The only way to access user strings for submenu entries is by testing **g\_entusr** (defined in **tools.def**), which contains the user string associated with the last primary menu or submenu entry selected. If the entry has no user text associated with it, **g\_entusr** is blank.

The maximum size of *text* is 80 characters.

### See also

[.ENTRY on page 2-29](#) for information about specifying user strings.

### Examples

The following example returns the user-defined text string for the menu entry “system” in **privs**. The user-defined text string could contain a security level that must be checked before the menu selection is processed.

```
xcall m_user("system", privs)
```

## MB\_BLANK – Add a blank row to a new column



```
xcall MB_BLANK (control)
```

### Arguments

*control*

The menu control structure. **(a)**

### Discussion

The MB\_BLANK subroutine adds a blank row to a new menu column. It is used when building a menu column at runtime.

The blank row added by the MB\_BLANK subroutine is not a blank entry; it's just a row that contains no text.

On Windows, blank rows can be highlighted, but the user will not be able to select them.

### See also

- ▶ [MB\\_COLUMN on page 10-65](#) for more information on the menu control structure.
- ▶ [.BLANK on page 2-9](#) for more information on adding a blank row to a menu or a selection window column.

### Examples

The following subroutine uses all of the “MB\_xxx” commands to build a menu at runtime.

```
main mbdemo
.include "WND:tools.def"
.include "WND:inpctl.def"

record
    colid      ,i4
    ctl        ,a12000

proc
    xcall u_start

    xcall mb_column(ctl, "c_general", "General", D_GLOBAL)
    xcall mb_entry(ctl, "O_HELP", "Help", F1_KEY)
    xcall mb_entry(ctl, "O_EXIT", "Exit", F4_KEY)
    xcall mb_entry(ctl, "U_ABOUT", "About")
    xcall mb_line(ctl)
    xcall mb_text(ctl, "Hot Entries", 2)
```

## Menu Routines

### MB\_BLANK

```
xcall mb_blank(ctl)
xcall mb_entry(ctl, "U_VIEW", "View", F3_KEY,,, TRUE)
xcall mb_entry(ctl, "U_DIR", "Directory", F2_KEY,,, TRUE)
xcall mb_entry(ctl, "U_EDITREND", "Renditions")
xcall mb_entry(ctl, "U_EDITKEYS", "Key mapping")
xcall mb_entry(ctl, "U_APP", "Application Keypad",,"p")
xcall mb_list(ctl, "LIBOPEN", 2, "U_VIEW", "U_DIR")
xcall mb_end(ctl, colid)
xcall m_process
xcall u_finish
endmain
```

## MB\_COLUMN – Create a new column



```
xcall MB_COLUMN(control, column, text, [global], [options], [disabled], [justification]
&                [, quick_select])
```

### Arguments

*control*

The menu control structure. **(a)**

*column*

The name of the menu column to create (a maximum of 15 characters). **(a)**

*text*

The heading text for the menu column. **(a)**

*global*

(optional) The global column flag: **(n)**

**D\_GLOBAL**            Column is global.

*options*

(optional) The load/place flag: **(n)**

**D\_NOLOAD**           Don't load the column.

**D\_NOPLC**            Don't place the column.

*disabled*

(optional) The true/false flag that indicates whether the column will be initially disabled. **(n)**

*justification*

(optional) One of the following justification flags: **(n)**

**0**            Left-justified beneath heading. (default)

**1**            Right-justified beneath heading.

**2**            Centered beneath heading.

*quick\_select*

The quick-select character for the column. **(a)**

## Discussion

The `MB_COLUMN` subroutine begins a menu column specification. This subroutine is used when building a new menu column at runtime.

The *control* argument must be large enough to include all of your column information. We recommend that *control* be several hundred bytes, but the size you'll need depends on the column information in your application. For example, a column with nine entries, one blank line, one horizontal line, and one text line would need 850 bytes. You can use this example as a guideline, but there is no simple algorithm to determine what you'll need for *control*. If the control area is too small for the column you're defining, Toolkit generates the following error:

### overflow of column build array

As another example, the size of the control space used by the Script program is 24,540. This setting accommodates the largest possible menu column.



The maximum available memory for all loaded columns (including columns created with `MB_COLUMN`) is 65,565 bytes on Windows and UNIX and 8,192 bytes on OpenVMS. If your application exceeds this, Toolkit will generate an error. Note that this limit includes all information about the columns: information you've specified and internal information. If you get this error, you must reduce the amount of information in the columns. For example, you might be able to reduce user text or shortcuts associated with the menu entries.

---

If you pass a null string (“”) for *column*, Toolkit assigns a unique column name in the form `_W_nnn`, where *nnn* is the column ID.

If you pass `D_GLOBAL`, the column is classified as global rather than local.

By default the column will be loaded and placed. You can, however, can pass `D_NOLOAD` to prevent the column from being loaded, and you can pass `D_NOPLC` to prevent the column from being placed on the menu. If you are creating pop-up columns or submenu columns, or if you are creating a column just to save it to a window library, the `D_NOLOAD` option can save space in the memory control structure (see note above). Note that `D_NOLOAD` implies `D_NOPLC` (though you can pass both by combining them with the bitwise operators `.BOR.` and `!`). Additionally, note the following restrictions for *unloaded* columns:

- ▶ You can't pass the column ID (*column\_id* returned by `MB_END`) of an unloaded column to `M_COLUMN` or `%M_TEXT`. This will cause a fatal error.
- ▶ You can't pass the column ID (*column\_id* returned by `MB_END`) of an unloaded column to `M_ENABLE` or `M_DISABLE` when using `D_ENTRY`, `D_LIST`, or `D_COLUMN`. This will cause a fatal error. You can, however, use an unloaded column with `M_ENABLE` and `M_DISABLE` when using `D_SUB`.

If you use `D_NOLOAD` or `D_NOPLC`, you can later load and/or place the column with `M_LDCOL` and `M_COLUMN`. See [M\\_LDCOL on page 10-40](#) and [M\\_COLUMN on page 10-11](#).

If *disabled* is present and non-zero, the column will initially be disabled when it is placed.



Use the *quick\_select* argument to specify the quick-select character (case-insensitive) for the menu column. If *quick\_select* is passed with more than one character, the first character becomes the quick-select character. If you don't pass *quick\_select*, Toolkit won't establish a quick-select character for the column header.

To create a submenu column, define the column, and then define the parent menu column (the menu from which the submenu will cascade). In the submenu column's definition, use the `D_NOPLC` argument. In the parent menu column's definition, use the `D_SUBMENU` argument for the menu entry that will cause the submenu to be displayed, and use the submenu column's name (the *column* argument for this routine, `MB_COLUMN`) as the entry name (the *entry* argument for `MB_ENTRY`) for the menu entry. You must define the submenu before you define its parent menu. See the example below.

## See also

[.COLUMN](#) on page 2-22 for information on beginning a menu column definition.

## Examples

For a complete example, see the example on [page 10-63](#), which uses all of the “MB\_xxx” subroutines.

The following example program has one subcolumn, “MYSUB”, that appears when a user selects “My sub” from the File menu.

```
.include 'WND:tools.def'
.include 'WND:inpctl.def'

record ids
    menu_id ,i4
    sub_id   ,i4

record
    control ,a1000

proc
    xcall u_start

    xcall mb_column(control,"MYSUB","My Sub",,D_NOPLC)
    xcall mb_entry(control,"SUB1","Sub1")
    xcall mb_entry(control,"SUB2","Sub2")
    xcall mb_entry(control,"SUB3","Sub3")
    xcall mb_end(control,sub_id)

    xcall mb_column(control,"FILE","File")
    xcall mb_entry(control,"O_EXIT","Exit",F4_KEY)
    xcall mb_entry(control,"MYSUB","My Sub",D_SUBMENU)
    xcall mb_end(control,menu_id)
```

## Menu Routines

MB\_COLUMN

```
repeat
  begin
    xcall m_process
    using (g_entnam) select
      ("O_EXIT"), exitloop
      (""), xcall u_message("Menu Entry: "+g_entnam)
    endusing
  end

  xcall u_finish
.end
```

## MB\_END – Define the end of a new column



```
xcall MB_END (control, column_id)
```

### Arguments

*control*

The menu control structure. (**a**)

*column\_id*

Returned with the ID of the menu column that is created. (**n**)

### Discussion

The MB\_END subroutine ends a menu column specification session. Use this subroutine when you are building a new menu column at runtime.

After you call MB\_END, you can't change the contents of the column.

Note that if you specified D\_NOLOAD in the MB\_COLUMN call, the value returned in *column\_id* cannot be passed to some Toolkit routines. See the Discussion for MB\_COLUMN on [page 10-66](#) for details.

### See also

- ▶ [MB\\_COLUMN on page 10-65](#) for more information on the menu control structure.
- ▶ [.END on page 2-28](#) for information on terminating the current window definition.

### Examples

The following example creates a menu column with three entries. The ID of the new menu column is returned in **colid**.

```
xcall mb_column(menuctl, "colors", "Color Choices")
xcall mb_entry(menuctl, "color_1", "red")
xcall mb_entry(menuctl, "color_2", "blue")
xcall mb_entry(menuctl, "color_3", "yellow")
xcall mb_end(menuctl, colid)
```

Also see the example on [page 10-63](#), which uses all of the “MB\_xxx” subroutines.

## MB\_ENTRY – Add a menu entry to a new column



```
xcall MB_ENTRY (control, entry, text, [shortcut], [shortcut_text], [quick_select], [justification]
&                [, disabled])
```

### Arguments

*control*

The menu control structure. **(a)**

*entry*

The name of the menu entry (a maximum of 10 characters). **(a)**

*text*

The display text for the entry. **(a)**

*shortcut*

(optional) The shortcut key code or the following: **(n)**

**D\_SUBMENU**      Place submenu.

*shortcut\_text*

(optional) The shortcut display text. (This argument is obsolete, though it is still available.) **(a)**

*quick\_select*

(optional) The quick-select character. **(a)**

*justification*

(optional) The justification flag. **(n)**

**0**      Left-justified beneath heading. (default)

**1**      Right-justified beneath heading.

**2**      Centered beneath heading.

*disabled*

(optional) The true/false flag that indicates whether or not the entry will be initially disabled. **(n)**

## Discussion

The `MB_ENTRY` subroutine adds a menu entry to a new column. This subroutine is used when building a new menu column at runtime. You can define up to 20 menu entries per menu column.

By defining `D_SUBMENU` for *shortcut*, you can cause the menu entry to display a submenu column. (Note that you must also pass the submenu column's name as the *entry* argument.) See the Discussion for `MB_COLUMN` on [page 10-66](#) for more information.

If *quick\_select* is not specified, the first non-blank character of text will be used as the quick-select character. If *disabled* is present and non-zero, the entry will initially be disabled on column placement.

To assign a shortcut to the menu entry, pass one of the identifiers defined in **inpctl.def** as the *shortcut* argument. For example, to assign the END key as the shortcut on Windows, pass `F60_KEY` as *shortcut*. To find out what to pass for a key or key combination, see the comments in **inpctl.def**, or open the key mapping utility and view the key map that will be used with the application.

The *shortcut\_text* argument is now obsolete. Before version 2.5 of UI Toolkit, menu shortcut text was derived from the **keymap.ctl** file at script time, and thus also had to be supplied to `MB_ENTRY` so that it could be included in the column controls. With version 2.5, runtime terminal binding was added to Toolkit. This feature looks up the key code in the key map for the user's keyboard at runtime, and loads the shortcut text as the column is loaded.

## See also

- ▶ [MB\\_COLUMN](#) on [page 10-65](#) for more information on the menu control structure.
- ▶ [.ENTRY](#) on [page 2-29](#) for information on defining a column entry.

## Examples

See the example on [page 10-63](#), which uses all of the “`MB_xxx`” subroutines.

## MB\_LINE – Add a line to a new column



```
xcall MB_LINE(control)
```

### Arguments

*control*

The menu control structure. **(a)**

### Discussion

The MB\_LINE subroutine adds a horizontal line to a new column. This subroutine is used when building a new menu column at runtime.

The line added by the MB\_LINE subroutine is not a menu entry; it's just a line in the menu column.

### See also

- ▶ [MB\\_COLUMN on page 10-65](#) for more information on the menu control structure.
- ▶ [.LINE on page 2-93](#) for information about drawing a line within a window definition.

### Examples

See the example on [page 10-63](#), which uses all of the “MB\_xxx” subroutines.

## MB\_LIST – Create a list entry in a new column



```
xcall MB_LIST(control, list, #entries, entry[, ...])
```

### Arguments

*control*

The menu control structure. (**a**)

*list*

The name of the list to create (a maximum of 10 characters.) (**a**)

*#entries*

The number of entries in the list. (**n**)

*entry*

The name of an entry in the list. You can have up to 20 entry names, separated by commas. (**a**)

### Discussion

The MB\_LIST subroutine creates a list entry in a new column. This subroutine is used when building a new menu column at runtime.

You must already have defined each entry with the MB\_ENTRY subroutine.

### See also

- ▶ [MB\\_COLUMN on page 10-65](#) for more information on the menu control structure.
- ▶ [.LIST on page 2-95](#) for information on creating a set of menu entries.

### Examples

See the example on [page 10-63](#), which uses all of the “MB\_xxx” subroutines.

## MB\_TEXT – Add a row of text to a new column



```
xcall MB_TEXT (control, text[, justification])
```

### Arguments

*control*

The menu control structure. (**a**)

*text*

The text to add to the column. (**a**)

*justification*

(optional) One of the following justification flags: (**n**)

- 0** Left-justified beneath heading. (default)
- 1** Right-justified beneath heading.
- 2** Centered beneath heading.

### Discussion

The MB\_TEXT subroutine adds a row of text to a new column. This subroutine is used when building a new menu column at runtime.

The *text* added by MB\_TEXT is not a menu entry; it's just a comment displayed in the menu column. On Windows, text in a menu column can be highlighted, but the user will not be able to select it.

If *justification* is present and has a value of **1**, *text* will be right-justified within the row. If *justification* has a value of **2**, *text* will be centered in the row.

### See also

- ▶ [MB\\_COLUMN on page 10-65](#) for more information on the menu control structure.
- ▶ [.TEXT on page 2-117](#) for information on adding text to a window or menu column.

### Examples

See the example on [page 10-63](#), which uses all of the “MB\_xxx” subroutines.



# 11

## .NET Routines

UI Toolkit .NET routines are not available in Synergy .NET.

### **Adding and Using .NET Forms, .NET Controls, and WPF Elements 11-2**

Discusses how you can use .NET forms, .NET controls, and WPF elements in Toolkit applications.

### **.NET Subroutines and Functions 11-6**

|                                                                                      |       |
|--------------------------------------------------------------------------------------|-------|
| DOTNET_TKADDCTL – Add a form, control, or element to a previously-embedded form..... | 11-7  |
| DOTNET_TKINPUT – Process an embedded form .....                                      | 11-10 |
| DOTNET_TKFORM – Retrieve form object from a Toolkit container .....                  | 11-14 |
| %DOTNET_TKWIN – Create a container window and embed a form, control, or element .... | 11-15 |

# Adding and Using .NET Forms, .NET Controls, and WPF Elements

The UI Toolkit .NET routines enable you to embed the following in a Toolkit application:

- ▶ .NET forms (System.Windows.Forms.Form)
- ▶ .NET controls (System.Windows.Forms.Control)
- ▶ Windows Presentation Foundation (WPF) elements (System.Windows.UIElement)

(They don't, however, work with Synergy .NET. For information on using Toolkit programs with Synergy .NET, see [“Using UI Toolkit with the .NET Framework” on page 1-22.](#))

Only .NET forms can be embedded directly into Toolkit windows, but you can embed .NET controls and WPF elements by either adding them to a .NET form and then embedding the form, or by instructing Toolkit to create a .NET form as you add a control or element.

With the Toolkit .NET routines, you can

- ▶ use a .NET form as a Toolkit window. This includes using a .NET form as a child for a composite window. See [“Embedding a .NET form” on page 11-3.](#)
- ▶ use a .NET control or WPF element as a Toolkit window. Note that to add a .NET control or a WPF element to a Toolkit application, the control or element must be on a .NET form. You can instruct Toolkit to embed the control or element in a form for you. See [“Embedding .NET forms, .NET controls, and WPF elements” on page 11-5.](#)
- ▶ add a .NET form, .NET control, or WPF element to an already embedded .NET form. See [“Embedding .NET forms, .NET controls, and WPF elements” on page 11-5.](#)
- ▶ process input for a .NET form. See [step 4 on page 11-4.](#)
- ▶ find out if a Toolkit window contains a .NET form. See [D\\_WINDOW\\_TYPE on page 7-35.](#)

The user sees the .NET form, .NET control, or WPF element as part of your Toolkit application. Input and menu entries work as they do with any other Toolkit window, and if a .NET form is part of a composite window, tabbing takes the user in and out of the form. Note, however, that unless the container window is part of a composite window, you won't be able to use TAB or SHIFT+TAB to access buttons on the Toolkit container window (the Toolkit window that contains the form, control, or element). See the Discussion for [DOTNET\\_TKINPUT on page 11-10](#) for more information on how keyboard input is handled.

When you embed a .NET form, .NET control, or WPF element, you associate it with a Toolkit container window. Because the container is a Toolkit window, you can perform all standard window-related Toolkit functions (place, remove, delete, resize, and so forth) by referencing the window ID for the container. Note, however, that resizing the Toolkit container window doesn't automatically resize the form. If you resize the container, areas of the form can be cut off or portions of the Toolkit container window may be visible on the bottom or right of the form. (You can adjust this by querying and setting the width and height properties of the form.) The only time Toolkit automatically sizes a form is when it automatically creates a form (when the *flags* argument is passed as DN\_MAKEFORM or DN\_WPF in a call to %DOTNET\_TKWIN).



Note the following:

- ▶ To run a Toolkit program that has .NET form or a .NET control, you must have .NET Framework version 2.0 or later.
  - ▶ To run a Toolkit program that has a WPF element, you must have .NET Framework version 3.0 or later.
- 

### Embedding a .NET form

The following is the basic procedure for embedding a .NET form in a Toolkit application and using the form as part of the application. (Note that you can also add a .NET form to a previously embedded form. See “[Embedding .NET forms, .NET controls, and WPF elements](#)” below.)

1. Load the assembly that contains the type to be instantiated, and create an instance of a .NET form contained in the assembly.

The easiest way to do this is by using **gennet**, **dblproto**, and the NEW keyword. For example, if you want to embed a form with a text editor named TextEditor that's in a prebuilt assembly named **MyTextEd.dll**, you can run **gennet** to generate a TextEditor class, run **dblproto** to generate prototype files for the class, and link to the file generated by **dblproto**.

```
gennet -out Editor.dbl "c:\MyForms\MyTextEd.dll"
dblproto Editor
dbl -qrelaxed:interop Editor
dbl MyTkProg
dblink MyTkProg Editor
```

You can then use **.INCLUDE** to include the **.inc** file generated by **gennet**, and use the NEW keyword to instantiate the class, which automatically loads the assembly:

```
.include "Editor.inc"

Record
    Txt          ,@TextEditor

Proc
    Txt = new TextEditor()
```

For more information, see

- ▶ “[Instantiating and using a class](#)” in the “Understanding Objects and Classes” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ “[The Synergy Prototype Utility](#)” and “[The Gennet Utility](#)” in the “General Utilities” chapter of *Synergy Tools*.

Note that you can also do this directly with the Synergy .NET API (see the “[Synergy .NET Assembly API](#)” chapter of the *Synergy DBL Language Reference Manual*), but we recommend using **gennet**, which simplifies the process.

2. Use %DOTNET\_TKWIN to embed the .NET form in a Toolkit container window. If the .NET form will be part of a composite window, you’ll also need to use the DC\_ADD subfunction for %C\_CONTAINER to add the container window to the composite window.
3. Access properties, call methods, and register event handlers for the .NET form object as necessary. Note that registering an event handler involves adding a delegate to an event. See the “[Synergy .NET Assembly API](#)” chapter of the *Synergy DBL Language Reference Manual*, and note that **gennet** creates a public variable for each event defined in a class. These variables contain event objects, and you can call an AddHandler method for these to add a delegate.
4. Do one of the following:
  - ▶ If the .NET form is *not* part of a composite window, call DOTNET\_TKINPUT to accept input for the .NET form.
  - ▶ If the .NET form *is* part of a composite window, call C\_PROCESS to process the composite window. (C\_METHNET, the default composite window processing method for .NET form windows, calls DOTNET\_TKINPUT.)
5. Respond to any new entries after the application exits from DOTNET\_TKINPUT or C\_PROCESS, and call methods or query properties for the .NET form to get the input results.
6. Delete the Toolkit container window, if it isn’t automatically deleted as a result of exiting the current environment (using E\_EXIT). This releases Toolkit’s reference to the .NET form.

**Embedding .NET forms, .NET controls, and WPF elements**

To add a .NET control or a WPF element to a Toolkit application, the control or element must be on a .NET form. But what if you have a .NET control or a WPF element that you'd like to use on its own (e.g., a grid control), and you don't have a form? Or what if you want to add a .NET form or control to a .NET form that's already embedded in a Toolkit window? Except for the first three steps listed above in [“Embedding a .NET form,”](#) the procedure is the same.

1. Create an instance of the .NET form, .NET control, or WPF element. See [step 1 on page 11-3](#), which discusses creating an instance of a .NET form. You can use the same procedure to create an instance of a .NET control or a WPF element.
2. Do one of the following:
  - ▶ If you want to add the .NET form, .NET control, or WPF element to a .NET window that's already been embedded in a Toolkit container window, use `DOTNET_TKADDCTL`, passing the container window ID as the *wndid* argument.
  - ▶ If you want to add a .NET control or a WPF element, but you don't want to add it to a .NET window that's already been embedded (for example, if you want to add a grid control to a composite window, and you have no .NET form), use `%DOTNET_TKWIN`, passing the *flags* argument as `DN_MAKEFORM` (for a .NET control) or `DN_WPF` (for a WPF element). This instructs `%DOTNET_TKWIN` to create a Toolkit window and a .NET form to contain the control or element. Pass the .NET control or WPF element (instead of a form) to `%DOTNET_TKWIN`, and the control or element will be placed on the automatically-generated form.
3. Follow [step 3](#) through [step 6](#) above in [“Embedding a .NET form.”](#)

## .NET Subroutines and Functions

This section discusses the syntax and arguments for each of the .NET subroutines and functions for Toolkit.

## DOTNET\_TKADDCTL – Add a form, control, or element to a previously-embedded form



```
xcall DOTNET_TKADDCTL(window_id, object[, flags])
```

### Arguments

*window\_id*

The ID of a window created by %DOTNET\_TKWIN. (Otherwise Toolkit throws an exception.) (n)

*object*

The .NET form, .NET control, or WPF element to add. This must be derived from System.Windows.Forms.Form, System.Windows.Forms.Control, or System.Windows.UIElement. If *object* is null or does not wrap a .NET form, .NET control or WPF element, Toolkit throws an exception. (@DotNetObject)

*flags*

(optional) Pass as DN\_WPF if *object* is a WPF element; otherwise omit this argument. (n)

### Discussion

On windows, DOTNET\_TKADDCTL adds a .NET form, a .NET control, or a WPF element to a previously embedded .NET form. (On UNIX and OpenVMS, this routine merely returns.)

To add a WPF element, pass *flags* as DN\_WPF. If you pass *flags* as DN\_WPF, *object* must be a WPF element (i.e., it must be instantiated from a class derived from System.Windows.UIElement); otherwise a DotNetException will be thrown.

Note that this routine adds the form, control, or element to the Controls collection for the previously-embedded form (contained in *window\_id*), but it does not adjust its size or position.

### See also

[%DOTNET\\_TKWIN](#) for information on embedding a .NET form in a Toolkit window.

## Examples

The following example adds two .NET controls (a label and a field) to a composite window and processes the composite window. Toolkit automatically creates a .NET form for the controls. Note that the first line uses `.INCLUDE` to include the `.inc` file generated by **gennet**. See [step 1 of “Embedding a .NET form” on page 11-3](#).

```
.include "MyForm.inc"           ;Include the .inc file generated by gennet.

main
.include "WND:tools.def"
record
    wndid ,i4
    ctrid ,i4
    ctl    ,@TextBox
    lbl    ,@Label
    form   ,@DotNetObject
proc
    xcall u_start
    ctrid = %c_container(DC_CREATE, "", 20, 78) ;Create the composite
                                           ; window.

    wndid = %dotnet_tkwin("", 18, 78, ^null) ;Create a Toolkit container
                                           ; window and an empty .NET
                                           ; form. (If you pass the
                                           ; <object> argument as null,
                                           ; Toolkit creates a .NET
                                           ; form, regardless of the
                                           ; <flags> setting.)

    xcall dotnet_tkform(wndid, form)        ;Make sure a form was
    if (form == ^null)                     ; created.
        throw new System.NullReferenceException()

    lbl = new Label()                     ;Instantiate a Label object.
    lbl.Text = "Label1: "                 ;Set Text property for Label object.
    xcall dotnet_tkaddctl(wndid, lbl) ;Add Label to the automatically-
                                           ; created .NET form.

    ctl = new TextBox()                   ;Instantiate a TextBox object.
    ctl.Text = "Lorem ipsum..." ;Set the Text property of the TextBox
                                           ; object.
    xcall dotnet_tkaddctl(wndid, ctl) ;Add TextBox to the automatically-
                                           ; created .NET form.

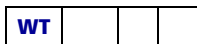
    ctl.Left = lbl.Left + lbl.Width + 10 ;Set position and
    ctl.Width = %u_winmetrics(D_CHARWIDTH, wndid) * 30 ; width of the
                                           ; TextBox.
```



```
xcall c_container(DC_ADD, ctrid, DC_WINDOW, wndid, 1, 1) ;Add and
                                                         ; place .NET
xcall u_window(D_PLACE, ctrid, 1, 1)                    ; form.

xcall c_process(ctrid)      ;Process composite window. The default
                             ; method for the .NET form window
                             ; (C_METHNET) will call DOTNET_TKINPUT.
xcall u_finish
endmain
```

## DOTNET\_TKINPUT – Process an embedded form



```
xcall DOTNET_TKINPUT (window_id, [help_id], [wait_time], [menu_flag][, focus])
```

### Arguments

*window\_id*

The ID of a window created by %DOTNET\_TKWIN. (Otherwise Toolkit throws an exception.) (n)

*help\_id*

(optional) A help identifier to be passed if the menu entry “O\_HELP” is signaled or selected. (a)

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. (n)

**D\_FOREVER** or **-1**                      Never time out.

**D\_GLOBAL** or **-2**                      Use the global value (see “[g\\_wait\\_time](#)” on page 18-6).  
(default)

**D\_IMMEDIATE** or **0**                      Time out immediately.

*n*                                          Wait up to *n* seconds (where *n* is a positive value) for the user  
to press a key.

*menu\_flag*

(optional) If passed and true, a flag that causes DOTNET\_TKINPUT to return utility menu entries (U\_ and O\_HELP) instead of processing them. (n)

*focus*

(optional) Indicates which component control (which .NET control or WPF form within the .NET form) to move focus to. (n)

**D\_FIRST**                                      Focus the first control.

**D\_LAST**                                      Focus the last control.

If any other value is passed as *focus*, or if *focus* is not passed, the form determines where to move focus. And if no suitable component control can be found, the form itself receives focus.

## Discussion

On Windows, the DOTNET\_TKINPUT routine processes a .NET form embedded in a Toolkit container window. DOTNET\_TKINPUT moves focus to the specified form (contained in *window\_id*) and enables your program to accept input for the form. At the same time, it allows menu entries to be selected and returned to Toolkit. (On UNIX and OpenVMS, this routine merely returns.)

When focus is on a .NET form, most keystrokes are sent first to the form as input. The form's `PreProcessMessage` method returns true if the form will consume the keyboard input, which prevents the Synergy runtime from processing the input. The `PreProcessMessage` method returns false if the form won't consume the keyboard input, which allows the Synergy runtime to process the input.

The exceptions are TAB and SHIFT+TAB. Toolkit sends TAB directly to the Toolkit container, rather than the form (enabling the Synergy runtime to process it) if the .NET form is part of a composite window and TAB is pressed when the last control in the form has focus. The same is true of SHIFT+TAB if pressed when the first control in the form has focus. TAB and SHIFT+TAB are otherwise sent to the form and used by the form to navigate among its controls.



If you have a .NET control that needs to consume a keystroke that is used by the form (e.g., SHIFT+TAB, ESCAPE, or an accelerator key), you will need to override the control's `ProcessCmdKey` or `IsInputKey` method or the form's `PreProcessMessage` method. See Synergex® KnowledgeBase article [100001973](#) for information.

---

If a keystroke can be mapped to a menu entry and isn't consumed by the .NET form, the menu entry is signaled. DOTNET\_TKINPUT recognizes the following:

- ▶ “C\_NEXT” and “C\_PREV” if the .NET form is part of a composite window. If the form isn't part of a composite window, these menu entries are returned immediately to the calling routine. See [chapter 6, “Composite Window Routines,”](#) for more information.
- ▶ “O\_HELP” if the *menu\_flag* argument is not passed or is passed as false. Otherwise, this menu entry is returned to the calling routine.
- ▶ “U\_\*” menu entries if the *menu\_flag* argument is not passed or is passed as false. Otherwise, these menu entries are returned to the calling routine.

DOTNET\_TKINPUT returns only when a menu entry is signaled (**g\_select** is true and **g\_entnam** contains the name of the menu entry), an exception has been thrown (`@DotNetException`), or the operation times out. If the operation times out, **g\_select** is set to true, and **g\_entnam** is set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See “[g\\_time\\_entry](#)” on [page 18-5](#).

If, while the form is active, focus is diverted to another application, when focus returns to your Toolkit application, it is established on the form, and the form reestablishes focus among its component controls.

### **.NET forms in composite windows**

If the Toolkit container window is part of a composite window, DOTNET\_TKINPUT must be called from the processing method for the child window (which is C\_METHNET by default), and TAB and SHIFT+TAB are processed by the Synergy runtime if pressed when the first or last control in a .NET form has focus (as described above). TAB moves forward through the following tabbing order, and SHIFT+TAB moves backward through the following.

1. Previous windows (or buttons if wrapping to the end) in the composite window's tabbing order
2. The .NET form
3. Buttons on the .NET form's Toolkit container window (in order)
4. Subsequent windows or buttons in the composite window's tabbing order

See [“Controlling tabbing, focus, and input context” on page 6-4](#) for more information.

### **Examples**

The following example embeds a .NET form in a Toolkit window and then processes it with DOTNET\_TKINPUT. The container window created below is not part of a composite window, so DOTNET\_TKINPUT is called directly. (If it was part of a composite window, the processing method for the child window, which is C\_METHNET by default, would call DOTNET\_TKINPUT.)

Note that the first line uses .INCLUDE to include the .inc file generated by **gennet**. See [step 1 of “Embedding a .NET form” on page 11-3](#).

```
.include "MyForm.inc"           ;Include the .inc file generated by gennet.

main
.include "WND:tools.def"
record
    form      ,@MyForm
    wndid     ,i4
    ctrid     ,i4

proc
    xcall u_start
    form = new MyForm()         ;Instantiate a MyForm object.
    wndid = %dotnet_tkwin("", 18, 78, form) ;Create a Toolkit container
                                         ; window and embed the form
                                         ; (the MyForm object).

    xcall b_button(wndid, "OK")
    xcall u_window(D_PLACE, wndid, 1, 1)  ;Place the container window.
    repeat
        begin
```

```
        xcall dotnet_tkinput(wndid,,, D_LAST) ;Process the container
                                           ; window.
    end
.
.
.
    xcall u_finish
endmain
```

## **DOTNET\_TKFORM – Retrieve form object from a Toolkit container**



```
xcall DOTNET_TKFORM(window_id, form)
```

### **Arguments**

*window\_id*

The ID of the Toolkit window that contains the .NET form. (Otherwise Toolkit throws an exception.) (**n**)

*form*

The returned form object. (@DotNetObject)

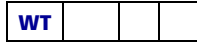
### **Discussion**

The DOTNET\_TKFORM routine returns the .NET form object (*form*) for the specified Toolkit container window (*window\_id*), even if the container window was automatically generated by %DOTNET\_TKWIN.

### **Examples**

See Examples on [page 11-8](#).

## %DOTNET\_TKWIN – Create a container window and embed a form, control, or element



*window\_id* = %DOTNET\_TKWIN (*name*, *height*, *width*, *object*[, *flags*])

### Return value

*window\_id*

On Windows, %DOTNET\_TKWIN returns the Toolkit container window ID. On UNIX and OpenVMS, this function returns a value of zero. (^VAL)

### Arguments

*name*

The name of the Toolkit container window to create. This can be up to 15 characters. If you specify a null string (“”), Toolkit assigns a unique window name in the form *\_W\_nnn*, where *nnn* is the window ID. (a)

*height*

The height of the window in character rows. If you pass either *height* or *width* as 0, Toolkit sets the window to the height and width of the application screen. (n)

*width*

The width of the window in character columns. If you pass either *height* or *width* as 0, Toolkit sets the window to the height and width of the application screen. (n)

*object*

The .NET form, .NET control, or WPF element to embed. This must be derived from System.Windows.Forms.Form, System.Windows.Forms.Control, or System.Windows.UIElement and wrapped in a Synergy class (i.e., as a DotNetObject) by **gennet**. (@DotNetObject)

*flags*

(optional) Instructs %DOTNET\_TKWIN to do one of the following: (n)

**DN\_MAKEFORM** Create a .NET form for a .NET control. (If you pass this, *object* must be a .NET form or control or null.)

**DN\_WPF** Create a .NET form for a WPF element. (If you pass this, *object* must be a WPF element or null.)

Note that although you can combine these bit flags with .BOR. or the vertical bar (|) operator (for a WPF element), this is not necessary because DN\_WPF includes DN\_MAKEFORM.

## Discussion

On Windows, the %DOTNET\_TKWIN function enables you to embed a .NET form, .NET control, or WPF element in a Toolkit application. To do this, it creates a Toolkit container window and, optionally, it creates a .NET form to contain the form, control, or element passed as *object*. (On UNIX and OpenVMS, this function returns zero, but otherwise does nothing.)

- ▶ To add a .NET form, pass the form as *object*, and omit the *flags* argument (unless you want the form to be treated as a .NET control and be added to an automatically-created .NET form).
- ▶ To embed a .NET control or a WPF element, pass the control or element as *object* and pass *flags* as DN\_MAKEFORM (for a .NET control) or DN\_WPF (for a WPF element). (If you want to add a .NET control or a WPF element to an already-embedded .NET form, use DOTNET\_TKADDCTL.)

Before you pass a .NET form, .NET control, or WPF element as *object*, you must wrap it in a Synergy class by using **gennet**. (See “[Embedding a .NET form](#)” on [page 11-3](#) for information.) Otherwise Toolkit throws an exception.

If you pass *flags* as DN\_MAKEFORM or DN\_WPF, this function creates a Toolkit container window with an embedded .NET form. If *object* is null, the .NET form will be empty. If *object* is non-null, Toolkit embeds *object* as a control in the Toolkit-created .NET form (even if *object* is a .NET form). *Object* is added to the Controls collection for the Toolkit-created form. Also note that *object* is sized and positioned to fill the form. You can subsequently resize and move *object* by modifying the Toolkit-created form.

If you don’t pass *flags* (or if you pass it as a value other than DN\_MAKEFORM or DN\_WPF) and *object* is null, this function creates a Toolkit container window with an embedded .NET form. If *object* is non-null, this function creates a Toolkit container window, but it doesn’t create a .NET form. Instead, Toolkit embeds *object* (which must be a .NET form) in the container window. Note the following:

- ▶ The embedded .NET form is not sized automatically, which means that the form may be cropped or portions of the Toolkit container window may be visible on the bottom or right of the .NET form. You can adjust this by querying and setting the width and height properties of the .NET form.
- ▶ When a .NET form is embedded in a Toolkit container window, the frame around the .NET form is turned off, and the Toolkit container window becomes the parent window of the form’s outermost window. (And when the container window is deleted, the .NET form’s style is set to WS\_POPUP, and its parent window is set to null.)

%DOTNET\_TKWIN creates a container window by calling W\_PROC. and passing *name*, *rows*, and *cols*. If W\_PROC generates an error, you can trap it. (See [W\\_PROC](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* for more information.) Note that the container window is logged with Toolkit at the current environment level. You can use U\_GBLWND to promote it to global.



When a user clicks on an embedded .NET form, that event does not automatically trigger a call to any UWNDEVENTS\_METHOD associated with the Toolkit container window. To trigger Windows event processing, the .NET form must fire an event of its own.

## Examples

See Examples on [page 11-8](#).



# 12

## Selection Routines

### Introduction to Selection Processing 12-2

Explains what selection windows are, how they look, and how the user can make a selection from them.

### The Selection Subroutines 12-5

|                                                                      |       |
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| S_SELBLD – Create a selection window .....                           | 12-6  |
| S_SELDFLT – Set or return default entry for a selection window ..... | 12-9  |
| S_SELECT – Process a selection window .....                          | 12-11 |
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| S_SELINF – Retrieve selection window information .....               | 12-16 |
| S_SELLD – Load new selections into a selection window .....          | 12-18 |
| S_UPDATECB – Update a check box selection window .....               | 12-20 |

## Introduction to Selection Processing

Selection windows enable you to present the user with a fixed set of items from which to choose.

A selection window can be attached to an input window field (using the `I_FLDSEL` subroutine) or processed directly. When a selection window is attached to an input field, the selected item becomes the input for that field. When a selection window is processed directly, either the text of the selected item or its ordinal position in the selection window can be returned to the calling routine.

Selection windows are like menu columns in the following ways:

- ▶ All of the possible choices are visible.
- ▶ You navigate them with arrow keys and quick-select characters.
- ▶ To select an item, you press ENTER.

However, they are unlike menu columns in that

- ▶ they are not attached to a menu bar.
- ▶ they may contain more than one column of selections.
- ▶ items can be reloaded at runtime.
- ▶ entries do not have shortcuts, entry names, or user text.

Selection windows compare and contrast with lists in the following ways:

- ▶ Like lists, you can load selection windows at runtime with a set of items drawn from any source (such as a file) so that the user has them available to select.
- ▶ While lists allow only one column of items, selection windows can contain more than one column of items.
- ▶ Unlike lists, selection windows only contain a fixed number of items, all of which must be visible.

Note that you can also create check box selection windows, which display a special character (usually a check mark or an “X”) to the left of any entry whose value is true. See [“Creating a check box selection window” on page 12-4](#).

## Generating selection windows

You can generate selection windows from script files or at runtime. The subroutine `S_SELBLD` supports the runtime generation of selection windows.

## General appearance of selection windows

Selection windows are windows that contain textual items from which the user can select. A selection window can also have a border and a title.

These items are listed in one or more columns in the window. All items are padded out to the same length, although the text of each may be left-justified, right-justified, or centered within that length.

The item currently being accessed in a selection window is always highlighted, regardless of whether the selection window is being processed.

## Display renditions

Five rendition states are associated with selection windows:

- ▶ Border
- ▶ Title
- ▶ Background
- ▶ Selected item
- ▶ Entry quick-select character

When a selection window is processed, the above renditions are applied to the window. The item currently being accessed is displayed in the selected item rendition. All other items and any text, lines, or blank entries are displayed in the background rendition.

By default,

- ▶ the border and title renditions are unchanged from how they were defined when the window was created.
- ▶ the background rendition is unchanged, except that reverse is disabled.
- ▶ the selected item rendition is unchanged, except that reverse is forced.
- ▶ the entry quick-select character is set to underlined, color palette 10.

For information on editing these renditions, see [“Customizing the Look of Your Application” on page 18-27](#).

## Making a selection

When a selection window is processed, the default item is highlighted. The user can then move the highlight to the desired item by pressing the arrow keys or a quick-select character. To select the item, the user presses ENTER.

On Windows, the mouse can be used to highlight and select entries.

## Creating a check box selection window

You can also define your selection windows as check box selection windows.

Check box selection windows enable you to display a special character (usually a check mark or an “X”) to the left of any entry that has a true value. These values correspond to an array that is passed to and from the check box routines.

The check box subroutines are

- ▶ S\_UPDATECB
- ▶ S\_SELECTCB

Typically, you would design a check box selection window in the following manner:

1. Create your selection window, either in a script with the .SELECT command or in your code with the S\_SELBLD subroutine. Leave the first character in each entry blank. This position will be used for the check mark.
2. In your program, load the selection window, and then call S\_UPDATECB to mark any items that are already true. The check mark character is defined in **tkctl.def** by the global field **g\_chk\_char**. This field is initialized by U\_START to an “X” on most environments. On UNIX and OpenVMS, you can change the check mark character by modifying the value of **g\_chk\_char**. On Windows, setting **g\_chk\_char** has no effect.
3. Call S\_SELECTCB to enable the user to process the window and toggle the truth value of each item. This subroutine returns when the user selects a menu entry unrecognized by S\_SELECTCB. An array is returned from this subroutine with the final values.

For more information, see [S\\_SELECTCB on page 12-14](#) and [S\\_UPDATECB on page 12-20](#).

# The Selection Subroutines

This section discusses the syntax and arguments for each of the selection subroutines.

### S\_SELBLD – Create a selection window



```
xcall S_SELBLD (window_id, window_name, fields, rows, array_data, [type], [quick_select],
&                [width], [default_entry][, nopad])
```

#### Arguments

*window\_id*

Returned with the window ID. **(n)**

*window\_name*

The name of the window to be created (a maximum of 15 characters). **(a)**

*fields*

The total number of items in the window, including text and lines. **(n)**

*rows*

The number of rows per column, including text and lines. **(n)**

*array\_data*

The first element in the array containing the data to load. **(a)**

*type*

(optional) The array of flags indicating one of the following types of entries: **(n)**

**D\_SEL\_ENTRY**      A field entry. (default)

**D\_SEL\_TEXT**        Non-entry text.

**D\_SEL\_LINE**        A horizontal line.

*quick\_select*

(optional) The array of *quick\_select* characters. **(a)**

*width*

(optional) The column width. The default width is `%len(array_data)`. **(n)**

*default\_entry*

(optional) The default entry. **(n)**

*nopad*

(optional) The true/false flag that specifies whether to suppress the blank columns that occur to the left and right of each entry in the selection window. **(n)**



## Discussion

The S\_SELBLD subroutine creates a selection window and loads it with data.

You can specify a maximum of 32767 fields. The number of rows per column (*rows*) must be greater than zero. (Note, however, that because Synergy cannot place windows that do not fit on the screen, the practical maximum number of entries will be much lower. For instance, if the size of the Toolkit's virtual screen is 25 rows by 80 columns, a selection window cannot be placed if it has more than 2000 entries—and 2000 would only be possible if there is no padding between the columns and each entry is a single character.)

S\_SELBLD loads the data from top to bottom and then left to right. The selection window will have a one-character margin on each side (unless you have passed *nopad*), except for horizontal line entries. Line entries in *array\_data* will be overwritten by a horizontal line; use a blank element in *array\_data*.

If you are processing with S\_SELECT, on Windows systems, the window is automatically placed. On UNIX and OpenVMS, you must place the window with U\_WINDOW(D\_PLACE).

Use I\_FLDSEL to associate the new selection window with a particular field.

Don't forget to log the window you create with the U\_LOGWND subroutine. See [U\\_LOGWND](#) on page 16-97.

If you pass a null string (“”) for *window\_name*, Toolkit assigns a unique window name in the form *\_W\_nnn*, where *nnn* is the window ID.

If *quick\_select* is not passed or is blank, the first non-blank character in each entry is used.

The elements in *array\_data*, *type*, and *quick\_select* correspond with each other.

---

### WIN

The *type* options D\_SEL\_TEXT and D\_SEL\_LINE, and the *quick\_select* argument are ignored and serve only as placeholders in a Windows environment. D\_SEL\_TEXT and D\_SEL\_LINE are not recognized because Windows environments do not categorize text and line items with selection items the user can select.

---

If *default\_entry* is not specified, the first selectable entry in the selection window becomes the default entry. You can change or override the default entry with S\_SELDFLT or when calling S\_SELECT. *Default\_entry* refers to the ordinal, selectable entry number (not counting text and line entries).

Note that horizontal lines do not connect with the selection window border.

If you have a selection window with more than one column, and that window does not have corresponding text or line entries in the same row of each column, left and right movement within the window won't be consistent. Therefore, we recommend that you either don't use text or line entries in a multi-column selection window, or make sure that each column in the selection window contains text or line entries in the same row.

## Examples

The following example creates a window called choices with a maximum of 25 entries, 5 per column. It loads the data from **data**.

```
xcall s_selbld(selid, "choices", 25, 5, data)
```

The next example, a selection window named names, can be created with the data records listed below.

| Team 1 | Team 2 | Team 3 |
|--------|--------|--------|
| Jim    | Bill   | Jan    |
| Kim    | Jill   | Dan    |
| Tim    | Phil   | Fran   |

```
data    ,15a6  ,"Team 1", " ", "Jim", "Kim", "Tim"
&       ,"Team 2", " ", "Bill", "Jill", "Phil"
&       ,"Team 3", " ", "Jan", "Dan", "Fran"
type    ,15d1  ,D_SEL_TEXT, D_SEL_LINE, D_SEL_ENTRY
&       ,D_SEL_ENTRY, D_SEL_ENTRY
&       ,D_SEL_TEXT, D_SEL_LINE, D_SEL_ENTRY
&       ,D_SEL_ENTRY, D_SEL_ENTRY
&       ,D_SEL_TEXT, D_SEL_LINE, D_SEL_ENTRY
&       ,D_SEL_ENTRY, D_SEL_ENTRY
```

```
xcall s_selbld(selid, "names", 15, 5, data, type)
```

## S\_SELDFLT – Set or return default entry for a selection window



```
xcall S_SELDFLT (window_id, [new_default] [, current_default])
```

### Arguments

*window\_id*

The ID of a loaded selection window. **(n)**

*new\_default*

(optional) The item number of a new default entry. **(n)**

*current\_default*

(optional) The returned item number of the current default entry (that is, the entry that was the default when S\_SELDFLT was called). **(n)**

### Discussion

S\_SELDFLT sets the default entry for a selection window or a set of radio buttons or returns the last default set with S\_SELDFLT. S\_SELDFLT does not affect check box selection windows.

Selection items are numbered from top to bottom and from left to right. (Text and line entries are not numbered as items.)

Note the following:

- ▶ If *new\_default* is not passed, is less than 1, or is greater than the number of items in the selection window, S\_SELDFLT will not set a default.
- ▶ A default set with S\_SELDFLT will override defaults specified with the DEFAULT option for .ITEM and the *default\_entry* argument for S\_SELBLD.
- ▶ If an input field is associated with selection window, and that field has a default (set with DEFAULT for .FIELD or D\_FLD\_DFLT for IB\_FIELD), that default will override a default set with *new\_default*.

The *current\_default* argument is returned with the last default set with S\_SELDFLT. If no default has been set with S\_SELDFLT, *current\_default* is returned with a value of 1. Note that S\_SELDFLT does *not* return defaults set by the DEFAULT option for .ITEM, the *default\_entry* argument for S\_SELBLD, the DEFAULT option for .FIELD, or the D\_FLD\_DFLT qualifier for IB\_FIELD.

Examples

The first S\_SELDFLT call in the following example changes the default selection to **Bill**—assuming that **selid** is the selection window ID for the following selection window. (The code to create this selection window is listed in Examples on [page 12-8](#).)

| Team 1 | Team 2 | Team 3 |
|--------|--------|--------|
| Jim    | Bill   | Jan    |
| Kim    | Jill   | Dan    |
| Tim    | Phil   | Fran   |

The second S\_SELDFLT call retrieves the item number for the current default (which is 4) set with S\_SELDFLT. Note that because *new\_default* hasn't been passed in the second call, it doesn't change the default.

```
record
    selid          ,i4
    default_entry  ,i4

proc
.
.
.
xcall s_seldflt(selid, 4)
.
.
.
xcall s_seldflt(selid,, default_entry)
.
.
.
```

## S\_SELECT – Process a selection window



```
xcall S_SELECT (window_id, [initial_field], [field_data], [select_column], [selected_field],
&               [help_id][, wait_time])
```

### Arguments

*window\_id*

The ID of the selection window to process. **(n)**

*initial\_field*

(optional) The number of the initial field. **(n)**

*field\_data*

(optional) Returned with the data of the selected field. **(a)**

*select\_column*

(optional) The selection column ID. **(n)**

*selected\_field*

(optional) Returned with the number of the selected field. **(n)**

*help\_id*

(optional) The help identifier. **(a)**

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. **(n)**

**D\_FOREVER** or **-1**                      Never time out.

**D\_GLOBAL** or **-2**                      Use the global value (see “[g\\_wait\\_time](#)” on page 18-6).  
(default)

**D\_IMMEDIATE** or **0**                      Time out immediately.

*n*                                          Wait up to *n* seconds (where *n* is a positive value) for I/O  
processing to be complete.

### Discussion

The S\_SELECT subroutine processes selection windows.

On UNIX and OpenVMS, you must place the window with U\_WINDOW(D\_PLACE) before processing with S\_SELECT. On Windows, however, the window is automatically placed for you. You don’t need to call U\_WINDOW(D\_PLACE).

## Selection Routines

### S\_SELECT

If *initial\_field* is passed, the specified field will be initially highlighted before selection processing begins. If not passed, any previous call to S\_SELDFLT or a default specified by S\_SELBLD (or in a .SELECT window script using the .ITEM DEFAULT qualifier) will be used. In either case, if the resulting value is less than 1, 1 will be used. If *initial\_field* is greater than the number of fields in the window, the last field will be highlighted.

If *field\_data* is passed, it will be returned with the data of the highlighted field at the time that ENTER was pressed, or an unrecognized menu entry was selected.

If *selected\_field* is passed, it will be returned with the ordinal number of the selected field.

---

### WIN

The *select\_column* is, by default, ignored when running on Windows. This column usually contains reserved menu entries that are automatically supported by the Windows environment. Additionally, the excessive placing and removing of columns causes a Windows menu bar to flicker.

---

---

### UNIX, VMS

If *select\_column* is passed and non-zero, the specified column will be placed on the menu and removed on exit in UNIX and OpenVMS environments. The alternative to specifying this column is to place the column before calling S\_SELECT.

---

The default behavior for each environment's handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. See [“g\\_plc\\_col\\_args” on page 18-4](#) for information.

The following internal menu entry names are recognized by S\_SELECT. Menu entries in the first column (those that start with E\_) are recognized only on Windows. These perform the associated Windows functionality, if applicable. See [“Appendix B: Reserved Menu Entries”](#) for information on reserved menu entries.

|         |         |
|---------|---------|
| E_CLEAR | S_UP    |
| E_COPY  | S_DOWN  |
| E_CUT   | S_LEFT  |
| E_MARK  | S_RIGHT |
| E_PASTE |         |

If the name of the selected menu entry begins with “U\_”, the EUTILS\_METHOD subroutine is called and the input is redone. If the internal name of the selected menu entry is “O\_HELP,” the EHELP\_METHOD subroutine is called with *help\_id* as its argument.

If some other menu entry is selected, control is returned to the calling routine. **G\_select** will be true and **g\_entnam** will hold the name of the entry.

You will need to clear **g\_select** after you satisfy the event.

If the operation times out, **g\_select** is set to true and **g\_entnam** set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See “**g\_time\_entry**” on page 18-5.

On Windows, the mouse can be used to highlight and select entries.

The S\_SELECT subroutine turns echo and the cursor off. Your calling routine should put an E\_ENTER and E\_EXIT around the call to this subroutine because S\_SELECT does not do an E\_ENTER, and it does not reset these parameters when done.

---

## WIN

For selection windows that are part of a composite window, TAB and SHIFT+TAB moves focus to the next or previous child (unless TAB or SHIFT+TAB is a shortcut on a placed menu column). TAB instructs S\_SELECT to signal “C\_NEXT”, and SHIFT+TAB instructs S\_SELECT to signal “C\_PREV”.

---

## Examples

This example loads a selection window and a menu column, then processes the selection window, starting on the third item. The S\_SELECT subroutine returns the chosen selection’s text in **selection** and its ordinal field number in **selnum**. If the user selects the menu entry “O\_HELP,” the EHELP\_METHOD subroutine is called, passing the help ID argument of “sel\_help.”

```
xcall u_ldwnd(id, g_utlib, "select")
xcall m_ldcol(colid, g_utlib, "selcol", D_NOPLC)
xcall s_select(id, 3, selection, colid, selnum, "sel_help")
```

## S\_SELECTCB – Process a check box selection window



```
xcall S_SELECTCB (window_id, flag_array, [current_item], [select_col][, help_id])
```

### Arguments

*window\_id*

The ID of an existing selection window. **(n)**

*flag\_array*

An array of true/false flags, which must have at least as many elements as the selection window has fields. **(n)**

*current\_item*

(optional) The item number you want initially selected. It is returned with the final selected item number. **(n)**

*select\_col*

(optional) The selection column ID. **(n)**

*help\_id*

(optional) The help identifier. **(a)**

### Discussion

S\_SELECTCB enables the user to process a check box selection window.

When the user presses ENTER on an item, its truth value is toggled. If an entry is false, a space is displayed. If true, the check mark character, which is generally an “X”, appears in the first position (to the left) of the entry. On UNIX and OpenVMS, the value of **g\_chk\_char** determines the check mark character. On Windows, setting **g\_chk\_char** has no effect. This subroutine returns whenever an item is toggled or an unrecognized menu entry is signaled.

On Windows, the mouse can be used to highlight and toggle items.

*Flag\_array* is an array of numeric true/false values. This array

- ▶ must already correspond to the visual truth values in the selection window. (See [S\\_UPDATECB on page 12-20](#).)
- ▶ must contain at least as many elements as there are selectable entries in the window.

On return, *flag\_array* contains the updated true/false values resulting from the user’s input.

If you don’t pass *current\_item*, S\_SELECTCB defaults to initially highlight the first item in the window. When the user exits, *current\_item* will return with the last item highlighted.



You can pass *select\_col* with the column ID of an existing menu column that you want placed upon entry to, and removed upon exit from this subroutine.

If the name of the selected menu entry begins with “U\_”, the EUTILS\_METHOD subroutine is called and the input is redone. If the internal name of the selected menu entry is “O\_HELP,” the EHELP\_METHOD subroutine is called with *help\_id* as its argument.

For information on designing check box selection windows, see [“Creating a check box selection window” on page 12-4](#).

## See also

[S\\_SELECT on page 12-11](#) for a list of recognized menu entries.

## S\_SELINF – Retrieve selection window information



```
xcall S_SELINF (window_id, entry_number, entry_text, [fields][, numeric])
```

### Arguments

*window\_id*

The ID of the selection window. **(n)**

*entry\_number*

The number of the selectable entry (supplied or returned). **(n)**

*entry\_text*

The text of the selectable entry (supplied or returned). **(a)**

*fields*

(optional) Returned with the number of fields. **(n)**

*numeric*

(optional) The true/false flag that specifies that *entry\_text* is a numeric value. **(n)**

### Discussion

The S\_SELINF subroutine returns information about a specified selection window.

If *entry\_number* is non-zero, S\_SELINF retrieves the text for that entry and returns it in *entry\_text*. If a matching entry is not found, *entry\_text* returns a blank. Note that entry numbers don't include text or line entries, only selectable entries. If *entry\_number* is zero, S\_SELINF searches for *entry\_text* in the specified selection window. If found, the associated entry number is returned in *entry\_number*. If not found, zero is returned. Note that the match is case sensitive and leading blanks are not ignored. However, if there is a leading blank created by S\_SELBLD or the script compiler, it is ignored.

If the selection window entries are numeric, pass true for the *numeric* argument.

If you pass *fields*, it is returned with the total number of selectable fields in the specified selection window.

If you want to get information about or modify a selection window whose ID you don't know, you can use the I\_FLDINF subroutine to retrieve the ID of an attached selection window for a specified field.

## Examples

With the following selection window, the first example returns “Bill” in **text**. The second example returns “4” in **enum** (provided that **enum** was zero upon entry) and “9” in **numflds**. (The code for the following selection window is listed in Examples for S\_SELBLD on [page 12-8](#).)

| Team 1 | Team 2 | Team 3 |
|--------|--------|--------|
| Jim    | Bill   | Jan    |
| Kim    | Jill   | Dan    |
| Tim    | Phil   | Fran   |

```
xcall s_selinf(wndid, 4, text)
xcall s_selinf(wndid, enum, "Bill", numflds)
```

## S\_SELLD – Load new selections into a selection window



```
xcall S_SELLD (window_id, array_data, [fields], [first_field][, quick_select])
```

### Arguments

*window\_id*

The ID of the selection window. **(n)**

*array\_data*

The first element of the array containing the data to load, which does not include any replacement text and horizontal lines. **(a)**

*fields*

(optional) The number of fields to be loaded. **(n)**

*first\_field*

(optional) The number of the field to load first. **(n)**

*quick\_select*

(optional) The array of quick-select characters. **(a)**

### Discussion

The S\_SELLD subroutine replaces the selectable entries in an existing selection window (created using S\_SELBLD).

You can specify a maximum of 100 fields in *fields*.

If *fields* is not specified, S\_SELLD loads one field.

If *first\_field* is specified, the first element of the array is loaded into the specified field. The second element of the array is loaded into *first\_field*+1, the third element into *first\_field*+2, and so on.

If *first\_field* is not specified, the first element of the array is loaded into the first field.

If *quick\_select* is not passed or is blank, the first non-blank character in each entry is used.

If the selection window contains lines or non-selectable text, they are not overwritten by S\_SELLD; only selectable entries are replaced. Use the Synergy DBL W\_DISP subroutine to replace text in a selection window. (See [W\\_DISP](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.)

## Examples

This example loads the selection window whose ID is stored in **selid** with the first 20 entries in **newdata**.

```
xcall s_selld(selid, newdata, 20)
```

## S\_UPDATECB – Update a check box selection window



```
xcall S_UPDATECB (window_id, num_flags, flag_array)
```

### Arguments

*window\_id*

The ID of the selection window. **(n)**

*num\_flags*

The number of flags. **(n)**

*flag\_array*

The array of true/false flags (which must have at least as many elements as the selection window has fields). **(n)**

### Discussion

The S\_UPDATECB subroutine updates the check mark characters in a loaded check box selection window.

Before you can call S\_UPDATECB, make sure the selection window meets the following criteria:

- ▶ The selection window was created with the .SELECT command, the SELECT option of the .FIELD command, or the S\_SELBLD subroutine.
- ▶ Each entry in the selection window has a space as the first character. This space will be used for the check mark character.
- ▶ The selection window is already loaded.

*Window\_id* is the window ID of the loaded selection window.

*Num\_flags* indicates both the number of elements in *flag\_array* and the number of entries in the selection window.

*Flag\_array* is an array of numeric true/false values. This subroutine displays a blank in the first position (the space) of each entry whose corresponding array element is false. For each true element, this subroutine displays the check mark character (which is generally an “X”) in the first position of the corresponding window entry. On UNIX and OpenVMS, the value of **g\_chk\_char** determines the check mark character. On Windows, setting **g\_chk\_char** has no effect.

For information on designing check box selection windows, see [“Creating a check box selection window” on page 12-4](#).

# 13

## Tab Set Routines

### **Tab Set Processing 13-2**

Discusses what a tab set is, why you would want to use one, and how tab set processing works. Also gives a brief overview of UI Toolkit tab set processing functions.

### **The Tab Set Functions 13-4**

|                                                          |      |
|----------------------------------------------------------|------|
| %TS_PROCESS – Process a tabbed dialog .....              | 13-5 |
| %TS_TABSET – Create and manipulate a tabbed dialog ..... | 13-9 |

# Tab Set Processing

Complex applications developed with Synergy/DE™ often contain input requirements that will not fit on a single-screen input window. Historically, this problem has been solved by one of the following:

- ▶ Several windows, which are navigated with a PAGE UP/DOWN equivalent.
- ▶ A single large window with a screen-sized movable display area.

Among software development platforms for Windows environments a standard approach to this problem has emerged: tabbed dialogs, where windows are rendered in the metaphor of tabbed file-folders.

The tab set processing functions in Toolkit enable you to associate windows or lists with the “tabs” of a tabbed dialog. Specific input window or list processing is handled using a method that you register with Toolkit.

The basic tab set functionality is as follows:

- ▶ A tab is associated with a window (or list) and a method, and is contained within a tab set. The associated window will be placed immediately below (or beside) the set of tabs, and will be made to appear to be joined to its associated tab.
- ▶ When the tab is selected (with a menu entry or mouse click), the associated window (or list) will be brought to the front, and the associated method routine will be invoked.
- ▶ The entire set of tabs and windows will be contained within a bounding window, which may also contain buttons.

A tab set is created with a call to `%TS_TABSET` using the `DTS_CREATE` subfunction. (Windows are added to the tab set with the `DTS_WINDOW` subfunction; lists are added with `DTS_LIST`.) The window or list is visually transformed into a tab page. It is placed adjacent to the tabs, a tab is created for it, and the border is rendered in a manner compatible with a tabbed page. On Windows, this is a blended 3-D effect.

On UNIX and OpenVMS systems, the top border of the window will be overlapped by a single-line window containing textually rendered tabs:

```
/Tab one \ /Tab two \ / Tab three \
```

Slashes are used to delimit the tabs, by default, and the underscore attribute is used to distinguish the inactive tabs from the active one. See the `DTS_CREATE`, `DTS_SELECT_ATTR`, and `DTS_NONSELECT_ATTR` subfunctions of `%TS_TABSET` on [page 13-9](#) for information on how to modify these separators and attributes.

By default, tabs are placed at the top of the tab set. You can change this by setting `DTS_BOTTOM`, `DTS_VERTICAL`, or `DTS_RIGHT` when creating a tab set. (Note, however, that for Windows themes, we recommend leaving tabs at the top of the tab set; `DTS_BOTTOM` and `DTS_VERTICAL` result in incorrectly drawn tabs.)



The text of the tab is the text of the window's title, if any. Subsequently, the placement of the window is left at the discretion of the tab set.

If the size of the window or list is larger than the number of rows and columns specified for the tab set on `DTS_CREATE`, by default the window or list will be clipped. If a resize event is specified for the window or list, scroll bars will be displayed as necessary.

The order in which windows are added to the tab set defines the ordering of the tabs. Only one row of tabs will be displayed. If this is not sufficient to display all of the tabs in the tab set, on Windows, scroll bars are used by default to indicate that more tabs exist. This style can be changed to use multi-line tabs instead of scroll bars by using the `DTS_MULTILINE` option when creating a tab set. On UNIX and OpenVMS systems, the active tab will always be visible.

A tab can be brought to the front programmatically by using the `DTS_ACTIVE` subfunction of `%TS_TABSET`.

To process a tab set, call `%TS_PROCESS`. When this routine is called, the method for the active tab is immediately invoked. When a tab switch occurs within `%TS_PROCESS`, the associated window is brought to the front, and its associated method is called. The only time that `%TS_PROCESS` returns is when a menu entry is selected that is not recognized by the currently active tab's method, nor by `%TS_PROCESS`.

To remove a tab from a tab set, use `DTS_REMOVE`. The user won't see the tab on the tab set, but the window will still reside in memory. You must use `U_WINDOW` with `D_DELETE` (or rely on an environment) to remove a window from memory.

To delete a tab set, do one of the following:

- ▶ Let an environment delete the tab set for you. By default the tab set container window is local to the current environment, so if you create and load the windows and tab set in an environment, Toolkit will delete the tab set and remove all of the tab set windows from memory when you exit the environment.
- ▶ Use `U_WINDOW` with the `D_DELETE` operation. You can do this because a tab set container is a Toolkit window. (To use `D_DELETE`, you'll need to pass the window ID that was returned when the tab set was created.) However, individual tab windows (input windows, lists, and ActiveX containers) will not be deleted when you delete the tab set container window. You'll need to use `U_WINDOW` with `D_DELETE` to delete each of the individual tab windows (use `L_DELETE` for lists) after you delete the tab set container window.

# The Tab Set Functions

This section discusses the syntax and arguments for each of the tab set functions.

## %TS\_PROCESS – Process a tabbed dialog



```
status = %TS_PROCESS (tabid[, method_arg, ...])
```

or

```
xcall TS_PROCESS (tabid[, method_arg, ...])
```

### Return value

*status*

%TS\_PROCESS always returns true. (^VAL)

### Arguments

*tabid*

The ID of the tab set returned by the DTS\_CREATE subfunction. (n)

*method\_arg*

(optional) One of up to 20 arguments that are passed to the method for each tab as it becomes active.

### Discussion

The %TS\_PROCESS function enables your applications to process tabbed dialogs.

When this function is called, the method for the active tab is immediately invoked. If no tab has been designated as the active tab (with DTS\_ACTIVE), then the first defined tab is presumed. When the user clicks on a tab, the menu entry “TS\_TAB*n*” is generated, where *n* is the index of the desired tab (there are exceptions for composite windows; see [“Controlling tabbing, focus, and input context” on page 6-4](#)). The tab method may “see” this menu entry and perform any cleanup or preparation for tab switching that may be needed, but it must allow this menu entry to be returned from the method in order for the automatic tab switching to occur. Clearing **g\_select** or modifying **g\_entnam** at this point will disable the tab switch.

On UNIX and OpenVMS environments, “TS\_TAB*n*” menu entries can be placed on the menu to achieve immediate tabbing. Also, the entries “TS\_TABNEXT” and “TS\_TABPREV” will create the same effect as signaling the corresponding next or previous “TS\_TAB*n*” menu entry. On Windows platforms, CTRL+TAB and CTRL+SHIFT+TAB will be automatically mapped to these latter two entries, respectively. For cross-platform compatibility, place any “TS\_xxx” menu entries on columns whose IDs are passed to Toolkit input routines. (By default, on UNIX and OpenVMS platforms, these will be placed; on Windows, they won’t be placed.)

When a tab switch occurs within %TS\_PROCESS, the associated window is brought to the front, and its associated method subroutine is called, passing the associated ID (window ID or list ID) and up to 20 optional arguments that were passed to %TS\_PROCESS.

When the method for a tab returns, if a menu entry has been signaled (**g\_select** is true), then if it is a menu entry which %TS\_PROCESS recognizes (TS\_xxx), it will be processed by %TS\_PROCESS and the method for the active tab will be called. If the menu entry is not recognized by %TS\_PROCESS, it is returned to the routine that called %TS\_PROCESS. If no menu entry has been signaled (**g\_select** is false) when the method returns, then the method is immediately called again.

If the method for a tab doesn't allow a TS\_xxx menu entry to be returned to %TS\_PROCESS, the method should reset the active tab by calling %TS\_TABSET with the DTS\_ACTIVE subfunction. Otherwise, the tab which is forward will not match the window displayed within. To prevent the tab from switching in the first place, remove or disable the other tabs.

Calls to %TS\_TABSET are allowed while within %TS\_PROCESS, even if they reference the same tab set.

We do not recommend using required fields in a tab set because, when the user clicks OK, the tab set field validation behavior does not follow general Windows conventions. Instead, we recommend filling the windows with valid data, so that required field validation does not occur.

The only time that %TS\_PROCESS returns is when a menu entry is selected that is not processed by the currently active tab's method subroutine, nor is recognized by %TS\_PROCESS.

## Examples

The following subroutine loads a tab set and processes it:

```
subroutine process_tabs

.include "WND:tools.def"
record
    tabid          ,int
    inpid1         ,int
    inpid2         ,int
    lstid          ,int
    inp_record     ,a10
    list_record    ,a40
proc

;Create a tab container large enough for windows of 14 x 70.
tabid = %ts_tabset(DTS_CREATE, "tab_container", 14, 70)

;Create the first tab as an input window.
xcall i_ldinp(inpid1,, "i_tab1")
xcall ts_tabset(DTS_WINDOW, tabid, inpid1, "inp_method")
```

```

;Create the second tab as a list.
xcall i_ldinp(inp_id2,, "i_tab2")
xcall l_create(lstid, inp_id2, list_record, g_utlib, "l_tab2")
xcall ts_tabset(DTS_LIST, tabid, lstid, "list_method")

;Add a button to the tab set.
xcall ts_tabset(DTS_BUTTON, tabid, "O_EXIT", DSB_TEXT, "Done")

;Main input loop
repeat
  begin
    xcall ts_process(tabid, inp_record, list_record)
    if (g_select)
      begin
        using g_entnam select
          ("O_EXIT "), exitloop
        ;Add other cases as needed.
        endusing
      end
    end
  xreturn
end

subroutine inp_method
;
; Tab method for the input window
;
  a_inp_id      ,n    ;The input window ID
  a_inp_record  ,a    ;The input record
  a_list_record ,a    ;The list record, though we don't use it here
proc
  ;Just perform input on the default set of the window,
  ; updating a_inp_record.
  xcall i_input(a_inp_id,, a_inp_record)
  xreturn
end

subroutine list_method
;
; Tab method for the list
;
  a_lstid      ,n    ;The list's ID
  a_inp_record  ,a    ;The input record, though we don't use
                      ; it here
  a_list_record ,a    ;The list record
record
  req          ,int  ;A variable for the list request code
proc

```

## Tab Set Routines

%TS\_PROCESS

```
        ;Just select an entry, and place its record in a_list_record.  
        xcall l_select(a_lstid, req=D_LNOP, a_list_record)  
        xreturn  
    end
```

## %TS\_TABSET – Create and manipulate a tabbed dialog



*return* = %TS\_TABSET(*subfunction*, *arg*[, ...])

or

xcall TS\_TABSET(*subfunction*, *arg*[, ...])

### Return value

*return*

Refer to [page 13-11](#) through [page 13-22](#) for the specific return values for *subfunction*. (^VAL)

### Arguments

*subfunction*

The function to perform. It must be one of the following: (n)

|                           |                                                                               |
|---------------------------|-------------------------------------------------------------------------------|
| <b>DTS_CREATE</b>         | Create a tab set. See <a href="#">page 13-11</a> .                            |
| <b>DTS_WINDOW</b>         | Add a window to a tab set. See <a href="#">page 13-14</a> .                   |
| <b>DTS_LIST</b>           | Add a list to a tab set. See <a href="#">page 13-16</a> .                     |
| <b>DTS_BUTTON</b>         | Add a button to a tab set. See <a href="#">page 13-17</a> .                   |
| <b>DTS_BUTTONSET</b>      | Modify the button set for a tab set. See <a href="#">page 13-19</a> .         |
| <b>DTS_ACTIVE</b>         | Bring a tab to the front. See <a href="#">page 13-21</a> .                    |
| <b>DTS_ENABLE</b>         | Enable a tab in a tab set. See <a href="#">page 13-22</a> .                   |
| <b>DTS_DISABLE</b>        | Disable a tab in a tab set. See <a href="#">page 13-22</a> .                  |
| <b>DTS_REMOVE</b>         | Remove a tab from a tab set. See <a href="#">page 13-22</a> .                 |
| <b>DTS_SELECT_ATTR</b>    | Modify the attributes for the selected tab. See <a href="#">page 13-23</a> .  |
| <b>DTS_NONSELECT_ATTR</b> | Modify the attributes for non-selected tabs. See <a href="#">page 13-26</a> . |
| <b>DTS_DEFAULT</b>        | Modify the default tab settings. See <a href="#">page 13-29</a> .             |
| <b>DTS_GETDEFAULT</b>     | Obtain the default tab settings. See <a href="#">page 13-29</a> .             |
| <b>DTS_NUMTABS</b>        | Obtain the number of tabs in a tab set. See <a href="#">page 13-32</a> .      |
| <b>DTS_TABINDEX</b>       | Obtain the tab index for a window or list. See <a href="#">page 13-33</a> .   |
| <b>DTS_TABINFO</b>        | Obtain information for a tab. See <a href="#">page 13-34</a> .                |

## Tab Set Routines

### %TS\_TABSET

#### DTS\_TABSET

Obtain the ID of the tab set that contains a specified window or list. See [page 13-36](#).

#### DTS\_CTRCONTEXT

Set context of window on tab. See [page 13-37](#).

*arg*

One or more arguments, depending on *subfunction*.

## Discussion

The %TS\_TABSET function enables you to create and manipulate a tabbed dialog. See [pages 13-12](#) through [13-34](#) for more information.

## Examples

See Examples for %TS\_PROCESS on [page 13-6](#), and see Examples for %TS\_TABSET subfunctions below.



## %TS\_TABSET (continued)

### DTS\_CREATE

```

window_id = %TS_TABSET(DTS_CREATE, name, rows, cols, [pre_tab_string],
&                                [post_tab_string][, style])
or
xcall TS_TABSET(DTS_CREATE, name, rows, cols, [pre_tab_string], [post_tab_string]
&                                [, style])

```

### Return value

*window\_id*

This subfunction returns the window ID of the created tab set container window. (^VAL)

### Arguments

*name*

A name for the created tab set (a maximum of 15 characters). (a)

*rows*

The maximum number of rows that a contained window may contain. (n)

*cols*

The maximum number of columns that a contained window may contain. (n)

### UNIX, VMS

---

*pre\_tab\_string*

(optional) The string to put before each tab in a tab set container window. (a)

*post\_tab\_string*

(optional) The string to put after each tab in a tab set container window. (a)

---

### WIN

---

*style*

(optional) One or more of the following options, combined using .BOR. or the vertical bar (|) operator: (n)

|                      |                                               |
|----------------------|-----------------------------------------------|
| <b>DTS_NONE</b>      | None of the following styles apply. (default) |
| <b>DTS_MULTILINE</b> | Multiple lines of tabs.                       |
| <b>DTS_VERTICAL</b>  | Left or right side.                           |

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| <b>DTS_BOTTOM</b> | Bottom (or right if DTS_VERTICAL is also specified).       |
| <b>DTS_RIGHT</b>  | Right (or bottom if DTS_VERTICAL is <i>not</i> specified). |

---

## Discussion

The DTS\_CREATE subfunction of %TS\_TABSET creates a tab set.

Since the window created is a UI Toolkit window, U\_WINDOW can be used to place, remove, move, or delete the tab set as a whole. Deleting the tab set does not delete its member windows, but does disassociate them from the tab set. (See “[Tab Set Processing](#)” on [page 13-2](#) for more information.) Note also that the containing window is by default local to the current environment (for instance, it will be deleted by a subsequent E\_EXIT), but it may also be promoted to global status with U\_GBLWND.

*Rows* and *cols* must be greater than or equal to the height and width, respectively, of the window specified with DTS\_WINDOW.

A tab set can have up to 24 tabs.

### UNIX, VMS

---

*Pre\_tab\_string* and *post\_tab\_string* are used to define the two delimiter strings. The maximum length of each string is 10 characters. If *pre\_tab\_string* or *post\_tab\_string* is not passed, the default strings “/” and “\” will be used, respectively. If *post\_tab\_string* is specified as an empty string (“”), the string specified in *pre\_tab\_string* will be repeated after the last tab. If *pre\_tab\_string* is an empty string, the container window’s border acts as a border for the first tab.

---

### WIN

---

When a tab set is created, the global default style is used. The global default style is determined by either the style specified in a prior call to %TS\_TABSET(DTS\_DEFAULT), the style specified by the TABSET\_STYLE initialization setting in **synergy.ini**, or the Toolkit’s default style. Toolkit’s default style is to display tabs on a single line (scrolling as necessary) on the top of the window.

You can override the default style currently in effect by specifying *style* for the DTS\_CREATE subfunction. The style options for a tabbed dialog cannot be changed after a tab set has been created. *Style* options should be combined using .BOR. or the vertical bar (|) operator.

To restore the default style in effect back to the Toolkit default style, specify DTS\_NONE.

If DTS\_MULTILINE is specified, the tabs display on multiple rows if they cannot fit on one row. This will use more container space for the tabs, so you may need to adjust the number of rows and columns specified in *rows* and *cols* to allow the contained windows to display fully. If tabs are displayed on the top or left, contained windows will be shifted down or to the right, respectively. This means that rows or columns at the bottom or right of the contained window may be truncated.

If `DTS_VERTICAL` is specified, tabs are displayed vertically on the left or right side of the contained windows with the text rotated 90 degrees to follow the vertical border. Setting `DTS_VERTICAL` forces `DTS_MULTILINE` to be set.



Note that when using “Windows XP style” display properties on Windows XP, tabs are supported only at the top of the tab set.

---

If `DTS_RIGHT` or `DTS_BOTTOM` is specified along with `DTS_VERTICAL`, the tabs are displayed on the right side. If `DTS_RIGHT` or `DTS_BOTTOM` is specified and `DTS_VERTICAL` is not, the tabs are displayed on the bottom.

---

## See also

“[DTS\\_DEFAULT, DTS\\_GETDEFAULT](#)” on page 13-29 for setting the default style.

## Examples

On UNIX and OpenVMS systems, the following example sets the tab delimiter to “|”, by setting *pre\_tab\_string* to “|” and *post\_tab\_string* to “”, as shown below.

```
tabid = %ts_tabset(DTS_CREATE, "Tabset1", 15, 50, "|", "")
```

```
!Tab 1|Tab 2|Tab 3!
```

On Windows, the following example specifies multi-line tabs on the bottom of the tab set.

```
tabid = %ts_tabset(DTS_CREATE, "Tabset2", 10, 30,,,
& DTS_MULTILINE .bor. DTS_BOTTOM)
```

## %TS\_TABSET (continued)

### DTS\_WINDOW

*index* = %TS\_TABSET (DTS\_WINDOW, *tab\_id*, *window\_id*, *method*, [*elb*][, *tooltip*])

or

xcall TS\_TABSET (DTS\_WINDOW, *tab\_id*, *window\_id*, *method*, [*elb*][, *tooltip*])

### Return value

*index*

This subfunction returns the tab index of the new tab, if successful, or zero if not. (^VAL)

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (n)

*window\_id*

The ID of a window to add to the tab set. (n)

*method*

The name of the subroutine to call when this tab is selected. (a)

*elb*

(optional) The .elb filename in which to find *method*. (a)

*tooltip*

(optional) The text of a ToolTip to be displayed if the mouse rests over the tab. (a)

### Discussion

The DTS\_WINDOW subfunction of %TS\_TABSET adds a window to a tab set.

The window referenced by *window\_id* is visually transformed into a tab page. This means that it is placed adjacent to the tabs, a tab is created for it, the border is turned off, and the window is made to appear to be a tabbed page.

When a tab is created, the window is sized to fit the tab. If the window is larger than the tab, the display area is resized, and scroll bars appear. If the window is smaller than the tab, the blank portion of the tab is filled with the background window color. When a tab is resized, the window display area is also resized.



When a window is added to a tab set, UI Toolkit changes the color of the window to the color palette entry specified by the **g\_tabfacecolor** global variable, if this variable is set to a value in the range 1 through 16. On Windows, **g\_tabfacecolor** is set to 9 by default if Windows themes are used. On UNIX and OpenVMS or on Windows if themes are not enabled, the default is 0, a setting that instructs Toolkit to leave a window's color as is.

When a window is removed from a tab set, Toolkit does not restore the original color for the window. If the color was changed when the window was added to a tab set, that change will stand until the program or the user changes the renditions for the window.

Additionally, if unfocused fields are displayed or cleared (initialized) after the input window for the fields is added to a tab set, Toolkit will apply the Input Field Display rendition or the Cleared Input Field rendition to the fields—renditions that might not match the **g\_tabfacecolor** palette entry (if that has been applied to the field). In this case, do one of the following:

- ▶ Before performing the display (I\_DISPLAY or I\_DSPFLD) or clear (I\_INIT), use U\_REND to set the Input Field Display rendition or the Cleared Input Field rendition to **g\_tabfacecolor**.
- ▶ After performing the display or clear, overwrite the renditions using W\_AREA. For example:

```
xcall w_area(wndid, WA_COPY, WAC_WTOP, WA_COLOR,
&             g_tabfacecolor)
```

For more information on **g\_tabfacecolor**, see [page 18-5](#).

---

## UNIX, VMS

On UNIX and OpenVMS systems, the tabs are rendered as a single-line window that uses slashes (by default) to delimit the tabs, and the underscore attribute (by default) to distinguish the inactive tabs from the active tab. (See [page 13-2](#) for an example.)

---

## %TS\_TABSET (continued)

### DTS\_LIST

*index* = %TS\_TABSET (DTS\_LIST, *tab\_id*, *list\_id*, *method*, [*elb*][, *tooltip*])

or

xcall TS\_TABSET (DTS\_LIST, *tab\_id*, *list\_id*, *method*, [*elb*][, *tooltip*])

### Return value

*index*

This subfunction returns the tab index of the new tab if successful, or zero if not. (^VAL)

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (n)

*list\_id*

The ID of a list to add to the tab set. (n)

*method*

The name of the subroutine to call when this tab is selected. (a)

*elb*

(optional) The .elb filename in which to find *method*. (a)

*tooltip*

(optional) The text of a ToolTip to be displayed if the mouse rests over the tab. (a)

### Discussion

The DTS\_LIST subfunction of %TS\_TABSET adds a list to a tab set.

This subfunction is similar to the DTS\_WINDOW subfunction, except that it's for lists. By default, when a tab is created, the list is sized to fit the tab regardless of the number of list items you've specified to display. If the tab is resized, the list is also resized. To override this behavior, specify the NOAUTOSIZE list class option.

## %TS\_TABSET (continued)

WIN

---

### DTS\_BUTTON

```
xcall TS_TABSET(DTS_BUTTON, tab_id, name, [type], [type_data], [method], [elb],
& [select_char], [position][, tooltip])
```

### Return value

The return value of this subfunction is undefined; therefore, we recommend that you use XCALL TS\_TABSET in this case.

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. **(n)**

*name*

The name of the button to add (a maximum of 30 characters). **(a)**

*type*

(optional) The button face type: **(n)**

**DSB\_TEXT**           Text. (default)

**DSB\_BITMAP**       Graphic.

*type\_data*

(optional) Text if *type* is DSB\_TEXT. The filename for a graphic if *type* is DSB\_BITMAP. **(a)**

*method*

(optional) The name of the subroutine to call when this button is selected. **(a)**

*elb*

(optional) The name of the library from which to draw *method*. **(a)**

*select\_char*

(optional) The quick-select character. **(a)**

*position*

(optional) The position the button will be inserted in the button set. **(a or n)**

*tooltip*

(optional) The text of a ToolTip to be displayed when the mouse pointer rests over the button. **(a)**

## Discussion

The DTS\_BUTTON subfunction of %TS\_TABSET adds a button to a tab set. If there are no existing buttons, a default button set is created. (On UNIX and OpenVMS, this subfunction is ignored.)

By default, button sets are placed at the bottom of the tab set, are left-justified, and can have as many buttons on a row as will fit before the row wraps. You can change these defaults with B\_BUTTONSET.

The tab set will expand downward or to the right to accommodate the buttons, which may cause your window to extend beyond the bottom or right side of the application window. Also, buttons are a standard size; text that exceeds that size will not be visible.

For information on the arguments for this subroutine, see the Discussion for DSB\_ADD on [page 5-7](#). All of the comments in that section apply to tab sets.

---



## %TS\_TABSET (continued)

WIN

---

### DTS\_BUTTONSET

```
xcall TS_TABSET(DTS_BUTTONSET, tab_id, [placement], [per_row_col], [justification]
&                [, button_name])
```

### Return value

The return value of this subfunction is undefined; we recommend that you use XCALL TS\_TABSET in this case.

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. **(n)**

*placement*

(optional) One of the following: **(n)**

**DSB\_BOTTOM**      The set of buttons will be placed horizontally along the bottom of the window with a maximum of *per\_row\_col* buttons per row. (default)

**DSB\_RIGHT**        The set of buttons will be placed vertically along the right side of the window with a maximum of *per\_row\_col* buttons per column.

*per\_row\_col*

(optional) The maximum number of buttons to place on a row if DSB\_BOTTOM is specified, or on a column if DSB\_RIGHT is specified. The default behavior is to display as many as will fit and wrap to the next row or column. **(n)**

*justification*

(optional) One of the following: **(n)**

**DSB\_BEGIN**        The buttons will be left-justified if DSB\_BOTTOM is specified, or positioned towards the top if DSB\_RIGHT is specified. (default)

**DSB\_CENTER**       The buttons will be centered along the designated side.

**DSB\_END**          The buttons will be right-justified if DSB\_BOTTOM is specified, or positioned towards the bottom if DSB\_RIGHT is specified.

*button\_name*

(optional) The name of the default button. **(a)**

## Discussion

The DTS\_BUTTONSET subfunction of %TS\_TABSET modifies the button set for a tab set. (On UNIX and OpenVMS, this subfunction is ignored.)

If a tab set container and its contained window both have buttons, the following rules are used to determine which button is the default:

- ▶ If only one, either the contained window or the tab set container, defines a default button, the specified button is the default button.
- ▶ If neither the contained window nor the tab set container defines a default button, the first button on the contained window is the default button.
- ▶ If both the contained object and the tab set container define a default button, the default button of the contained window is the default button.

If the E\_STATE option D\_RETURNBTN is set, the default button will be selected if you press RETURN, no matter what field you're on in the window. If *button\_name* is not specified and D\_RETURNBTN is set, the first button in the window is the default.

## See also

- ▶ [B\\_BUTTONSET on page 5-15](#) for more information on defining the placement of a set of buttons.
  - ▶ [.BUTTON\\_SET on page 2-19](#) for defining the placement of a window's button set in a script file.
  - ▶ [L\\_BUTTON on page 9-55](#) for creating buttons within a list.
  - ▶ [L\\_BUTTONSET on page 9-62](#) for information about specifying button placement for a list.
  - ▶ [E\\_STATE on page 7-45](#) for information about the ENTER key selecting the default button.
-

## %TS\_TABSET (continued)

### DTS\_ACTIVE

*index* = %TS\_TABSET (DTS\_ACTIVE, *tab\_id*[, *new\_index*])

or

xcall TS\_TABSET (DTS\_ACTIVE, *tab\_id*[, *new\_index*])

### Return value

*index*

If *new\_index* is passed, the index of the previously active tab is returned. Otherwise, the index of the currently active tab is returned. (^VAL)

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (n)

*new\_index*

(optional) The index of the tab to bring to the front, which will be processed on the next call to %TS\_PROCESS. (See [page 13-5](#) for more information.) (n)

### Discussion

The DTS\_ACTIVE subfunction of %TS\_TABSET brings a tab to the front.

## %TS\_TABSET (continued)

### DTS\_ENABLE, DTS\_DISABLE, DTS\_REMOVE

*curr\_index* = %TS\_TABSET (DTS\_REMOVE, *tab\_id*, *index*)

or

xcall TS\_TABSET (DTS\_ENABLE | DTS\_DISABLE | DTS\_REMOVE, *tab\_id*, *index*)

### Return value

*curr\_index*

The DTS\_REMOVE subfunction returns the index of the active tab. (^VAL)

The return value of the DTS\_ENABLE and DTS\_DISABLE subfunctions is undefined; therefore, we recommend that you use XCALL TS\_TABSET in those cases.

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (n)

*index*

The index of the tab to enable, disable, or remove. (n)

### Discussion

The DTS\_ENABLE subfunction of %TS\_TABSET enables a tab in a tab set.

The DTS\_DISABLE subfunction of %TS\_TABSET disables a tab in a tab set. Be aware that the disabled tab is not rendered visually. For behavior that is more Windows-like, we recommend removing the tab.

The DTS\_REMOVE subfunction of %TS\_TABSET removes a tab from a tab set. (It does not remove the tab window from memory. See “[Tab Set Processing](#)” on page 13-2 for more information.)

*Index* is the tab index returned from the DTS\_WINDOW or DTS\_LIST subfunctions.



Although UI Toolkit may change the color palette entry for a window when the window is added to a tab set, Toolkit does not restore the original palette entry setting for the window when it is removed from the tab set. See [DTS\\_WINDOW on page 13-14](#) for information.

---

## %TS\_TABSET (continued)

UNIX, VMS

---

### DTS\_SELECT\_ATTR

*status* = %TS\_TABSET (DTS\_SELECT\_ATTR, *tab\_id*, [*option+attribute*][, *palette#*])

or

xcall TS\_TABSET (DTS\_SELECT\_ATTR, *tab\_id*, [*option+attribute*][, *palette#*])

### Return value

*status*

DTS\_SELECT\_ATTR returns true if successful, false if not. (^VAL)

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (n)

*option*

One of the following: (n)

**DA\_SET**                      Set attributes.

**DA\_CLR**                     Clear attributes.

*attribute*

One of the following flags defined in **tools.def**: (n)

**A\_NONE**                    No attributes.

**A\_U**                        Underlined.

**A\_R**                        Reverse.

**A\_RU**                      Reverse, underlined.

**A\_B | A\_I**                Blinking (on UNIX and OpenVMS) or italic (on Windows). “I” can be substituted whenever “B” appears in the following flags.

**A\_BU**                      Blinking, underlined.

**A\_BR**                      Blinking, reverse.

**A\_BRU**                    Blinking, reverse, underlined.

## Tab Set Routines

### %TS\_TABSET

|               |                                             |
|---------------|---------------------------------------------|
| <b>A_H</b>    | Highlighted.                                |
| <b>A_HU</b>   | Highlighted, underlined.                    |
| <b>A_HR</b>   | Highlighted, reverse.                       |
| <b>A_HRU</b>  | Highlighted, reverse, underlined.           |
| <b>A_BH</b>   | Blinking, highlighted.                      |
| <b>A_BHU</b>  | Blinking, highlighted, underlined.          |
| <b>A_BHR</b>  | Blinking, highlighted, reverse.             |
| <b>A_BHRU</b> | Blinking, highlighted, reverse, underlined. |
| <b>A_ALL</b>  | All attributes (same as A_BHRU).            |

*palette#*

(optional) A palette number, in the range 1 to 16, to set for the selected tab. (**n**)

## Discussion

The DTS\_SELECT\_ATTR subfunction of %TS\_TABSET sets the rendition for the selected tab in a tab set. These renditions apply to the currently selected tab as well as any tab selected in the future. (On Windows, this subfunction is ignored.)

Using DTS\_SELECT\_ATTR, you can set and clear various attributes for the selected tab to modify the effect of which tab is selected. See the example below.

This subfunction has no effect on Windows systems.

If *option+attribute* is not passed, the default attribute will be used. The default is DA\_CLR+A\_U, unless it is modified through %TS\_TABSET(DTS\_DEFAULT). It is important to note that whatever attributes are specified using DTS\_SELECT\_ATTR overwrite the default attributes for a selected tab. For example, if DA\_SET+A\_R is specified, and the current default is DA\_SET+A\_U, the attribute of the selected tab will be reverse *only*.

If *palette#* is not passed, the default color will be used. The initial default color palette number is 1. If *palette#* is specified, but not between 1 and 16, a fatal error will be generated.

Changes to the selected tab's renditions will take effect either at the next call to the %TS\_PROCESS function using *tab\_id*, or within a call to %TS\_PROCESS as a result of returning from a tab method.

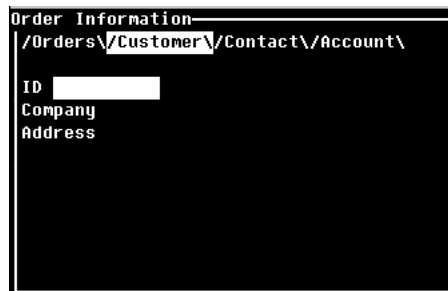
## See also

- ▶ [DTS\\_DEFAULT, DTS\\_GETDEFAULT](#) on page 13-29 for information about setting the default rendition for tab sets.
- ▶ [DTS\\_NONSELECT\\_ATTR](#) on page 13-26 for information about setting the rendition for non-selected tabs in a tab set.
- ▶ The “[Synergy Windowing API](#)” chapter of the *Synergy DBL Language Reference Manual* for more information on the effects of setting, changing, loading, and clearing attributes.
- ▶ The “[Colors and the color palette](#)” in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* for more information on using color palettes.

## Examples

The following example sets the rendition for the selected tab, in this case, Tab 2, in tab set **tabid** to be reverse video, and clears reverse non-selected tabs.

```
if (%TS_TABSET(DTS_SELECT_ATTR, tabid, DA_SET+A_R))
    status = %TS_TABSET(DTS_NONSELECT_ATTR, tabid, DA_CLR+A_U)
```



## %TS\_TABSET (continued)

UNIX, VMS

---

### DTS\_NONSELECT\_ATTR

*status* = %TS\_TABSET (DTS\_NONSELECT\_ATTR, *tab\_id*, [*option+attribute*][, *palette#*])

or

xcall TS\_TABSET (DTS\_NONSELECT\_ATTR, *tab\_id*, [*option+attribute*][, *palette#*])

### Return value

*status*

DTS\_NONSELECT\_ATTR returns true if successful, false if not. (^VAL)

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (n)

*option*

One of the following: (n)

**DA\_SET** Set attributes.

**DA\_CLR** Clear attributes.

*attribute*

One of the following flags defined in **tools.def**: (n)

**A\_NONE** No attributes.

**A\_U** Underlined.

**A\_R** Reverse.

**A\_RU** Reverse, underlined.

**A\_B | A\_I** Blinking (on UNIX and OpenVMS) or italic (on Windows). “I” can be substituted whenever “B” appears in the following flags.

**A\_BU** Blinking, underlined.

**A\_BR** Blinking, reverse.

**A\_BRU** Blinking, reverse, underlined.

**A\_H** Highlighted.

**A\_HU** Highlighted, underlined.



|               |                                             |
|---------------|---------------------------------------------|
| <b>A_HR</b>   | Highlighted, reverse.                       |
| <b>A_HRU</b>  | Highlighted, reverse, underlined.           |
| <b>A_BH</b>   | Blinking, highlighted.                      |
| <b>A_BHU</b>  | Blinking, highlighted, underlined.          |
| <b>A_BHR</b>  | Blinking, highlighted, reverse.             |
| <b>A_BHRU</b> | Blinking, highlighted, reverse, underlined. |
| <b>A_ALL</b>  | All attributes (same as A_BHRU).            |

*palette#*

(optional) A palette number, in the range 1 to 16, to set for the selected tab. (**n**)

## Discussion

The DTS\_NONSELECT\_ATTR subfunction of %TS\_TABSET sets the rendition for non-selected tabs in a tab set. These renditions apply to the currently non-selected tabs as well as any unselected tabs in the future. (On Windows, this subfunction is ignored.)

Using DTS\_NONSELECT\_ATTR, you can set and clear various attributes for the non-selected tabs to modify the effect of which tabs aren't selected. See the example on [page 13-25](#).

If *option+attribute* is not passed, the default attribute will be used. The default is DA\_SET+A\_U, unless it is modified through %TS\_TABSET(DTS\_DEFAULT). It is important to note that whatever attributes are specified using DTS\_NONSELECT\_ATTR overwrite the default attributes for unselected tabs. For example, if DA\_SET+A\_R is specified, and the current default is DA\_SET+A\_U, the attribute of the non-selected tab will be reverse *only*.

If *palette#* is not passed, the default color will be used. The initial default color palette number is 1. If *palette#* is specified, but not between 1 and 16, a fatal error will be generated.

Changes to the non-selected tab's renditions will take effect either at the next call to the %TS\_PROCESS function using *tab\_id*, or within a call to %TS\_PROCESS as a result of returning from a tab method.

## See also

- ▶ [DTS\\_DEFAULT, DTS\\_GETDEFAULT](#) on [page 13-29](#) for information about setting the default rendition for tab sets.
- ▶ [DTS\\_SELECT\\_ATTR](#) on [page 13-23](#) for information about setting the rendition for the selected tab in a tab set.
- ▶ The “[Synergy Windowing API](#)” chapter of the *Synergy DBL Language Reference Manual* for more information on the effects of setting, changing, loading, and clearing attributes.
- ▶ “[Colors and the color palette](#)” in the “[Synergy Windowing API](#)” chapter of the *Synergy DBL Language Reference Manual* for more information on using color palettes.

## Tab Set Routines

%TS\_TABSET

### Examples

See Examples on [page 13-25](#).

---

## %TS\_TABSET (continued)

### DTS\_DEFAULT, DTS\_GETDEFAULT

*status* = %TS\_TABSET(DTS\_DEFAULT | DTS\_GETDEFAULT, *function*)

or

xcall TS\_TABSET(DTS\_DEFAULT | DTS\_GETDEFAULT, *function*)

### Return value

*status*

This subfunction returns true if successful, and false if not. (^VAL)

### Arguments

*function*

(optional) One of the following: (n)

### UNIX, VMS

---

**DTS\_SELECT\_ATTR**, [*option+attribute*][, *palette#*]

Rendition for the selected tab in a tab set.

**DTS\_NONSELECT\_ATTR**, [*option+attribute*][, *palette#*]

Rendition for non-selected tabs in a tab set.

*option* is one of the following:

|                |                                             |
|----------------|---------------------------------------------|
| <b>DA_SET</b>  | Set attributes.                             |
| <b>DA_CHNG</b> | Change existing attributes.                 |
| <b>DA_LOAD</b> | Set listed attributes and clear all others. |
| <b>DA_CLR</b>  | Clear attributes.                           |

*attribute* is one of the following flags defined in **tools.def**:

|                  |                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>A_NONE</b>    | No attributes.                                                                                                             |
| <b>A_U</b>       | Underlined.                                                                                                                |
| <b>A_R</b>       | Reverse.                                                                                                                   |
| <b>A_RU</b>      | Reverse, underlined.                                                                                                       |
| <b>A_B   A_I</b> | Blinking (on UNIX and OpenVMS) or italic (on Windows). “I” can be substituted whenever “B” appears in the following flags. |
| <b>A_BU</b>      | Blinking, underlined.                                                                                                      |

|               |                                             |
|---------------|---------------------------------------------|
| <b>A_BR</b>   | Blinking, reverse.                          |
| <b>A_BRU</b>  | Blinking, reverse, underlined.              |
| <b>A_H</b>    | Highlighted.                                |
| <b>A_HU</b>   | Highlighted, underlined.                    |
| <b>A_HR</b>   | Highlighted, reverse.                       |
| <b>A_HRU</b>  | Highlighted, reverse, underlined.           |
| <b>A_BH</b>   | Blinking, highlighted.                      |
| <b>A_BHU</b>  | Blinking, highlighted, underlined.          |
| <b>A_BHR</b>  | Blinking, highlighted, reverse.             |
| <b>A_BHRU</b> | Blinking, highlighted, reverse, underlined. |
| <b>A_ALL</b>  | All attributes (same as A_BHRU).            |

*palette#* An optional palette number, in the range 1 to 16, to set for the selected tab. **(n)**

**DTS\_TABTEXT**, [*pre\_tab\_string*][, *post\_tab\_string*]

*pre\_tab\_string* The optional string to put before each tab in a tab set container window. **(a)**

*post\_tab\_string* The optional string to put after each tab in a tab set container window. **(a)**

## WIN

**DTS\_STYLE** [, *style*]      Tabbed dialog style.

*style* is one or more of the following options, combined using .BOR. or the vertical bar (|) operator: **(n)**

|                      |                                                            |
|----------------------|------------------------------------------------------------|
| <b>DTS_NONE</b>      | None of the following styles apply. (default)              |
| <b>DTS_MULTILINE</b> | Multiple lines of tabs.                                    |
| <b>DTS_VERTICAL</b>  | Left or right side.                                        |
| <b>DTS_BOTTOM</b>    | Bottom (or right if DTS_VERTICAL is also specified).       |
| <b>DTS_RIGHT</b>     | Right (or bottom if DTS_VERTICAL is <i>not</i> specified). |

## Discussion

The DTS\_DEFAULT subfunction of %TS\_TABSET either sets or gets default settings for tab sets. Defaults will be used for the next tab set created using the %TS\_TABSET(DTS\_CREATE) function. DTS\_DEFAULT overrides the Toolkit's default styles and any styles set by the TABSET\_STYLE initialization setting.

If any of the optional arguments are not passed for a given *function*, no default settings will be set or retrieved for that function.

### UNIX, VMS

---

*Pre\_tab\_string* and *post\_tab\_string* can be used to define the two delimiter strings. The maximum length of each string is 10 characters. If *post\_tab\_string* is specified as an empty string (""), the string specified in *pre\_tab\_string* will be repeated after the last tab. If *pre\_tab\_string* is an empty string, the container window's border acts as a border for the first tab.

---

## See also

- ▶ [DTS\\_SELECT\\_ATTR on page 13-23](#) for information about setting the rendition for the selected tab in a tab set.
- ▶ [DTS\\_NONSELECT\\_ATTR on page 13-26](#) for information about setting the rendition for non-selected tabs in a tab set.
- ▶ [DTS\\_CREATE on page 13-11](#) for information about creating a tabbed dialog with specific delimiter strings and tabbed dialog style.
- ▶ [TABSET\\_STYLE](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for setting the global default style in **synergy.ini**.
- ▶ [“Colors and the color palette”](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* for more information on using color palettes.
- ▶ The [“Synergy Windowing API”](#) chapter of the *Synergy DBL Language Reference Manual* for more information on effects of setting, changing, loading, and clearing attributes.

## Examples

The following example sets the default rendition for non-selected tabs to use reverse video, underline, and color palette number 10.

```
status = %TS_TABSET(DTS_DEFAULT, DTS_NONSELECT, DA_SET+A_RU, 10)
```

The following example sets the default tab delimiter to be “|”.

```
status = %TS_TABSET(DTS_DEFAULT, DTS_TABTEXT, "|", "")
```

## %TS\_TABSET (continued)

### DTS\_NUMTABS

*tab\_count* = %TS\_TABSET (DTS\_NUMTABS, *tab\_id*)

or

xcall TS\_TABSET (DTS\_NUMTABS, *tab\_id*)

### Return value

*tab\_count*

This subfunction returns the number of tabs currently in the tab set. (^**VAL**)

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (**n**)

### Discussion

The DTS\_NUMTABS subfunction of %TS\_TABSET obtains the number of tabs associated with a tab set.

## %TS\_TABSET (continued)

### DTS\_TABINDEX

*index* = %TS\_TABSET (DTS\_TABINDEX, *tab\_id*, *type*, *type\_id*)

or

xcall TS\_TABSET (DTS\_TABINDEX, *tab\_id*, *type*, *type\_id*)

### Return value

*index*

This subfunction returns the index of the tab, or 0 if the window or list is not contained within the specified tab set. (^**VAL**)

### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (**n**)

*type*

One of the following: (**n**)

**DTS\_WINDOW**      A window.

**DTS\_LIST**          A list.

*type\_id*

The ID of the window or list. (**n**)

### Discussion

The DTS\_TABINDEX subfunction of %TS\_TABSET obtains the tab index that contains the specified window or list.

If *tab\_id* is not a valid tab set ID, a fatal error occurs.

Because the index of a tab can change when other tabs are added and removed, this subfunction should be called immediately before the returned information is required.

## **%TS\_TABSET (continued)**

### **DTS\_TABINFO**

*status* = %TS\_TABSET (DTS\_TABINFO, *tab\_id*, *tab\_index*, *type*, *type\_id*[, *disabled*])

or

`xcall` TS\_TABSET (DTS\_TABINFO, *tab\_id*, *tab\_index*, *type*, *type\_id*[, *disabled*])

### **Return value**

*status*

This subfunction returns true if successful, false if not. (^**VAL**)

### **Arguments**

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (**n**)

*tab\_index*

The index of the tab. (**n**)

*type*

One of the following: (**n**)

**DTS\_WINDOW**      A window.

**DTS\_LIST**          A list.

*type\_id*

The ID of the window or list. (**n**)

*disabled*

(optional) Returned true if the tab is disabled, false if enabled. (**n**)

### **Discussion**

The DTS\_TABINFO subfunction of %TS\_TABSET obtains the type and ID of a contained object on a specified tab.

If *tab\_id* is not a valid tab set ID, a fatal error occurs.

If *tab\_index* is not in the range from 1 to the number of tabs in the specified tab set, the subfunction returns false with *type* and *type\_id* set to 0.



If *tab\_id* and *tab\_index* are valid values, the subfunction returns true with values set for *type* and *type\_id*.

Because the index of a tab can change when other tabs are added and removed, this subfunction should be called immediately before the returned information is required.

You can XCALL this subfunction if the return value is not required.

## %TS\_TABSET (continued)

### DTS\_TABSET

```
tab_id = %TS_TABSET (DTS_TABSET, type, id[, container])
```

or

```
xcall TS_TABSET (DTS_TABSET, type, id[, container])
```

### Return value

*tab\_id*

This subfunction returns the ID of the tab set that contains the window or list specified by *id*, or it returns zero if the window or list is not contained in a tab set. (^VAL)

### Arguments

*type*

One of the following: (n)

**DTS\_WINDOW**      A window.

**DTS\_LIST**          A list.

*id*

The ID of the window or list. If *id* is not the ID for a window or list that has been logged with Toolkit, U\_ABORT generates a Toolkit error. (n)

*container*

(optional) The returned ID of the composite window that contains *id* and is contained by the returned tab set (*tab\_id*). If *id* is not part of a composite window on a tab set, *container* is returned as zero. (n)

### Discussion

The DTS\_TABSET subfunction of %TS\_TABSET returns the ID of a tab set that contains the specified window or list (*id*), or it returns zero if the window or list is not contained in a tab set. This ID is returned if the window or list is directly placed on a tab set or if the window or list is part of a composite window that's placed on a tab set. If there are nested tab sets, DTS\_TABSET returns the ID of the innermost tab set that contains the window or list. If you want the ID of the outermost tab set, call this function iteratively using the returned ID.

If the window or list is part of a composite window on the *tab\_id* tab set, you can also get the ID of the composite window by passing the *container* argument. If there are nested composite windows, the *container* argument returns the ID of the outermost composite window, which is the composite window that is directly placed on the tab set. (To get the ID of the innermost container window use the DC\_CONTAINER subfunction for %C\_CONTAINER. See [DC\\_CONTAINER](#) on page 6-31.)

## %TS\_TABSET (continued)

### DTS\_CTRCONTEXT

```
xcall TS_TABSET (DTS_CTRCONTEXT, tab_id, reason)
```

#### Arguments

*tab\_id*

The ID of the tab set returned by the DTS\_CREATE subfunction. (**n**)

*reason*

The reason the tabbed dialog was activated, which can be blank (indicating that it was already activated), a program-supplied reason passed because it was activated programmatically, or one of the following: (**a**)

|                |                                                                                                                                                                              |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_FIRST</b> | Focus moved in attempt to reach first child in a composite window.                                                                                                           |
| <b>C_LAST</b>  | Focus moved in attempt to reach last child in a composite window.                                                                                                            |
| <b>C_NEXT</b>  | Focus moved from previous child in a composite window (e.g., by pressing TAB).                                                                                               |
| <b>C_PREV</b>  | Focus moved from next child in a composite window (e.g., by pressing SHIFT+TAB).                                                                                             |
| <b>C_SET</b>   | Child explicitly activated. For example, this could be the result of a mouse click, or it could be that the child was activated programmatically without a specified reason. |

#### Discussion

DTS\_CTRCONTEXT is designed for use in child processing methods for tab sets, where it enables users to tab through the buttons and input fields on the windows and lists in a tab set. It does this by calling routines for the various window types, which in turn use the reason code passed to the child method by C\_PROCESS to determine what should have focus. (You could directly call the following, but DTS\_CTRCONTEXT makes this easier by figuring out for you what type of window is on a tab.)

- ▶ For an input window on a tab, DTS\_CTRCONTEXT calls I\_CTRCONTEXT, passing the ID of the input window and *reason* on to that routine. See [I\\_CTRCONTEXT on page 8-10](#) for information.
- ▶ For a list on a tab, DTS\_CTRCONTEXT calls L\_CTRCONTEXT, passing the ID of the list and *reason* on to that routine. See [L\\_CTRCONTEXT on page 9-82](#) for information.
- ▶ For a composite container window on a tab, DTS\_CTRCONTEXT calls the DC\_CTRCONTEXT subfunction of %C\_CONTAINER, passing the ID of the container and *reason* on to that routine. See [DC\\_CTRCONTEXT on page 6-35](#) for information.

## Tab Set Routines

### %TS\_TABSET

- ▶ For a tab set on a tab (which we don't recommend), DTS\_CTRCONTEXT recursively calls itself, passing the ID of the child tab set and *reason*.
- ▶ For any other type of window, DTS\_CTRCONTEXT calls U\_CTRCONTEXT, passing the ID of the window and *reason* on to that routine. See [U\\_CTRCONTEXT on page 16-24](#) for information.

To use in a child method, pass the reason passed to the child method (by C\_PROCESS) as the *reason* argument for DTS\_CTRCONTEXT. See the **ctrmeths.dbl** file included in your UI Toolkit distribution for an example. This file includes code for the C\_METHTS method, which uses DTS\_CTRCONTEXT.

Note that if %TS\_TABSET is invoked as a function with DTS\_CTRCONTEXT, the return value for the function will be true.

### See also

- ▶ [C\\_PROCESS on page 6-45](#) for information on how it uses child processing methods.
- ▶ [“Controlling tabbing, focus, and input context” on page 6-4](#) for information on tabbing indices.

### Examples

See the **ctrmeths.dbl** file included in your UI Toolkit distribution. It includes code for the C\_METHTS method, which uses DTS\_CTRCONTEXT.

# 14

## Text Routines

### Using Text Subroutines 14-2

Explains the capabilities of the text subroutines.

### The Text Subroutines 14-3

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## Using Text Subroutines

The text subroutines enable you to view (display) or edit text in a window. These subroutines optionally support margins and word wrap. Also, the window view can be scrolled if it is smaller than the entire window.

The view function supports both horizontal and vertical movement within the window, as well as character, word, and line movement.

The edit function gives you editing capabilities such as character, word, and line deletion, inserting a line, joining lines, and toggling insert and overstrike mode.

If desired, the text subroutines can store text entries in a compressed format. These can be stored to, or loaded from, either a text window or an array. Text windows also can be loaded from an array.

# The Text Subroutines

This section discusses the syntax and arguments for each of the text subroutines.

## T\_EDIT – Edit the text in a text window



```
xcall T_EDIT(window_id, [row], [column], [insert], [direction], [case], [col_id1], [col_id2],
&           [col_id3], [help_id][, decimal_value])
```

### Arguments

*window\_id*

The ID of the text window. **(n)**

*row*

(optional) The text row at which to begin editing; returned with a row value on exit. **(n)**

*column*

(optional) The text column at which to begin editing; returned with a column value on exit. **(n)**

*insert*

(optional) Variable for the default insert/overstrike mode. It is also returned with a mode value on exit. **(n)**

**1**        Insert. (default)

**0**        Overstrike.

*direction*

(optional) The editing direction variable. It is also returned with a direction value on exit. **(n)**

**1**        Forward. (default)

**0**        Reverse.

*case*

(optional) A value specifying whether lowercase is allowed and is also returned with a case value on exit: **(n)**

**0**        Lowercase allowed. (default)

**1**        Uppercase only allowed.

*col\_id1*

*col\_id2*

*col\_id3*

(optional) The IDs of menu columns to place. **(n)**



*help\_id*

(optional) The help identifier. (**a**)

*decimal\_value*

(optional) The first character to input (specified as a decimal value). (**n**)

## Discussion

T\_EDIT performs text editing in a window that T\_SETUP has converted to a text window. You must call T\_SETUP at least once for a window prior to using T\_EDIT to edit it. (For information on an alternative text-editing routine that preserves hard returns, see [U\\_EDIT on page 16-33](#).)

The T\_EDIT subroutine places any specified menu columns and sets the entry values for the row and column at which to begin editing, insert/overstrike mode, editing direction, and case. All of these values are stored and returned upon exit so the user can continue editing where they left off. Note the following:

- ▶ *Row* and *column* are the text line and position to edit, not the window line and position. For example, if *row* and *column* each have a value of 1, the edit position will be the first character of the first text line, regardless of any margins. The default *row* and *column* values are both 1.
- ▶ If you define a display area, it must be the same width as the window.

---

## WIN

The following internal menu entry names are recognized by T\_EDIT in Windows environments:

E\_CLEAR  
E\_COPY  
E\_CUT  
E\_MARK  
E\_MODE  
E\_PASTE

Note the following:

- ▶ The *col\_id* arguments are, by default, ignored when running on Windows. These columns usually contain reserved menu entries that are automatically supported by the Windows environments. Additionally, the excessive placing and removing of columns causes a Windows menu bar to “flicker.” Instead, we recommend that menu columns be placed before the call to T\_EDIT and removed afterwards.
- ▶ The *decimal\_value* argument is ignored on Windows.

- ▶ If the height of the display area is less than the height of the window, a scroll bar is displayed. To prevent the scroll bar from occluding text entered in the text window, make the window size large enough to accommodate the scroll bar and the text, and then in the T\_SETUP call, specify a right margin that is large enough for the scroll bar. For example:

```
; Get the width of a character.
charwidth = %u_winmetrics(D_CHARWIDTH, WID_APP)
; Use character width to get width (in chars) of scrollbar.
extra_width = (%u_winmetrics(D_VSCROLL_X) + charwidth - 1) / charwidth
; Create window with extra width for scrollbar.
xcall w_proc(WP_CREATE, wndid, "text", 20,
&          textbox_cols + extra_width, WP_PLACE, wndid, 1, 1)
xcall t_setup(wndid, D_INIT, 0, extra_width, 0, 0, ,
&          1, 1, textbox_rows, textbox_cols + extra_width)
```

- ▶ We recommend that a fixed font be used for text in a text window. Using a proportional font may cause the text to wrap unpredictably.
- ▶ T\_EDIT's handling of line ends in incoming data is controlled by the **g\_txt\_softreturn** field, which is defined in **tools.def**. See “[g\\_txt\\_softreturn](#)” on page 18-7 for information.
- ▶ For text windows that are part of a composite window, TAB and SHIFT+TAB moves focus to the next or previous child (unless TAB or SHIFT+TAB is a shortcut on a placed menu column). TAB instructs T\_EDIT to signal “C\_NEXT”, and SHIFT+TAB instructs T\_EDIT to signal “C\_PREV”.

## UNIX, VMS

If any *col\_ids* are passed, the specified columns will be placed on the menu and removed on exit in UNIX and OpenVMS environments. (The alternative to specifying menu columns in a T\_EDIT call is to place them before calling T\_EDIT.)

The following internal menu entry names are recognized by T\_EDIT in UNIX and OpenVMS environments:

|          |        |        |         |
|----------|--------|--------|---------|
| E_TOP    | E_LMOV | E_DIR  | E_XUP   |
| E_BOTTOM | E_PDEL | E_MODE | E_XDOWN |
| E_UP     | E_LDEL | E_WMOV |         |
| E_DOWN   | E_WDEL | E_EMOV |         |
| E_LEFT   | E_EDEL | E_BMOV |         |
| E_RIGHT  | E_CDEL | E_JOIN |         |
| E_PMOV   | E_LCLR | E_ILIN |         |

If passed, *decimal\_value* is converted to its alpha (ASCII) equivalent and placed into the window as if it were the first character entered by the user. T\_EDIT then clears the variable passed as *decimal\_value*, which makes it easier to use T\_EDIT in a loop.

---

In any environment, if the internal name of the selected menu entry begins with “U\_,” the EUTILS\_METHOD subroutine is called and the input is redone. If the internal name of the selected menu entry is “O\_HELP,” the EHELP\_METHOD subroutine is called, with *help\_id* as its argument. If some other menu entry is selected, control is returned to the calling routine. **G\_select** will be true and **g\_entnam** will hold the name of the entry. You will need to clear **g\_select** after you satisfy the event.

The default behavior for each environment’s handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. See “[g\\_plc\\_col\\_args](#)” on [page 18-4](#) for information.

## See also

- ▶ [EHELP\\_METHOD on page 7-78](#) for more information about help processing.
- ▶ [EUTILS\\_METHOD on page 7-88](#) for information about utility processing.
- ▶ “[Appendix B: Reserved Menu Entries](#)” for the functions performed by the UI Toolkit reserved menu entries.

## Examples

This code fragment shows the three steps involved in editing a text window. The window in **wndid** is loaded with U\_LDWND and converted to a text window with T\_SETUP. Next, a menu column listing edit commands is loaded but not placed on the menu bar. The edit column is placed by T\_EDIT. Editing begins at the first character of the first text line, in insert mode, in the forward direction by default. “H\_KEYPAD” is passed to the EHELP\_METHOD subroutine if the “O\_HELP” entry is selected from the menu.

```
xcall u_ldwnd(wndid, g_utlib, "textwnd")
xcall t_setup(wndid)
xcall m_ldcol(ecolid, g_utlib, "edit_ctl", D_NOPLC)
do
  begin
    xcall t_edit(wndid,,,,, ecolid,, "H_KEYPAD")
    if(g_select)
      case(g_entnam) of
        begincase
          "ENTRY1": call ENTRYONE ; one of these subroutines will
          "ENTRY2": call ENTRYTWO ; set the done flag
        endcase
      end
    until(done)
```

## T\_GETLIN – Get lines of text from a text window



```
xcall T_GETLIN (window_id, obtained_lines, array_size, first_line, num_obtained)
```

### Arguments

*window\_id*

The ID of the text window to access. **(n)**

*obtained\_lines*

Returned with the line(s) obtained. **(a)**

*array\_size*

The number of lines to get, or the size of the array. **(n)**

*first\_line*

The starting text line: **(n)**

**1** First line.

**2** Second line.

and so on.

*num\_obtained*

Returned with the number of lines that were obtained. **(n)**

### Discussion

The T\_GETLIN subroutine retrieves one or more lines of loaded text from a text window. If the desired text is divided into 40 lines in the text window, T\_GETLIN will retrieve up to 40 lines of text.

This subroutine assumes that the length of *obtained\_lines* is large enough to hold the returned lines. *Obtained\_lines* is either an alpha field or the first element of an alpha array.

If *array\_size* is greater than 1, *obtained\_lines* is considered to be the first element of an array that has at least as many elements as *array\_size*. (If *array\_size* is 1, the array is a single alpha field.)

*First\_line* is the number of the text line within the window at which to start retrieval. It depends on the margins whether the number of this line corresponds with the row number. If *first\_line* specifies a starting line that is less than one or greater than the number of text lines in the window, *num\_obtained* will be returned as zero. A value of zero can also indicate that there are no more lines of text or that the first line is invalid. However, if the window is entirely empty and *first\_line* is 1, *num\_obtained* is returned as 1, and the first element of *obtained\_lines* is returned blank.

## Examples

This example starts at line one and tries to get 10 lines. It puts the lines in **newtext** and the actual number of lines in **numlines**.

```
xcall t_getlin(wndid, newtext, 10, 1, numlines)
```

## T\_PUTTXT – Put text into a text window



```
xcall T_PUTTXT (window_id, [text], [array_size][, option, ...])
```

### Arguments

*window\_id*

The ID of the text window to access. **(n)**

*text*

(optional) The text to load. **(a)**

*array\_size*

(optional) The number of lines to load. **(n)**

*option*

(optional) One or more of the following options: **(n)**

|                        |                                               |
|------------------------|-----------------------------------------------|
| <b>D_NEWLN</b>         | Start new line before first line output.      |
| <b>D_PARA</b>          | Start new paragraph before first line output. |
| <b>D_KEEPLEADING</b>   | Keep interline spacing for a window.          |
| <b>D_NOKEEPLEADING</b> | Remove interline spacing for a window.        |
| <b>D_STRIP</b>         | Set trailing blank strip mode.                |
| <b>D_NOSTRIP</b>       | Turn off strip mode.                          |
| <b>D_WRAP</b>          | Set wrap mode.                                |
| <b>D_NOWRAP</b>        | Turn off wrap mode.                           |
| <b>D_WRITES</b>        | Set WRITES mode.                              |
| <b>D_NOWRITES</b>      | Turn off WRITES mode.                         |
| <b>D_PERM</b>          | Make specified modes permanent.               |

### Discussion

When T\_PUTTXT loads text, it structures the text according to the structure of the text window. It automatically breaks lines when necessary and wraps the text if wrap is set. Thus, loading can be independent of the form of the text being loaded. For example, if you load 2,000 characters of straight text (with no line breaks), T\_PUTTXT will break the text into lines and you might end up

with 40 lines of text (depending on the margins of your window). To change the text's appearance, you simply change the configuration of the window (such as margins and renditions) rather than re-creating the text itself.

You cannot use T\_PUTTXT to load text into a window that has not been set up with T\_SETUP. In other words, the window specified by *window\_id* must be a text window, as opposed to an input window or a window created with the Synergy DBL W\_PROC subroutine.

*Text* is either an alpha variable or the first element of an alpha array. If *array\_size* is present and non-zero, *text* is considered to be the first element of an array whose size is equal to or greater than *array\_size*. If *array\_size* is omitted or has a value of zero, *text* is considered to be a single alpha field. There is no limit on the size of *text*. Note that *text* is optional; you can use T\_PUTTXT to set permanent options for future text "puts" without loading any text at this time.

As with the T\_SETUP subroutine, every *option* is processed before the text is output. Separate multiple *options* with commas. You can specify up to 10 *options*. If a particular mode is not specified, the current default (as set by T\_SETUP or a previous T\_PUTTXT) will be used.

If D\_PERM is not present, the modes will only be in effect for the duration of this subroutine. If D\_PERM is present, any modes specified in this subroutine will become the new defaults. The T\_SETUP subroutine can also modify the defaults.

If D\_NEWLW or D\_PARA are not present, the text will be output beginning at the current window position.

When entering T\_EDIT or T\_VIEW on Windows,

- ▶ D\_KEEPLADING prevents Toolkit from removing the interline spacing for a window. Note that with T\_EDIT, this may cause more rows of text to become visible than the display area of the window would dictate.
- ▶ D\_NOKEEPLADING restores default behavior: Toolkit removes interline spacing for a window, which makes the window vertically shorter.

Note that D\_KEEPLADING and D\_NOKEEPLADING are ignored on Windows if D\_PERM is not passed. These options are always ignored on UNIX and OpenVMS.

When strip mode is in effect, the trailing blanks are stripped from each element of text before the items are loaded into a text window. If wrap mode is also in effect, a single trailing blank is implicitly added to each stripped line.

In wrap mode, each line is considered to be one or more items that are separated by one or more blanks. Text is output until an item crosses the right margin. At this point, the item that would have crossed the margin is placed on the next line, and loading continues.

In WRITES mode, each line of output is displayed as if the Synergy DBL WRITES statement had been used; at the end of each line, the current position within the window automatically moves to the left margin of the next line in the text window.

If specified modifiers conflict, the last one to be processed will be in effect.

## Examples

The following example loads 10 lines from **newtext** to the window, one line of text per window line.

```
xcall t_puttxt(wndid, newtext, 10, D_WRITES)
```

The next example loads the 15 elements of **newtext** into the window, stripping trailing blanks and wrapping to the next line on overflow. (This means the text will wrap, as described above.)

```
xcall t_puttxt(wndid, newtext, 15, D_STRIP, D_WRAP)
```



## T\_SETUP – Specify a text window’s characteristics



```
xcall T_SETUP (window_id, [initialize], [left_margin], [right_margin], [top_margin],
&               [bottom_margin], [paragraph], [origin_row], [origin_col], [rows],
&               [columns][, option, ...])
```

### Arguments

*window\_id*

The ID of the window that will be used. **(n)**

*initialize*

(optional) The initialization flag. **(n)**

**D\_INIT**                      Initialize window.

*left\_margin*

(optional) The size (in columns) of the left margin (i.e., the offset from the left edge of the window). **(n)**

*right\_margin*

(optional) The size (in columns) of the right margin (i.e., the offset from the right edge of the window). **(n)**

*top\_margin*

(optional) The size (in rows) of the top margin (i.e., the offset from the top edge of the window). **(n)**

*bottom\_margin*

(optional) The size (in rows) of the bottom margin (i.e., the offset from the bottom edge of the window). **(n)**

*paragraph*

(optional) Paragraph options of the form *xy* (a two-digit value), where *x* is the number of blank lines between paragraphs, and *y* is the number of spaces to indent a paragraph. **(n)**

*origin\_row*

(optional) The row at which the display area will begin. **(n)**

*origin\_col*

(optional) The column at which the display area will begin. **(n)**

*rows*

(optional) The number of rows in the text window (i.e., the height of the display area). **(n)**

*columns*

(optional) The number of columns in the text window (i.e., the width of the display area). **(n)**

*option*

(optional) One or more of the following default load state flags: **(n)**

|                        |                                                  |
|------------------------|--------------------------------------------------|
| <b>D_ATTR</b>          | Attributes. (See the table below.)               |
| <b>D_COLOR</b>         | Color palette number.                            |
| <b>D_KEEPLEADING</b>   | Keep interline spacing for a window.             |
| <b>D_NOKEEPLEADING</b> | Remove interline spacing for a window. (default) |
| <b>D_STRIP</b>         | Set trailing blank strip mode. (default)         |
| <b>D_NOSTRIP</b>       | Turn off strip mode.                             |
| <b>D_WRAP</b>          | Set wrap mode. (default)                         |
| <b>D_NOWRAP</b>        | Turn off wrap mode.                              |
| <b>D_WRITES</b>        | Set WRITES mode.                                 |
| <b>D_NOWRITES</b>      | Turn off WRITES mode. (default)                  |

## Discussion

The T\_SETUP subroutine configures a low-level Synergy window (created with W\_PROC) as a text window and sets the window's characteristics. You also can use T\_SETUP to reconfigure an existing general or input window as a text window. For example, you can use T\_SETUP to change an input window into a text window (but you will lose all input fields).

All arguments except *window\_id* are optional and are useful only if you're going to be loading text into the window.

If *initialize* is specified, the window will be cleared and flagged as empty. If it is not specified, the window will not be cleared and is assumed to contain data. The number of text lines will be calculated by stripping all blank lines from the window.

Each margin argument (*left\_margin*, *right\_margin*, etc.) specifies how many columns or rows will be allotted to a margin, as measured from the window's edge. This determines how much text can be entered in the window. For example, if you have a 30 by 30 window, but you set the margins in T\_SETUP to 1,1,1,10, there will be 28 rows and 19 columns for text (30 minus 2 for the left and right margins, and 30 minus 11 for the top and bottom margins). Any omitted arguments default to zero. If the window is not initialized and you specify a margin, the text processing system assumes that there is no data within that margin. (Text in a margin will be unavailable for editing.)

If *paragraph* is not specified, both the number of blank lines and the number of indent spaces default to zero.

The display area arguments (*origin\_row*, *origin\_col*, *rows*, and *columns*) determine how much of the window you can see (not how much text you can enter in the window, which is determined by the size of the window minus any margins.) If none of the display arguments are present, the display area for the window is used.

You can specify up to eight *options*. If specified modifiers conflict, the last one to be processed will take effect.

T\_SETUP clears all attributes if D\_ATTR is not set. (ATTR\_LOAD is assumed. See “[The Windowing Routines](#)” in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.) If set, D\_ATTR must be followed by one of the attribute flags listed in the following table. Each flag consists of a series of codes: B=blinking (italic on Windows), H=highlighted (bold), R=reverse, and U=underlined. Note that you can substitute I for B (for example, A\_IR instead of A\_BR). These are defined in **tools.def**.

| Attribute Flag Definitions |                                                        |
|----------------------------|--------------------------------------------------------|
| Attribute flag             | Definition                                             |
| A_NONE                     | No attributes.                                         |
| A_U                        | Underlined.                                            |
| A_R                        | Reverse.                                               |
| A_RU                       | Reverse, underlined.                                   |
| A_B                        | Blinking (on UNIX and OpenVMS) or italic (on Windows). |
| A_BU                       | Blinking, underlined.                                  |
| A_BR                       | Blinking, reverse.                                     |
| A_BRU                      | Blinking, reverse, underlined.                         |
| A_H                        | Highlighted.                                           |
| A_HU                       | Highlighted, underlined.                               |
| A_HR                       | Highlighted, reverse.                                  |
| A_HRU                      | Highlighted, reverse, underlined.                      |
| A_BH                       | Blinking, highlighted.                                 |
| A_BHU                      | Blinking, highlighted, underlined.                     |

| Attribute Flag Definitions (Continued) |                                             |
|----------------------------------------|---------------------------------------------|
| Attribute flag                         | Definition                                  |
| A_BHR                                  | Blinking, highlighted, reverse.             |
| A_BHRU                                 | Blinking, highlighted, reverse, underlined. |
| A_ALL                                  | All attributes (same as A_BHRU).            |

D\_COLOR must be followed by the color palette number (1-16). T\_SETUP sets the color to 1 if D\_COLOR is not set.

When entering T\_EDIT or T\_VIEW on Windows,

- ▶ D\_KEEPLEADING prevents Toolkit from removing the interline spacing for a window. Note that with T\_EDIT, this may cause more rows of text to become visible than the display area of the window would dictate.
- ▶ D\_NOKEEPLEADING restores default behavior: Toolkit removes interline spacing for a window, which makes the window vertically shorter.

On UNIX and OpenVMS, D\_KEEPLEADING and D\_NOKEEPLEADING are ignored.

The D\_STRIP, D\_NOSTRIP, D\_WRAP, D\_NOWRAP, D\_WRITES, and D\_NOWRITES options define the defaults for T\_PUTTXT. See “[T\\_PUTTXT](#)” on page 14-10.

## See also

- ▶ [.INPUT](#) on page 2-89 or [.WINDOW](#) on page 2-133 for information about creating windows.
- ▶ [W\\_PROC](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* for information on creating a low-level Synergy window.

## Examples

This example changes the low-level Synergy window “txtwnd” into a text window and initializes it. It will have the default text options.

```
xcall u_ldwnd(txtid, g_utlib, "txtwnd")
xcall t_setup(txtid, init)
```

The following example sets up the window specified by **txtid**. It will have a two-column left margin, there will be no paragraph indentation or spacing, the text will start two columns in from the upper left corner, and the display area will include 10 rows of 16 characters of text.

```
xcall t_setup(txtid,, 2, 0, 0, 0,, 1, 1, 10, 18)
```

## T\_TXTRD – Read text from a window library



```
xcall T_TXTRD (channel, entry_name, control, text, array_size, lines_read)
```

### Arguments

*channel*

The channel on which the window library is opened. **(n)**

*entry\_name*

The identifier (name) under which the text is stored in the library. **(a)**

*control*

One of the following processing controls on entry: **(n)**

**D\_FIRST**                      Start with the first line.

**D\_NEXT**                      Continue with line after last read.

*text*

The first element of the text array into which to read lines. **(a)**

*array\_size*

The dimension of *text*. **(n)**

*lines\_read*

Returned with the number of lines read. **(n)**

### Discussion

The T\_TXTRD subroutine reads lines of text from a window library text entry created using T\_TXTWRT.

The *channel* must be opened in update mode. This allows T\_TXTRD to modify the control record in order to maintain read context within the text entry.

*Control* is returned with a value of D\_NOFIND (defined in **tools.def**) if the specified entry does not exist. D\_NOFIND is a negative number. You can test for an error situation by checking whether *control* is less than zero.

If *lines\_read* is zero, there are no more lines.

## Examples

The following example reads the first 10 lines from the window “menuhelp” in the window library opened on **g\_utlib** and stores them into the variable **helptxt**. If “menuhelp” is not found, **ctrl** is returned as **D\_NOFIND**.

```
ctrl = D_FIRST  
xcall t_txtrd(g_utlib, "menuhelp", ctrl, helptxt, 10, rdsiz)
```

## T\_TXTWRT – Store text into a window library



```
xcall T_TXTWRT (channel, entry_name, control[, text, array_size])
```

### Arguments

*channel*

The channel on which the window library is opened. **(n)**

*entry\_name*

The identifier (name) of the text entry in the library (a maximum of 15 characters). **(a)**

*control*

One of the following processing controls on entry: **(n)**

**D\_CREATE**            Create new entry, no replacement.

**D\_REPLACE**          Create entry, replace any existing.

**D\_APPEND**           Append to existing entry.

*text*

(optional) The first element of the text array to be written. **(a)**

*array\_size*

(optional) The number of entries in the *text* array. **(n)**

### Discussion

T\_TXTWRT creates and/or writes to text entries in a window library. These entries are stored in compressed form: trailing blanks are stripped and multiple blanks are compressed.

On exit, *control* is set to D\_APPEND if the operation is successful or D\_EXISTS if you request that an entry that already exists be created (with D\_CREATE). *Control* is set to D\_NOFIND (defined in the **tools.def** file) if you request an append operation to an entry that does not exist. D\_EXISTS and D\_NOFIND are negative numbers, and you can test for an error condition by checking whether *control* is less than 0.

If D\_CREATE or D\_REPLACE is successful and no *text* was passed, the entry within the library has been created and is empty. (In other words, if you create or replace an entry without specifying any text, you create an empty entry.)

*Entry\_name* must be unique among all other window names stored in the library.

If you write text to a library using T\_TXTWRT, that text can only be read with T\_TXTRD. You can add text to an entry at any time.

## Examples

The following example takes 10 elements from **helptxt**, compresses them, and creates a text entry called “menuhlp” in the window library opened on **g\_utlib**.

```
ctrl=D_CREATE  
xcall t_txtwrt(g_utlib, "menuhlp", ctrl, helptxt, 10)
```



## T\_VIEW – Control view through a text window



```
xcall T_VIEW(window_id, [col_id], [help_id][, unmapped_key])
```

### Arguments

*window\_id*

The ID of the text window to view. **(n)**

*col\_id*

(optional) The ID of the view-control menu column. **(n)**

*help\_id*

(optional) The help identifier. **(a)**

*unmapped\_key*

(optional) Returned with the decimal value of any pressed key not mapped to a function code. **(n)**

### Discussion

The T\_VIEW subroutine enables the user to move the view of a text window using a view-control menu column. The T\_VIEW subroutine performs the following actions:

- ▶ Places the view-control column on the menu (if *col\_id* is present and if running).
- ▶ Does view processing (in all environments).
- ▶ Turns off the cursor and echo in the current environment level (in all environments).

#### WIN

---

Unlike T\_EDIT, T\_VIEW does not display a scroll bar by default. However, you can enable the scroll bars by calling the W\_BRDR windowing subroutine. For more information, see the “[Synergy Windowing API](#)” chapter of the *Synergy DBL Language Reference Manual*. The text window can also be navigated using arrow keys by setting the **g\_plc\_col\_args** flag to true. (See “[g\\_plc\\_col\\_args](#)” on page 18-4 for information.)

The *col\_ids* are, by default, ignored when running on Windows. These columns usually contain reserved menu entries that are automatically supported by the Windows environments. Additionally, the excessive placing and removing of columns causes a Windows menu bar to “flicker.”

If there’s more than one line in the text window, there will be unusable space at the bottom of the window. The amount of unusable space depends on the number of lines of text and is caused by leading that’s added as a result of the mapping from the native Windows edit control (used under the hood for text windows) to the rows of the Toolkit window used to display the text. This added

leading causes the text window to be larger than it needs to be to display the rows, resulting in the unusable space. If the text window is part of a tab set, however, you may be able to work around this by making the text window larger than the tab set. This allows the extra rows to be used by T\_VIEW because the tab set container stretches the window's display area to encompass that size.

---

#### UNIX, VMS

In UNIX and OpenVMS environments, T\_VIEW assumes that the column identified by *col\_id* will contain one or more of the menu entries for scrolling listed below:

|          |          |          |
|----------|----------|----------|
| T_LINUP  | T_RSIDE  | T_TOP    |
| T_LINDWN | T_LSIDE  | T_BOTTOM |
| T_SCRUP  | T_PAGUP  | T_SCRLFT |
| T_SCRDWN | T_PAGDWN | T_SCRRT  |

---

The default behavior for each environment's handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. See [“g\\_plc\\_col\\_args” on page 18-4](#) for information.

In all environments, if the internal name of a selected menu entry begins with “U\_,” the EUTILS\_METHOD subroutine is called and the input is redone. If the internal name of the selected menu entry is “O\_HELP,” the EHELP\_METHOD subroutine is called, with *help\_id* as its argument.

---

#### WIN

In addition, T\_VIEW recognizes the following menu entries on Windows. These perform the associated Windows functionality, if applicable. See [“Appendix B: Reserved Menu Entries”](#) for information on reserved menu entries.

E\_CLEAR  
E\_COPY  
E\_CUT  
E\_MARK  
E\_PASTE

---

If a selection is made that is neither a T\_VIEW entry, a utility or help entry, or one of the E\_ menu entries listed above for Windows, control returns to the calling subroutine with **g\_select** set to true and **g\_entnam** containing the name of the selected entry in uppercase.

You must clear **g\_select** after you satisfy the event.

If *unmapped\_key* is passed, when the user presses a key that is not mapped to a function code, the decimal value of the corresponding ASCII character will be returned in this argument. If passed and the user presses ENTER, *unmapped\_key* will return with a zero. Passing *unmapped\_key* may be

useful if you want to test for a certain ASCII character and then provide an alternative processing for that character if the test is true. For example, you could allow the user to press ENTER to exit the view function, even though you can't define the ENTER key as a regular shortcut.

If you omit *unmapped\_key*, any unmapped key the user presses will ring the terminal bell, but T\_VIEW will continue viewing.

### Creating the view-control column

Use the menu column script file commands .COLUMN and .ENTRY to create the view-control column and its entries.

The following command creates a menu column named "text\_view" whose text in the menu bar is "Scrolling."

```
.column text_view, Scrolling
```

To enable scrolling on UNIX or OpenVMS, the view-control column must contain some subset of the menu entries listed on [page 14-22](#).

Your script file commands will look something like this:

```
.entry t_linup, "Up 1 line", key(up)
.entry t_lindwn, "Down 1 line", key(down)
```

### See also

- ▶ [EHELP\\_METHOD on page 7-78](#) for information about help processing.
- ▶ [EUTILS\\_METHOD on page 7-88](#) for information about utility processing.
- ▶ ["Appendix B: Reserved Menu Entries"](#) for the functions performed by Toolkit reserved menu entries.

### Examples

This code fragment shows the three steps required to view a text window. The window is loaded with U\_LDWND and converted to a text window with T\_SETUP. Next, a menu column that lists view commands is loaded but not placed on the menu bar. The view column is placed by T\_VIEW in this example. T\_VIEW only returns when a non-view command is selected.

```
xcall u_ldwnd(wndid, g_utlib, "intro_text")
xcall t_setup(wndid)
xcall m_ldcol(vcolid, g_utlib, "view_ctl", D_NOPLC)
do
  begin
    xcall t_view(wndid, vcolid)
    if(g_select)
      case(g_entnam) of
```

## Text Routines

### T\_VIEW

```
        begincase
"ENTRY1": call ENTRYONE    one of these subroutines will
"ENTRY2": call ENTRYTWO    set the done flag
"ENTRY3": call ENTRYTHREE
        endcase
    end
until(done)
```

## T\_WNDRD – Load a text window from a window library



```
xcall T_WNDRD (channel, entry_name, window_id, status[, lines_loaded])
```

### Arguments

*channel*

The channel of the window library. (n)

*entry\_name*

The identifier (name) under which the text is stored in the library. (a)

*window\_id*

The ID of the text window to process. (n)

*status*

The returned status flag. (n)

*lines\_loaded*

(optional) Returned with the number of lines loaded. (n)

### Discussion

The T\_WNDRD subroutine reads the data for a text window from a window library and puts it into the window. This subroutine obtains data using one or more calls to T\_TXTRD and stores that data into the text window by calling T\_PUTTXT.

*Status* is returned with a value of zero if the operation is successful, or D\_NOFIND if the text entry cannot be found in the library. D\_NOFIND is a negative number, therefore you can test for an error situation by checking whether *status* is less than zero.

### Examples

The following example finds the text entry “menuhelp” in the window library opened on **libchn** and puts the text out to the window identified by **txtid**.

```
xcall t_wndrd(libchn, "menuhelp", txtid, status, numlines)
```

## T\_WNDWRT – Store a text window’s contents in a window library



```
xcall T_WNDWRT (channel, entry_name, window_id, control[, lines_written])
```

### Arguments

*channel*

The channel of the window library. **(n)**

*entry\_name*

The identifier (name) of the text entry in the library (a maximum of 15 characters). **(a)**

*window\_id*

The ID of the text window to process. **(n)**

*control*

One of the following processing controls on entry: **(n)**

**D\_CREATE**            Create a new entry; generate an error if it already exists.

**D\_REPLACE**        Create a new entry and replace any existing entry.

*lines\_written*

(optional) The number of lines written. **(n)**

### Discussion

The T\_WNDWRT subroutine stores the data within a text window as a text entry in a window library. This subroutine obtains data using one or more calls to T\_GETLIN and writes that data out to the library by calling T\_TXTWRT.

Upon exit, *control* is returned with a value of zero if the operation is completed successfully, or D\_EXISTS if *control* was set to D\_CREATE on entry and the text entry already exists. D\_EXISTS is a negative number, therefore you can test for an error condition by checking whether *control* is less than zero.

### Examples

This example takes the text from **txtid**, makes it into a text entry, and stores it as “menuhlp” in the window library opened on **libchn**.

```
ctrl = D_CREATE
xcall t_wndwrt(libchn, "menuhlp", txtid, ctrl, numlines)
```

# 15

## Toolbar Routines

### **Toolbar Processing 15-2**

Discusses what toolbar processing is, how it works, and why you would want to use a toolbar.

### **The Toolbar Subroutines and Functions 15-3**

|                                                                     |       |
|---------------------------------------------------------------------|-------|
| %TB_BUTTON – Load and manipulate toolbar buttons.....               | 15-4  |
| %TB_INFO – Return toolbar information .....                         | 15-14 |
| %TB_TKCREATE – Create and log a toolbar with the environment .....  | 15-31 |
| TB_TKDEL – Delete a toolbar that’s logged with the environment..... | 15-33 |
| TB_TKGLOBAL – Promote a toolbar to global .....                     | 15-34 |
| TB_TKLOG – Log a toolbar with the environment.....                  | 15-35 |
| %TB_TOOLBAR – Create and manipulate a toolbar .....                 | 15-36 |

# Toolbar Processing

The toolbar functions enable you to create and manipulate an application window toolbar.

The toolbar is a variable-size rectangle containing buttons. A toolbar button is selected by clicking the mouse on the button face. Toolbars are used as extensions to or replacements for the menu bar. They provide an alternative method for invoking functions within an application.

Horizontal toolbars will occlude the entire width of the top or bottom of the application window. Similarly, vertical toolbars will blank out the entire vertical area of the application window on the specified side. Toolbars are sized to the full extent of the application window with respect to the border where they are defined.

A toolbar button can display either text or a graphic on its face. See [“Toolkit button graphics” on page 2-17](#) for more information. Additionally, on Windows you can apply 3-D borders to toolbar buttons by setting the SYN\_3D\_TOOLBAR environment variable to 1. For information, see SYN\_3D\_TOOLBAR in the “Environment Variables” chapter of *Environment Variables & System Options*.

Selecting a toolbar button can trigger the simulation of one or more characters pressed on the keyboard, or it can invoke an entire subroutine of application code. A common approach is to have a function key invoke a particular action such as Find, Select, Page Up, and so forth. It’s also common to use %M\_SIGNAL as the button method to signal the name of the button as a menu entry. Toolbar button actions are specified at runtime when the button is loaded onto the toolbar.

A special type of button, the numeric bar, contains the numbers 0 through 9. To load the numeric bar, a special reserved name, “#NUMBER”, can be passed to %TB\_BUTTON.

Toolbars and toolbar buttons can be managed by the Toolkit’s environment control. You can do this by creating the toolbar with %TB\_TKCREATE or by using %TB\_TKLOG to log the toolbar with Toolkit—if you created it with %TB\_TOOLBAR.

When you log a toolbar with an environment, the following are controlled by the environment:

- ▶ Deletion of the toolbar when its environment is exited
- ▶ Placement of the toolbar
- ▶ The state of toolbar buttons, including enablement and forced-down state. Note that toolbar buttons created in an environment will be deleted when the environment is exited, but no button deleted in an environment will be restored when that environment is exited.

Note that with toolbars, you must use Toolkit environment processing consistently or not at all. Once a toolbar has been logged with Toolkit, you must leave the management of the toolbar to Toolkit, and you must use TB\_TKDEL to explicitly delete the toolbar.

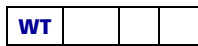
You may use TB\_PUSHSTATE and TB\_POPSTATE when you create a toolbars with %TB\_TOOLBAR, but we recommend that you don’t use them for toolbars that are under environment control; this may confuse Toolkit.



# The Toolbar Subroutines and Functions

This section discusses the syntax and arguments for each of the toolbar subroutines and functions.

## %TB\_BUTTON – Load and manipulate toolbar buttons



```
return = %TB_BUTTON (id, subfunction, arg[, ...])
```

or

```
xcall TB_BUTTON (id, subfunction, arg[, ...])
```

### Return value

*return*

On Windows in traditional Synergy, this function returns a value specific to *subfunction*. On UNIX and OpenVMS, this function always returns false. (^VAL)

### Arguments

*id*

The toolbar identifier, the value of which is returned from the TB\_CREATE subfunction of %TB\_TOOLBAR. (n)

*subfunction*

The specific toolbar function to perform. It must be one of the following: (n)

|                    |                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>TBB_LOAD</b>    | Add a button to the toolbar. See <a href="#">page 15-7</a> .                                                        |
| <b>TBB_GROUP</b>   | Define a button group on the toolbar. See <a href="#">page 15-10</a> .                                              |
| <b>TBB_SELECT</b>  | Force a button to appear in either an up or down state; or simulate a mouse click. See <a href="#">page 15-11</a> . |
| <b>TBB_DELETE</b>  | Delete (and remove) a toolbar button. See <a href="#">page 15-13</a> .                                              |
| <b>TBB_ENABLE</b>  | Enable a disabled toolbar button. See <a href="#">page 15-13</a> .                                                  |
| <b>TBB_DISABLE</b> | Disable a toolbar button. See <a href="#">page 15-13</a> .                                                          |
| <b>TBB_STATE</b>   | Return the up or down state of a toolbar button. See <a href="#">page 15-13</a> .                                   |

*arg*

One or more arguments, depending on *subfunction*.

### Discussion

The %TB\_BUTTON function enables you to load and manipulate toolbar buttons. Refer to [page 15-7](#) through [page 15-13](#) for the syntax and discussions of the above *subfunctions*.

You must include the file **toolbar.def** to use this function.

## Examples

The following example uses %TB\_BUTTON to add buttons to a toolbar. If the user chooses to change the image for a button, a call to %TB\_BUTTON deletes the button and adds a new one with the selected image.

```
;Create a toolbar at the top of the application, with unspecified
; width and a height of 70 pixels
tb_toolbar(TB_CREATE, tbid, TBC_TOP, 0, 70)

;Add a 60x60 pixel button named "O_EXIT" at 5,5 using the image exit.png
;On left click, call m_signal with the button name
;On right click, call mod_button with the button name
tb_button(tbid, TBB_LOAD, "O_EXIT", 5, 5, 60, 60, TBLOAD_TYPE_BMAP,
&      "exit.png", "Exit the application",,, "m_signal",,,,,
&      "mod_button")

;Now do the same for "O_HELP", but placed at 75,5 and using the
; image help.png
tb_button(tbid, TBB_LOAD, "O_HELP", 75, 5, 60, 60, TBLOAD_TYPE_BMAP,
&      "help.png", "Get Help",,, "m_signal",,,,,, "mod_button")

;Place the toolbar
tb_toolbar(TB_PLACE, tbid)

repeat
  begin
    m_process("")          ;Process the menu
                           ; (you could call any input routine here)
    if (g_select)
      using g_entnam select
        ("O_EXIT "),      exitloop      ;Handle O_EXIT by exiting
                                     ;We don't need to handle O_HELP,
                                     ; because M_PROCESS does
      endusing
    end
  .
  .
  .
function mod_button, ^val, reentrant
;
; Routine to allow the user to select a new image for a button
;
in req a_name ,a      ;Name of the button

external common
  tbid      ,int      ;Toolbar ID
```

## Toolbar Routines

### %TB\_BUTTON

```
record                                ;Place to save off button information
    x                                ,int
    y                                ,int
    cx                               ,int
    cy                               ,int
    image                            ,a256
tooltip                              ,a256
proc
    x = %tb_info(tbid, TBI_LEFT, a_name)
    y = %tb_info(tbid, TBI_TOP, a_name)
    cx = %tb_info(tbid, TBI_WIDTH, a_name)
    cy = %tb_info(tbid, TBI_HEIGHT, a_name)
    tb_info(tbid, TBI_TYPE, a_name, image)
    tb_info(tbid, TBI_TOOLTIP, a_name, tooltip)

    if (%u_getfilename(image, "Choose a new image",,,, image))
        begin
            ;User selected a new image, so first delete the old button
            tb_button(tbid, TBB_DELETE, a_name)

            ;Then add it back using the new image
            tb_button(tbid, TBB_LOAD, a_name, x, y, cx, cy, TBLOAD_TYPE_BMAP,
                & image, %atrim(tooltip),,, "m_signal",,,,, "mod_button")
        end

    m_signal("O_UPDT")                ;Force an update
    freturn TRUE
end
```

## %TB\_BUTTON (continued)

### TBB\_LOAD

```

status = %TB_BUTTON (id, TBB_LOAD, name, [left], [top], width, height, type_spec, type_arg,
& [tooltip], [left_vk_code], [left_string], [left_method], [mid_vk_code],
& [mid_string], [mid_method], [right_vk_code], [right_string]
& [, right_method])

or

xcall TB_BUTTON (id, TBB_LOAD, name, [left], [top], width, height, type_spec, type_arg,
& [tooltip], [left_vk_code], [left_string], [left_method], [mid_vk_code],
& [mid_string], [mid_method], [right_vk_code], [right_string]
& [, right_method])

```

### Return value

*status*

This subfunction returns the status of the operation. (^VAL)

**TB\_SUCCESS**      1

**TB\_FAILURE**      0

### Arguments

*id*

The toolbar identifier, the value of which is returned from the TB\_CREATE subfunction of %TB\_TOOLBAR. (n)

*name*

The name of the button (a maximum of 30 characters). “#NUMBER” is a reserved name that will load the numeric bar. (a)

*left*

(optional) The pixel location of the left edge of the button relative to the top left corner of the toolbar. (n)

*top*

(optional) The pixel location of the top edge of the button relative to the top left corner of the toolbar. (n)

For horizontal toolbars, if *left* or *top* are not specified, the button will be placed automatically, following a left-to-right, top-to-bottom pattern.

For vertical toolbars, if *left* or *top* are not specified, the button will be placed automatically, following a top-to-bottom, left-to-right pattern.

*width*

The width of the button in pixels. **(n)**

*height*

The height of the button in pixels. **(n)**

*type\_spec*

The button face type: **(n)**

**TBLOAD\_TYPE\_TEXT**      Text.

**TBLOAD\_TYPE\_BMAP**      Graphic.

*type\_arg*

The button type data. If *type\_spec* is TBLOAD\_TYPE\_TEXT, this is the text string to load on the face of the button. If *type\_spec* is TBLOAD\_TYPE\_BMAP, this is the filename for the graphic to be placed on the face of the button. (See [“Toolkit button graphics” on page 2-17](#) for information.) **(a)**

*tooltip*

(optional) The text of a ToolTip to be displayed if the mouse rests over the button. **(a)**

*left\_vk\_code*

*mid\_vk\_code*

*right\_vk\_code*

(optional) “Virtual keys” generated when the left, middle, and right mouse buttons are used to select this toolbar button. Example virtual key definitions are: VK\_LBUTTON, VK\_TAB, and so forth, listed in the file **toolbar.def**. **(n)**

*left\_string*

*mid\_string*

*right\_string*

(optional) Strings generated when the left, middle, and right mouse buttons are used to select this toolbar button. The strings generated will precede any virtual key generation that may be defined for this button. **(a)**

*left\_method*

*mid\_method*

*right\_method*

(optional) The names of the subroutines invoked when the left, middle, and right mouse buttons are used to select this toolbar button. **(a)**

## Discussion

The `TBB_LOAD` subfunction of `%TB_BUTTON` adds a button to the toolbar. If you don't specify a position for the button and no other button have been added, the button will be placed at the leftmost position on the toolbar. If you don't specify a position for the button but other buttons have been added, the button will be placed to the right of the last specified button—even if the last specified button has been deleted (which will create a gap before the new button on the toolbar.)

When a mouse button is clicked while on a toolbar button, the specified method routine is called. This method routine is passed one argument, the name of the button. If the method returns a value of false, the action sequence terminates and no further actions are taken on that keypress. If the method returns a value of true, any string is posted, followed by any `VK_xxx` virtual key.

## See also

[“Appendix D: Methods”](#).

## %TB\_BUTTON (continued)

### TBB\_GROUP

```
status = %TB_BUTTON(id, TBB_GROUP, name1[, name2, ...])
```

or

```
xcall TB_BUTTON(id, TBB_GROUP, name1[, name2, ...])
```

### Return value

*status*

This subfunction returns the status of the operation. (^**VAL**)

**TB\_SUCCESS**        1

**TB\_FAILURE**        0

### Arguments

*id*

The toolbar identifier, the value of which is returned from the TB\_CREATE subfunction of %TB\_TOOLBAR. (**n**)

*name1*

The name of the button in the group that will initially receive the down state. (**a**)

*name2*, ...

(optional) The name of one or more buttons that define the rest of the group. (**a**)

### Discussion

The TBB\_GROUP subfunction of %TB\_BUTTON is used to define a button group. A button group is a set of buttons on a toolbar. When a button is selected, it exhibits a down state. If that button is part of a group, all other buttons in the group exhibit an up state. At all times, one and only one button in a group will exhibit a down state. Regardless of state, all buttons are always selectable if enabled.

When specified, all button name arguments given in TBB\_GROUP must be successfully loaded by TBB\_LOAD prior to the TBB\_GROUP call. An error will result if a TBB\_GROUP button name argument is not a loaded button. A button can only be a member of one group. You cannot delete a group directly, but you can use TBB\_DELETE to delete buttons from the group. When the last button in the group is deleted, the group is deleted. See the Discussion for TBB\_DELETE on [page 15-13](#) for more information on deleting buttons in a group.



## %TB\_BUTTON (continued)

### TBB\_SELECT

*status* = %TB\_BUTTON(*id*, TBB\_SELECT, *name*, *option*)

or

xcall TB\_BUTTON(*id*, TBB\_SELECT, *name*, *option*)

### Return value

*status*

This subfunction returns the status of the operation. (^VAL)

**TB\_SUCCESS**      1

**TB\_FAILURE**      0

### Arguments

*id*

The toolbar identifier, the value of which is returned from the TB\_CREATE subfunction of %TB\_TOOLBAR. (n)

*name*

The name of the button. (a)

*option*

One of the following five toolbar button-state options: (n)

**TBBS\_HOLD**      Forces the button to appear in the down state until TBBS\_RELEASE is called for that button. The down state indicates that a selection is currently being processed.

**TBBS\_RELEASE**   Releases a TBBS\_HOLD button from its forced down state. The up state indicates that the selection being processed is now completed.

**TBBS\_LEFT**      Simulates a left mouse button press on a toolbar button. All events defined for the button with TBB\_LOAD are executed.

**TBBS\_MIDDLE**    Simulates a middle mouse button press. All events defined for the button with TBB\_LOAD are executed.

**TBBS\_RIGHT**     Simulates a right mouse button press. All events defined for the button with TBB\_LOAD are executed.

## Toolbar Routines

### %TB\_BUTTON

#### Discussion

The TBB\_SELECT subfunction of %TB\_BUTTON forces a button to appear in either an up or down state. It can also simulate a user mouse-press on a button. If a method, string, or virtual key is defined for the toolbar button, the actions are invoked in the sequence described under TBB\_LOAD.

## %TB\_BUTTON (continued)

### TBB\_DELETE, TBB\_ENABLE, TBB\_DISABLE, TBB\_STATE

```

return = %TB_BUTTON (id, TBB_DELETE | TBB_ENABLE | TBB_DISABLE | TBB_STATE,
&
                        name)

or

xcall TB_BUTTON (id, TBB_DELETE | TBB_ENABLE | TBB_DISABLE | TBB_STATE,
&
                        name)

```

### Return value

*return*

TBB\_DELETE, TBB\_ENABLE, and TBB\_DISABLE return the status of the requested operation. (^VAL)

**TB\_SUCCESS**      1

**TB\_FAILURE**      0

TBB\_STATE returns the state of the specified button. (^VAL)

**Down (selected)**      1

**Up (not selected)**      0

### Arguments

*id*

The toolbar identifier, the value of which is returned from the TB\_CREATE subfunction of %TB\_TOOLBAR. (n)

*name*

The name of the button. (a)

### Discussion

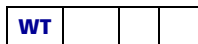
TBB\_DELETE removes a toolbar button from the toolbar. You can delete a button that's part of a group. If the button is the selected member of a group, the first remaining member (in the order the members were specified when the group was created) becomes the selected member, and its left click event is signaled. If the button is the only remaining button in the group, the group is deleted.

TBB\_ENABLE enables a disabled toolbar button.

TBB\_DISABLE disables a toolbar button. The toolbar button remains on the screen, but nothing happens if it is selected. When a button is disabled, it is grayed out.

TBB\_STATE returns the up or down state of a toolbar button. The state is returned as the value of the %TB\_BUTTON function.

## %TB\_INFO – Return toolbar information



```
return = %TB_INFO (tbid, subfunction[, arg, ...])
```

or

```
xcall TB_INFO (tbid, subfunction[, arg, ...])
```

### Return value

*return*

On Windows in traditional Synergy, %TB\_INFO returns a value that is specific to the requested information. On UNIX and OpenVMS, this function always returns false. (^VAL)

### Arguments

*tbid*

The ID of a toolbar whose information you want returned. (n)

*subfunction*

One of the following: (n)

|                        |                                                                                                                                      |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>TBI_BUTTONS</b>     | Return the number of buttons on the toolbar and optionally return the button names. See <a href="#">TBI_BUTTONS on page 15-16</a> .  |
| <b>TBI_CLICK</b>       | Return click actions for a toolbar button. See <a href="#">TBI_CLICK on page 15-17</a> .                                             |
| <b>TBI_ENABLED</b>     | Return the enabled state of a toolbar or a toolbar button. See <a href="#">TBI_ENABLED on page 15-19</a> .                           |
| <b>TBI_GROUP</b>       | Return the number of buttons in a button group and optionally return the button names. See <a href="#">TBI_GROUP on page 15-20</a> . |
| <b>TBI_HEIGHT</b>      | Return the height (in pixels) of a toolbar or a toolbar button. See <a href="#">TBI_HEIGHT on page 15-22</a> .                       |
| <b>TBI_HWND</b>        | Return the window handle for a toolbar or a toolbar button. See <a href="#">TBI_HWND on page 15-23</a> .                             |
| <b>TBI_LEFT</b>        | Return the horizontal position of a toolbar button. See <a href="#">TBI_LEFT on page 15-24</a> .                                     |
| <b>TBI_ORIENTATION</b> | Return the side of the application window that the toolbar occupies. See <a href="#">TBI_ORIENTATION on page 15-25</a> .             |
| <b>TBI_PLACED</b>      | Return the placed state of a toolbar. See <a href="#">TBI_PLACED on page 15-26</a> .                                                 |

|                    |                                                                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TBI_TOOLTIP</b> | Return the ToolTip text for a toolbar button. See <a href="#">TBI_TOOLTIP on page 15-27</a> .                                                        |
| <b>TBI_TOP</b>     | Return the vertical position of a toolbar button. See <a href="#">TBI_TOP on page 15-28</a> .                                                        |
| <b>TBI_TYPE</b>    | Return the type of a toolbar button (text or bitmap) and optionally return the caption or graphic path. See <a href="#">TBI_TYPE on page 15-29</a> . |
| <b>TBI_WIDTH</b>   | Return the width (in pixels) of a toolbar or a toolbar button. See <a href="#">TBI_WIDTH on page 15-30</a> .                                         |

*arg*

(optional) One or more arguments as required for *subfunction*.

## Discussion

The %TB\_INFO function returns information about toolbars and toolbar buttons. The information it returns depends on the value of *subfunction*.

Note that the value passed in *tbid* must be the ID of a toolbar created in Toolkit, or Toolkit will generate a runtime error. (The Toolbar does not need to be placed.) And the value passed as *subfunction* must be one of the TBI\_ values listed above, or Toolkit will generate a runtime error.

## %TB\_INFO (continued)

### TBI\_BUTTONS

```
return = %TB_INFO (tbid, TBI_BUTTONS, [max, buttons])
```

or

```
xcall %TB_INFO (tbid, TBI_BUTTONS, [max, buttons])
```

### Return value

*return*

The number of buttons on the toolbar specified by *tbid*. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

*max*

(optional) The maximum number of button names to return in the *buttons* array. (n)

*buttons*

(optional) The first element of an alphanumeric array of at least *max* elements. This is required if a value greater than zero is passed as *max*. (a)

### Discussion

The TBI\_BUTTONS subfunction returns the number of buttons on the specified toolbar (*tbid*). It returns zero if there are no buttons.

TBI\_BUTTONS also returns the names of buttons on the specified toolbar if you pass *max* and *buttons*, and if *max* is greater than zero. It returns these names in all uppercase characters as elements in the *buttons* array. (The number of returned button names is the lesser of *return* and *max*.) Note that if you pass a value that's greater than zero as *max*, you must also pass *buttons*. If you don't pass *max*, the *buttons* argument is ignored (so button names are not returned).

### Examples

The following example returns the number of buttons on the **tb\_id** toolbar.

```
btn_num = %tb_info(tb_id, TBI_BUTTONS)
```

The next example returns the number of buttons on the **tb\_id** toolbar, and it returns the names of the buttons. The first button name is stored in the first element of the array **btn\_array**. Subsequent names are returned in subsequent array elements.

```
btn_num = %tb_info(tb_id, TBI_BUTTONS, btn_max, btn_array)
```

## %TB\_INFO (continued)

### TBI\_CLICK

```
return = %TB_INFO (tbid, TBI_CLICK, button_name, mouse_button, [vk_code], [string]
&
                    [, method])

or

xcall %TB_INFO (tbid, TBI_CLICK, button_name, mouse_button, [vk_code], [string]
&
                    [, method])
```

### Return value

*return*

One or more of the following bit values (indicating which actions will be taken on a mouse click to the specified toolbar button) or, if no action is taken, a value of 0. (^VAL)

|                    |                                         |
|--------------------|-----------------------------------------|
| <b>TBIC_VK</b>     | A keystroke is sent to the application. |
| <b>TBIC_STRING</b> | A string is sent to the application.    |
| <b>TBIC_METHOD</b> | A method is invoked.                    |

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

*button\_name*

The name (case-insensitive) of a button on the toolbar specified by *tbid*. (a)

*mouse\_button*

One of the following: (n)

|                    |               |
|--------------------|---------------|
| <b>TBIC_LEFT</b>   | Left click.   |
| <b>TBIC_MIDDLE</b> | Middle click. |
| <b>TBIC_RIGHT</b>  | Right click.  |

*vk\_code*

(optional) The virtual key code for the specified *mouse\_button*, or zero if there is no virtual key code. (n)

*string*

(optional) The string generated by the specified *mouse\_button*, or all spaces if no string is generated. (a)

*method*

(optional) The method for the specified *mouse\_button*, or all spaces if there is no method. Method names are returned in all uppercase characters. (a)

## Discussion

The TBI\_CLICK subfunction enables you to determine if any action will be taken on a mouse click to a toolbar button (*button\_name*), and returns information about actions taken (i.e., any virtual key generated, string generated, or method called).



If a mouse button does not have a method, Toolkit will not generate a virtual key code or a string, even if these are assigned to the button. See the Discussion for [TBB\\_LOAD](#) on [page 15-7](#).

---

If *button\_name* isn't a valid button name for *tbid*, Toolkit will generate a runtime error.

## Examples

The following example determines if there are any actions for the button specified by **btn\_name**. Each of the following IF statements (which use the bitwise operator &) returns true if the specified bit is set in **btn\_actions** or zero if it isn't.

```
btn_actions = %tb_info(tb_id, TBI_CLICK, btn_name, mouse)
if (btn_actions & TBIC_VK)           ;True if button has a virtual key
.
.
.
if (btn_actions & TBIC_STRING)       ;True if button has a string
.
.
.
if (btn_actions & TBIC_METHOD)       ;True if button has a method
.
.
.
```

The next example returns the virtual key code, string, and method for the specified button.

```
btn_actions = %tb_info(tb_id, TBI_CLICK, btn_name, mouse, btn_vk,
&                btn_string, btn_method)
```



## %TB\_INFO (continued)

### TBI\_ENABLED

```
return = %TB_INFO (tbid, TBI_ENABLED[, button_name])
```

or

```
xcall %TB_INFO (tbid, TBI_ENABLED[, button_name])
```

### Return value

*return*

True if the button or toolbar is enabled; false if the button or toolbar is disabled. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

*button\_name*

(optional) The name (case-insensitive) of a button on the toolbar specified by *tbid*. (a)

### Discussion

If *button\_name* is passed, TBI\_ENABLED returns the enabled state of the button. (If *button\_name* is passed as a non-blank value that isn't a button name for *tbid*, Toolkit will generate a runtime error.)

If *button\_name* is not passed or is blank, TBI\_ENABLED returns the enabled state of the toolbar specified by *tbid*.

### Examples

The following example returns the enabled state of the **tb\_id** toolbar.

```
tb_status = %tb_info(tb_id, TBI_ENABLED)
```

The next example returns the enabled state of the toolbar button **btn\_name**.

```
btn_status = %tb_info(tb_id, TBI_ENABLED, btn_name)
```

## %TB\_INFO (continued)

### TBI\_GROUP

*return* = %TB\_INFO (*tbid*, TBI\_GROUP, *button\_name*, [*max*, *members*])

or

xcall %TB\_INFO (*tbid*, TBI\_GROUP, *button\_name*, [*max*, *members*])

### Return value

*return*

The number of buttons in the group that *button\_name* belongs to, or zero if *button\_name* is not part of a button group. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

*button\_name*

The name (case-insensitive) of a button on the toolbar specified by *tbid*. (a)

*max*

(optional) The maximum number of button names to return in the *members* array. (n)

*members*

(optional) The first element of an alphanumeric array of at least *max* elements. This is required if *max* is passed and is greater than zero. (a)

### Discussion

The TBI\_GROUP subfunction returns the number of buttons in the group that *button\_name* belongs to. It returns zero if *button\_name* is not a member of a button group. If *button\_name* is not a valid button name for *tbid*, Toolkit will generate a runtime error.

TBI\_GROUP also returns the names of buttons in the group if you pass *max* and *members*, and if *max* is greater than zero. It returns these names as elements in the *members* array. (The number of returned button names is the lesser of *return* and *max*.) Note that if you pass a value that's greater than zero as *max*, you must also pass *members*. If you don't pass *max*, the *members* argument is ignored (so button names are not returned).

## Examples

The following example returns the number of buttons in the group that the button **btn\_name** belongs to. If **btn\_name** doesn't belong to a button group, the following returns zero.

```
btn_number = %tb_info(tb_id, TBI_GROUP, btn_name)
```

The next example returns the number of buttons in the button group that **btn\_name** belongs to, and it returns the names of the buttons in that group. The first button name is stored in the first element of the array **btn\_array**. Subsequent names are returned in subsequent array elements.

```
btn_number = %tb_info(tb_id, TBI_GROUP, btn_name, btn_max, btn_array)
```

## %TB\_INFO (continued)

### TBI\_HEIGHT

```
return = %TB_INFO (tbid, TBI_HEIGHT[, button_name])
```

or

```
xcall %TB_INFO (tbid, TBI_HEIGHT[, button_name])
```

### Return value

*return*

The height in pixels of a toolbar or a toolbar button. (^**VAL**)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (**n**)

*button\_name*

(optional) The name (case-insensitive) of a button on the toolbar specified by *tbid*. (**a**)

### Discussion

If *button\_name* is passed and isn't blank, TBI\_HEIGHT returns the height of the specified button in pixels. (If *button\_name* is passed as a non-blank value that isn't a valid button name for *tbid*, Toolkit will generate a runtime error.)

If *button\_name* is not passed or is blank, TBI\_HEIGHT returns the height of the toolbar (*tbid*) in pixels. Note that this is the actual height of the toolbar's window (whether placed or not), which may differ from the height passed when the toolbar was created (i.e., the height passed to the TB\_CREATE subfunction of %TB\_TOOLBAR or %TB\_TKCREATE).

### Examples

The following example returns the height of the **tb\_id** toolbar.

```
tb_height = %tb_info(tb_id, TBI_HEIGHT)
```

The next example returns the height of the toolbar button specified by **btn\_name**, unless **btn\_name** is blank (in which case it returns the toolbar height).

```
tb_height = %tb_info(tb_id, TBI_HEIGHT, btn_name)
```

## %TB\_INFO (continued)

### TBI\_HWND

*return* = %TB\_INFO (*tbid*, TBI\_HWND[, *button\_name*])

or

xcall %TB\_INFO (*tbid*, TBI\_HWND[, *button\_name*])

### Return value

*return*

The handle to a toolbar or a toolbar button. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

*button\_name*

(optional) The name (case-insensitive) of a button on the toolbar specified by *tbid*. (a)

### Discussion

The TBI\_HWND subroutine returns the window handle for a toolbar or a toolbar button. This is useful if you want to subclass the window or query its characteristics.

If *button\_name* is passed and isn't blank, TBI\_HWND returns the window handle for the specified toolbar button. (If *button\_name* is passed as a non-blank value that isn't a valid button name for *tbid*, Toolkit will generate a runtime error.)

If *button\_name* is not passed or is blank, TBI\_HWND returns the window handle for the toolbar (*tbid*).

### Examples

The following example returns the handle of the **tb\_id** toolbar.

```
tb_handle = %tb_info(tb_id, TBI_HWND)
```

The next example returns the handle of a button (**btn\_name**) on the **tb\_id** toolbar.

```
tb_handle = %tb_info(tb_id, TBI_HWND, btn_name)
```

## %TB\_INFO (continued)

### TBI\_LEFT

*return* = %TB\_INFO (*tbid*, TBI\_LEFT, *button\_name*)

or

xcall %TB\_INFO (*tbid*, TBI\_LEFT, *button\_name*)

### Return value

*return*

The horizontal position (in pixels) of the left side of *button\_name*. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (**n**)

*button\_name*

The name (case-insensitive) of a button on the toolbar specified by *tbid*. (**a**)

### Discussion

The TBI\_LEFT subfunction returns the horizontal position in pixels of the left side of the button specified by *button\_name*. This position is relative to the toolbar's client area.

If *button\_name* isn't a valid button name for *tbid*, Toolkit will generate a runtime error.

### Examples

The following example returns the horizontal position of the left side of button **btn\_name**.

```
left_side = %tb_info(tb_id, TBI_LEFT, btn_name)
```

## %TB\_INFO (continued)

### TBI\_ORIENTATION

```
return = %TB_INFO (tbid, TBI_ORIENTATION)
```

or

```
xcall %TB_INFO (tbid, TBI_ORIENTATION)
```

### Return value

*return*

The side of the application window that the toolbar occupies. (^VAL)

**TCB\_TOP**            Top.

**TCB\_BOTTOM**        Bottom.

**TCB\_LEFT**           Left side.

**TCB\_RIGHT**          Right side.

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

### Discussion

The TBI\_ORIENTATION subfunction returns the side of the application window that the specified toolbar (*tbid*) occupies (or will occupy if the toolbar is not placed).

### Examples

The following example returns the position of the **tb\_id** toolbar in the application window.

```
position = %tb_info(tb_id, TBI_ORIENTATION)
```

## %TB\_INFO (continued)

### TBI\_PLACED

*return* = %TB\_INFO (*tbid*, TBI\_PLACED)

or

xcall %TB\_INFO (*tbid*, TBI\_PLACED)

### Return value

*return*

True if the toolbar is placed; otherwise false. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

### Discussion

The TBI\_PLACED subfunction returns the placed state of the toolbar specified by *tbid*.

### Examples

The following example determines if the **tb\_id** toolbar is placed.

```
position = %tb_info(tb_id, TBI_PLACED)
```



## %TB\_INFO (continued)

### TBI\_TOOLTIP

*return* = %TB\_INFO (*tbid*, TBI\_TOOLTIP, *button\_name*[, *text*])

or

xcall %TB\_INFO (*tbid*, TBI\_TOOLTIP, *button\_name*[, *text*])

### Return value

*return*

The number of characters in the ToolTip for the specified button, or 0 if there is no ToolTip for the button. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

*button\_name*

The name (case-insensitive) of a button on the toolbar specified by *tbid*. (a)

*text*

(optional) The text of the ToolTip, or all spaces if there is no ToolTip. (a)

### Discussion

The TBI\_TOOLTIP subfunction enables you to determine if a toolbar button has a ToolTip and returns the length of the ToolTip if there is one. It also returns the text for the ToolTip if you pass *text*. Note that *return* is the actual length of the ToolTip, which may be longer than *text*.

If *button\_name* isn't a valid button name for *tbid*, Toolkit will generate a runtime error.

### Examples

The following example returns the text for the ToolTip for **btn\_name**.

```
%tb_info(tb_id, TBI_TOOLTIP, btn_name, tooltip)
```

## %TB\_INFO (continued)

### TBI\_TOP

*return* = %TB\_INFO (*tbid*, TBI\_TOP, *button\_name*)

or

xcall %TB\_INFO (*tbid*, TBI\_TOP, *button\_name*)

### Return value

*return*

The vertical position (in pixels) of the top side of *button\_name*. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (**n**)

*button\_name*

The name (case-insensitive) of a button on the toolbar specified by *tbid*. (**a**)

### Discussion

The TBI\_TOP subfunction returns the vertical position in pixels of the top side of the button specified by *button\_name*. This position is relative to the client area.

If *button\_name* isn't a valid button name for *tbid*, Toolkit will generate a runtime error.

### Examples

The following example returns the vertical position of the top side of button **btn\_name**.

```
top_side = %tb_info(tb_id, TBI_TOP, btn_name)
```

## %TB\_INFO (continued)

### TBI\_TYPE

*return* = %TB\_INFO (*tbid*, TBI\_TYPE, *button\_name*[, *text*])

or

xcall %TB\_INFO (*tbid*, TBI\_TYPE, *button\_name*[, *text*])

### Return value

*return*

The type of a button: (^VAL)

**TBLOAD\_TYPE\_TEXT**      A text button.

**TBLOAD\_TYPE\_BMAP**      An image button.

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (**n**)

*button\_name*

The name (case-insensitive) of a button on the toolbar specified by *tbid*. (**a**)

*text*

(optional) The caption for a text button or the path for the image for an image button. (**a**)

### Discussion

The TBI\_TYPE subfunction returns the type of a button and, if *text* is passed, one of the following:

- ▶ If *return* is TBLOAD\_TYPE\_TEXT, this function will return the caption of the specified button in *text*.
- ▶ If *return* is TBLOAD\_TYPE\_BMAP, this function will return the path of the image file (the path passed to the TBB\_LOAD subfunction of %TB\_BUTTON) as *text*.

If *button\_name* isn't a valid button name for *tbid*, Toolkit will generate a runtime error.

### Examples

The following example uses the type of button **btn\_name** to determine which routine to call, and it passes the caption or the image path to the routine.

```
using (btn_type = %tb_info(tb_id, TBI_TYPE, btn_name, btn_text))
& select
    (TBLOAD_TYPE_TEXT), xcall change_text_btn(btn_name, btn_text)
    (TBLOAD_TYPE_BMAP), xcall change_bmap_btn(btn_name, btn_text)
endusing
```

## %TB\_INFO (continued)

### TBI\_WIDTH

*return* = %TB\_INFO (*tbid*, TBI\_WIDTH[, *button\_name*])

or

xcall %TB\_INFO (*tbid*, TBI\_WIDTH[, *button\_name*])

### Return value

*return*

The width in pixels of the toolbar or toolbar button. (^VAL)

### Arguments

*tbid*

The ID of a toolbar created in Toolkit. (n)

*button\_name*

(optional) The name (case-insensitive) of a button on the toolbar specified by *tbid*. (a)

### Discussion

If *button\_name* is passed, TBI\_WIDTH returns the width of the specified button in pixels. (If *button\_name* is passed as a non-blank value that isn't a button name for *tbid*, Toolkit will generate a runtime error.)

If *button\_name* is not passed or is blank, TBI\_WIDTH returns the width of the toolbar (*tbid*) in pixels. Note that this is the actual width of the toolbar's window (whether placed or not), which may differ from the width passed when the toolbar was created (i.e., the width passed to the TB\_CREATE subfunction of %TB\_TOOLBAR or to %TB\_TKCREATE).

### Examples

The following example returns the width of the **tb\_id** toolbar.

```
tb_width = %tb_info(tb_id, TBI_WIDTH)
```

The next example returns the width of the toolbar button specified by **btn\_name**, unless **btn\_name** is blank (in which case it returns the toolbar width).

```
tb_width = %tb_info(tb_id, TBI_WIDTH, btn_name)
```

## %TB\_TKCREATE – Create and log a toolbar with the environment



```
tbid = %TB_TKCREATE ([orientation], [width], [height], [no_placement][, global])
```

or

```
xcall TB_TKCREATE ([orientation], [width], [height], [no_placement][, global])
```

### Return value

*tbid*

On Windows, %TB\_TKCREATE returns the ID of the toolbar created by this function. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*orientation*

(optional) The toolbar's position in the application container. (n)

**TBC\_TOP**                      Top of container. (default)

**TBC\_BOTTOM**                Bottom of container.

**TBC\_LEFT**                    Left side of container.

**TBC\_RIGHT**                 Right side of container.

*width*

(optional) The width of the toolbar in pixels. Pass this when placing the toolbar on the left or right side of the container (which places the toolbar vertically). (n)

*height*

(optional) The height of the toolbar in pixels. Pass this when placing the toolbar on the top or bottom of the container (which places the toolbar horizontally). (n)

*no\_placement*

(optional) The no placement flag. (n)

**D\_NOPLC**                    Do not place the toolbar.

*global*

(optional) The global toolbar flag. (n)

**D\_GLOBAL**                  Toolbar is global.

## Discussion

`%TB_TKCREATE` creates a toolbar and logs it with the current environment. If you pass `D_GLOBAL` as the *global* argument, the toolbar is logged at the global environment level. If *global* is not passed, the toolbar is logged at the current environment level.

If you pass *no\_placement* as `D_NOPLC`, the toolbar is not placed until you place it with the `TB_PLACE` subfunction of `%TB_TOOLBAR`. If *no\_placement* is not passed, the toolbar is placed immediately.



Once a toolbar has been assigned to an environment, you must leave the management of the toolbar to Toolkit, and you must use `TB_TKDEL` if you want to explicitly delete the toolbar.

---

## TB\_TKDEL – Delete a toolbar that’s logged with the environment



```
xcall TB_TKDEL(tbid)
```

### Arguments

*tbid*

The ID of a toolbar that has been logged with the environment. (n)

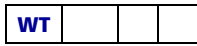
### Discussion

TB\_TKDEL deletes a toolbar that’s been logged with the current environment or the global environment. On UNIX and OpenVMS, this routine is ignored.

If *tbid* is *not* the ID of a toolbar that’s been logged with the current environment or the global environment, a fatal error will occur.

Note that if you use TB\_DELETE to delete a toolbar that’s been logged with an environment, a fatal error will occur on the next call to E\_ENTER or E\_EXIT.

## TB\_TKGLOBAL – Promote a toolbar to global



```
xcall TB_TKGLOBAL (tbid)
```

### Arguments

*tbid*

The ID of a toolbar that has been logged at the current Toolkit environment level. **(n)**

### Discussion

TB\_TKGLOBAL promotes a toolbar and the current state of all its buttons to the global environment level. On UNIX and OpenVMS, this routine is ignored.

If *tbid* is an invalid toolbar ID or has not been logged with the current environment, a fatal error will occur. (If *tbid* is already global, no error occurs.)



## TB\_TKLOG – Log a toolbar with the environment



```
xcall TB_TKLOG (tbid[, global])
```

### Arguments

*tbid*

The ID of a toolbar created by the TB\_CREATE subfunction of %TB\_TOOLBAR. (n)

*global*

(optional) A flag that logs the toolbar as global. (n)

**D\_GLOBAL**            Log the toolbar as global.

### Discussion

TB\_TKLOG logs a toolbar with the environment. On UNIX and OpenVMS, this routine is ignored.

Use this function only if you created the toolbar with the TB\_CREATE subfunction of %TB\_TOOLBAR. If you pass D\_GLOBAL as the *global* argument, the toolbar is logged with the global environment. If *global* is not passed or is passed as false, the toolbar is logged with the current environment.

If *tbid* is an invalid toolbar ID or has already been logged with an environment, a fatal error will occur.



Once a toolbar has been logged with an environment, you must leave the management of the toolbar to Toolkit, and you must use TB\_TKDEL if you want to explicitly delete the toolbar.

---

## %TB\_TOOLBAR – Create and manipulate a toolbar



```
status = %TB_TOOLBAR (function, id, [orientation], [width][, height])
```

or

```
xcall TB_TOOLBAR (function, id, [orientation], [width][, height])
```

### Return value

*status*

On Windows, this subfunction returns the status of the operation. (^**VAL**)

**TB\_SUCCESS**        1

**TB\_FAILURE**        0

On UNIX and OpenVMS, this function always returns false.

### Arguments

*function*

The specific toolbar function to be performed. It must be one of the following: (**n**)

**TB\_CREATE**        Creates the toolbar. It does not display the toolbar on the application window. (To display the toolbar, use **TB\_PLACE**.)

**TB\_DELETE**        Deletes the toolbar.

**TB\_DISABLE**       Disables a toolbar.

**TB\_ENABLE**        Enables a disabled toolbar.

**TB\_PLACE**         Places (shows) the toolbar.

**TB\_POPSTATE**      Restores a previously saved state of the toolbar.

**TB\_PUSHSTATE**    Saves the present state of the toolbar.

**TB\_REMOVE**       Removes (hides) the toolbar.

*id*

The toolbar identifier; the value of *id* is returned on **TB\_CREATE** and passed on all other toolbar functions. (**n**)

### *orientation*

(optional) Used with TB\_CREATE. *Orientation* defines the application window side where the toolbar will be placed. It must be one of the following: **(n)**

|                   |                            |
|-------------------|----------------------------|
| <b>TBC_TOP</b>    | Top of container (default) |
| <b>TBC_BOTTOM</b> | Bottom of container        |
| <b>TBC_LEFT</b>   | Left side of container     |
| <b>TBC_RIGHT</b>  | Right side of container    |

### *width*

(optional) Used with TB\_CREATE. *Width* defines the width of the toolbar in pixels. If *orientation* is TBC\_TOP or TBC\_BOTTOM, this argument is optional and ignored since the toolbar will be created the full width of the window. **(n)**

### *height*

(optional) Used with TB\_CREATE. *Height* defines the height of the toolbar in pixels. If *orientation* is TBC\_LEFT or TBC\_RIGHT, this argument is optional, ignored, and defaults to the full height of the window. **(n)**

## Discussion

The %TB\_TOOLBAR function enables you to create and manipulate an application-window toolbar. You must include the file **WND:toolbar.def** to use this function.

TB\_CREATE creates a toolbar, but does not display it on the application window, and it does not assign it to an environment. To display the toolbar, use TB\_PLACE. To create a toolbar and assign it to an environment, use %TB\_TKCREATE. (You can also use TB\_TKLOG to assign a toolbar to an environment if you create it with TB\_TOOLBAR.) For more information, see [%TB\\_TKCREATE on page 15-31](#) and [TB\\_TKLOG on page 15-35](#).

TB\_DELETE deletes a toolbar that's not assigned to an environment. If a toolbar is assigned to an environment, use TB\_TKDEL; if you use TB\_DELETE, a fatal error will occur on the next call to E\_ENTER or E\_EXIT.

You can place up to four toolbars per application window: one at the top, left, right, and bottom of the window. (You can create up to 256 toolbars per application.) The toolbars will be displayed in the order in which they were placed (with TB\_PLACE). When placed, the toolbars will blank out the entire width (or height) of that area of the screen. Note that if you place a toolbar on a side where another toolbar is already placed, the original toolbar is removed, though if it's logged with Toolkit, a subsequent call to E\_EXIT could remove the new toolbar and replace it with the original.

If TB\_DISABLE is passed, the toolbar remains on the screen, but nothing happens if a button is selected. Disabling a toolbar disables all of its buttons.

## Toolbar Routines

### %TB\_TOOLBAR

TB\_PUSHSTATE saves the current state of a Toolbar by pushing it onto a stack. This enables you to save a state, make changes to it, and then restore the state. To restore a state saved by TB\_PUSHSTATE, use TB\_POPSTATE. The stack follows normal last-on, first-off behavior, and there's no limit to the size of the stack other than available memory. If you pass TB\_POPSTATE and there's no saved state for the toolbar, *status* will be TB\_FAILURE, and nothing will happen to the toolbar.

TB\_PUSHSTATE and TB\_POPSTATE may be used for toolbars created with %TB\_TOOLBAR, but we recommend that you don't use them for toolbars that are under environment control; this may confuse Toolkit.

## Examples

See Examples for %TB\_BUTTON on [page 15-5](#).

# 16

## Utility Routines

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# The Utility Subroutines and Functions

In addition to the routines that handle menus, input windows, text windows, selection windows, and lists, UI Toolkit consists of many other routines which simplify and standardize your application. These are classified as the “utility” subroutines.

Two of the most important Toolkit utility routines are `U_START` and `U_FINISH`. These routines initialize and shut down the UI Toolkit environment. `U_START` must be called before any other Toolkit subroutine.

A subset of the utility subroutines enables you to load and manipulate windows. These routines are `U_GBLWND`, `U_LDWND`, `U_LOGWND`, `U_SAVE`, `U_WINDOW`, `U_UPDATE`, and `U_REDRAW`. The routines `U_CHR` and `U_FLD` accept a character or field of input from the terminal.

File I/O and channel maintenance are managed using `U_CHNINF`, `U_CLOSE`, `U_FNDFIL`, `U_GBLCHN`, `U_GETCHN`, `U_OPEN`, and `U_RLSCHN`.

The routines `U_DIALOG`, `U_FLASH`, `U_MESSAGE`, `U_POPUP`, `U_ABORT`, `U_BAR`, and the function `%U_MSGBOX` enable you to standardize error and status messages.

Key mapping can be performed using `U_EDITKEYS`.

Rendition utilities are provided through `U_EDITREND`, `U_HELPREND`, `U_LDREND`, `U_MODREND`, `U_REND`, `U_RSTREND`, `U_SAVREND`, and `U_STOREND`.

Scroll bars for UNIX and OpenVMS environments may be defined and manipulated through `U_CHARSB`, `U_CREATESB`, `U_UPDATESB`, and `U_RESIZESB`.

A subset of the utility routines were developed specifically to support Windows-specific features: `%U_GETFILENAME` displays a standard Windows “Open” or “Save As” dialog box. You can set window icons with `%U_ICON`. `%U_PRINTQUERY` retrieves printer information, and `%U_PRINTSETUP` displays a standard Windows “Print Setup” dialog box. Initialization settings can be written to **synergy.ini** or **synuser.ini** using `U_SAVELOG` and `U_SAVESETTINGS`. Providing Help in a Windows environment can be done with `%U_WINHELP`. `%U_WNDEVENTS` allows you to associate methods with various mouse events, and `%U_WNDFONT` displays the standard Windows “Font” dialog for changing the font at runtime.

Additional utility routines provide for conversion of date and time values, access to the text message file, access to the UI Toolkit version number, and access to the UI Toolkit window debugger.



## U\_ABORT – Process an abort



```
xcall U_ABORT(message1 [, message2, ..., message5])
```

### Arguments

*message1* to  
*message5*

Up to five error messages. *Message1* is required. *Message2* through *message5* are optional. (a)

### Discussion

When a Toolkit error or a window error is generated, the error is automatically sent to U\_ABORT, unless the error is returned in an argument for a Toolkit routine, such as the *error* argument for L\_CREATE. (If this happens, the error number is returned in the argument, and you can use %U\_GETWNDERR to get the error text.) However, you can also call U\_ABORT directly when you detect a fatal error condition in your application.

The U\_ABORT subroutine behaves differently depending on the value of **g\_throwabort**, a global defined in **tkctl.def**. The default behavior (active when **g\_throwabort** is set to zero) may be adequate for interactive Toolkit applications, where the resulting fatal error message can be displayed to the screen. But for error trapping, use the second type of U\_ABORT processing (active when **g\_throwabort** is set to a non-zero value). Error trapping gives you greater control over errors generated by U\_ABORT and enables server-side applications and applications running as services to pass error information on to client programs. You can set the **g\_throwabort** global from your program or you can change its initial setting by setting the DTK\_THROW\_ABORT environment variable.

If **g\_throwabort** is set to zero (the default), U\_ABORT performs a STOP and displays a fatal error message. The STOP will have an exit status of D\_EXIT\_FAILURE, and U\_ABORT will not return to the calling routine. (Most operating systems have commands that enable you to test the exit status. See your operating system documentation for information.) The error message will have the following format:

```
** ERROR ** ERROR ** ERROR **
```

```
message(s)
```

where *message(s)* is the contents of the *message1* to *message5* argument(s). If you pass more than one *message* argument, each message will start a new physical line of text. You can pass up to five messages.

Additionally, note the following:

- ▶ On Windows, this subroutine creates a Windows-style message box with a stop sign icon and an OK button. Each message can wrap, so the total length of all messages is limited only by your desktop's size.
- ▶ On UNIX and OpenVMS, each message can be up to 70 characters long. Additional characters are truncated.
- ▶ U\_ABORT cannot time out on Windows.
- ▶ On UNIX or OpenVMS, if a time-out occurs **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as "O\_TIMEOUT".

If **g\_throwabort** is set to a non-zero value, U\_ABORT calls U\_FINISH to shut down the Toolkit environment and then calls EXITE to throw a trappable error with the mnemonic \$ERR\_TOOLKIT and the error text "Toolkit error." Message arguments passed to U\_ABORT are passed on as informational messages for the thrown error and can be retrieved using %ERR\_TRACEBACK once the error has been trapped. Because U\_ABORT shuts down the Toolkit environment, you will need to call U\_START to perform any further Toolkit operations.

If **g\_throwabort** is set to throw an error, your application should be written to catch and handle the thrown error. Otherwise the application may continue to execute in situations where it would have terminated had U\_ABORT performed a STOP. For example, if input is redirected but the application's error catching mechanism does not terminate the application after a certain number of EOFs, U\_ABORT may cause the application to run indefinitely. Additionally, you may need to modify any automated procedures (batch files and so forth) that invoke U\_ABORT so that they work with the new behavior.

If an interactive Toolkit application fails to trap an error thrown by U\_ABORT

- ▶ on Windows, the Synergy™ runtime will display a fatal error message box (which is different than the message displayed with U\_ABORT's default behavior).
- ▶ on UNIX and OpenVMS, the Synergy runtime will generate a fatal error traceback (which does not require user input and which returns immediately to the command prompt). Additionally, U\_FINISH will clear the screen unless the error occurs within U\_START.

## See also

- ▶ **ONERROR** in the "Synergy DBL Statements" chapter of the *Synergy DBL Language Reference Manual*.
- ▶ **%ERR\_TRACEBACK** in the "System-Supplied Subroutines and Functions" chapter of the *Synergy DBL Language Reference Manual*.
- ▶ **DTK\_THROW\_ABORT** in the "Environment Variables" chapter of *Environment Variables & System Options*.

## Examples

The following call generates the specified messages (in addition to the **\*\*ERROR\*\*** message) if **g\_throwabort** is set to 0. If **g\_throwabort** is set to a non-zero value, it throws a trappable error and passes the messages on as informational error messages for the thrown error.

```
xcall u_abort("Customer file is corrupt", "Please call your distributor")
```

The next example is written for error trapping (active when **g\_throwabort** is non-zero). It uses **ONERROR** to enable error trapping and **%ERR\_TRACEBACK** to retrieve error information.

```
proc
  xcall u_start
  .
  .
  .
  onerror ($ERR_CATCH) catch      ;Need this to activate error trapping.
  xcall u_open(chan, "I", " cusmas ")
  reads(chan, cusmas, bad_cusmas) ;We need to have a control record.
  if (cusmas.control .ne. 0)      ;If it is not a control record...
    begin
bad_cusmas, ;Either we have no record, or it is not a control record
      xcall u_abort("This is the first line of the message.",
&          "This is the second line of the message.")
    end
  .
  .
  .
catch,
  offererror      ;Prevents an error within catch from looping back to
                  ; the catch label.
  xcall u_start   ;Need this because U_ABORT shuts down Toolkit, but we
                  ; need Toolkit to call U_MSGBOX.
  set cnt, len = 1
  while cnt      ;Loop through messages passed by U_ABORT.
    begin
      cnt = %err_traceback(errtext(len,^size(errtext)))
      if (cnt)
        begin
          len = %trimz(errtext) + 1
          errtext(len:2) = "
          len += 2
        end
      end
    end
  xcall u_msgbox(errtext(1:len), D_MICONSTOP, "Trapped error")
  .
  .
  .
```

## U\_ABOUT – Display an “About” help window



```
xcall U_ABOUT (application, version, compiled)
```

### Arguments

*application*

The name of the application. **(a)**

*version*

The version of the application. **(a)**

*compiled*

The date the application was compiled. **(a)**

### Discussion

The U\_ABOUT subroutine displays an “About” help window. An “About” window contains general information about the current application:

- ▶ Application name
- ▶ Version
- ▶ Date compiled
- ▶ Current version of Synergy DBL
- ▶ Current version of UI Toolkit
- ▶ Application icon (in Windows environments only)

You pass the text for the first three items (in *application*, *version*, and *compiled*) when you call U\_ABOUT. U\_ABOUT supplies the information for the next two items. If you have specified an application icon with %U\_ICON, it will be displayed in the window.

U\_ABOUT creates a window named “u\_about” and displays it on the screen. It then waits for the user to press RETURN (or click the OK button in a Windows environment). After the user responds, the window is deleted, and this subroutine returns. Typically, you will call this subroutine within a case statement in your EUTILS\_METHOD to support an “About” hot entry for your application.

The About window uses the current help window renditions. It displays 16 lines above the information line, and is centered horizontally on the screen. Each of the items in the bulleted list above is displayed on a separate line. The text is centered horizontally. Each line of information can contain a maximum of 76 characters. The About window title displays as “About *application*.”

Static text in the window is maintained in the text message file, under facility DTK. Mnemonics are ABOUT, VERSION, COMPILED, and DTKVERS.

If a window named “u\_about” already exists when this subroutine is called, a fatal error occurs.

In a Windows environment, this subroutine creates a Windows-style message box with an OK button and any application icon you have specified (using %U\_ICON). The text within the message box will be left-justified rather than centered. Note that U\_ABOUT cannot time out on Windows.

If a time-out occurs on UNIX or OpenVMS, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. See “[g\\_time\\_entry](#)” on page 18-5.

## Examples

The following displays an “About” window like the ones in [figure 16-1](#) and [figure 16-2](#).

```
xcall u_about("Repository", "8.3.1", %datecompiled)
```

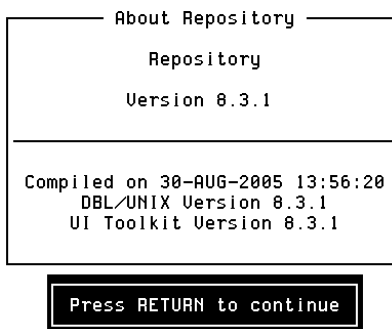


Figure 16-1. An “About” window in a UNIX or OpenVMS environment.

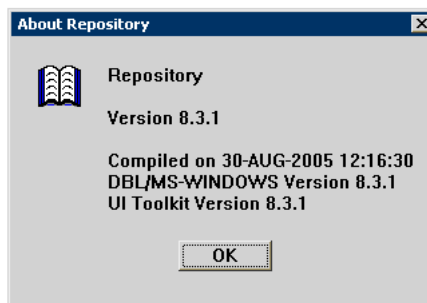


Figure 16-2. A Windows-style “About” window.

## U\_BAR – Place or remove the menu bar or information line



```
xcall U_BAR([action,] bar[, ...])
```

### Arguments

*action*

(optional) The action to perform: **(n)**

**D\_PLACE**                    Place the item. (default)

**D\_REMOVE**                Remove the item.

*bar*

The item on which to perform the action: **(n)**

**D\_MENU**                    Menu bar.

**D\_INFO**                    Information line.

### Discussion

The U\_BAR subroutine places or removes the menu bar and/or information line from the screen. It can have a maximum of three arguments.

---

#### WIN

D\_REMOVE has no effect on a menu bar in Windows. A menu bar always displays if any menu columns have been placed.

---



---

#### UNIX, VMS

If the menu bar is removed from the screen and the process-menu key is pressed, the menu bar will temporarily be placed on the screen until an entry is selected or until the process-menu key is pressed again. You can remove the menu bar permanently by redefining the process-menu key to be nothing.

---

When D\_REMOVE is used, the extra row in the display is only available for the placement and display of an unbounded window.

### Examples

The following example removes both the menu bar and the information line from the screen.

```
xcall u_bar(D_REMOVE, D_MENU, D_INFO)
```

## U\_BEEP – Ring the terminal bell



```
xcall U_BEEP
```

### Discussion

The U\_BEEP subroutine rings the terminal bell. It can replace the following DISPLAY statement, which also rings the terminal bell:

```
display(g_terminal, 7)
```

Using U\_BEEP rather than the above DISPLAY statement enables you to set a debugger breakpoint at the U\_BEEP call in your code, and then examine the traceback to track down the source of an unwanted terminal bell.

Note that U\_BEEP has no effect if **g\_beep** is set to false. See [“g\\_beep” on page 18-2](#).

# U\_CHARSB – Copy or load scroll bar characters



xcall U\_CHARSB (*operation*, *characters*)

## Arguments

*operation*

The operation to perform. (**n**)

**D\_LOAD**                      Set scroll bar characters.

**D\_COPY**                      Return current scroll bar characters.

*characters*

The series of scroll bar characters. (**a12**)

## Discussion

The U\_CHARSB subroutine copies or loads the characters you want to use for denoting the various states of a scroll bar window in UNIX or OpenVMS environments. (This routine does work on Windows, but the results are non-standard.)

If D\_LOAD is specified, the contents of *characters* will supersede any previously-defined scroll bar characters. D\_COPY returns to the current settings for the scroll bar characters in *characters*.

*Characters* contains 12 individual characters to display in a scroll bar. The table below shows the order of specification and the “initial” values of the characters upon program setup. The horizontal and vertical fill characters are set to the horizontal and vertical line-drawing characters. This makes the indicator appear to “slide” along a line, which many times coincides with the window’s border. Renditions for scroll bar sections may be modified with the routines U\_REND, U\_MODREND, or U\_EDITREND.

| Scroll Bar Characteristics                                          |                 |
|---------------------------------------------------------------------|-----------------|
| Description                                                         | Initial setting |
| Scroll to “more” upwards                                            | ^               |
| Scroll to “more” downwards                                          | v               |
| Scroll to “more” to the left                                        | <               |
| Scroll to “more” to the right                                       | >               |
| Screen position already at the top edge; there is “no more” upwards | ^               |



| Scroll Bar Characteristics (Continued)                                     |                 |
|----------------------------------------------------------------------------|-----------------|
| Description                                                                | Initial setting |
| Screen position already at the bottom edge; there is “no more” downwards   | v               |
| Screen position already at the left edge; there is “no more” to the left   | <               |
| Screen position already at the right edge; there is “no more” to the right | >               |
| Vertical pointer                                                           | —               |
| Horizontal pointer                                                         |                 |
| Horizontal area fill                                                       | —               |
| Vertical area fill                                                         |                 |

## Examples

The following example sets the “more” upwards and “more” downwards scroll bar characters to ‘+’ and sets the “no more” characters and “fill” characters to blank. The other characters are set to the default values.

```
chars  ,a12

chars = "++<>    -|  "
xcall u_charsb(D_LOAD, chars)
```

## U\_CHECKVERSION – Check for minimum version of any product



```
xcall U_CHECKVERSION(product, version, minvers)
```

### Arguments

*product*

The product name (displayed in the error message if the comparison results in a fatal error). **(a)**

*version*

The version of the product in use. **(a)**

*minvers*

The minimum version required. **(a)**

### Discussion

This subroutine checks *version* to see if it is at least as high as *minvers*. If not, a fatal error occurs.

The *version* and *minvers* strings are expected to be in the form *v*[.*r*][.*m*], where *v* is the application version number, *r* is the major revision number, and *m* is the minor revision number. Note that you can use an uppercase letter for a two-byte version number. For example, you can use A for 10 as in A.1.1 (for 10.1.1). But if you do use an uppercase letter, it must be the first character of *v*, *r*, or *m*, and a second character for *v*, *r*, or *m* is ignored. For example, 1A.2.3 is interpreted as 1.2.3, and A1.2.3 is interpreted as 10.2.3.

### Examples

The following example compares the current Toolkit version in **version**, with the minimum allowed version, defined by MIN\_VRSN. If **version** is less than MIN\_VRSN, a fatal error occurs.

```
xcall u_version(version)
xcall u_checkversion("UI Toolkit", version, MIN_VRSN)
```

## U\_CHNINF – Return information about a channel



```
xcall U_CHNINF (channel, [filename], [mode][, class])
```

### Arguments

*channel*

The channel about which to obtain information. **(n)**

*filename*

(optional) Returned with the name of the file open on the channel. **(a)**

*mode*

(optional) Returned with the I/O mode in which the file is open. **(a)**

*class*

(optional) Returned with one of the following class values: **(n)**

**0** If the channel is not in use (according to the UI Toolkit system).

**-1** If the channel is global.

**-2** If the channel is a Toolkit system channel.

*environment level*

*that owns channel* If the channel is local.

### Discussion

The U\_CHNINF subroutine returns information about a channel.

If *channel* is not in use, *filename* and *mode* will be returned blank.

### Examples

In the following, U\_CHNINF returns the name of the file open on the channel stored in **chnl**, the I/O mode for which the file is open, and the class of the channel (local, global, and so forth).

```
xcall u_chninf(chnl, filnam, iomode, class)
```

This example closes all global channels.

```
for chnl from 1 thru 32
  begin
    xcall u_chninf(chnl, , , class)
    if (class.eq.-1)
      xcall u_close(chnl)
  end
```

## U\_CHR – Accept one character from the terminal



```
xcall U_CHR (character, [window_id], [row, col], [help_id][, wait_time])
```

### Arguments

*character*

Returned with the character that was input. **(a)**

*window\_id*

(optional) The ID of the window in which to perform input. This is required if echo is on. **(n)**

*row, col*

(optional) The window row and column positions this subroutine will be reading from. **(n)**

*help\_id*

(optional) The help identifier. **(a)**

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. **(n)**

**D\_FOREVER** or **-1**

Never time out.

**D\_GLOBAL** or **-2**

Use the global value (see “[g\\_wait\\_time](#)” on page 18-6).  
(default)

**D\_IMMEDIATE** or **0**

Time out immediately.

*n*

Wait up to *n* seconds (where *n* is a positive value) for I/O processing to be complete.

### Discussion

The U\_CHR subroutine accepts one character of input from the terminal. If you are performing input to a list item, use the L\_CHR subroutine instead of U\_CHR. While waiting for character input, this subroutine will do any menu or shortcut processing.

#### WIN

---

U\_CHR recognizes the following reserved menu entries on Windows. E\_PASTE pastes a single character if echo is on. The others do nothing when U\_CHR is being processed.

E\_CLEAR

E\_COPY

E\_CUT

E\_MARK  
E\_PASTE

---

If echo is on (in other words, if the D\_ECHO state for E\_STATE is on), you must pass *window\_id*. If echo is off, *window\_id* is optional. In that case, U\_CHR accepts a character (in *character*) without displaying it.

If you pass *row*, you must also pass *col*. If you omit both, U\_CHR uses the current display location in the window. Note that if echo is on, the display location (whether it's the default or a location set by *row* and *col*) must be visible. If not, Toolkit will generate a fatal error.

If **g\_select** is set on return, a menu entry has been selected, and **g\_entnam** contains the name of the selected entry. If the internal name of the selected menu entry begins with "U\_," the EUTILS\_METHOD subroutine is called and the input is redone. If the internal name of the selected menu entry is "O\_HELP," the EHELP\_METHOD subroutine is called with *help\_id* as its argument.

You will need to clear **g\_select** after you satisfy the event.

On return, the field **gi\_sts** (defined in **inpctl.def**) will be set with the status. If a printable character was entered, **gi\_sts** will be NORMAL\_INPUT (zero) and the character received will be in *character*. If a control character (ASCII value 1-31) was input, **gi\_sts** will be non-zero and the control character will be in *character*. If any other character was input, **gi\_sts** will be non-zero, and *character* will be a null (binary zero).

If the operation times out, **g\_select** is set to true and **g\_entnam** set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See "[g\\_time\\_entry](#)" on page 18-5.

## See also

[L\\_CHR](#) on page 9-66 for information on performing input to a list item.

## Examples

The following example returns the character that was input to the variable **chr**. This input comes from the current position in the window whose ID is stored in **wndid[i]**.

```
xcall u_chr(chr, wndid[i])
```

The next example also returns the character that was input to **chr**. Input comes from the current input window at position (15,30). The subroutine passes the identifier "glhelp" to the EHELP\_METHOD subroutine.

```
xcall u_chr(chr,, 15, 30, "glhelp")
```

## U\_CLOSE – Close or purge a channel



```
xcall U_CLOSE(close_channels[, D_PURGE, purge_channels])
```

```
xcall U_CLOSE(D_PURGE, purge_channels)
```

### Arguments

*close\_channels*

One or more channels to be closed. If there's more than one channel, separate channels with commas. **(n)**

**D\_PURGE**

The purge flag. **(n)**

*purge\_channels*

One or more channels to be purged. If there's more than one channel, separate channels with commas. **(n)**

### Discussion

The U\_CLOSE subroutine closes or purges one or more channels.

Channels that follow the optional D\_PURGE are purged rather than closed. Channels that precede D\_PURGE are closed. If D\_PURGE is not passed, all specified channels are closed.

### Examples

In this example, the channel stored in **chn** is closed:

```
xcall u_close(chn)
```

In the following example, the channels stored in **chn\_1** and **chn\_2** are closed, and the channel stored in **purchn** is purged:

```
xcall u_close(chn_1, chn_2, D_PURGE, purchn)
```

In the next example, the channels stored in **purchn\_1** and **purchn\_2** are purged:

```
xcall u_close(D_PURGE, purchn_1, purchn_2)
```

## %U\_CMDLINOPT – Search for a command line option



*status*=%U\_CMDLINOPT (*option*, [*max*], [*args*][, *argcount*])

### Return value

*status*

%U\_CMDLINOPT returns true if the option is found, false if not. (^VAL)

### Arguments

*option*

Command line option to search for. (**a**)

*max*

(optional) Maximum number of arguments to return for the option. (**n**)

*args*

(optional) Array for returned arguments. (**a**)

*argcount*

(optional) Number of returned arguments. (**n**)

### Discussion

%U\_CMDLINOPT searches the command line for the command line option specified by *option*. A command line option is defined as a dash (-) or a slash (/) (if you've set DBLOPT 34) followed immediately by a string that identifies the option. The string can be up to 80 characters. If the option has arguments, they follow the option with separating spaces.

%U\_CMDLINOPT parses the entire command line. If the option occurs multiple times, the argument sets are concatenated. Unless the last character in *option* is a space, %U\_CMDLINOPT selects each option that starts with the characters specified by *option*, even if an option has more characters than *option* specifies. For example, if you specify "n" for *option*, %U\_CMDLINOPT will select **-number**. However, if you specify "n " (note the space), %U\_CMDLINOPT selects only **-n** or **/n**, not **-number** or **/number**.

If *max* is passed, it specifies the maximum number of arguments that may be returned for this option. If *max* is greater than 0, *args* is presumed to be the base of an array with *max* or greater elements that contains the returned arguments. If *argcount* is passed, it is returned with the actual number of arguments found for the option, even if that number is greater than *max*. (Note, however, that only *max* arguments will be returned in *args*.)

For example, to retrieve the first two options (opt1 and opt2) from the command line

```
dbr myprogram -a "opt1" "opt2" "opt3"
```

your program could have the following:

```
status = %U_CMDLINOPT("a", 2, options_array, count)
```

Switches that precede the program name on the command line are ignored. For example, %U\_CMDLINOPT will always return false for the following command:

```
dbr -n program_name
```

It may return true, however, for the following:

```
dbr program_name -n
```

## Examples

The following example looks for an option with **-r** (or **/r** if DBLOPT 34 is set):

```
if (%u_cmdlinopt("r"))
```

Note that **-rec** would qualify because it starts with **-r**. To search for a command line option that contains only **-r** or **/r**, specify the following:

```
if (%u_cmdlinopt("r "))
```

Note the space after the r in the above example; this prevents anything other than **-r** (**-rec** for example) from qualifying.

In the next example, %U\_CMDLINOPT looks for **-names** or **/names**. Note that it will retrieve only 10 arguments and that the address of the returned arguments will be assigned to nmnames.

```
if (%u_cmdlinopt("names ", 10, names, nmnames))
```



## U\_CNVDAT – Convert lunar and Julian dates



```
xcall U_CNVDAT (mode, year, month, day, julian)
```

### Arguments

*mode*

Determines whether the conversion is to lunar or Julian. It has one of the following values: **(n)**

**1**        Convert lunar to Julian.

**2**        Convert Julian to lunar.

*year*

The year to convert. **(n)**

*month*

The month to convert or is returned with the converted month. **(n)**

*day*

The day to convert or is returned with the converted day. **(n)**

*julian*

The Julian day or is returned with the converted Julian day. **(n)**

### Discussion

The U\_CNVDAT subroutine converts lunar (month-oriented) dates to Julian and vice versa.

U\_CNVDAT returns either a converted month and day in *month* and *day* or a converted Julian day in *julian*, depending on whether the mode is 1 or 2. The year stays the same regardless of *mode*.

If any of the input arguments are invalid, number 9s will be returned.

### Examples

The following example places the Julian day for January 25, 1994 into **julie**.

```
xcall u_cnvdatt(1, 94, 1, 25, julie)
```

The next example places the month and day of the 265th day of 1993 into **mn** and **dy**.

```
xcall u_cnvdatt(2, 93, mn, dy, 265)
```

## U\_CREATESB – Create a scroll bar window



```
xcall U_CREATESB (scroll_id, name, size, [type][, endpoints])
```

### Arguments

*scroll\_id*

Returned with the ID of the scroll bar window created. **(n)**

*name*

The name of the scroll bar window (a maximum of 15 characters). **(a)**

*size*

The length or height of the scroll bar. **(n)**

*type*

(optional) The type of scroll bar window to create. **(n)**

**D\_VERTICAL**                      Vertical scroll bar. (default)

**D\_HORIZONTAL**                  Horizontal scroll bar.

*endpoints*

(optional) A flag that specifies whether or not endpoint indicators should be displayed. **(n)**

**D\_ENDPOINTS**                    Display endpoint indicators. (default)

**D\_NOENDPOINTS**                Do not display endpoint indicators.

### Discussion

The U\_CREATESB subroutine creates a scroll bar window in UNIX and OpenVMS environments. A scroll bar window is one character wide if vertical, one character high if horizontal. (This routine does work on Windows, but the results are non-standard.)

*Endpoints* are single-character indicators at either end of the scroll bar which indicate whether or not further progress in that direction is possible. These characters, along with the character for the background fill for the scroll bar, can be changed with the U\_CHARSB subroutine.

A scroll bar window indicates progress and regress with the movement of an indicator (through the window's display area). For example, if you use a scroll bar with a list, the entire scroll bar represents the whole list; the location of the indicator within the scroll bar area represents the location of the current item relative to the list.

As you move through the list, you would update the scroll bar to represent the relative movement through the list using U\_UPDATESB. Upon creation, the indicator is not placed within the scroll bar. U\_UPDATESB must be called to place the indicator.

By default, U\_CREATESB creates scroll bar windows without borders, but you can change this by calling W\_BRDR. For more information, see the “[Synergy Windowing API](#)” chapter of the *Synergy DBL Language Reference Manual*.

U\_CREATESB automatically logs the scroll bar window to the current environment.

If you pass a null string (“”) for *name*, Toolkit assigns a unique window name in the form `_W_nnn`, where *nnn* is the window ID.

A scroll bar window is deleted when the environment in which it was created is exited using the E\_EXIT subroutine. To place, remove, and explicitly delete a scroll bar, use U\_WINDOW.

## See also

- ▶ [U\\_CHARSB on page 16-12](#) for information on changing the character used to denote various states of a scroll bar.
- ▶ [U\\_RESIZESB on page 16-127](#) for information on resizing a scroll bar window.
- ▶ [U\\_UPDATESB on page 16-151](#) for information on updating a scroll bar window.
- ▶ [U\\_WINDOW on page 16-166](#) information about placing, moving, removing and deleting windows.

## Examples

The following example creates a vertical scroll bar window “vscroll,” which is 10 characters tall, and has no endpoint indicators.

```
xcall u_createsb(scrld, "vscroll", 10,, D_NOENDPOINTS)
```

## U\_CTRCONTEXT – Establish context within a child window



```
xcall U_CTRCONTEXT (window_id, reason)
```

### Arguments

*window\_id*

The ID of the child window. (**n**)

*reason*

The reason the window was activated (which determines what U\_CTRCONTEXT will move context to). This argument can be passed as blank (which indicates that the window was already activated), a program-supplied reason passed because it was activated programmatically, or one of the following: (**a**)

- |                |                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C_FIRST</b> | Focus moved in attempt to reach the first child in the composite window. This instructs U_CTRCONTEXT to move focus to the window itself (rather than a button on the window).                                                                                                                                                                                                                     |
| <b>C_LAST</b>  | Focus moved in attempt to reach the last child in the composite window. This instructs U_CTRCONTEXT to move context to the last active button for the window. If the window is part of a tab set with an active button, this moves context to the last active button for the tab set. If there is no active button for the window or tab set, this moves focus to the window itself.              |
| <b>C_NEXT</b>  | Focus moved from the previous child in the composite window—e.g., by pressing TAB. This instructs U_CTRCONTEXT to move context to the window itself (rather than a button on the window).                                                                                                                                                                                                         |
| <b>C_PREV</b>  | Focus moved from the next child in the composite window—e.g., by pressing SHIFT+TAB. This instructs U_CTRCONTEXT to move context to the last active button for the window. If the window is part of a tab set with an active button, this moves context to the last active button for the tab set. If there is no active button for the window or tab set, this moves focus to the window itself. |
| <b>C_SET</b>   | Window or button explicitly activated. For example, this could be the result of a mouse click, or it could be that the window or button was activated programmatically without a specified reason. With this reason, U_CTRCONTEXT does not change focus.                                                                                                                                          |

If *reason* is blank or any value other than the C\_ values above, U\_CTRCONTEXT does not change focus

## Discussion

When used in a child processing method, U\_CTRCONTEXT enables users to tab through buttons in windows that are part of a composite window. For example, if a composite window has a text window and a list, and the user presses SHIFT+TAB to move from the list back to the text window, U\_CTRCONTEXT moves focus to the last button in the text window.

U\_CTRCONTEXT uses *reason* to determine where to establish focus, and since C\_PROCESS passes a reason code to child processing methods, this reason code can then be passed as *reason* to U\_CTRCONTEXT. This enables focus to initially reflect the reason the window was activated.

There are several similar Toolkit routines that are designed to be called from child processing methods and that use a reason code to control focus in a child, but U\_CTRCONTEXT is for child windows that are not input windows, container windows for lists, tab set windows, or composite container windows. For example, it is used in the default methods C\_METHAX (for ActiveX windows), C\_METHSEL (for selection windows), and C\_METHTXT (for text windows). (For the other types of windows listed above, see [I\\_CTRCONTEXT](#) on page 8-10, [L\\_CTRCONTEXT](#) on page 9-82, [DTS\\_CTRCONTEXT](#) on page 13-37, and [DC\\_CTRCONTEXT](#) on page 6-35.)

For examples of how to use U\_CTRCONTEXT in a child processing method, see the **ctrmeths.dbl** file included in the UI Toolkit distribution. This file has the code for the default methods C\_METHAX, C\_METHSEL, and C\_METHTXT, all of which use U\_CTRCONTEXT.

On UNIX and OpenVMS and in Synergy .NET, this routine is ignored.

## See also

- ▶ [C\\_METHAX](#) on page 6-51.
- ▶ [C\\_METHSEL](#) on page 6-65.
- ▶ [C\\_METHTXT](#) on page 6-69.
- ▶ “Controlling tabbing, focus, and input context” on page 6-4 for information on tabbing indices.

## U\_DCDDAT – Decode an alpha date string into its numeric components



```
xcall U_DCDDAT (status, [string], type, [D_TODAY], year, month, day)
```

### Arguments

*status*

Returned with the decoding status (0 if valid, non-zero if invalid). **(n)**

*string*

(optional) The string to convert to numeric form. **(a)**

*type*

The type of date into which *string* will be converted: **(n)**

**1**      *PP/YY*

**2**      *PP/YYYY*

**3**      *DD/MM/YY*

**4**      *DD/MM/YYYY*

**D\_TODAY**

(optional) The flag that specifies that the date should default to today if *string* is passed and blank. **(n)**

*year*

Returned with the converted year. **(n)**

*month*

Returned with the converted month or period. **(n)**

*day*

Returned with the converted day. **(n)**

### Discussion

The U\_DCDDAT subroutine decodes an alpha date string into separate numeric values for month, day, and year.

If U\_DCDDAT is decoding a period, the period will be returned in *month*.

If *string* is not present, the current date will always be returned and D\_TODAY, if passed, will be ignored.

*String* can be either numeric or delimited. A delimited date string has any number of non-digit characters separating each of the date's components.

*String* can contain digits — or the three-letter abbreviation for the month. (The U\_MONTHS subroutine determines the abbreviation for each month. The default is the first three letters of the month in English.)

Any component of the *string* value not specified, defaults to the current date. If *string* contains */day/year*, the month will default to the current month. If *string* contains a single value, it will be used as the day. Therefore if *string* contains **5**, the date will default to the fifth day of the current month and year. If *string* contains a single value followed by the date separator, that value will be used as the month. For example, if *string* contains *5/*, the date will default to May and the current day and year.

## Examples

The following example decodes the date stored in **date** to the form *DD/MM/YYYY* and returns it in **yr**, **mn**, and **dy**. (For example, if **date** contains Jan 30, 1999, **yr** will be returned with 1999, **mn** will be returned with 01, and **dy** will be returned with 30.) **Sts** will contain the decoding status.

```
xcall u_dcddat(sts, date, 4, 0, yr, mn, dy)
```

The next example decodes today's date to the form *DD/MM/YY* and returns it in **yr**, **mn**, and **dy**.

```
xcall u_dcddat(sts,, 3, D_TODAY, yr, mn, dy)
```

## U\_DCDTIM – Decode an alpha time string into its numeric components



```
xcall U_DCDTIM (status, [string], [D_NOW], hour, minute[, second])
```

### Arguments

*status*

Returned with the decoding status (zero if valid, non-zero if not). **(n)**

*string*

(optional) The time string to convert to numeric form. **(a)**

**D\_NOW**

(optional) The flag that specifies that the time should default to the current system time if string is passed and blank. **(n)**

*hour*

Returned with the converted hour. **(n)**

*minute*

Returned with the converted minute. **(n)**

*second*

(optional) Returned with the converted second. **(n)**

### Discussion

The U\_DCDTIM subroutine decodes an alpha time string into separate numeric values for hour, minute, and second.

If you don't pass *string*, the current system time will be returned and D\_NOW, if passed, will be ignored.

*String* can be either numeric or delimited. A delimited time string has any number of non-digit characters separating each of the time's components.

If *string* is a numeric string containing one or two digits, UI Toolkit considers it to be the hour. If it contains three or four digits, it is considered to be the hour and minute. (The rightmost two digits will be the minute, and the leftmost digits will be the hour.) If five or more digits are present, they are considered to be the hour, minute, and second. The rightmost two digits will be the second, the next two digits are the minute, and the leftmost digits are the hour.



If *string* is delimited, and if any component of the time is missing, the missing part will be assumed to be zero. If one of the non-numeric components is the post-meridian indicator (pm), twelve hours will be added to the time specified.

The post-meridian indicator is the text defined in the UI Toolkit message file as facility name DTK, mnemonic PM. It is not case sensitive. As distributed, this is set to “PM.” Any abbreviation of this text will be recognized. Thus “1:45p” will be recognized as 13:45 military time, so long as the text file entry for PM starts with a ‘p’ (uppercase or lowercase).

## Examples

The following example decodes the time string in **time** to the form *HHMMSS* and returns the *HH* value in **hr**, and the *MM* value in **mn**. The *SS* value is ignored. (For example, if **time** contains “03:45 pm,” **hr** will be returned with 15, and **mn** will be returned with 45.) **Sts** will contain the decoding status.

```
xcall u_dcdtim(sts, time,, hr, mn)
```

The next example decodes the current system time to the form *HHMMSS* and returns the *HH* value in **hr**, the *MM* value in **mn**, and the *SS* value in **sc**.

```
xcall u_dcdtim(sts,, D_NOW, hr, mn, sc)
```

## U\_DEBUG – Invoke the UI Toolkit window debugger



```
xcall U_DEBUG
```

### Discussion

The U\_DEBUG subroutine invokes the UI Toolkit window debugger. See [“Debugger” on page 17-1](#) for information on using the Toolkit window debugger.

On Windows, U\_DEBUG brings up the Toolkit window debugger in a separate window. The initial size and location of this window is user-definable using the DBG\_X, DBG\_Y, DBG\_WIDTH, and DBG\_HEIGHT environment variables. The font is user-definable using the FONT\_DEBUG environment variable. See the [“Environment Variables”](#) chapter of *Environment Variables & System Options* for information on these.

## U\_DIALOG – Generate and process a dialog box



```
xcall U_DIALOG (response, [row, col], [border_flag], message[, ...])
```

### Arguments

*response*

Returned with the response entered by the user in the dialog box's input field. **(a)**

*row, col*

(optional) The row and column where the window will be placed on the screen. **(n)**

*border\_flag*

(optional) Flag that specifies whether the window border around the dialog box is on or off: **(n)**

**D\_ON**                      Border is on. (default)

**D\_OFF**                     Border is off.

*message*

A line of message text. You can have up to 12 lines of text, but each line must be specified as a separate *message* argument. **(a)**

### Discussion

The U\_DIALOG subroutine generates and processes a simple dialog box.

The dialog box contains one input field for a user response and up to 12 lines of text (specified in *message*). The height of the box is determined by the number of message lines. The width of the box is the width of the longest message line, plus the response field. The response field immediately follows the text of the last message line. The size of the response field is determined by the data declaration of *response*. The window is centered if row and column are not specified or if they have values of 0.

To obtain a default response, set the response argument to the default value before calling U\_DIALOG.

You can set the window rendition using the U\_REND subroutine and the D\_RND\_DLG display rendition.

---

#### WIN

In addition, U\_DIALOG recognizes the following menu entries, which are described in [“Appendix B: Reserved Menu Entries”](#):

- E\_CLEAR
- E\_COPY
- E\_CUT
- E\_MARK
- E\_PASTE

---

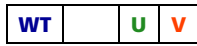
If a time-out occurs, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as “O\_TIMEOUT”.

#### Examples

This example generates a dialog box that contains a line of text and an input field for the user’s response, which will be stored in **resp**. The dialog box is placed at row 1, column 1 of the screen body and has a border. “N” is the default response.

```
resp="N"
xcall u_dialog(resp, 1, 1, D_ON,
&                "Are you sure you want to delete that file? [Y/N] ")
```

## U\_EDIT – Edit text and control line breaks in a window



```
xcall U_EDIT(window_id, text_array, [line], [character], [flags], [col_id1], [col_id2],
& [col_id3], [help_id][, decimal_value])
```

### Arguments

*window\_id*

The ID of the window that will be the container for text editing. **(n)**

*text\_array*

A System.Collections.ArrayList array for passing initial text to be inserted when U\_EDIT starts, and for returning the final state of text in the window when program control returns from U\_EDIT. (System.Collections.ArrayList)

*line*

(optional) A writable variable whose value determines the line that the cursor will be initially positioned on when U\_EDIT starts. When control returns from U\_EDIT, *line* returns the line that the cursor was on when last used for input. *Line* defaults to 1. **(n)**

*character*

(optional) A writable variable whose value determines the cursor's character position in *line* when program control moves to U\_EDIT. When control returns from U\_EDIT, *character* returns the character position last occupied by the cursor. *Character* defaults to 1. **(n)**

*flags*

(optional) A writable variable that sets one or more of the following flags and that returns the final state of these flags (except D\_EDIT\_SELECTALL, which is never returned). By default these are set to off. They are defined in **tools.def** and can be combined using .BOR. or the vertical bar (|) operator: **(n)**

|                          |                                           |
|--------------------------|-------------------------------------------|
| <b>D_EDIT_SELECTALL</b>  | Initially select all text (Windows only). |
| <b>D_EDIT_OVERSTRIKE</b> | Use overstrike mode.                      |
| <b>D_EDIT_BACKWARD</b>   | Use backward navigation.                  |
| <b>D_EDIT_SOFT</b>       | Insert soft return for ENTER.             |

*col\_id1*

*col\_id2*

*col\_id3*

(optional) The IDs of menu columns to place or remove. **(n)**

*help\_id*

(optional) A help identifier. **(a)**

*decimal\_value*

(optional) A writable variable whose value specifies an initial character to be input. This value must be passed as a decimal value for an ASCII character (e.g., pass 65 for the letter A). **(n)**

## Discussion

The U\_EDIT routine enables users to enter and edit text in a window. U\_EDIT is similar to T\_EDIT in that you control where editing starts, whether insert mode or overstrike mode is used, and the direction for certain menu entries. You can also optionally specify menu columns to load while the routine is processing, a help ID, and an initial character for input. And when control returns from U\_EDIT, it returns the line and character position last used for input, so your program can enable users to continue editing where they left off.

However, unlike T\_EDIT, the U\_EDIT routine

- ▶ preserves hard returns, and enables you to specify the kind of return (hard or soft) that is created when the user presses ENTER.
- ▶ enables you to supply initial text to be displayed when U\_EDIT starts (this text can include hard returns), and returns the resulting edited text in a way that preserves the location of hard returns. (You supply initial text in *text\_array*, and U\_EDIT returns text in *text\_array*.)
- ▶ uses System.Collections.ArrayList arrays.
- ▶ doesn't require T\_SETUP to be called for the window. If T\_SETUP has been called, its settings are ignored.

U\_EDIT uses the entire visible area of the window (*window\_id*) as the editing area. The visible area of a window is usually defined by its display area, but note that on Windows systems this can be affected by altering the container size with the WP\_SIZE subfunction of W\_PROC. To create an editing area that occupies only part of the window, turn off the window's border and make the window a child of a larger window.

---

## WIN

If the window is resized while U\_EDIT is processing (e.g., if the window has a size event and is therefore resizable by the user, or if some other asynchronous event resizes the window), the editing area is resized accordingly.

---

The maximum length for text in the editing area is 65,535 characters. On Windows, that includes two characters for every hard return and three characters for every user-inserted soft return. On UNIX and OpenVMS, a user-inserted soft return requires one character, while a hard return doesn't require a character. Note the following:

- ▶ If a user attempts to insert characters (by typing or pasting) that would cause the maximum length to be exceeded, the insertion is ignored.
- ▶ If the text supplied in *text\_array* exceeds this maximum when control moves to U\_EDIT, the text will be truncated to 65,535 characters before it's displayed. Text lost in truncation will not be returned when control returns from U\_EDIT.

If it is not possible to wrap text on a space, the text will be wrapped (with a soft return) at the character that exceeds the available width.

Hard returns are logical characters and can be deleted using any available method for deleting a character. Soft returns are not logical characters. Inserting or deleting text before a soft return (but after the preceding hard return) may remove the soft return. Furthermore, U\_EDIT does not preserve soft returns in the text it returns to the calling routine.

The window specified by *window\_id* must be the ID of a window registered and placed with Toolkit. Otherwise Toolkit will generate a U\_ABORT error.

Note the following for *text\_array*:

- ▶ When program control moves to U\_EDIT, each element of the ArrayList is converted to a string and appended as a line of text in the editing area, with a hard return between each element. (If you don't want hard returns in the text, pass all text in one element.)
- ▶ When control returns from U\_EDIT, all ArrayList elements are removed and replaced by strings that represent the updated state of each line.

Values passed as *line* and *character* set the current cursor location when program control moves to U\_EDIT, and these arguments are returned with the updated position when control returns from U\_EDIT. If *line* or *character* is not passed or contains a value that's less than 1, the default (1) is used.

Note the following for *line*:

- ▶ *Line* corresponds to an element in *text\_array*. When U\_EDIT returns, *line* contains the line number (not considering soft returns) where the cursor was last located. Note that because System.Collections.ArrayList arrays are 0-based, *line* is the *text\_array* element number for that text plus 1. It's not necessary to take this into consideration when using line in U\_EDIT calls, but you will need to account for this if you use the ArrayList outside of U\_EDIT.
- ▶ If you pass a number that's greater than the number of elements in *text\_array*, *line* is assumed to be specifying the last line. (So passing a value greater than 65535 ensures that you're specifying the last line.)

Note the following for *character*:

- ▶ *Character* is the character position within *line*, beginning at 1.
- ▶ If you pass a value that's greater than the length of the specified line, the cursor is positioned after the last character in the line. (So passing a value that's greater than or equal to 65535 ensures that the cursor will be positioned at the end of the line.)
- ▶ When U\_EDIT returns, *character* contains the position at which the cursor was last located within a line of text.

Note the following for *flags*:

- ▶ D\_EDIT\_BACKWARD determines the direction used for the following menu entries: E\_LMOV, E\_WMOV, E\_PDEL, E\_LDEL, and E\_WDEL. By default, the direction is forward, but if D\_EDIT\_BACKWARD is set to on, the direction is backward. The E\_DIR menu entry enables users to toggle the direction.
- ▶ D\_EDIT\_SOFT controls the type of line wrap inserted when the user presses ENTER. By default, ENTER inserts a hard return. If D\_EDIT\_SOFT is set to on, ENTER inserts a soft return. The E\_HARD menu entry enables users to toggle this setting.
- ▶ The E\_MODE menu entry enables users to toggle insert/overstrike mode. When text is selected on Windows, typing a character replaces the selection regardless of insert/overstrike mode.

If you pass any of the *col\_id* arguments while the global variable **g\_plc\_col\_args** is set to true, the specified columns are placed when program control moves to U\_EDIT and are removed when control returns from U\_EDIT.

---

## WIN

Note that because *col\_id* arguments are used only when **g\_plc\_col\_args** is set to true, these arguments are ignored by default on Windows. These columns are often unnecessary because they usually contain reserved menu entries that are automatically supported by Windows. Additionally, the excessive placing and removing of columns caused by the *col\_id* arguments causes Windows menu bars to “flicker.” If you want to place menu entries, we instead recommend placing them before a call to U\_EDIT and removing them after control returns from U\_EDIT.

---

If *decimal\_value* is passed as a non-zero value, it is converted to its alpha (ASCII) equivalent and placed in the window as if it were the first character entered by the user (after text supplied by *text\_array*). U\_EDIT then clears the variable passed as *decimal\_value*, which makes it easier to use U\_EDIT in a loop.

U\_EDIT calls EUTILS\_METHOD for menu entries whose names begin with U\_, and it calls EHELP\_METHOD for the O\_HELP menu entry, passing *help\_id* as the argument. (If *help\_id* is not passed to U\_EDIT, no help ID argument is passed to EHELP\_METHOD.) If an entry other than these or the entries listed below is called, control is returned to the calling routine, **g\_select** is set to true, and **g\_entnam** stores the name of the entry.



U\_EDIT recognizes the following internal menu entry names on all platforms:

|          |        |        |         |
|----------|--------|--------|---------|
| C_NEXT   | E_DIR  | E_LEFT | E_RIGHT |
| C_PREV   | E_HARD | E_MODE | E_TOP   |
| E_BOTTOM | E_ILIN | E_PDEL | E_WDEL  |
| E_CDEL   | E_JOIN | E_PMOV | E_WMOV  |

On Windows (but not with Synergy .NET), U\_EDIT also recognizes the following:

|         |         |
|---------|---------|
| E_CLEAR | E_MARK  |
| E_COPY  | E_PASTE |
| E_CUT   |         |

On UNIX and OpenVMS, U\_EDIT also recognizes the following:

|        |        |         |
|--------|--------|---------|
| E_BMOV | E_LCLR | E_XDOWN |
| E_DOWN | E_LDEL | E_XUP   |
| E_EDEL | E_LMOV |         |
| E_EMOV | E_UP   |         |

Note the following:

- ▶ The E\_ILIN menu entry inserts a hard return regardless of the way D\_EDIT\_SOFT is set.
- ▶ For the E\_LMOV, E\_EMOV, and E\_LDEL menu entries, a line is considered the text delimited by either hard or soft returns.
- ▶ For the E\_PMOV and E\_PDEL menu entries, a paragraph is considered a logical line of text (i.e., a string of text ending in a hard return).
- ▶ The E\_JOIN menu entry removes the next hard return (the return at or following the current cursor location).

For text windows that are part of a composite window, TAB and SHIFT+TAB move focus to the next or previous child, unless TAB or SHIFT+TAB is already associated with a menu entry on a placed menu column. TAB instructs U\_EDIT to signal C\_NEXT, and SHIFT+TAB instructs U\_EDIT to signal C\_PREV.

## See also

- ▶ [T\\_EDIT on page 14-4.](#)
- ▶ [System.Collections.ArrayList](#) in the “System-Supplied Classes” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ [EHELP\\_METHOD on page 7-78](#) for more information about help processing.
- ▶ [EUTILS\\_METHOD on page 7-88](#) for information about utility processing.
- ▶ “Appendix B: Reserved Menu Entries” for the functions performed by the UI Toolkit reserved menu entries.

## Examples

The following example results in a window that accepts text that can include hard and soft returns:

```
import System.Collections      ;U_EDIT uses System.Collections.ArrayList
                               ; for the text_array argument.

main

.include "DBLDIR:windows.def"
.include "WND:tools.def"

record
    text      ,@Arraylist
    wndid     ,int
    line      ,int
    char      ,int
    flags     ,int
    dchr      ,int
proc
    u_start
    .
    .
    .
    u_window(D_PLACE, wndid, 1, 1)
    text = new ArrayList()
    repeat
        begin
            xcall u_edit(wndid, text, line, char, flags,,, "help", dchr)
            if (g_select)
                using g_entnam select
                .
                .
                .
                ( ),      exitloop
            endusing
        end
    u_finish
end
```

## U\_EDITKEYS – Edit a key map



```
xcall U_EDITKEYS ([help_id])
```

### Arguments

*help\_id*

(optional) The help identifier. (a)

### Discussion

U\_EDITKEYS enables the user to create or modify the key map definitions for any terminal type. This subroutine is used by Proto to support the “Key mapping” function.

#### WIN

---

Shortcut keys are mapped to a native Windows accelerator table to enable their use. The key mapping function available through Proto or U\_EDITKEYS has an effect only on the shortcut text displayed in the menus. The actual keystrokes required for each function code are fixed, and are reflected in the MSWINDOWS key map.

---

The current key map is initially loaded when you call U\_EDITKEYS. Changes made to the current key map take effect after U\_EDITKEYS returns.

Refer to [“Customizing Key Mapping for Menu Shortcuts” on page 18-11](#) for information on editing key maps.

This subroutine recognizes the following menu entry names if they are included in a placed menu column.

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| <b>O_ACCEPT</b>   | Accept the shortcut sequence directly.                     |
| <b>O_CANCEL</b>   | Cancel changes.                                            |
| <b>O_CHGTERM</b>  | Change which terminal key map is being modified.           |
| <b>O_COPYTERM</b> | Copy a terminal key map definition.                        |
| <b>O_DELTERM</b>  | Delete a terminal key map definition.                      |
| <b>O_EXIT</b>     | Exit and save all changes.                                 |
| <b>O_HELP</b>     | Call the EHELP_METHOD subroutine and pass <i>help_id</i> . |
| <b>S_UP</b>       | Move to the previous selection window item.                |

|                |                                                    |
|----------------|----------------------------------------------------|
| <b>S_DOWN</b>  | Move to the next selection window item.            |
| <b>S_LEFT</b>  | Move to the selection item in the previous column. |
| <b>S_RIGHT</b> | Move to the selection item in the next column.     |

Any other menu entries cause U\_EDITKEYS to return with **g\_select** set to true and **g\_entnam** set to the selected menu entry.

On Windows, U\_EDITKEYS cannot time out.

On UNIX and OpenVMS, if a time-out occurs, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. See [“g\\_time\\_entry” on page 18-5](#).

## Examples

The following subroutine provides the entire “Key mapping” utility included in Proto.

```
subroutine keymap
.include "WND:tools.def"
record
    colid ,i4
proc
    xcall e_enter                ;Enter new environment
    xcall m_column(D_REMOVE, D_LOCAL) ;Remove all local columns
    xcall m_ldcol(colid, g_utlib, "c_editkeys");Load key editing column
    xcall m_defcol(9)            ;Make it default column
    xcall u_editkeys             ;Call edit routine
    xcall e_exit                 ;Exit environment
    xreturn
endsubroutine
```

## U\_EDITREND – Create and modify rendition schemes



```
xcall U_EDITREND([filename], [number], [description], [windows], [areas],
&                [field_numbers][, help_id])
```

### Arguments

*filename*

(optional) The name of the rendition file in which to save the rendition schemes. **(a)**

*number*

(optional) The number of user renditions to change. The default is 0. **(n)**

*description*

(optional) The array of user rendition descriptions to load in the “Select Screen Area” selection window. If *description* is not passed and user renditions are to be changed, the default descriptions (“User rendition X”) will be supplied. **(a)**

*windows*

(optional) The array of window IDs for the user renditions to load in the “Sample Windows” window on UNIX or OpenVMS. (This is ignored on Windows.) Each window will be placed on the screen at its default position. **(n)**

*areas*

(optional) The array of the screen areas within *windows* that will be affected on UNIX or OpenVMS. (This is ignored on Windows.) These areas can be added together for combined effects. If *areas* is 0, then none are affected. The default is all three areas. **(n)**

**D\_RND\_AREA**      Processing area.

**D\_RND\_BRDR**      Border area.

**D\_RND\_TITLE**      Title area.

*field\_numbers*

(optional) The array of field numbers within *windows* that will be affected on UNIX or OpenVMS. The default is none. (This is ignored on Windows.) **(n)**

**WFN\_ALL**              Affect all fields.

*help\_id*

(optional) The help identifier. **(a)**

## Discussion

The U\_EDITREND subroutine enables the user to create or modify rendition schemes and save them to a rendition file.

U\_EDITREND affects the default and user renditions referenced in the U\_REND subroutine section. (These renditions, as listed in the **tools.def** file, are D\_RND\_MNU\_ENA through D\_RND\_USER\_5).



U\_EDITREND cannot set

- ▶ the Input Field Processing rendition on Windows. (It can on UNIX and OpenVMS).
  - ▶ the following on any platform: Disabled Input Field, Read-only Input Field Display, and Read-Only Field Processing. (These can be set only by U\_REND and can be set only on UNIX and OpenVMS.)
- 

This subroutine is used by Proto to support the task of editing renditions. See [“Using the Renditions window \(Windows\)” on page 18-41](#) for more information.

## WIN

---

In Windows environments, U\_EDITREND invokes the Renditions Control where users can graphically modify and maintain window system renditions. See [“Customizing the Look of Your Application” on page 18-27](#) for more information on editing renditions in a Windows environment.

---

If *filename* doesn't exist, it is created. If *filename* is not specified, UI Toolkit searches for the rendition file as follows:

- ▶ If the environment variable DTKRNDFIL is defined, the rendition filename is the value of DTKRNDFIL.
- ▶ If DTKRND is defined instead of DTKRNDFIL, the rendition file is opened as **DTKRND:dtkrnd.ism**.
- ▶ If neither environment variable is defined, **dtkrnd.ism** is opened in the current directory.

If *windows* is not specified and user renditions are used, default sample windows are created. All created windows are deleted upon exit.

U\_EDITREND recognizes the following menu entry names if they are included in a placed menu column:

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| <b>O_CANCEL</b>   | Cancel changes to area with which you are working.         |
| <b>O_EXIT</b>     | Exit and save all changes.                                 |
| <b>O_HELP</b>     | Call the EHELP_METHOD subroutine and pass <i>help_id</i> . |
| <b>O_DEFAULT</b>  | Set renditions to their default values.                    |
| <b>O_LDSCHEME</b> | Load rendition schemes from the rendition file.            |

|                   |                                                                |
|-------------------|----------------------------------------------------------------|
| <b>O_PALETTE</b>  | Modify a color palette.                                        |
| <b>O_RESET</b>    | Reset to the working rendition scheme that was saved on entry. |
| <b>O_RMScheme</b> | Remove a rendition scheme from the rendition file.             |
| <b>O_STScheme</b> | Store rendition schemes to the rendition file.                 |
| <b>S_UP</b>       | Move to the previous selection window item.                    |
| <b>S_DOWN</b>     | Move to the next selection window item.                        |
| <b>S_LEFT</b>     | Move to the selection item in the previous column.             |
| <b>S_RIGHT</b>    | Move to the selection item in the next column.                 |

Any other menu entries cause this subroutine to return with **g\_select** set to true and **g\_entnam** set to the selected menu entry.

O\_EXIT causes U\_EDITREND to return to the calling program, but it does not clear **g\_select** and **g\_entnam**. This enables a layered calling routine to continue a seamless exit.

This subroutine always stores the UI Toolkit's current renditions to the rendition file as the working rendition settings upon both entry and exit of the subroutine.

## See also

[“Customizing the Look of Your Application” on page 18-27.](#)

## Examples

The following subroutine provides the entire “Renditions” utility included in Proto.

```
subroutine editrnd
.include "WND:tools.def"
record
    colid ,i4
proc
    xcall e_enter                ;Enter new environment
    xcall m_column(D_REMOVE, D_LOCAL) ;Remove all local columns
    xcall m_ldcol(colid, g_utlib, "c_editrend") ;Load edit column
    xcall m_defcol(9)            ;Make it the default column
    xcall u_editrend             ;Edit renditions
    xcall e_exit                 ;Exit environment
    xreturn
endsubroutine
```

## %U\_ENUMWNDS – Return a list of windows in a library



```
nmwnds=%U_ENUMWNDS (channel, [max][, array])
```

### Return value

*nmwnds*

The number of windows in the window library specified by *channel*. (**^VAL**)

### Arguments

*channel*

A window library channel. (**n**)

*max*

(optional) Maximum number of window names to return. (**n**)

*array*

(optional) The first element in an array for returned names. (**a**)

### Discussion

The %U\_ENUMWNDS function returns the number of windows in a window library and optionally returns the window names.

*Channel* must be an open file channel for a window library. If it isn't open, Toolkit will generate a runtime error ("Channel has not been opened"), and if the file that *channel* is open on is not a window library, unpredictable behavior will result.

If *max* is less than the number returned in *nmwnds*, not all window names will be returned in *array*. If *max* is not passed or is less than 1, *array* is ignored.

If *max* is passed and is greater than zero, *array* must be the first element of an array (pseudo or real) of at least *max* elements.

If any read failure occurs (other than EOF), Toolkit generates a trappable runtime error.

### Examples

The following example returns (in **num\_windows**) the number of windows in the specified channel (**chan**), and it returns the names of the windows in **names**.

```
num_windows = %u_enumwnds(chn, max_names, names)
```



## U\_FINISH – Terminate the UI Toolkit environment



```
xcall U_FINISH([no_clear][, cancel])
```

### Arguments

*no\_clear*

(optional) The flag that determines whether or not the screen will be cleared: **(n)**

**D\_NOCLR**                      Don't clear screen.

*cancel*

(optional) Returned true if the close method subroutine cancels the shutdown. **(n)**

### Discussion

U\_FINISH shuts down the UI Toolkit environment. It purges all channels U\_START or U\_OPEN opened in output mode except the terminal (if it was opened by U\_START). U\_FINISH is called by your application. It is also called internally by UI Toolkit.

If you have used E\_METHOD to register an ECLOSE\_METHOD with the environment, U\_FINISH calls that ECLOSE\_METHOD to perform any additional processing before shutting down the application.

If you pass *cancel*, it is passed on to your ECLOSE\_METHOD. If you want your ECLOSE\_METHOD to cancel termination, have it set *a\_cancel* to true, and it will get passed back to your application through *cancel*.

If you do not pass *cancel*, your ECLOSE\_METHOD will not have the opportunity to cancel the shutdown.

U\_FINISH's default is to clear the screen when Toolkit processing is terminated. If you pass D\_NOCLR, the screen will not be cleared.

On Windows, if the application has previously called U\_START and interrupt is enabled, the user can also close the application through the System-menu box or with the interrupt key. In both cases, UI Toolkit will internally call U\_FINISH.

### See also

[E\\_METHOD on page 7-38](#) and [ECLOSE\\_METHOD on page 7-63](#) for more information about environment-level events (such as shutting down the application).

## Examples

The following example terminates Toolkit processing without clearing the screen.

```
xcall u_finish(D_NOCLR)
```

## U\_FLASH – Flash a message window



```
xcall U_FLASH([channel], window_name, [window_id][, flag])
```

### Arguments

*channel*

(optional) The channel of the window library containing the window to flash. **(n)**

*window\_name*

The name of the window to load from the window library. **(a)**

*window\_id*

(optional) Returned with the window ID. **(n)**

*flag*

(optional) A flag returned non-zero if the specified window is not found. **(n)**

### Discussion

The U\_FLASH subroutine flashes a message window on the screen.

The window will be loaded (if it's not already) and placed. The current message window renditions will be applied to the window. The screen will be updated in order to make the window visible. The window will then be removed upon the next screen update.

The window will be deleted when the current environment is exited, or it may be explicitly deleted with the U\_WINDOW subroutine.

This subroutine is ideal for handling “Please wait” type messages because any input or other visible change to the screen will remove the message. However, if *window\_id* is passed, the calling routine can place or remove the window at will after this subroutine is called.

If *channel* is not passed, **g\_utlib** will be used.

### Examples

This example will try to load the window named “wait” from the window library opened on **g\_utlib**. If the window is found, **nofind** will be returned as zero, the *window\_id* will be returned in **wndid**, and the window will be displayed on the screen until the next screen update occurs.

```
xcall u_flash(g_utlib, "wait", wndid, nofind)
```

## U\_FLD – Accept one field from the terminal



```
xcall U_FLD(data_area, [window_id], [row], column \ field#, [paint], [length],
&          [begin_position], [mode], [help_id][, wait_time])
```

### Arguments

*data\_area*

(required if *row* is passed) Returned with the set of characters that was input. **(a)**

*window\_id*

(optional) The ID of the window (created by U\_LDWND) from which the input will come. **(n)**

*row*

(optional) The window row from which this subroutine will be reading. **(n)**

*column* or

*field#*

The column (if *row* is also specified) from which to read or the field number (if *row* is not specified) at which to do the input. **(n)**

*paint*

(optional) The paint character. **(a)**

*length*

(optional) The initial data length and is returned with the final data length on exit. **(n)**

*begin\_position*

(optional) The initial field position and is returned with the final input position on exit. **(n)**

*mode*

(optional) An insert/overstrike mode variable. This is ignored in Windows environments. **(n)**

**0** Overstrike. (default)

**1** Insert.

*help\_id*

(optional) The help identifier. **(a)**

*wait\_time*

(optional) The time-out limit for I/O processing to be completed before returning to the calling routine. (**n**)

**D\_FOREVER** or **-1**                      Never time out.

**D\_GLOBAL** or **-2**                      Use the global value (see “[g\\_wait\\_time](#)” on page 18-6).  
(default)

**D\_IMMEDIATE** or **0**                      Time out immediately.

*n*                                              Wait up to *n* seconds (where *n* is a positive value) for I/O  
processing to be complete.

## Discussion

The U\_FLD subroutine accepts a set of characters from the terminal.

U\_FLD is designed to perform field input in a non-input window. You cannot use it with an input window (one defined by the .INPUT script command or by the IB\_INPUT subroutine). See [I\\_INPFLLD on page 8-53](#) and [I\\_INPUT on page 8-57](#) for information about performing input in an input window.

This subroutine allows menu or shortcut processing.

If *window\_id* is not present, the current input window will be used.

If you want input performed at a specific row and column within the window, pass a non-zero value to *row* and the column number as the next argument (which UI Toolkit will assume to be *column*). Together these two arguments define the position within the window at which to do the input. This is known as a “position-mode call.”

When processing a position-mode call, the *data\_area* argument is required and specifies the maximum length of the input. If no field set is defined, UI Toolkit will create and use one with a single field.

If you want input performed on a field number, omit *row* and pass the window field number as the following required argument. (When *row* is not passed, UI Toolkit assumes this next argument to be the *field#*). This is known as a “field-mode call.”

When processing a field-mode call, the *data\_area* field is optional. If *data\_area* is not present, it is the responsibility of the calling routine to ensure that the specified field’s contents match the passed parameters and to retrieve the input data from the window field upon completion of the call. The maximum width of the input is determined by the length of the specified window field, regardless of the size of any *data\_area* that is specified.

If *length* is present, it is the number of data characters in the field upon entry and exit. The initial data length in the field will be *length*’s entering value. On exit, *length* will be loaded with the final data length.

If *length* is not specified, the entering data length is assumed to be 0.

If the entering data length is non-zero, the number of characters from *data\_area* are placed in the leftmost part of the field before the initial input.

If *begin\_position* is present, it is the position of input within the field upon entry and exit. The initial input will begin at this character position (a value of 1 means the input position is at the field's first character, 2 means it's at the second character, and so forth). On exit, *begin\_position* will be loaded with the final input position.

If *begin\_position* is not present or has a value of zero, the initial position will be the initial data length plus one.

If *mode* is present and non-zero, the input will be performed in insert mode. Any characters at and to the right of the initial input position (as determined by the entering data length and the initial position) will be “pushed around” as data is entered and deleted during input.

---

### UNIX, VMS

If *mode* is not present or has a value of zero, input will be performed in overstrike mode. Characters to the right of the input position will be replaced by entered characters, while characters to the left will be replaced by the paint character on deletes.

---

---

### WIN

In addition, U\_FLD recognizes the following menu entries, which are described in [“Appendix B: Reserved Menu Entries”](#):

- E\_CLEAR
- E\_COPY
- E\_CUT
- E\_MARK
- E\_PASTE

---

On return, if **g\_select** is set, a menu entry has been selected, and **g\_entnam** contains the name of the selected entry. If the selected menu entry begins with “U\_” the EUTILS\_METHOD subroutine is called and the input is redone. If the selected menu entry is “O\_HELP,” the EHELP\_METHOD subroutine is called, with the *help\_id* as its argument.

You will need to clear **g\_select** after you satisfy the event.

The field **gi\_sts** will be loaded with the type of the input. If the input is NORMAL\_INPUT (zero), the input was terminated normally by a ENTER. If **gi\_sts** is non-zero, the input was terminated by a special entry.

If the operation times out, **g\_select** is set to true and **g\_entnam** set to the entry name specified in **g\_time\_entry**, which is defined in **tkctl.def**. See [“g\\_time\\_entry” on page 18-5](#).

## Examples

The first example returns the set of characters that was input to the variable **custnam**. This input comes from the 4th field of the window whose ID is stored in **wndid[i]**.

```
xcall u_fld(custnam, wndid[i],, 4)
```

The second example also returns the characters that were input to **custnam**. Input comes from the current input window at position (15,30). The routine passes the identifier “cushelp” to the EHELP\_METHOD subroutine.

```
xcall u_fld(custnam,, 15, 30,,,, "cushelp")
```

U\_FMTDAT – Format a date value into an alpha date string



```
xcall U_FMTDAT (type, date, [year], [month \ julian_day], [day], [justify], [order]
&                [, separator])
```

Arguments

*type*

The code for the type of date format: **(n)**

| Code | Default display | Storage format |
|------|-----------------|----------------|
| 1    | PP/YY           | YYPP           |
| 2    | MM/DD/YY        | YYJJJ          |
| 3    | MM/DD/YY        | YYMMDD         |
| 4    | PP/YYYY         | YYYYPP         |
| 5    | MM/DD/YYYY      | YYYYJJJ        |
| 6    | MM/DD/YYYY      | YYYYMMDD       |

*date*

Returned with the formatted date. **(a)**

*year*

(optional) The year of the date or the entire date in storage format. **(n)**

*month or  
julian\_day*

(optional) The month of the date if *type* 1, 3, 4, or 6 is specified. It is the Julian day if *type* 2 or 5 is specified. **(n)**

*day*

(optional) The day of the date if *type* is 1, 3, 4, or 6 and if month is passed. *Types* 2 and 5 ignore *day*. **(n)**

*justify*

(optional) The left-justification flag: **(n)**

**D\_LEFT**



*order*

(optional) The code for the date order. It is applicable for *types* 2, 3, 5, and 6. The codes are as follows: (**n**)

- 0**        Month, day, year (default)
- 1**        Day, month, year
- 2**        Year, month, day

*separator*

(optional) The separator between parts of the date (e.g., a slash between day, month, and year). (**a**)

## Discussion

The U\_FMTDAT subroutine formats separate date values into an alpha date string.

If *type* is **2** or **5** (YYYY or YYYYJJJ) and you omit *year* but pass *julian\_day*, U\_FMTDAT will use the day passed and default to use the current year. If *year* is passed but *julian\_day* is omitted, U\_FMTDAT assumes *year* contains the entire date in storage format. If neither argument is passed, U\_FMTDAT defaults to use the current system date.

If *type* is **1**, **3**, **4**, or **6** and if *year* is not passed, *month* and *day* will be ignored and U\_FMTDAT will default to use the current system date. (If you omit all three arguments, U\_FMTDAT will also default to use the current date.) If *year* is passed but *month* is not, *day* is ignored and *year* is assumed to be the entire date in storage format.

The returned format for *types* **2**, **3**, **5**, and **6** is further controlled by the value of *order*. *Order* determines the order of their date components. The default value for *order* is the value in **g\_date\_order** (defined in **tkctl.def**).

The separator for all format types will be loaded from *separator*. The default value for *separator* is the value in **g\_date\_sep**, which is defined in **tkctl.def** and is initialized by U\_START to a forward slash (/).

If *type* is **5** or **6**, and the length of *date* is exactly 8, a two-digit year will be displayed.

## See also

DATE/NODATE on [page 2-54](#) for more information about date processing. DATE and NODATE are qualifiers for the .FIELD command.

## Examples

In the following example, the date (returned in **date**) is left-justified and formatted as *DD-MM-YY*.

```
xcall u_fmtdat(2, date, yr, mn, dy, D_LEFT, 1, "-")
```

In the next example, the date is returned in **date**. **Stor** contains the entire date in storage format in the form *YYYYJJJ*.

```
xcall u_fmtdat(5, date, stor)
```

## U\_FMTTIM – Format a time value into an alpha time string



```
xcall U_FMTTIM(type, time, [hour], [minute], [second], [justify][, separator])
```

### Arguments

*type*

The type of time format. The codes are as follows: **(n)**

- 1**        *HH:MM*
- 2**        *HH:MM am/pm*
- 3**        *HH:MM:SS*
- 4**        *HH:MM:SS am/pm*

*time*

Returned with the formatted time. **(a)**

*hour*

(optional) The hour of the time or the entire time in storage format. **(n)**

*minute*

(optional) The minute of the time. **(n)**

*second*

(optional) The second of the time. **(n)**

*justify*

(optional) The left-justification flag: **(n)**

**D\_LEFT**

*separator*

(optional) The separator between parts of the time (for example, a colon between hour, minute, and second). **(a)**

### Discussion

The U\_FMTTIM subroutine formats separate time values into an alpha time string.

If *hour* is not passed, the current system time is assumed.

If *hour* is passed but *minute* is not passed, *second* is ignored and *hour* is assumed to be the entire time in storage format.

The type of storage format is defined by *type* as follows:

**1 or 2** HHMM

**3 or 4** HHMMSS

The separator for all of the format types will be loaded from *separator*. The default value for *separator* is the value in **g\_time\_sep**, which is defined in **tkctl.def** and initialized by U\_START to a colon (:).

The meridian indicators are the text defined in the UI Toolkit message file as facility DTK, mnemonics “AM” and “PM,” respectively. The actual text is “AM” and “PM,” but can be modified.

## Examples

In the following example, the time (returned in **time**) is left-justified and formatted as *HH:MM* AM/PM.

```
xcall u_fmttim(2, time, hr, mn,, D_LEFT)
```

In the second example, the time is returned in **time**, formatted as *HH:MM:SS* AM/PM. **Stor** contains the entire time in storage format in the form *HHMMSS*.

```
xcall u_fmttim(4, time, stor)
```

## U\_FNDFIL – Search for a file



```
xcall U_FNDFIL([filename], [mode], [channel], [base_channel][, I/O_mode])
```

### Arguments

*filename*

(optional) The name of the file to find. **(a)**

*mode*

(optional) The mode in which the file is opened. **(a)**

*channel*

(optional) Returned with the channel on which the file is opened. **(n)**

*base\_channel*

(optional) The base channel examined in the search for a file. **(n)**

*I/O\_mode*

(optional) Returned with the mode of the found file. **(a)**

### Discussion

The U\_FNDFIL subroutine searches for a file and determines if it is already open.

This subroutine enables you to search for a file yourself and is most useful when you are converting existing applications. U\_OPEN can perform this file searching automatically.

If *filename* is omitted or blank, U\_FNDFIL searches for the file specified in the last U\_FNDFIL call. If there's no previous call, U\_FNDFIL returns a value of 0 for *channel* and returns *I/O\_mode* as blank.

If *mode* is omitted or blank, the first channel on which the file is opened, regardless of *I/O\_mode*, is returned.

*Channel* is returned with a value of 0 if the file or the mode is not found. If channel is omitted, U\_FNDFIL will not perform a search.

If you specify *base\_channel*, all channels less than or equal to *base\_channel* will not be examined for the *filename*. If you do not specify *mode*, U\_FNDFIL will find the first channel after *base\_channel*. You can thus create a loop, using a *base\_channel* specification to get past the previous channel that was examined until the file is found.

## Examples

The first example looks for a file “cusmas” that was opened in mode “I:I” and returns the channel on which the file is opened in variable **cuschn**.

```
xcall u_fndfil("cusmas", "i:i", cuschn)
```

The second example also looks for “cusmas” and returns the channel on which the file is opened in **cuschn**, but it also returns the I/O mode of the file in variable **iomode**.

```
xcall u_fndfil("cusmas",, cuschn,, iomode)
```

The third example looks for the file named “cusmas” opened in mode “I:I,” ignoring channels 1 through 3 and beginning with channel 4. It returns the channel on which the file is opened in **cuschn**.

```
xcall u_fndfil("cusmas", "i:i", cuschn, 3)
```

## U\_GBLCHN – Give channel global status



```
xcall U_GBLCHN(channel)
```

### Arguments

*channel*

The channel to be promoted. (**n**)

### Discussion

The U\_GBLCHN subroutine promotes a local channel to global status.

A global channel stays open even after the environment that opened it is exited.

If *channel* is local, but not local to the current environment, a fatal error occurs. If *channel* is already global, this subroutine is ignored.

### Examples

In the following example, the variable **archn** is returned with the allocated channel, and the U\_GBLCHN subroutine promotes the channel stored in **archn** to global status.

```
xcall u_open(archn, "i:i", "aropen")
xcall u_gblchn(archn)
```

## U\_GBLWND – Give window global status



```
xcall U_GBLWND(window_id)
```

### Arguments

*window\_id*

The ID of the window to be promoted. (**n**)

### Discussion

The U\_GBLWND subroutine promotes a local window to global status.

A global window is not deleted even when the environment that created it is exited.

If *window\_id* is not local to the current environment, a fatal error occurs. If *window\_id* is already global, this subroutine is ignored.

When promoting an input window to global status, any selection windows associated with the SELECT qualifier of the .FIELD command will also be promoted.

However, if an associated selection window was linked to an input field using the SELWND qualifier of the .FIELD command or the I\_FLDSEL subroutine, UI Toolkit cannot guarantee that the associated selection window was created in the current environment. In this situation, you must promote the selection window yourself.

### Examples

In the following example, the variable **wndid** is returned with the allocated channel, and the U\_GBLWND subroutine promotes the window whose ID is stored in **wndid** to global status.

```
xcall u_ldwnd(wndid, g_utlib, "cusmas")  
xcall u_gblwnd(wndid)
```



## U\_GETCHN – Obtain a channel



```
xcall U_GETCHN(allocated_channel, [global], requested_channel)
```

### Arguments

*allocated\_channel*

Returned with the allocated channel. (**n**)

*global*

(optional) The global flag: (**n**)

**D\_GLOBAL**            Allocate as global.

*requested\_channel*

(optional) The channel number requested. (**n**)

### Discussion

The U\_GETCHN subroutine obtains a channel for your own use.

If D\_GLOBAL is present, the channel is allocated as global rather than local (meaning that it has to be explicitly purged rather than being purged implicitly upon exit from the current environment). U\_FINISH will purge the global channels.

If you do not specify *requested\_channel*, the channel returned in *allocated\_channel* is the first channel available. *Allocated\_channel* is returned as 0 if *requested\_channel* is not available for usage. If *requested\_channel* is specified and available, it is used.

You can use this subroutine in conjunction with specifying U\_OPEN's D\_NOALLOC flag. Its primary use is in converting existing applications. If you allocate channels ahead of time and make them global, your existing logic will work.

We recommend that you use U\_GETCHN only when converting your applications to use UI Toolkit. Channel allocation is best handled by UI Toolkit's U\_OPEN subroutine and this subroutine can help you coincide your application's current channel usage with U\_OPEN's future channel allocation. During conversion, you can request a certain channel number (with *requested\_channel*) and then have U\_OPEN use *that* channel rather than allocating a new one.

After conversion, we recommend that you don't use U\_GETCHN to explicitly allocate channels. Allowing U\_OPEN to maintain channel usage will help you keep your application modular.

### See also

[U\\_RLSCHN](#) on page 16-128 for information about releasing channels allocated with U\_GETCHN.

## Examples

The following example allocates channel 15 and logs it as a global channel.

```
xcall u_getchn(chn, D_GLOBAL, 15)
```

The second example gets the first available channel as a local channel.

```
xcall u_getchn(chn)
```

## %U\_GETFILENAME – Prompt user for filename



```
status = %U_GETFILENAME (filename, title, [#filters], [filter_desc], [filters], [default_name],
&                        [extension], [input_column], [select_column], [list_column],
&                        [help_id][, option, ...])
```

### Return value

*status*

On Windows, %U\_GETFILENAME returns the filter index (1-based) that is returned by the Microsoft Open or Save As dialog box, or it returns false if the Cancel button is pressed on the dialog box or if the dialog box returns an error. On UNIX and OpenVMS, it returns true if a filename is selected, and it returns false if no filename is selected or an error occurred. (^VAL)

### Arguments

*filename*

Returned with the entered or selected filename. (a)

*title*

The title for the input window or dialog box. (a)

*#filters*

(optional) The number of file filters for browsing. (n)

*filter\_desc*

(required if #filters passed) The array of filter descriptions. (a)

*filters*

(required if #filters passed) The array of filters. (a)

*default\_name*

(optional) The default filename. (a)

*extension*

(optional) The default extension. (a)

*input\_column*

(optional) The ID of the input column. (n)

*select\_column*

(optional) The ID of the selection column. (n)

*list\_column*

(optional) The ID of the list column. **(n)**

*help\_id*

(optional) The help identifier. **(a)**

*option*

(optional) One or more of the following option flags for Windows platforms. For traditional Synergy, you can pass more than one option by combining options with .BOR. or the vertical bar (|) operator. For Synergy .NET, only D\_OFN\_SAVEAS is supported. **(n)**

**D\_OFN\_CENTER** Center dialog box over application window.

**D\_OFN\_NONETWORK** No Network button.

**D\_OFN\_SAVEAS** Save as, instead of Open.

**D\_OFN\_NOTRANS** Don't translate logicals.

## Discussion

The %U\_GETFILENAME function pops up a dialog box or window that enables the user to select a file either by entering a filename in a field or by browsing and then selecting a filename from a list. Note that to actually open the selected file, your program must call U\_OPEN.

If the user selects a filename, **g\_select** is set to false. Otherwise, **g\_select** is set as follows:

- ▶ If the user pressed the “Cancel” button, **g\_select** will be false. (Windows only)
- ▶ If the user selected the “O\_EXIT” or “O\_ABANDON” menu entry, **g\_select** will be false.
- ▶ If the user selected some other menu entry that is not recognized by %U\_GETFILENAME, **g\_select** will be true.

In Windows environments (traditional Synergy and Synergy .NET), %U\_GETFILENAME calls the standard file “Open” or “Save as” dialog box, and users can change directories as they browse.

On UNIX and OpenVMS, %U\_GETFILENAME goes through two or three stages:

1. It opens a window with the “File” input field. The user can either enter a filename into this field or “browse” files. To browse, the user presses ENTER on the empty field or selects the menu entry “O\_BROWSE.” (You must include “O\_BROWSE” on one of your menus to make it available.) The browse is limited to the initial directory.

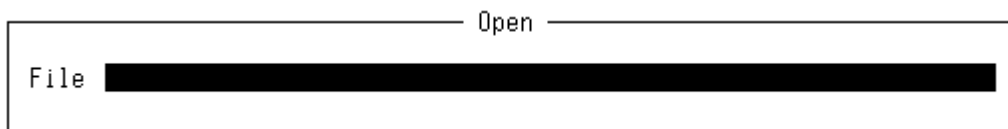


Figure 16-3. Stage 1.

2. (optional) If you passed the filter arguments (*#filters*, *filter\_desc*, and *filters*) and if *#filters* is greater than one, when the user requests a browse, %U\_GETFILENAME will display a filter description box. The user can select one of the filters, or select either the “O\_EXIT” or “O\_ABANDON” menu entry to return to the “File” input field. (These menu entries must be included on one of your menus.)

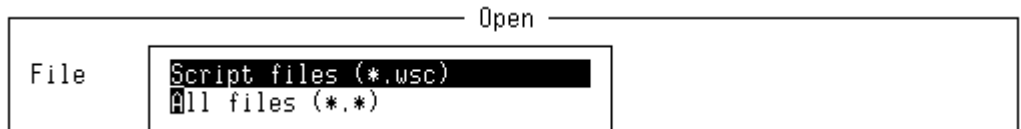


Figure 16-4. Stage 2.

3. %U\_GETFILENAME removes the filter description box (if displayed) and displays a file browse box containing the filenames associated with the selected filter. The title of the browse box is the filter description. The user can select a file, or select “O\_EXIT” or “O\_ABANDON” to go back to the previous input point (which would be either the filter description box or the “File” input field).



Figure 16-5. Stage 3.

On UNIX and OpenVMS, %U\_GETFILENAME uses `L_INPUT` to process the “File” input field, `S_SELECT` to process filter selections, and `L_SELECT` for the file browser box. So you can use reserved menu entries for these routines when %U\_GETFILENAME is using them. For example, you can use the reserved menu entries for `S_SELECT` while your program processes filter selections. To use reserved menu entries for these routines, pass *input\_column*, *select\_column*, or *list\_column* with the name of the menu column that contains the entries.

%U\_GETFILENAME does not time out on Windows. On UNIX and OpenVMS, if a time-out occurs, `g_select` is set to true and `g_entnam` is set to the entry name specified by `g_time_entry` (see “[g\\_time\\_entry](#)” on page 18-5).

#### ***filename***

*Filename* is returned with the name of the selected file—whether entered directly into the “File (Name)” field or selected from the file browse box. If the user entered the filename into the “File (Name)” field, the returned *filename* also will contain any path specification explicitly typed. Native path specification or standard Synergy DBL logical translation (in the form of *LOGICAL:filename*) is supported.

If the variable passed as *filename* is not big enough to hold the full path specification, %U\_GETFILENAME returns false, and *filename* will be blank. We recommend a variable size of 256.

---

#### **WIN**

In a Windows environment, if the user enters a filename but no path, the current path of the dialog box will be prefixed to the returned *filename*. When the user first enters the dialog box, the initial path will be

- ▶ the path contained in *default\_name*.
- ▶ the current working directory if no path is specified in *default\_name* or if *default\_name* is not passed.

(Remember, however, that in Windows environments the user may change the directory of the dialog box.)

---

#### **UNIX, VMS**

In UNIX and OpenVMS environments, if the user doesn’t include a path when entering the filename into the “File” field, any path contained in *default\_name* will be prefixed to the returned *filename*.

---

#### ***title***

- ▶ On Windows, *title* becomes the title for the “Open” or “Save as” dialog box.
- ▶ On UNIX and OpenVMS, *title* becomes the title for the input window containing the “File” input field.

#### ***#filters, filter\_desc, and filters***

If *#filters* is passed, the *filter\_desc* and *filters* arguments are required. If you do not pass the *#filters* argument, *filter\_desc* and *filters* are ignored if they are passed.

*Filter\_desc* must be an alphanumeric array of at least *#filters* elements. Each element must contain the description for one of the *filters*.

*Filters* must also be an alphanumeric array of at least *#filters* elements. The elements in the *filters* array contain the filters themselves. Be sure to use the appropriate form for your application's system when specifying the elements in filters. For example, if an application generates script files, one of the filter elements might be \*.wsc.

If *#filters* is not passed, the file browse box will contain all files and the filter description box will contain only the "All files (\*.\*)" filter.

---

## UNIX, VMS

In UNIX and OpenVMS environments, the file browse box is built as a list with the filter description as the list's title.

---

### ***default\_name***

If *default\_name* is passed, *filename* will be returned with the contents of *default\_name* if the user doesn't select a filename.

If *default\_name* is not passed and the user doesn't select a filename, the contents of *filename* will be blank.

*Default\_name* can include a complete path name (directory and filename). If no path is specified, %U\_GETFILENAME searches for the default filename in the current working directory. You can use native path specification or standard Synergy DBL logical translation (in the form of *LOGICAL:filename*) as the path specification in *default\_name*. See "filename" above for ramifications of including a path name.

### ***extension***

If *extension* is passed, when the user enters a filename without an extension into the "File (Name)" field, %U\_GETFILENAME will append a period (".") followed by *extension* to the returned *filename*. If the user selects a file from the file browse box, *extension* is ignored.

---

## UNIX, VMS

### ***input\_column, select\_column, and list\_column***

If *input\_column* is passed, that column is placed before and removed after performing input to the "File (Name)" field.

If *select\_column* is passed, that column is placed before and removed after processing the filter description box.

If *list\_column* is passed, that column is placed before and removed after processing the file browse box.

#### ***help\_id***

If you pass *help\_id*, %U\_GETFILENAME will pass it to the current input routine. The current input routine will be

- ▶ I\_INPUT if the “File (Name)” field is active.
  - ▶ S\_SELECT if the filter description box is active.
  - ▶ L\_SELECT if the file browse box is active.
- 

#### **WIN**

---

##### ***option***

D\_OFN\_CENTER centers the dialog box over the application window, which matches behavior on UNIX and OpenVMS. Default positioning on Windows is determined by Windows Common Dialogs and is generally in the upper left-hand corner of the screen.

D\_OFN\_NONETWORK suppresses the inclusion of the “Network” button in the dialog box. This button is included by default. If included, it enables the user to browse other file systems connected to the current system.

D\_OFN\_SAVEAS indicates that the standard “Save as” dialog box should be used instead of the “Open” dialog box. %U\_GETFILENAME uses the “Open” dialog box by default.

D\_OFN\_NOTRANS indicates that any logicals entered by the user should not be translated in the filename that is returned.

---



## U\_GETTXT – Get text from the text library



```
xcall U_GETTXT (facility, text_number, text[, text_length])
```

### Arguments

*facility*

The name of the facility to choose from in the text message library. **(a3)**

*text\_number*

The text message number. **(n)**

*text*

Returned with the message text. **(a)**

*text\_length*

(optional) Returned with the length of the text. **(n)**

### Discussion

The U\_GETTXT subroutine gets a line of text from the text message library.

The text message library is opened by U\_START. It contains all Toolkit error and text messages, as well as any customized messages you add using the Synergy UI Toolkit Control Panel.

The facility name for Toolkit text messages is DTK. If you've created your own facility in the text message library, use your own unique *facility* name.

The maximum size of Toolkit messages is 200 characters.

### See also

See [“The Synergy UI Toolkit Control Panel”](#) in the “General Utilities” chapter of *Synergy Tools* for information on determining the text message file in use and for information on using the Synergy UI Toolkit Control Panel for customizing text messages.

### Examples

The following example uses the UI Toolkit error “A window with that name already exists” as its own error message.

```
subroutine create_window
    a_name    ,a    ;Window name to create

    .include "WND:tools.def"
    .include "WND:dtkmsg.def"
```

## Utility Routines

### U\_GETTXT

```
record
    sts      ,i4
    len      ,i4
    text     ,a200
    .
    .
    .
proc
    call chk_if_exists      ; If it exists, sts set to 1
    if (sts)
        begin
            xcall u_gettxt("DTK", DTK_DUPNAME, text, len) ;DTK_DUPNAME
            xcall u_message(text(1:len))                  ; is defined in dtkmsg.def
            xreturn
        end
    .
    .
    .
endsubroutine
```

## %U\_GETWNDERR – Get a window system error



```
window_error = %U_GETWNDERR ([text])
```

or

```
xcall U_GETWNDERR ([text])
```

### Return value

*window\_error*

The window system error. (^VAL)

### Arguments

*text*

(optional) Returned with the error message text. (a)

### Discussion

The %U\_GETWNDERR function returns the error number of the last window error returned as a result of Toolkit calling a Synergy windowing API routine (which it often does when you call a Toolkit routine). For information on window errors, see “[Window error messages](#)” in the “Error Messages” chapter of *Synergy Tools*.

If a Toolkit routine returns a Toolkit error, %U\_GETWNDERR returns the accompanying window error number (not the Toolkit error number) in *window\_error*. (The routine that returned the error returns the number for the Toolkit error.) For example, if you pass the error argument for L\_CLASS and Toolkit is unable to create the list class because one already exists with the name you specified, Toolkit returns the Toolkit error number (519) in the *error* argument for L\_CLASS, and it returns the window error number (14) in *window\_error*.

If you pass *text*, %U\_GETWNDERR also returns the text of the window or Toolkit error.

If no Toolkit error has been returned and no window error was returned by the last windowing subroutine call within Toolkit, *window\_error* is returned with 0 and *text* is returned blank. Note, however, that this function should only be called immediately after a Toolkit routine has signaled that a window error has been trapped. Otherwise, errors that are part of Toolkit’s normal processing may be erroneously returned, or subsequent Toolkit calls to Synergy window API routine may overwrite the error information.

### See also

See “[Window error messages](#)” in the “Error Messages” chapter of *Synergy Tools*, and see [L\\_CLASS](#) on page 9-69, [L\\_CREATE](#) on page 9-76, and [I\\_LDINP](#) on page 8-64 for Toolkit error messages.

## U\_HELPREND – Use help window renditions



```
xcall U_HELPREND (window_id)
```

### Arguments

*window\_id*

The ID of the window. (**n**)

### Discussion

The U\_HELPREND subroutine sets the renditions of the window specified by *window\_id* to the help window renditions. The default help window renditions can be set in U\_REND using the following rendition codes.

**D\_RND\_HLP\_BCK**            Help window background.

**D\_RND\_HLP\_BDR**            Help window border.

**D\_RND\_HLP\_TTL**            Help window title.

You also can use U\_EDITREND or Proto to set these renditions.

You can use U\_HELPREND within your EHELP\_METHOD subroutine to change the window's renditions before it is placed on the screen.

### See also

- ▶ [U\\_EDITREND on page 16-41.](#)
- ▶ [“Proto” on page 3-1.](#)

### Examples

```
subroutine my_help_method
    a_help_id      ,a      ;optional help identifier

    .include "WND:tools.def"

record
    colid          ,i4      ;Text editing column id
    wndid          ,i4      ;Window id
    srch           ,i4

proc
    xcall e_enter
    if (%passed(a_help_id)) then
        xcall u_ldwnd(wndid, g_utlib, a_help_id,, srch)
```

```
    else
        xcall u_ldwnd(wndid, g_utlib, "h_general",, srch)

    xcall t_setup(wndid)
    xcall u_helprend(wndid)
    xcall m_ldcol(colid, g_utlib, "c_text",, srch)
    xcall t_view(wndid)
    xcall e_exit
    clear g_select
    xreturn
endsubroutine
```

## %U\_HTMLHELP – Invoke HTML Help



```
result = %U_HTMLHELP (subfunction[, arg, ...])
```

or

```
xcall U_HTMLHELP (subfunction[, arg, ...])
```

### Return value

*result*

On Windows, %U\_HTMLHELP returns a value that is specific to *subfunction*. (For most of the subfunctions, this is the handle for the outermost Help window.) On UNIX and OpenVMS, this function always returns zero. (^VAL)

### Arguments

*subfunction*

The operation to perform. It must be one of the following (defined in **WND:tools.def**):

|                                |                                                                                                         |
|--------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>D_HH_ALINK_LOOKUP</b>       | Looks up topics for specified Alink names. See <a href="#">page 16-76</a> .                             |
| <b>D_HH_CLOSE_ALL</b>          | Closes all Help windows associated with the application. See <a href="#">page 16-78</a> .               |
| <b>D_HH_DISPLAY_INDEX</b>      | Displays the Index tab. See <a href="#">page 16-79</a> .                                                |
| <b>D_HH_DISPLAY_SEARCH</b>     | Displays the Search tab. See <a href="#">page 16-80</a> .                                               |
| <b>D_HH_DISPLAY_TEXT_POPUP</b> | Displays text in a pop-up Help window. See <a href="#">page 16-81</a> .                                 |
| <b>D_HH_DISPLAY_TOC</b>        | Displays the Contents tab. See <a href="#">page 16-84</a> .                                             |
| <b>D_HH_DISPLAY_TOPIC</b>      | Opens a Help topic. See <a href="#">page 16-85</a> .                                                    |
| <b>D_HH_GET_WIN_HANDLE</b>     | Returns the handle for the window created for a specified window type. See <a href="#">page 16-86</a> . |
| <b>D_HH_HELP_CONTEXT</b>       | Displays the Help topic for a given context ID. See <a href="#">page 16-87</a> .                        |
| <b>D_HH_KEYWORD_LOOKUP</b>     | Looks up topics for specified keywords. See <a href="#">page 16-88</a> .                                |

*arg*

(optional) One or more arguments if required for the subfunction. (**a** or **n**)

## Discussion

%U\_HTMLHELP wraps much of Microsoft's HTML Help API to enable you to access HTML Help (**.chm** files) from a Toolkit application. Each *subfunction* corresponds to an HTML Help API command. See the Microsoft documentation for the HTML Help API for more information.

## See also

[%U\\_WINHELP on page 16-169](#) for information on invoking Microsoft WinHelp from your application.

## %U\_HTMLHELP (continued)

### D\_HH\_ALINK\_LOOKUP

```
result = %U_HTMLHELP (D_HH_ALINK_LOOKUP, help_file, alinks, [window], fail_action)
```

or

```
xcall U_HTMLHELP (D_HH_ALINK_LOOKUP, help_file, alinks, [window], fail_action)
```

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file. (a)

*alinks*

One or more associative keywords (Alink names) that will be used to look up topics. You can search for multiple Alink names by passing them in a semicolon-delimited string. (a)

*window*

(optional) The name of the window type to use to display a looked-up topic or a topic specified for D\_HH\_KEYWORD\_FAIL\_PATH. (a)

*fail\_action*

One of the following, which specify how a failure to find any of the *alinks* values should be handled: (n)

**D\_HH\_KEYWORD\_FAIL\_INDEX** Display the Index tab and populate its field with the keywords.

**D\_HH\_KEYWORD\_FAIL\_MSG**, *text*[, *title*]

Pop up a message box with the text specified by *text* and with the title specified by *title*.

**D\_HH\_KEYWORD\_FAIL\_PATH**, *path*

Display the topic specified by *path*.

*text*

The text for a pop-up message box. (a)



*title*

(optional) The title for a pop-up message box. (a)

*path*

The path and filename for a topic in the HTML Help file. (a)

## Discussion

The `D_HH_ALINK_LOOKUP` subfunction looks up topics for *alinks* for the specified Help file (*help\_file*), opening the Help file if necessary. Alink names (sometimes called bookmarks) mark locations within topics, so when a looked-up topic is opened, the topic is scrolled down to the location marked by the *alinks* value.

Note the following for *help\_file*:

- ▶ You can use an environment variable to specify the path, part of the path, or the full path and filename.
- ▶ If you don't specify an extension, Toolkit assumes the extension is **.chm**.
- ▶ If the specified file does not exist, a catchable runtime error (`$ERR_FNF`) is generated.
- ▶ You cannot use an *xfServer* path (e.g., `myhelpfile.chm@myserver`) to access an HTML Help file on a remote machine. (Because of a Microsoft security feature, you may not be able to access an HTML help file on a remote machine in any case. See Synergex® KnowledgeBase article [100001779](#) for information.)

If you don't pass *window*, if *window* is not in the file specified by *help\_file*, or if you pass an empty string for *window*, the default window type for the Help file is used to display the topic.

For *path*, pass the path and filename used in the HTML Help file structure. For example, to specify the topic **my\_topic.html** in the `/my_folder/my_subfolder` directory, pass **/my\_folder/my\_subfolder/my\_topic.html** (including the first slash) for *path*. Note that if the topic specified by *path* cannot be found, **Hhctrl.ocx**, the ActiveX control for HTML Help, determines the result. This is generally a message such as "The page cannot be displayed."

## Examples

The following example looks up topics associated with the Alink name "orders". If there are no topics for this, it displays a pop-up message box with the title "Error" and the text "No topic found."

```
.define D_HELPFILE, "MYAPPDIR:bin\myhelp.chm"
.
.
.
help_handle = %u_htmlhelp(D_HH_ALINK_LOOKUP, D_HELPFILE, "orders", mywin,
&
                        D_HH_KEYWORD_FAIL_MSG, "No topic found",
&
                        "Error")
```

## **%U\_HTMLHELP (continued)**

### **D\_HH\_CLOSE\_ALL**

```
xcall U_HTMLHELP(D_HH_CLOSE_ALL)
```

#### **Discussion**

The `D_HH_CLOSE_ALL` subfunction closes all Help windows associated with the application. If this is called as a function, it always returns zero.

If `D_HH_CLOSE_ALL` has not been called when the application shuts down, it is automatically invoked, unless the program is in a chain.

## %U\_HTMLHELP (continued)

### D\_HH\_DISPLAY\_INDEX

```
result = %U_HTMLHELP (D_HH_DISPLAY_INDEX, help_file[, keyword])
```

or

```
xcall U_HTMLHELP (D_HH_DISPLAY_INDEX, help_file[, keyword])
```

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*keyword*

(optional) A keyword (index entry) to highlight on the Index tab. (a)

### Discussion

The D\_HH\_DISPLAY\_INDEX subfunction displays the Index tab for the specified Help file (*help\_file*), opening the Help file if necessary. If you pass a valid *keyword*, the keyword is highlighted on the Index tab.

### Examples

The following example displays the Index tab with the keyword “vendors” highlighted on the tab:

```
.define D_HELPFILE, "MYAPPDIR:bin\myhelp.chm"  
.  
.  
.  
help_handle = %u_htmlhelp(D_HH_DISPLAY_INDEX, D_HELPFILE, "vendors")
```

## %U\_HTMLHELP (continued)

### D\_HH\_DISPLAY\_SEARCH

*result* = %U\_HTMLHELP (D\_HH\_DISPLAY\_SEARCH, *help\_file*)

or

xcall U\_HTMLHELP (D\_HH\_DISPLAY\_SEARCH, *help\_file*)

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

### Discussion

The D\_HH\_DISPLAY\_SEARCH subfunction displays the Search tab for the specified Help file (*help\_file*), opening the Help file if necessary.

### Examples

The following example displays the Search tab:

```
.define D_HELPFILE, "MYAPPDIR:bin\myhelp.chm"
.
.
.
help_handle = %u_htmlhelp(D_HH_DISPLAY_SEARCH, D_HELPFILE)
```

## %U\_HTMLHELP (continued)

### D\_HH\_DISPLAY\_TEXT\_POPUP

```
result = %U_HTMLHELP (D_HH_DISPLAY_TEXT_POPUP, text_string | text_id, x, y,  
& [foreground],[background],[left], [top], [right], [bottom][, font])  
or  
xcall U_HTMLHELP (D_HH_DISPLAY_TEXT_POPUP, text_string | text_id, x, y,  
& [foreground], [background], [left], [top], [right], [bottom][, font])
```

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*text\_string*

The text to be displayed. (a)

*text\_id*

A series of three arguments: *id*, *help\_file*, *path*

*id*

The map ID of a text string within *help\_file*. (n)

*help\_file*

The path and filename for an HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*path*

The path within the *help\_file* to the text file that contains the text string. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*x*

The screen-relative x-axis pixel coordinate for the top-center of the pop-up window. (n)

*y*

The screen-relative y-axis pixel coordinate for the top-center of the pop-up window. (n)

*foreground*

(optional) An RGB value for the text color. See [GetCellColor on page 9-24](#) for information on the format of this value. (n)

#### *background*

(optional) An RGB value for the pop-up window's background color. See [GetCellColor](#) on [page 9-24](#) for information on the format of this value. (n)

#### *left*

(optional) The width in pixels of the margin between the text and the pop-up window's left edge. (n)

#### *top*

(optional) The width in pixels of the margin between the text and the pop-up window's top edge. (n)

#### *right*

(optional) The width in pixels of the margin between the text and the pop-up window's right edge. (n)

#### *bottom*

(optional) The width in pixels of the margin between the text and the pop-up window's bottom edge. (n)

#### *font*

(optional) A string with the following format:

"[*facename*], [*point\_size*], [*charset*][, BOLD ITALIC UNDERLINE]"

#### *facename*

(optional) The name of the type face. (a)

#### *point\_size*

(optional) The font size in points. (n)

#### *charset*

(optional) The character set. (n)

## Discussion

The `D_HH_DISPLAY_TEXT_POPUP` subfunction displays text in a pop-up Help window. The text is taken from one of the following, depending on the data type of the second argument (the argument that follows `D_HH_DISPLAY_TEXT_POPUP`):

- ▶ If you pass *text\_string* (in other words, if the second argument is an alpha value), the text is taken from the specified text string.
- ▶ If you pass *text\_id* (in other words, if the second argument is a numeric value), the text is taken from a text file included in the HTML Help file.

If you omit *foreground*, *background*, *left*, *top*, *right*, or *bottom*, or pass -1 for any of these, the system default is used.

If you don't pass *font* or one or more of its components, the omitted font characteristics are determined by system defaults. For example, if you omit *point\_size*, the text in the pop-up window will have the default point size for the user's system.

For *font*, you can pass one, all, or any two of the following: BOLD, ITALIC, and UNDERLINE. Use spaces to separate them. See example below.

## Examples

The following example displays a pop-up Help window with the text "Text to display" in 14 point bold and underlined Courier:

```
help_handle = %u_htmlhelp(D_HH_DISPLAY_TEXT_POPUP, "Text to display",  
&                                100, 100,,,,,, "Courier, 14,, BOLD UNDERLINE")
```

The next example displays a pop-up Help window with text from the text file **/info.txt**, which is contained in D\_HELPFILE. System defaults are used for all optional settings.

```
.define D_HELPFILE, "MYAPPDIR:bin\myhelp.chm"  
.  
.  
.  
help_handle = %u_htmlhelp(D_HH_DISPLAY_TEXT_POPUP, 61288, D_HELPFILE,  
&                                "/info.txt", 100, 100)
```

## %U\_HTMLHELP (continued)

### D\_HH\_DISPLAY\_TOC

*result* = %U\_HTMLHELP (D\_HH\_DISPLAY\_TOC, *help\_file*[, *path*])

or

xcall U\_HTMLHELP (D\_HH\_DISPLAY\_TOC, *help\_file*[, *path*])

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*path*

(optional) The path within the HTML Help file to the topic whose Contents entry you want highlighted. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

### Discussion

The D\_HH\_DISPLAY\_TOC subfunction displays the Contents tab for the specified Help file (*help\_file*), opening the Help file if necessary. Passing a valid *path* may cause D\_HH\_DISPLAY\_TOC to highlight the Contents entry for the topic specified by *path* and to display the topic. For example, this will occur if D\_HH\_DISPLAY\_TOC opens the Help file, but it may not occur if the Help file is already open in a window that displays the navigation pane (the pane that displays the Contents, Index, and Search tabs).

### Examples

The following example displays the Contents tab but does not change highlighting on the tab or the displayed topic because *path* is omitted.

```
help_handle = %u_htmlhelp(D_HH_DISPLAY_TOC, "MYAPPDIR:bin\myhelp.chm")
```



## %U\_HTMLHELP (continued)

### D\_HH\_DISPLAY\_TOPIC

*result* = %U\_HTMLHELP (D\_HH\_DISPLAY\_TOPIC, *help\_file*, *path*[, *window*])

or

xcall U\_HTMLHELP (D\_HH\_DISPLAY\_TOPIC, *help\_file*, *path*[, *window*])

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file you want to open. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*path*

The path within the HTML Help file to the topic you want displayed. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*window*

(optional) The name of the window type to use to display the topic. (a)

### Discussion

The D\_HH\_DISPLAY\_TOPIC subfunction opens a specified Help topic (*path*) in the default window or in a specified window (*window*).

If you don't pass *window*, if *window* is not in the file specified by *help\_file*, or if you pass an empty string for *window*, the default window type for the Help file is used to display the topic.

### Examples

The following example displays the **/entry/orders.htm** topic with the mywin window type.

```
.define D_HELPFILE, "MYAPPDIR:bin\myhelp.chm"
.
.
.
help_handle = %u_htmlhelp(D_HH_DISPLAY_TOPIC, D_HELPFILE,
&                                "/entry/orders.htm", mywin)
```

## %U\_HTMLHELP (continued)

### D\_HH\_GET\_WIN\_HANDLE

*result* = %U\_HTMLHELP (D\_HH\_GET\_WIN\_HANDLE, *help\_file*, *window*)

or

xcall U\_HTMLHELP (D\_HH\_GET\_WIN\_HANDLE, *help\_file*, *window*)

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the window for the specified window type or a value of 0 if there is no such window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*window*

The name of the window type whose handle you want to retrieve. (a)

### Discussion

The D\_HH\_GET\_WIN\_HANDLE subfunction returns (in *result*) the handle for the window of the type specified in *window*. If no window has yet been created for the specified window type (i.e., if no topic has been displayed using the specified type), *result* is returned with a value of 0.

### Examples

The following example returns the handle for the Help window of type mywin, or it returns a value of 0 if no Help window of that type has been created.

```
.define D_HELPFILE, "MYAPPDIR:bin\myhelp.chm"
.
.
.
help_handle = %u_htmlhelp(D_HH_GET_WIN_HANDLE, D_HELPFILE, mywin)
```

## %U\_HTMLHELP (continued)

### D\_HH\_HELP\_CONTEXT

*result* = %U\_HTMLHELP (D\_HH\_HELP\_CONTEXT, *help\_file*, *context\_id*[, *window*])

or

xcall U\_HTMLHELP (D\_HH\_HELP\_CONTEXT, *help\_file*, *context\_id*[, *window*])

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*context\_id*

A context ID mapped to a topic in the HTML Help file. (n)

*window*

(optional) The name of the window type to use to display the topic. (a)

### Discussion

The D\_HH\_HELP\_CONTEXT subfunction displays the topic specified by *context\_id*, which is a numeric ID that maps to a topic in *help\_file*, opening the Help file if necessary.

If you don't pass *window*, if *window* is not in the file specified by *help\_file*, or if you pass an empty string for *window*, the default window type for the Help file is used to display the topic.

### Examples

The following example displays the Help topic with the context ID of 102 in a mywin type window:

```
.define D_HELPFILE, "MYAPPPDIR:bin\myhelp.chm"  
.  
.  
.  
help_handle = %u_htmlhelp(D_HH_HELP_CONTEXT, D_HELPFILE, 102, "mywin")
```

## %U\_HTMLHELP (continued)

### D\_HH\_KEYWORD\_LOOKUP

```
result = %U_HTMLHELP (D_HH_KEYWORD_LOOKUP, help_file, keywords, [window],
&                                     fail_action)
```

or

```
xcall U_HTMLHELP (D_HH_KEYWORD_LOOKUP, help_file, keywords, [window],
&                                     fail_action)
```

### Return value

*result*

On Windows, this function returns the handle (D\_ADDR) of the outermost Help window. (^VAL)

### Arguments

*help\_file*

The path and filename for the HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). (a)

*keywords*

The keyword(s) whose topic(s) will be looked up. You can search for multiple keywords by passing them in a semicolon-delimited string. (a)

*window*

(optional) The name of the window type to use to display a looked-up topic or a topic specified for D\_HH\_KEYWORD\_FAIL\_PATH. (a)

*fail\_action*

One of the following, which specify how a failure to find any of the keywords should be handled: (n)

**D\_HH\_KEYWORD\_FAIL\_INDEX** Display the Index tab and populate its field with the keywords.

**D\_HH\_KEYWORD\_FAIL\_MSG**, *text*[, *title*]

Pop up a message box with the text specified by *text* and with the title specified by *title*.

**D\_HH\_KEYWORD\_FAIL\_PATH**, *path*

Display the topic specified by *path*.

*text*The text for a pop-up error message. **(a)***title*(optional) The title for a pop-up error message. **(a)***path*The path and filename for a topic in the HTML Help file. For information, see the Discussion for D\_HH\_ALINK\_LOOKUP on [page 16-77](#). **(a)**

## Discussion

The D\_HH\_KEYWORD\_LOOKUP subfunction looks up topics for *keywords* in the specified Help file (*help\_file*), opening the Help file if necessary.

If you don't pass *window*, if *window* is not in the file specified by *help\_file*, or if you pass an empty string for *window*, the default window type for the Help file is used to display the topic.

## Examples

The following example looks up topics associated with the keyword "accounts." If there are topics for this, it displays a pop-up message box with the title "Error" and the text "No topic found."

```
.define D_HELPFILE, "MYAPPPDIR:bin\myhelp.chm"
.
.
.
help_handle = %u_htmlhelp(D_HH_KEYWORD_LOOKUP, D_HELPFILE, "accounts",
&                               mywin, D_HH_KEYWORD_FAIL_MSG, "No topic found",
&                               "Error")
```

The next example does the same, but instead of displaying a pop-up message box if no topics are found, it displays the Index tab, populating the field on the tab with the keyword "accounts."

```
.define D_HELPFILE, "MYAPPPDIR:bin\myhelp.chm"
.
.
.
help_handle = %u_htmlhelp(D_HH_KEYWORD_LOOKUP, D_HELPFILE, "accounts",
&                               mywin, D_HH_KEYWORD_FAIL_INDEX)
```

## %U\_ICON – Set an icon



```
status = %U_ICON (operation, filename, index | count[, window_id])
```

or

```
xcall U_ICON (operation, filename, index | count[, window_id])
```

### Return value

*status*

On Windows, the return value is true (1) if the icon file exists and contains icons. The return value is false (0) if the icon file does not exist or if it contains no icons. On UNIX and OpenVMS, this function always returns false. (^**VAL**)

### Arguments

*operation*

The operation to perform. It must be one of the following: (**n**)

**D\_ICONSET**                      Set the icon.

**D\_ICONCOUNT**                Get the count of icons in the file.

*filename*

The name of the icon file to use. (**a**)

*index* or

*count*

The icon index for **D\_ICONSET** (1-based), or the icon count returned from **D\_ICONCOUNT**. (**n**)

*window\_id*

(optional) The ID of the window. (**n**)

### Discussion

%U\_ICON sets an icon for a window or gets a count of icons in a file.

*Filename* can be an **.ico** file, a DLL, an executable program (**.exe**), or a bitmap image (**.bmp**). You can use environment variables in *filename*.

In Synergy .NET, this routine works only for the container window, and it uses only the first icon in the icon file. It ignores the *index* or *count* argument (though you still must pass it) and the *window\_id* argument.

### Setting an icon for a window

To set an icon for a window, pass `D_ICONSET` for *operation*, and pass the index (1 based) for the icon (i.e., pass the icon's position in the file) as *index*. An index value of 0 will set the icon to the default Windows system icon. Note that with an **.ico** file, you must pass 1 as *index*.

*Window\_id* determines which window the icon will be applied to:

- ▶ To apply the icon to the application window, omit *window\_id* or pass zero. In either case, the icon is displayed in the About box if `U_ABOUT` is subsequently called, and the application uses the icon for its system menu and its taskbar button.
- ▶ To apply the icon to window other than the application window, pass the window ID as *window\_id*. In this case, the icon is used for the system menu, which is displayed if a close, move, size, minimize or maximize method is associated with the window. It can also be used if a DLL routine adds a system menu, changes the window frame style, or minimizes the window.

### Getting a count of icons in a file

To get a count of icons in a file, pass `D_ICONCOUNT` for *operation*, and pass a variable as *count* to accept the returned count. *Window\_id* is ignored for `D_ICONCOUNT`.

### See also

[%L\\_ICON on page 9-98](#) for setting a list icon.

### Examples

The following example sets the application icon to the third icon in a file named **iconfil.dll**. If the icon cannot be found, an error is displayed.

```
if (.not.(%u_icon(D_ICONSET, "iconfil.dll", 3)))  
    xcall u_message("Could not set icon")
```

## U\_INITREND – Reset Toolkit renditions

|  |    |   |   |
|--|----|---|---|
|  | WN | U | V |
|--|----|---|---|

```
xcall U_INITREND
```

### Discussion

The U\_INITREND subroutine resets UI Toolkit renditions to initial settings established by U\_START. For information on these initial settings, see the “[U\\_START initialization](#)” columns of the “[Renditions](#)” table on page 18-29.



## U\_LDREND – Load a rendition scheme



```
xcall U_LDREND (channel, [scheme][, status])
```

### Arguments

*channel*

The channel on which the rendition file is already opened. **(n)**

*scheme*

(optional) The rendition scheme name. **(a)**

*status*

(optional) Returned with zero (0) if the load operation is successful, or with a Synergy DBL error number if it is unsuccessful. **(n)**

### Discussion

The U\_LDREND subroutine loads a rendition scheme from an open rendition file.

If *scheme* is not passed or is blank, the working rendition settings are loaded.

Once the rendition scheme is loaded, the rendition definitions are used for subsequent screen displays.

### See also

[“Customizing the Look of Your Application” on page 18-27.](#)

### Examples

The following utility subroutine loads and saves personalized rendition schemes from a rendition file.

```
subroutine pers_rend
    a_scheme      ,a
    a_ldflg       ,n      ;Load flag: 1=load, 0=store

    .include "WND:tools.def"

    global data section mygb
    record
        rendchn      ,i4
    endglobal
```

## Utility Routines

### U\_LDREND

```
record
    error          ,i4
proc
    if (a_ldflg) then
        xcall u_ldrend(rendchn, a_scheme, error)
    else
        xcall u_storend(rendchn, a_scheme, error, TRUE)
    if (error)
        xcall proc_error
    xreturn
endsubroutine
```

## U\_LDWND – Load a window from a library



```
xcall U_LDWND (window_id, [channel], window_name, [no_placement], [search], [error]
&                [, saved_name], {reserved})
```

### Arguments

*window\_id*

Returned with the ID of the window. **(n)**

*channel*

(optional) The channel of the window library. **(n)**

*window\_name*

The name of the window to load. **(a)**

*no\_placement*

(optional) The no-placement flag: **(n)**

**D\_NOPLC**                      Don't place window.

*search*

(optional) The search variable. **(n)**

*error*

(optional) The error return variable. **(n)**

*saved\_name*

(optional) The name of the window when it was originally saved. **(a)**

*{reserved}*

Reserved for internal use. **(n)**

### Discussion

The U\_LDWND subroutine loads a window from a window library.

Use U\_LDWND to load text windows, selection windows, or general windows from a window library. Use I\_LDINP to load input windows, and M\_LDCOL to load menu columns. Lists must be created using L\_CREATE, although you can load the list class into memory with U\_LDWND.

The loaded window is not placed on the screen if D\_NOPLC is present.

If *channel* is not passed, **g\_utlib** will be used.

If you pass a null string (“”) for *window\_name*, Toolkit assigns a unique window name in the form *\_W\_nnn*, where *nnn* is the window ID. You must pass *saved\_name* in this case.

If you want to create multiple instances of the same window, you can call U\_LDWND as many times as you need, using *window\_name* to give each succeeding window a new unique name. You must also pass *saved\_name* if *window\_name* is different than the name under which the window was saved.

To create another instance of the same window, pass “” for *window\_name*. You must pass *saved\_name* in this case. A window name is automatically generated for you.

If *search* is present, U\_LDWND searches for an existing window with the specified name before attempting to load the window. If the window is found, a successful load is simulated, *window\_id* is set to the ID of the window that was found, and the *search* variable is set to true. If the window is not found, the *search* variable is cleared and the load continues normally.

If *error* is present, it will be returned with a zero (0) if the requested window was found in the specified library or a non-zero value (the error code number) if the window was not found. A fatal error occurs if *error* is not present and the window cannot be found; we recommend that you pass it.

### See also

- ▶ [I\\_LDINP on page 8-64](#) for loading input windows.
- ▶ [M\\_LDCOL on page 10-40](#) for loading menu columns.
- ▶ [L\\_CREATE on page 9-76](#) for creating lists.

### Examples

The first example loads a window with the name in **wndname(i)** from the window library on the channel stored in **chnl**, and returns the ID to **wndid(i)**. This window will not be placed on the screen. **sts** is the error variable and is returned with a value of 0 if the operation is successful.

```
xcall u_ldwnd(wndid(i), chnl, wndname(i), D_NOPLC,, sts)
```

The second example loads the window whose name is “password” from the library on the channel stored in **chnl**, and returns the ID to **passid**. The routine will look for an existing window named “password” before loading. Again, **sts** is the error variable. The window is placed on the screen.

```
xcall u_ldwnd(passid, chnl, "password",, found, sts)
```

## U\_LOGWND – Log a window as global or local



```
xcall U_LOGWND (window_id[, global])
```

### Arguments

*window\_id*

The ID of the window to be logged. (**n**)

*global*

(optional) The global flag: (**n**)

**D\_GLOBAL**            Global window.

### Discussion

The U\_LOGWND subroutine logs a window ID as either global or local.

The window is logged as global if D\_GLOBAL is present. The window is entered into the current (local) environment if D\_GLOBAL is not present.

Always use this subroutine with a window created outside of the UI Toolkit utilities (for example, if you created it yourself with the Synergy DBL W\_xxx subroutines, loaded it from your own library, and so forth). If you don't, UI Toolkit environment will not recognize its existence.

### Examples

The following example logs the window whose ID is stored in the **passid** variable as local.

```
xcall u_logwnd(passid)
```

## U\_MESSAGE – Display a message



```
xcall U_MESSAGE (message[, wait, ...])
```

### Arguments

*message*

The message to display. (**a**)

*wait*

(optional) One of the following wait flags. (See [U\\_WAIT](#) on page 16-154 for more information.) (**n**)

|                 |                                   |
|-----------------|-----------------------------------|
| <b>D_BELL</b>   | Ring the terminal bell. (default) |
| <b>D_NOBELL</b> | Do not ring the terminal bell.    |
| <b>D_ALERT</b>  | Do alert processing. (default)    |
| <b>D_ERROR</b>  | Do error processing.              |

### Discussion

The U\_MESSAGE subroutine displays a message in a message window.

#### UNIX, VMS

---

On UNIX and OpenVMS, U\_MESSAGE performs the following steps:

1. Looks for an existing message window called `u_message`.

If it cannot find an existing `u_message` window, it looks in the window library opened on `g_utlib`. If it cannot find a `u_message` window in the library, U\_MESSAGE creates a message window and places it 12 lines above the information line.

2. Displays *message* in the `u_message` window.

If *message* is longer than 76 characters it will be divided up into a maximum of 5 lines with up to 76 characters each. This will be done by searching for the space or tab nearest to, but not beyond, the 76th character after the previous break.

If the `u_message` window already exists, it should be 5 lines long. U\_MESSAGE will shorten the display area of the existing `u_message` window, if necessary, to the appropriate height (based on the number of lines *message* takes).

If U\_MESSAGE creates the window, the created window's display area will be two columns wider than the length of the message's longest line and have a height determined by the number of lines (not to exceed five lines).

3. Calls U\_WAIT, which creates another message window telling the user what to do, and waits for a user response.



If you supply a window for U\_MESSAGE, you may also want to supply a window for U\_WAIT. If you don't, the U\_WAIT window will be centered three lines above the information line, which may not match the placement you specified for the u\_message window. For more information, see [U\\_WAIT on page 16-154](#). (Note that this is *not* true for %U\_MSGBOX; if you supply a window for %U\_MSGBOX, the selection window will be placed relative to the %U\_MSGBOX window.)

---

If a time-out occurs, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as "O\_TIMEOUT". (U\_MESSAGE cannot time out on Windows.)

4. Removes the message window from the screen prior to exiting the subroutine.

Note that you can change the rendition of the message window with the U\_REND subroutine. And note that the terminal bell will not ring if **g\_beep** is set to false. See ["g\\_beep" on page 18-2](#).

---

## WIN

---

In Synergy .NET, Toolkit uses a cell-based-style message box if **g\_netnativemsgbox** (a field in **tools.def**) is set to false, which is the default. If **g\_netnativemsgbox** is set to true, Toolkit uses a native Windows message box.

On Windows in traditional Synergy, U\_MESSAGE creates a Windows-style message box with an icon and an OK button. The icon is an information icon (i) if you pass D\_ALERT, an exclamation point (!) if you pass D\_ERROR.

Toolkit interprets \n in *message* as a line break. If you want to specify explicit line breaks, insert \n where you'd like the line to break. If you want the message to include the characters "\n", rather than a line break, prefix the characters with another backslash. For example, the following displays a two-line message with "First" in the first line and "Second" in the second:

```
xcall u_message("First\nSecond")
```

The next example, however, displays only one line, "C:\maps\northHaven", which includes the "\n" characters in the message.

```
xcall u_message("C:\maps\\northHaven")
```

---

For all environments, if your message requires a Yes/No or OK/Cancel type of response, see [%U\\_MSGBOX on page 16-105](#).

For abort processing, see [U\\_ABORT on page 16-5](#). The U\_ABORT subroutine creates its own message window.

#### See also

[U\\_REND on page 16-121](#) for information on changing window renditions.

#### Examples

This example displays the message “Invalid Customer Account” in the message window and waits in the error state for a user response.

```
xcall u_message("Invalid Customer Account", D_ERROR)
```



## U\_MINVERSION – Check for minimum Synergy/DE product versions



```
xcall U_MINVERSION([minimum_toolkit][, minimum_runtime])
```

### Arguments

*minimum\_toolkit*

(optional) The minimum UI Toolkit version required. **(a)**

*minimum\_runtime*

(optional) The minimum Synergy Runtime version required. **(a)**

### Discussion

The U\_MINVERSION subroutine checks the version of UI Toolkit against *minimum\_toolkit* and the version of the Synergy Runtime against *minimum\_runtime*. If the version of UI Toolkit or the Synergy Runtime is lower than a minimum passed to U\_MINVERSION, Toolkit generates a fatal error.

Use the following syntax for *minimum\_toolkit* and *minimum\_runtime* (where *v* is the version number, *r* is the major revision number, and *m* is the minor revision number):

*v[.r][.m]*

You can use an uppercase letter for a two-byte version number. For example, you can use A for 10, as in A.1.1 for 10.1.1. But note that if you do use an uppercase letter, it must be the first character of *v*, *r*, or *m*. In this case, the second character is ignored—for example, 1A.2.3 is interpreted as 1.2.3, and A1.2.3 is interpreted as 10.2.3. Additionally, note the following:

- ▶ If *v* or *m* is omitted, a major or minor revision number of 0 is assumed.
- ▶ Characters other than the following are ignored: numbers, periods (.), and capital letters that are used for two-byte version numbers.

### Examples

The following generates a fatal Toolkit error if the Synergy Runtime version is lower than 9.5.3:

```
xcall u_minversion("9.5.3")
```

The following examples check to make sure that the version of both UI Toolkit and the Synergy Runtime are at least 10.1.1:

```
xcall u_minversion("10.1.1", "10.1.1")
```

```
xcall u_minversion("A.1.1", "A.1.1")
```

## U\_MODREND – Modify the current rendition scheme



```
xcall U_MODREND ([number], [descriptions], [windows], [areas], [field_numbers][, help_id])
```

### Arguments

#### *number*

(optional) The number of user renditions to use. The default is 0. **(n)**

#### *descriptions*

(optional) The array of user rendition descriptions. If an array is not specified and user renditions are used, a default description is supplied. **(a)**

#### *windows*

(optional) The array of window IDs for user renditions on UNIX and OpenVMS. (This is ignored on Windows.) Each window is placed by a move 0,0. If an array is not specified and user renditions are used, a default window is created. All created windows are deleted upon exit of this subroutine. **(n)**

#### *areas*

(optional) The array of which areas within *windows* will be affected on UNIX and OpenVMS. (This is ignored on Windows.) These areas can be added together for combined effects. If *areas* is 0, then none are affected. The default is all three areas. **(n)**

**D\_RND\_AREA**      Processing area.

**D\_RND\_BRDR**      Border area.

**D\_RND\_TITLE**      Title area.

#### *field\_numbers*

(optional) The array of field numbers that will be affected on UNIX or OpenVMS. The default is none. (This is ignored on Windows.) **(n)**

**WFN\_ALL**          Affect all fields.

#### *help\_id*

(optional) The help identifier. **(a)**

## Discussion

The U\_MODREND subroutine enables the user to modify the current rendition scheme without saving the changes. (U\_EDITREND saves and restores renditions.)



U\_MODREND cannot set

- ▶ the Input Field Processing rendition on Windows (though it can on UNIX and OpenVMS).
  - ▶ the following on any platform: Disabled Input Field, Read-only Input Field Display, and Read-Only Field Processing. (These can be set only by U\_REND and can be set only on UNIX and OpenVMS.)
- 

U\_MODREND modifies the rendition scheme that is held in memory and does not call any of the renditions file manipulation routines. So you can save the rendition scheme in any manner you choose.

U\_MODREND recognizes the following menu entry names if they are included in a placed menu column:

|                  |                                                            |
|------------------|------------------------------------------------------------|
| <b>O_CANCEL</b>  | Cancel changes.                                            |
| <b>O_EXIT</b>    | Exit.                                                      |
| <b>O_HELP</b>    | Call the EHELP_METHOD subroutine and pass <i>help_id</i> . |
| <b>O_DEFAULT</b> | Set renditions to their default values.                    |
| <b>O_PALETTE</b> | Modify a color palette.                                    |
| <b>S_UP</b>      | Move to the previous selection window item.                |
| <b>S_DOWN</b>    | Move to the next selection window item.                    |
| <b>S_LEFT</b>    | Move to the selection item in the previous column.         |
| <b>S_RIGHT</b>   | Move to the selection item in the next column.             |

Any other menu entries cause this subroutine to return with **g\_select** set to true and **g\_entnam** set to the selected menu entry.

O\_EXIT causes U\_MODREND to return to the calling program, but it does not clear **g\_select** and **g\_entnam**. This enables a layered calling routine to continue a seamless exit.

If a time-out occurs, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as "O\_TIMEOUT".

## See also

[“Customizing the Look of Your Application” on page 18-27.](#)

## U\_MONTHS – Assign alpha characters to represent months

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| W | T | W | N | U | V |
|---|---|---|---|---|---|

```
xcall U_MONTHS (months)
```

### Arguments

*months*

The first element of a 12-element array containing the month abbreviations. (a)

### Discussion

The U\_MONTHS subroutine determines the alpha character string that represents each month.

*Month* defines the alpha characters that can be used to specify months. If you do not call this subroutine, the array will be initialized to the first three characters of each month (in English). In other words, January will be represented as **jan**, February will be represented by **feb**, and so on.

This subroutine is particularly useful for assigning month specifications for foreign languages. For example, the Spanish word for “January” is “Enero.” Thus, in Spain a user would want to enter **ene**, rather than **jan**, to designate the first month of the year. You could specify the entire string “**enero**” in this subroutine as well.

Note that U\_MONTHS will only read the first five characters of each string.

### Examples

In this example, **mon** is the array that consists of month names.

```
xcall u_months(mon)
```

## %U\_MSGBOX – Pop up a Windows-style message box



```
button = %U_MSGBOX (message, [styles], [title], [select_col][, help_id])
```

or

```
xcall U_MSGBOX (message, [styles], [title], [select_col][, help_id])
```

### Return value

*button*

%U\_MSGBOX returns false if the user doesn't select a message box button, but instead tries to select a menu entry. If one of the message box buttons is selected, it returns with the corresponding option below: (^VAL)

|                    |                         |
|--------------------|-------------------------|
| <b>D_MIDOK</b>     | OK button selected.     |
| <b>D_MIDCANCEL</b> | Cancel button selected. |
| <b>D_MIDABORT</b>  | Abort button selected.  |
| <b>D_MIDRETRY</b>  | Retry button selected.  |
| <b>D_MIDIGNORE</b> | Ignore button selected. |
| <b>D_MIDYES</b>    | Yes button selected.    |
| <b>D_MIDNO</b>     | No button selected.     |

### Arguments

*message*

The message text or string. (**a**)

*styles*

(optional) One or more of the following options, which can be combined using .BOR. or the vertical bar (|) operator. If *styles* is not passed, %U\_MSGBOX will default to the documented default values. (**n**)

Dialog options:

|                  |                                                                                     |
|------------------|-------------------------------------------------------------------------------------|
| <b>D_MCENTER</b> | Center dialog box over application window. (This is not supported in Synergy .NET.) |
|------------------|-------------------------------------------------------------------------------------|

Button options:

|                       |                               |
|-----------------------|-------------------------------|
| <b>D_MOK</b>          | OK button only. (default)     |
| <b>D_MOKCANCEL</b>    | OK and Cancel buttons.        |
| <b>D_MABTRETIGN</b>   | Abort, Retry, Ignore buttons. |
| <b>D_MYESNOCANCEL</b> | Yes, No, Cancel buttons.      |
| <b>D_MYESNO</b>       | Yes and No buttons.           |
| <b>D_MRETRYCANCEL</b> | Retry and Cancel buttons.     |

Icon style options: (No icon is the default)

|                        |                        |
|------------------------|------------------------|
| <b>D_MICONSTOP</b>     | Stop sign.             |
| <b>D_MICONQUESTION</b> | Question mark (?).     |
| <b>D_MICONEXCLAM</b>   | Exclamation point (!). |
| <b>D_MICONINFO</b>     | Information (i).       |

Default button options:

|                      |                                         |
|----------------------|-----------------------------------------|
| <b>D_MDEFBUTTON1</b> | Sets default to first button. (default) |
| <b>D_MDEFBUTTON2</b> | Sets default to second button.          |
| <b>D_MDEFBUTTON3</b> | Sets default to third button.           |

Modality options:

|                         |                              |
|-------------------------|------------------------------|
| <b>D_MAPPLMODAL</b>     | Application modal. (default) |
| <b>D_MSYSYSTEMMODAL</b> | System modal.                |

*title*

(optional) The title of the message box. **(a)**

*select\_col*

(optional) The selection column ID (UNIX and OpenVMS only). **(n)**

*help\_id*

(optional) The help identifier. **(a)**

## Discussion

The %U\_MSGBOX function pops up a Windows-style message box.

- ▶ On UNIX and OpenVMS, %U\_MSGBOX follows the same steps to create a message window as U\_MESSAGE does. (See the Discussion for U\_MESSAGE on [page 16-98](#).) %U\_MSGBOX, however, looks for a window named u\_msgbox, creates a selection window (rather than a “Press... to continue” message), and processes the selection window for valid options. If a menu entry is selected, the function returns false and **g\_select** is cleared. Otherwise, %U\_MSGBOX returns the value that corresponds to the selected button. (See “Return value” above.)
- ▶ On Windows in traditional Synergy, %U\_MSGBOX creates a Windows-style message box with one to three buttons, depending on the arguments passed. The icon can be a stop sign, exclamation point (!), question mark (?), or the information icon (i). Button choices are Yes, No, OK, Cancel, Abort, Retry, and Ignore. Since this function invokes the standard Windows MessageBox function, which is application-modal, no menu processing (or any other type of processing) is available while a message box is displayed.
- ▶ On Windows in Synergy .NET, Toolkit uses a cell-based-style message box if **g\_netnativemsgbox** (a field in **tools.def**) is set to false, which is the default. If **g\_netnativemsgbox** is set to true, Toolkit uses a native Windows message box.

*Message* is wrapped according to the same rules as apply to the U\_MESSAGE subroutine.

*Styles* enables you to set optional values for the dialog box, buttons and the icon on the dialog box, and modality. The options available to *styles* are defined in **tools.def**. Note the following:

- ▶ The dialog box, icon, and modality options have no effect in UNIX and OpenVMS environments.
- ▶ Default positioning on Windows is determined by Windows Common Dialogs and is generally centered in the screen. Specifying D\_MCENTER, however, centers the dialog box over the application window, which matches UNIX and OpenVMS behavior.
- ▶ On Windows, the close button for the message box is disabled if you pass D\_MABTRETIGN or D\_MYYESNO. If you pass a *styles* option that includes the Cancel button, the close button causes %U\_MSGBOX to return D\_MIDCANCEL. If you pass D\_MOK, the close button causes %U\_MSGBOX to return D\_MIDOK.

If you omit *title* in a Windows environment with traditional Synergy, the message box inherits the application’s window title. With Synergy .NET, the default title is the Windows default, “Error”. In UNIX and OpenVMS environments, the default for *title* is blank.

---

### UNIX, VMS

If *select\_col* is passed and non-zero, the specified column is placed on the menu and removed on exit. As an alternative, you can place the column before calling %U\_MSGBOX.

---

Additionally, note the following:

- ▶ The default behavior for each environment's handling of columns is controlled by the **g\_plc\_col\_args** flag, which is defined in the distributed **tkctl.def** file. See “[g\\_plc\\_col\\_args](#)” on [page 18-4](#) for information.
- ▶ %U\_MSGBOX cannot time out on Windows.
- ▶ If a time-out occurs on UNIX or OpenVMS, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as “O\_TIMEOUT”.
- ▶ If *help\_id* is passed, it will be passed to EHELP\_METHOD if the user selects “O\_HELP” while in this function.

## WIN

On Windows, *select\_col* is ignored. (Columns passed as *select\_col* usually contain reserved menu entries that are automatically supported on Windows. Excessive placing and removing of columns causes Windows menu bars to flicker.)

## See also

- ▶ [U\\_ABORT](#) on [page 16-5](#) for information about abort processing that creates its own message window.
- ▶ [U\\_ABOUT](#) on [page 16-8](#) for information about displaying an “About” message box.
- ▶ [U\\_MESSAGE](#) on [page 16-98](#) for information about a more simple message box.
- ▶ [EHELP\\_METHOD](#) on [page 7-78](#) for information about help processing.

## Examples

The following example pops up a window titled “Inquire” that contains the text “Error opening file”. On UNIX and OpenVMS, a single-item selection window is displayed containing the item “OK”. On Windows, a stop sign icon is displayed, along with an OK button. See [figure 16-6](#).

```
rtn = %u_msgbox("Error opening file", D_MOK|D_MICONSTOP, "Inquire")
```

If the user selected “OK”, **rtn** would contain D\_MIDOK. If the user selected a menu entry (available only on UNIX and OpenVMS), **rtn** would be false, and **g\_select** would be true.

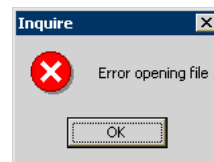


Figure 16-6. An example %U\_MSGBOX window for UNIX or OpenVMS (left) and Windows (right).



## U\_OPEN – Open a channel/file



```
xcall U_OPEN(channel, [I/O_mode], filename, [options], [search], [error]
&                [, no_allocation])
```

### Arguments

*channel*

Returned with the allocated channel. **(n)**

*I/O\_mode*

(optional) The I/O mode in which to open the file. **(a)**

*filename*

The name of the file to open. **(a)**

*options*

(optional) The open OPTIONS string. **(a)**

*search*

(optional) The search variable. **(n)**

*error*

(optional) Returned with the error value. **(n)**

*no\_allocation*

(optional) The no channel allocation flag: **(n)**

**D\_NOALLOC**      Use passed *channel*.

### Discussion

The U\_OPEN subroutine allocates a global or local channel and opens a file.

The open is performed using an OPTIONS qualifier on the OPEN statement. The contents of the *I/O\_mode* argument are appended to the string “IO=” and the result is placed into the OPTIONS string. *I/O\_mode* must be one of the valid Synergy DBL open modes for the file (**I** for input, **U:I** for ISAM update, **O:S** for output sequential, and so forth).

If *I/O\_mode* is not specified, the default open mode is **I:I**.

If *options* is present and non-blank, a slash and the contents of that variable are appended to the OPTIONS string discussed above.

If *search* is not present, the file is opened on a new channel in the specified mode.

U\_OPEN will search for *filename* in the specified *I/O\_mode* if *search* is present and the file is not being opened for output. If *filename* is found, a successful open is simulated, *channel* is set to the channel on which the file is opened, and the *search* variable is set to true. If *filename* is not found, the *search* variable is cleared and the open continues normally. Note that the *I/O\_mode* and *filename* must match in content *exactly* and that *filename* is case sensitive and can have up to 256 characters. (*I/O\_mode* is not case sensitive.)

If *error* is present, it is returned with a value of 0 if the open request is successful, or the number of the Synergy DBL error that occurs if the open fails. The *channel* argument is not loaded if an error occurs. If *error* is not present, any error that occurs will cause a fatal Toolkit error.

If *no\_allocation* is present and non-zero, no channel will be allocated and the *channel* argument is assumed to contain the channel to use on entry. This is useful for converting existing applications that have “hard-wired” channels.

Rather than explicitly allocating channels yourself, it is best to enable U\_OPEN to manage channel allocation for you. Enabling U\_OPEN to maintain channel usage will help you keep your application modular.

The available *channels* are from 1 to 255. (The maximum number of channels Toolkit can log is 255.)

*No\_allocation* is ignored if *search* is present.

## See also

- ▶ [U\\_CLOSE on page 16-18](#) for information about how to close or purge channels.
- ▶ [U\\_FINISH on page 16-45](#) for information about how to close and purge channels at application shut down.
- ▶ [U\\_START on page 16-141](#) for information about how to open channels to the window library, text library, and the terminal and to determine the number of channels available to your application.
- ▶ [U\\_GETCHN on page 16-61](#) for information about how to convert applications.

## Examples

In the first example, the variable **chnl** is returned with the allocated channel. The “cusmas” file is opened in ISAM update mode.

```
xcall u_open(chnl, "u:i", "cusmas")
```

The variable **chnl** is returned with the allocated channel in this example also. The file named “tagfil” is opened in output mode and the success of the operation is reported in **sts**.

```
xcall u_open(chnl, "o", "tagfil",,, sts)
```

The third example is the same as the first example, except that U\_OPEN will see if the file is already opened in **U:I** mode before opening it. If it is already opened, the existing channel number is returned in **chnl**. If it isn't already opened, U\_OPEN tries to open it and returns **0** to **sts** if the open is successful or the number of the Synergy DBL error if the operation is not successful.

```
xcall u_open(chnl, "u:i", "cusmas",, srchflg, sts)
```

## U\_PARSEVERSION – Parse a version number



```
xcall U_PARSEVERSION(ver_number, version, revision, minor)
```

### Arguments

*ver\_number*

The incoming version number (*v.r.m*). (**a**)

*version*

Returned with the application version number. (**n**)

*revision*

Returned with the major revision number. (**n**)

*minor*

Returned with the minor revision number. (**n**)

### Discussion

The U\_PARSEVERSION subroutine parses a version number string (*ver\_number*) into numeric values.

The *version\_num* string is expected to be in the form *v.r.m*, where *v* is the application version number, *r* is the major revision number, and *m* is the minor revision number.

You can use an uppercase letter for a two-byte version number. For example, you can use A for 10, as in A.1.1 (for 10.1.1). But note that if you use an uppercase letter, it must be the first character of *v*, *r*, or *m*. In this case, the second character is ignored—for example, 1A.2.3 is interpreted as 1.2.3, and A1.2.3 is interpreted as 10.2.3.

### See also

[U\\_CHECKVERSION](#) on page 16-14 for information about testing version numbers.

## U\_POPUP – Pop up a window



```
xcall U_POPUP ([channel], window_name, [search], [wait_bell], [wait_error],
& [error][, help])
```

### Arguments

*channel*

(optional) The window library channel. **(n)**

*window\_name*

The name of the window to load. **(a)**

*search*

(optional) The search variable. **(n)**

*wait\_bell*

(optional) One of the following wait flags: **(n)**

**D\_BELL** Ring the terminal bell. (default)

**D\_NOBELL** Don't ring the terminal bell.

*wait\_error*

(optional) One of the following wait flags: **(n)**

**D\_ALERT** Do alert processing. (default)

**D\_ERROR** Do error processing.

*error*

(optional) Returned with the error value. **(n)**

*help*

(optional) The help window flag: **(n)**

**D\_HELP** Use help window renditions.

### Discussion

The U\_POPUP subroutine “pops up” a window.

U\_POPUP calls U\_LDWND to load the window from the specified library. If channel is not passed, **g\_utlib** will be used.

If *search* is present, U\_POPUP will search for an existing window with the specified name before trying to load it from the library. If it isn't already loaded and it isn't in the library, a fatal Toolkit error occurs.

The *wait\_bell* and *wait\_error* arguments are passed to the U\_WAIT subroutine to wait for a user response. If neither wait argument is specified, U\_POPUP assumes an alert state rather than an error waiting state. Note that the terminal bell (and MessageBeep on Windows) will not ring if **g\_beep** is set to false (see “**g\_beep**” on page 18-2).

If D\_HELP is present, the renditions of *window\_name* will be set to the help window renditions.

If the window was loaded by U\_POPUP, it will be deleted before the subroutine returns. A “Window not found” error occurs if the specified window cannot be found.

On Windows, U\_POPUP creates a Windows-style message box with an “OK” button.

### See also

[U\\_WAIT on page 16-154](#) for more information on the wait flags.

### Examples

This example pops up the window named “custhlp,” located in the window library on the channel stored in **chnl**. U\_POPUP assumes an error-style waiting state and displays the window with help window renditions.

```
xcall u_popup(chnl, "custhlp", , , D_ERROR, , D_HELP)
```

## %U\_PRINTQUERY – Retrieve printer characteristics



```
status = %U_PRINTQUERY (subfunction, info_record)
```

or

```
xcall U_PRINTQUERY (subfunction, info_record)
```

### Return value

*status*

On Windows (including Synergy .NET), %U\_PRINTQUERY returns true if successful, and it returns false if unsuccessful (if the specified printer is not found). If D\_ENUM\_PRINTERS or D\_ENUM\_WITH\_INFO is specified on Windows, a value of -1 (D\_EOLIST) is returned if there are no more printers configured in the print manager. On UNIX and OpenVMS, this function always returns false. (^VAL)

### Arguments

*subfunction*

One of the following: (n)

|                         |                                                 |
|-------------------------|-------------------------------------------------|
| <b>D_DEVICEINFO</b>     | Return info about a specific printer.           |
| <b>D_ENUM_PRINTERS</b>  | Return the next printer ID.                     |
| <b>D_ENUM_WITH_INFO</b> | Return the next printer ID and its information. |
| <b>D_ENUM_RESET</b>     | Reset D_ENUM_PRINTERS to its initial state.     |

*info\_record*

Returned with a structure containing printer characteristics. (a)

### Discussion

On Windows, including Synergy .NET, the %U\_PRINTQUERY function retrieves information about the currently selected printer or a specified printer from your Windows Print Manager. It can also retrieve the names of all printers configured in your Windows Print Manager. The *info\_record* format is

```
record info_record
    lpp          , i4      ;Lines per page
    cpl          , i4      ;Characters per line
    flags        , i4      ;Miscellaneous flags
    unused       , a20     ;Reserved space
```

```
printerid      ,a80      ;For pre-7.5 compatibility
driver         ,a32      ;Printer driver name
extprinterid   ,a256     ;Extended printer name and port(s)
```



Windows requires support for 256 character printer names. Because of this, you must use the **extprinterid** field, added in version 7.5, rather than **printerid** on Windows.

---

If `D_DEVICEINFO` is specified, *info\_record* is returned with information about the printer designated by **printerid**. If **printerid** is blank, information on the currently selected printer is returned.

If `D_ENUM_PRINTERS` is specified, **printerid** is filled in with the name of the next printer from the Windows Print Manager list of installed printers. The first call retrieves the ID for the first installed printer, the second call retrieves the ID for the second installed printer, etc. When all printer IDs have been returned through this function, a call to `D_ENUM_PRINTERS` returns `D_EOLIST`, and **printerid** is cleared. (The next call to `D_ENUM_PRINTERS` will return the first printer ID again.)

`D_ENUM_WITH_INFO` works in the same way as `D_ENUM_PRINTERS`: the first call returns information on the first printer in the list, and so forth. But with `D_ENUM_WITH_INFO`, the entire *info\_record* is returned.

If `D_ENUM_RESET` is specified, the `D_ENUM_PRINTERS` function is reset with the next `D_ENUM_PRINTERS` call returning the first printer ID.

The **flags** field contains bit flags for various printer characteristics. To test a flag, use **.band.** with the .defined value from **tools.def**. Currently, we provide the flag for proportional spacing only. To test for proportional spacing, use

```
proportional = (info_record.flags .band. D_PRT_PROPORTIONAL)
```



## %U\_PRINTSETUP – Display a Print Setup dialog box



*status* = %U\_PRINTSETUP

### Return value

*status*

On Windows (including Synergy .NET), %U\_PRINTSETUP returns true if a printer was selected. If the user cancels or an error occurs, %U\_PRINTSETUP returns false. On UNIX and OpenVMS, this function always returns false. (^VAL)

### Arguments

This function has no arguments.

### Discussion

On Windows, including Synergy .NET, the %U\_PRINTSETUP function displays a standard Microsoft Print Setup dialog box. In this dialog box, your user can change the default printer or printer properties to which an LPQUE statement will print when the LPNUM qualifier is *not* specified.

Before %U\_PRINTSETUP is called, the default printer is the printer selected as the default for Windows (in “Devices and Printers” in Windows Control Panel). %U\_PRINTSETUP does not change this permanent default; the default is only changed for the life of the current Toolkit program, or until %U\_PRINTSETUP is called again. When a Toolkit program is run again, the default reverts to the default printer specified in Print Manager.

### Using the Print Setup dialog box

With the Print Setup dialog box (figure 16-7), the user can

- ▶ select a printer from the printer list setup in Print Manager.
- ▶ select form and orientation characteristics.
- ▶ select 2-sided printing (if supported by the selected printer).

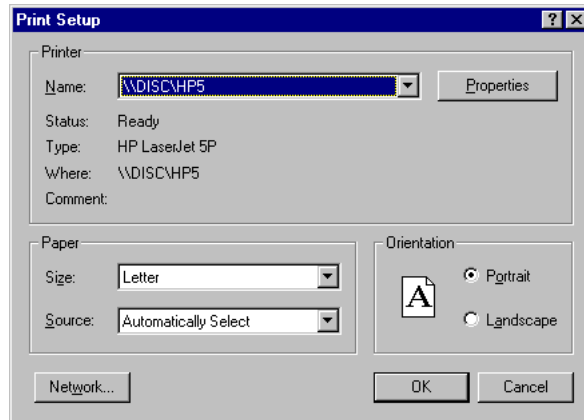


Figure 16-7. The Print Setup dialog box.

Selecting the Properties button displays the Document Properties dialog box (figure 16-8). The user can now

- ▶ set up graphics resolutions.
- ▶ select either color or monochrome printing.
- ▶ set optimizations.

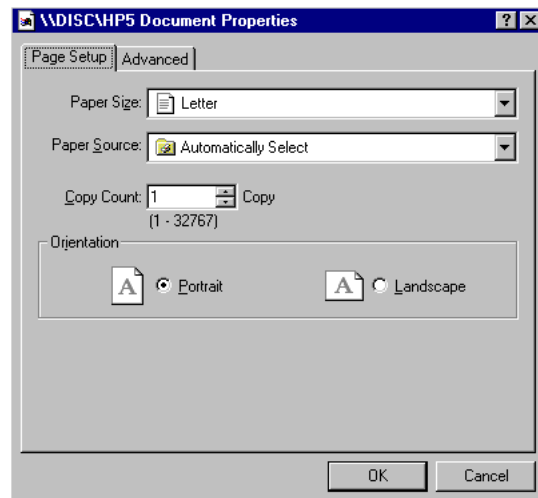


Figure 16-8. The Document Properties dialog box.

Selecting the Network button displays the Connect to Printer dialog box (figure 16-9). The user can now

- ▶ specify a printer.
- ▶ view a graphical representation of the available shared network printers.
- ▶ view printer information such as the print job description, print job status, and number of documents waiting.

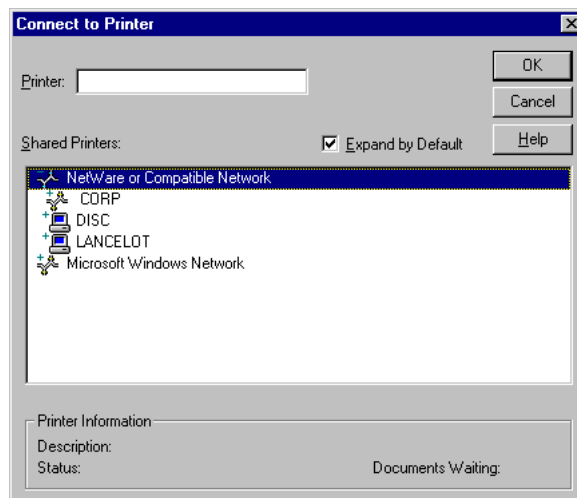


Figure 16-9. The Connect to Printer dialog box.

## See also

- ▶ “[Printing](#)” in the “Statements, Functions, and Subroutines” chapter of the *Professional Series Portability Guide*.
- ▶ The *Migrating Your Application to Windows* guide, available in the [Synergex website](#).

## U\_REDRAW – Clear screen and redraw it



```
xcall U_REDRAW
```

### Discussion

The U\_REDRAW subroutine clears the screen and redraws it from scratch on the next update.

Normally, you don't need to clear the screen and redraw it; as changes are made to the screen, the affected characters are repainted as needed.

The situations in which you would be most likely to use this subroutine are as follows:

- ▶ When you want to enable the user to redraw the screen with a key(s) other than CTRL+R.
- ▶ When your application is returning from a task done in the shell. (Since the windowing system does not keep track of shell activities, the windowing environment must be redrawn upon re-entry.)
- ▶ When a portion of your application uses display statements to the terminal, and you subsequently return to the UI Toolkit portion of your code.

## U\_RENDER – Process display renditions



```
xcall U_RENDER([operation], [renditions, attr, color], [...],
&                [D_PALETTE, palette#, backgrd, foregrd][, D_DSPLY_ALL, ctrl_record])
```

### Arguments

#### *operation*

(optional) A function code that specifies whether a copy or load operation will occur: **(n)**

|               |                                 |
|---------------|---------------------------------|
| <b>D_COPY</b> | Copy (retrieve) the renditions. |
| <b>D_LOAD</b> | Set the renditions. (default)   |

#### *renditions*

(optional) One of the following display renditions: **(n)**

|                      |                                               |
|----------------------|-----------------------------------------------|
| <b>D_RND_MNU_ENA</b> | Enabled Menu Entry.                           |
| <b>D_RND_MNU_DSA</b> | Disabled Menu Entry.                          |
| <b>D_RND_MNU_SEL</b> | Selected Menu Entry.                          |
| <b>D_RND_MNU_HQS</b> | Menu Header Quick-Select.                     |
| <b>D_RND_MNU_EQS</b> | Menu Entry Quick-Select.                      |
| <b>D_RND_INP_DSP</b> | Input Field Display.                          |
| <b>D_RND_INP_PRC</b> | Input Field Processing.                       |
| <b>D_RND_INP_CLR</b> | Cleared Input Field.                          |
| <b>D_RND_INP_BCK</b> | Input Window Background.                      |
| <b>D_RND_INP_TTL</b> | Input Window Title.                           |
| <b>D_RND_INP_BDR</b> | Input Window Border.                          |
| <b>D_RND_INP_DSA</b> | Disabled Input Field.                         |
| <b>D_RND_INP_ROD</b> | Read-Only Input Field Display.                |
| <b>D_RND_INP_ROP</b> | Read-Only Input Field Processing.             |
| <b>D_RND_SEL_SEL</b> | Select Wnd Selected Item.                     |
| <b>D_RND_SEL_BCK</b> | Selection Window Body (and unselected items). |
| <b>D_RND_SEL_TTL</b> | Selection Window Title.                       |

|                        |                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_RND_SEL_BDR</b>   | Selection Window Border.                                                                                                               |
| <b>D_RND_SEL_EQS</b>   | Sel Wnd Quick-Selects.                                                                                                                 |
| <b>D_RND_WIN_BCK</b>   | Generic Window Background.                                                                                                             |
| <b>D_RND_WIN_TTL</b>   | General Window Title.                                                                                                                  |
| <b>D_RND_WIN_BDR</b>   | General Window Border.                                                                                                                 |
| <b>D_RND_MSG</b>       | Message Window Body.                                                                                                                   |
| <b>D_RND_MSG_BDR</b>   | Message Window Border.                                                                                                                 |
| <b>D_RND_HLP_BCK</b>   | Help Window Body.                                                                                                                      |
| <b>D_RND_HLP_TTL</b>   | Help Window Title.                                                                                                                     |
| <b>D_RND_HLP_BDR</b>   | Help Window Border.                                                                                                                    |
| <b>D_RND_HDR</b>       | Screen Header.                                                                                                                         |
| <b>D_RND_INF</b>       | Information Line.                                                                                                                      |
| <b>D_RND_FTR</b>       | Screen Footer.                                                                                                                         |
| <b>D_RND_DLG</b>       | Dialog Box Body.                                                                                                                       |
| <b>D_RND_DLG_BDR</b>   | Dialog Box Border.                                                                                                                     |
| <b>D_RND_LST_ENA</b>   | Enabled List.                                                                                                                          |
| <b>D_RND_LST_ENA_B</b> | Enabled List Border.                                                                                                                   |
| <b>D_RND_LST_ENA_T</b> | Enabled List Title.                                                                                                                    |
| <b>D_RND_LST_HDR</b>   | Enabled List Header.                                                                                                                   |
| <b>D_RND_LST_FTR</b>   | Enabled List Footer.                                                                                                                   |
| <b>D_RND_LST_SEL</b>   | Selected Item in List (used in place of D_RND_INP_DSP, D_RND_INP_CLR, or D_RND_INP_BCK if the input window is associated with a list). |
| <b>D_RND_LST_DSA</b>   | Disabled List (body, border, and title).                                                                                               |
| <b>D_RND_LST_DSA_S</b> | Disabled Selected Item.                                                                                                                |
| <b>D_RND_SCR_BAR</b>   | Scroll Bar.                                                                                                                            |
| <b>D_RND_SCR_IND</b>   | Scroll Bar Indicators.                                                                                                                 |
| <b>D_RND_USER_1</b>    | User Rendition 1.                                                                                                                      |
| <b>D_RND_USER_2</b>    | User Rendition 2.                                                                                                                      |

|                     |                   |
|---------------------|-------------------|
| <b>D_RND_USER_3</b> | User Rendition 3. |
| <b>D_RND_USER_4</b> | User Rendition 4. |
| <b>D_RND_USER_5</b> | User Rendition 5. |

*attr*

The attributes to set if loading (with D\_LOAD) or the current attribute values if copying (with D\_COPY). See the table below. (n)

*color*

The palette number to use for the specified rendition if loading or the current color value if copying. (n)

**D\_PALETTE**

(optional) Signifies that color palette codes will follow. (n)

*palette#*

Either the palette number to reference or the following qualifier: (n)

**D\_ALL\_CODES** All palette codes.

*backgrd*

Either the background color code (if *palette#* is a palette number) or the base of a 16-element array for all background color codes (if *palette#* is D\_ALL\_CODES). (n)

*foregrd*

Either the foreground color code (if *palette#* is a palette number) or the base of a 16-element array for all foreground color codes (if *palette#* is D\_ALL\_CODES). (n)

**D\_DSPLY\_ALL**

(optional) Signifies that all rendition controls will be accessed. (n)

*ctrl\_record*

The name of a variable that holds the entire rendition control record. (a425)

## Discussion

The U\_REND subroutine retrieves (copies) or sets (loads) display renditions.

The D\_COPY and D\_LOAD function codes determine whether the codes that follow will define copy or load operations. D\_COPY copies the current renditions into the specified variables (*attr* and *color*, *backgrd* and *foregrd*, or *ctrl\_record*) so you can examine the current renditions and save them so you can reset them later. D\_LOAD sets the renditions specified by the *attr* and *color*, *backgrd* and *foregrd*, or *ctrl\_record* variables.

Each rendition code (passed as the *renditions* argument) must be followed by *attr* and *color* arguments. Attributes that aren't referenced in the *attr* argument are reset to off. (For information on the default state for a rendition, see [“Renditions” on page 18-28.](#))

**WIN**

Note the following:

- ▶ The Windows environment overrides many of the renditions set with U\_RENDER (as well as by Proto and U\_EDITREND). See [“Renditions” on page 18-28](#) for information.
- ▶ U\_RENDER can accept or return a color number from 0 through 511 for the *backgrd* and *foregrd* arguments, so variables for these arguments must be at least an **i2** or **d3**. (We recommend **i4**.)

The table below lists the flags you can pass as the *attr* argument. Each flag consists of a series of codes: B=blinking (italic on Windows), H=highlighted (bold), R=reverse, and U=underlined. Note that you can substitute I for B (for example, A\_IR instead of A\_BR).

| Attribute Flag Definitions |                                                        |
|----------------------------|--------------------------------------------------------|
| Attribute flag             | Definition                                             |
| A_NONE                     | No attributes.                                         |
| A_U                        | Underlined.                                            |
| A_R                        | Reverse.                                               |
| A_RU                       | Reverse, underlined.                                   |
| A_B                        | Blinking (on UNIX and OpenVMS) or italic (on Windows). |
| A_BU                       | Blinking, underlined.                                  |
| A_BR                       | Blinking, reverse.                                     |
| A_BRU                      | Blinking, reverse, underlined.                         |
| A_H                        | Highlighted.                                           |
| A_HU                       | Highlighted, underlined.                               |
| A_HR                       | Highlighted, reverse.                                  |
| A_HRU                      | Highlighted, reverse, underlined.                      |
| A_BH                       | Blinking, highlighted.                                 |
| A_BHU                      | Blinking, highlighted, underlined.                     |



| Attribute Flag Definitions (Continued) |                                             |
|----------------------------------------|---------------------------------------------|
| Attribute flag                         | Definition                                  |
| A_BHR                                  | Blinking, highlighted, reverse.             |
| A_BHRU                                 | Blinking, highlighted, reverse, underlined. |
| A_ALL                                  | All attributes (same as A_BHRU).            |

If you want to save two different sets of display renditions, you can use the `D_DSPLY_ALL` argument to recall an entire set of renditions. `D_DSPLY_ALL` requires a single argument that is used to access the entire rendition control information. If the rendition operation is a copy (i.e., `D_COPY` was specified), the *ctrl\_record* variable must be large enough to hold the control record (**a425**).

See the table in “Renditions” on page 18-28 for the default renditions.

## See also

- ▶ [U\\_EDITREND on page 16-41](#) for information about creating and modifying rendition schemes.
- ▶ [“Customizing the Look of Your Application” on page 18-27.](#)

## Examples

The first example sets the blinking attribute for the information line.

```
xcall u_render(D_LOAD, D_RND_INF, A_B)
```

The second example sets the highlighted and underlined attributes for selected menu entries.

```
xcall u_render(D_LOAD, D_RND_MNU_SEL, A_HU)
```

The following example saves the current rendition of the dialog box, changes the dialog box’s rendition for the next `U_DIALOG` subroutine, and then restores the previous rendition.

```
xcall u_render(D_COPY, D_RND_DLG, att_sav, clr_sav)
xcall u_render(D_LOAD, D_RND_DLG, att_new, clr_new)
xcall u_dialog(. . .)
xcall u_render(D_LOAD, D_RND_DLG, att_sav, clr_sav)
```

The final example copies all rendition controls into **rendctl**, where **rendctl** is at least 404 bytes in size. You might use a subroutine like this to save all the current renditions so you can reset them later.

```
xcall u_render(D_COPY, D_DSPLY_ALL, rendctl)
```

## U\_RESIZE – Resize the screen



```
xcall U_RESIZE([height][, width])
```

### Arguments

*height*

(optional) The new screen height in rows. (**n**)

*width*

(optional) The new screen width in columns. (**n**)

### Discussion

The U\_RESIZE subroutine resizes the screen without reinitializing the windowing system.

If you specify only one of the arguments (either *height* or *width*), the other dimension will remain unchanged.

If the *height* is changed, only the screen body will be affected.

If the *width* is changed, all of the screen sections will be resized. U\_RESIZE will also rejustify any centered (D\_CENTER) or right-justified (D\_RIGHT) text within the new dimensions. If re-justifying causes any text to overlap, the centered text will prevail, truncating the right- or left-justified text.

Placement of any windows (other than the screen sections) will remain unaffected, except as limited by the window system.

### WIN

---

You can control the font used by the application window. See [“Using Fonts on Windows” on page 18-46](#).

---

### Examples

The first example sets the number of screen rows to 25, and the number of screen columns to 132.

```
xcall u_resize(25,132)
```

The second example sets the number of screen columns to 80 and leaves the number of screen rows unaffected.

```
xcall u_resize(,80)
```

## U\_RESIZESB – Resize a scroll bar window



```
xcall U_RESIZESB(scroll_id, new_length)
```

### Arguments

*scroll\_id*

The ID of a scroll bar window. (n)

*new\_length*

The new length in characters for the scroll bar window. (n)

### Discussion

The U\_RESIZESB subroutine changes the length of a scroll bar window. It changes the height of a vertical scroll bar, or it changes the width of a horizontal scroll bar.

*Scroll\_id* must be a window ID returned by U\_CREATE\_SB.

### See also

[U\\_CREATE\\_SB on page 16-22](#) for information on creating scroll bar windows.

## U\_RLSCHN – Release a channel



```
xcall U_RLSCHN(channel)
```

### Arguments

*channel*

The channel to release. (**n**)

### Discussion

This subroutine is used to release a channel previously allocated with the U\_GETCHN subroutine.

Do *not* use U\_RLSCHN to deallocate a channel that was allocated with U\_OPEN. Use U\_CLOSE instead.

### Examples

This example releases the channel contained in **chn**.

```
xcall u_rlschn(chn)
```

## U\_RSTREND – Restore renditions



```
xcall U_RSTREND([filename], [scheme][, status])
```

### Arguments

*filename*

(optional) The name of the rendition file. **(a)**

*scheme*

(optional) The rendition scheme name. **(a)**

*status*

(optional) Returned with zero (0) if the restore operation is successful, or with a Synergy DBL error number if it is unsuccessful. **(n)**

### Discussion

The U\_RSTREND subroutine restores a rendition scheme from a rendition file.

U\_RSTREND opens *filename* in **I:I** mode and closes it upon exit.

If *filename* does not exist and *status* is not passed, errors during the open are ignored and no renditions are restored.

If *filename* is not specified, UI Toolkit searches for the rendition file as follows:

- ▶ If the environment variable DTKRNDFIL is defined, the rendition filename is DTKRNDFIL's value.
- ▶ If DTKRND is defined instead of DTKRNDFIL, the rendition file is opened as **DTKRND:dtkrnd.ism**.
- ▶ If neither environment variable is set, **dtkrnd.ism** is opened in the current directory.

If Toolkit can't find the renditions file, U\_RSTREND does nothing. Additionally, if Toolkit can't open a renditions file, no error occurs and no action is taken. You can use *status* to find out if the operation failed or was successful.

If *scheme* is not specified or is blank, the currently loaded renditions are used.

Once a file is opened, U\_RSTREND loads the rendition scheme. If *scheme* is passed, it is used as the key (which is not case sensitive) to the file. If *scheme* is not passed, a blank key is used. A blank key marks the current rendition scheme. If the desired scheme cannot be found in the file, no error occurs and no renditions are modified. You can use *status* to find out if the operation failed or was successful.

Once the rendition scheme is loaded, the rendition definitions are used for subsequent screen displays.

## See also

[“Customizing the Look of Your Application” on page 18-27.](#)

## Examples

The following utility subroutine restores and stores personalized rendition schemes from a rendition file.

```
subroutine pers_rend
  a_scheme    ,a
  a_rstflg    ,n      ;Restore flag: 1=restore, 0=save

  .include "WND:tools.def"
  .define RENDFILE  , "RND:persrnd"

  record
    error      ,i4

  proc
    if (a_rstflg) then
      xcall u_rstrend(RENDFILE, a_scheme, error)
    else
      xcall u_savrend(RENDFILE, a_scheme, error, TRUE)
    if (error)
      xcall proc_error
    xreturn
  endsubroutine
```

## U\_SAVE – Save a window to a window library



```
xcall U_SAVE(channel, window_id, window_name[, error])
```

### Arguments

*channel*

The I/O channel to use. This channel must already be open in update mode. **(n)**

*window\_id*

The ID of the window to be saved. **(n)**

*window\_name*

The window name. **(a)**

*error*

(optional) Returns false (0) if the save was successful. If the save failed, this argument returns the error number of the resulting Synergy DBL error. **(n)**

### Discussion

The U\_SAVE subroutine saves a window to a window library.

If you save a window that already exists in the window library open on *channel*, the new window replaces the existing one.

### See also

The “[Error Messages](#)” chapter of *Synergy Tools* for information about Synergy DBL error numbers.

### Examples

The following example saves the window whose ID is stored in **help\_id** to a sequential file or window library on the channel stored in **help\_chan**. If the name stored in **help\_verb** is already present, the existing window will be overwritten.

```
xcall u_save(help_chan, help_id, help_verb)
```

## %U\_SAVELOG – Save an initialization setting to synergy.ini or synuser.ini

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %U_SAVELOG (setting_name, [value], [section][, all_users])
```

or

```
xcall U_SAVELOG (setting_name, [value], [section][, all_users])
```

### Return value

*status*

On Windows, %U\_SAVELOG returns true if the function is successful; otherwise, it returns false. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*setting\_name*

The name of the initialization setting. (**a**)

*value*

(optional) The value to save for the logical. (**a** or **n**)

*section*

(optional) The section of the initialization file you want to save the setting in. (**a**)

*all\_users*

(optional) One of the following: (**n**)

**TRUE**                      Save initialization setting to **synergy.ini**.

**FALSE**                     Save initialization setting to **synuser.ini**. (default)

### Discussion

The U\_SAVELOG subroutine writes an initialization setting (*setting\_name* and *value*) to **synergy.ini** or **synuser.ini**. The setting does not take effect until the next time the runtime is started. (Chaining does not cause Toolkit to re-read **synergy.ini** or **synuser.ini**.) If the function fails, which causes *status* to be returned as false, you can use %SYSERROR to retrieve the system-specific error code.

If *value* is numeric, it is converted to a string. If *value* is not passed, the current value of the initialization setting, *setting\_name*, is used.



If “synergy” is specified for *section*, this symbol will apply to all Synergy programs and tools. If a program name is passed, it will only apply to that program. If *section* is not passed, the name of the currently executing **.dbr** file is used. *Section* is case insensitive. If *section* doesn’t exist, it will be created.

If the file (**synergy.ini** or **synuser.ini**) Toolkit is attempting to write to does not exist, it will be created. The **synergy.ini** file will be created in the directory specified by SFWINIPATH if it’s set. If this variable isn’t set, **synergy.ini** will be created in the directory specified by DBLDIR. The **synuser.ini** file will be created in the user’s application data directory. For more information, see the “[Environment Variables](#)” chapter of *Environment Variables & System Options*.

## Examples

The following example writes the initialization setting “APP\_STATE=MAXIMIZED” to the [synergy] section of **synuser.ini**. (Note that *all\_users* isn’t passed.)

```
xcall u_savelog("APP_STATE", "MAXIMIZED", "synergy")
```

## %U\_SAVESETTINGS – Save application window settings to synergy.ini or synuser.ini

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %U_SAVESETTINGS ([flags])
```

or

```
xcall U_SAVESETTINGS ([flags])
```

### Return value

*status*

On Windows, %U\_SAVESETTINGS returns true if the function is successful; otherwise, it returns false. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*flags*

(optional) One or more of the following, combined using .BOR. or the vertical bar (|) operator: (n)

|                       |                                           |
|-----------------------|-------------------------------------------|
| <b>D_APP_ALLUSERS</b> | Save the settings to <b>synergy.ini</b> . |
| <b>D_APP_STATE</b>    | Save the application window state.        |
| <b>D_APP_POS</b>      | Save the application position.            |
| <b>D_APP_SCALE</b>    | Save the scaling percentage.              |
| <b>D_APP_SIZE</b>     | Save the application height and width.    |

### Discussion

The %U\_SAVESETTINGS function saves the state, position, scaling percentage, and size of the application window to **synuser.ini** or, if you pass D\_APP\_ALLUSERS, **synergy.ini**. For the size, %U\_SAVESETTINGS saves the size at U\_START or as of the last call to U\_RESIZE. For state, position, and scaling percentage, %U\_SAVESETTINGS saves current settings. Settings are saved to the section in the initialization file that's labeled with the name of the currently executing .dbr file.

If you don't pass *flags*, the application window settings are saved to **synuser.ini**.

If the file (**synergy.ini** or **synuser.ini**) that Toolkit is attempting to write to does not exist, it will be created. The **synergy.ini** file will be created in the directory specified by SFWINIPATH if it's set. If it isn't set, **synergy.ini** will be created in the directory specified by DBLDIR. The **synuser.ini** file will be created in the user's application data directory. For more information, see the “[Environment Variables](#)” chapter of *Environment Variables & System Options*.

If %U\_SAVESETTINGS fails (which causes *status* to be returned as false), you can use %SYSERROR to retrieve the system-specific error code.

## See also

- ▶ [%U\\_SAVELOG on page 16-132](#) for information on saving other initialization settings to **synergy.ini** or **synuser.ini**.
- ▶ [APP\\_X](#), [APP\\_Y](#), [APP\\_HEIGHT](#), [APP\\_WIDTH](#), and [APP\\_SCALE](#) in the “[Environment Variables](#)” chapter of *Environment Variables & System Options*.

## Examples

The following example saves the application size (as of U\_START or the last U\_RESIZE) to **synergy.ini**.

```
xcall u_savesettings(D_APP_SIZE|D_APP_ALLUSERS)
```

The next example does the same, but by calling U\_RESIZE with the current application window height and width, it causes %U\_SAVESETTINGS to save the current size of the application window to **synergy.ini**.

```
stack record
    wnd_handle ,i4
    group rect ,a
        left ,i4
        top ,i4
        right ,i4
        bottom ,i4
    endgroup
    row_num ,i4
    col_num ,i4

wnd_handle = %W_INFO(WIF_HWND, WID_APP) ;Get the window handle for the
                                           ; application window.
xcall u_winmetrics(D_CLIENT_RECT, wnd_handle, rect) ;Get coordinates for
                                                    ; client area of
                                                    ; application window.

row_num = %u_winmetrics(D_YTOROW, WID_APP, bottom-1) ;Get number of last
                                                    ; row.
col_num = %u_winmetrics(D_XTOCOL, WID_APP, right-1) ;Get number of last
                                                    ; column.
```

## Utility Routines

### %U\_SAVESETTINGS

```
xcall u_resize (row_num, col_num) ;Call U_RESIZE with current height and
                                   ; width (so the application window
                                   ; doesn't change).
xcall u_savesettings(D_APP_SIZE|D_APP_ALLUSERS) ;Save application window
                                                  ; position and size to
                                                  ; synergy.ini.
```

## U\_SAVREND – Save a rendition scheme to a file



```
xcall U_SAVREND([filename], [scheme], [status][, flag])
```

### Arguments

*filename*

(optional) The name of the rendition file. **(a)**

*scheme*

(optional) The rendition scheme name (a maximum of 30 characters). **(a)**

*status*

(optional) Returned with zero (0) if the save operation is successful, or a Synergy DBL error number if it is unsuccessful. **(n)**

*flag*

(optional) The true/false flag that tells U\_SAVREND whether to issue a warning before replacing an existing rendition scheme name. **(n)**

### Discussion

The U\_SAVREND subroutine saves a rendition scheme to a rendition file.

U\_SAVREND opens *filename* in **U:I** mode and closes it upon exit. If *filename* doesn't exist, it is created.

If *filename* is not specified, UI Toolkit searches for the rendition file as follows:

- ▶ If the environment variable DTKRNDFIL is defined, the rendition filename is DTKRNDFIL's value.
- ▶ If DTKRND is defined instead of DTKRNDFIL, the rendition file is opened as **DTKRND:dtkrnd.ism**.
- ▶ If neither environment variable is set, **dtkrnd.ism** is opened or created in the current directory.

If *scheme* is not specified or is blank, the currently loaded renditions are saved to the working rendition scheme (blank key).

If *flag* is true (non-zero), U\_SAVREND prompts the user before replacing an existing scheme.

### See also

[“Customizing the Look of Your Application” on page 18-27.](#)

## Examples

The following utility subroutine loads and saves personalized rendition schemes from a rendition file.

```
subroutine pers_rend
  a_scheme      ,a
  a_rstflg      ,n      ;Restore flag: 1=restore, 0=save
  .include "WND:tools.def"
  .define RENDFILE  , "RND:persrnd"

  record
    error        ,i4

  proc
    if (a_rstflg) then
      xcall u_rstrend(RENDFILE, a_scheme, error)
    else
      xcall u_savrend(RENDFILE, a_scheme, error, TRUE)
    if (error)
      xcall proc_error
    xreturn
  endsubroutine
```

## %U\_SELPALETTE – Select a color palette entry



*user\_selection* = %U\_SELPALETTE (*initial\_selection*)

### Return value

*user\_selection*

On Windows, the number of the palette entry chosen by the user. If cancelled, this function returns false. On UNIX and OpenVMS, this function always returns false. (^VAL)

### Arguments

*initial\_selection*

The number of the initially selected palette entry (the entry you want selected when the window opens). This number must be in the range 1-16. (n)

### Discussion

A call to %U\_SELPALETTE opens a selection window from your application that enables users to select a Synergy color combination. Typically this is used to customize user preferences. See [figure 16-10](#).

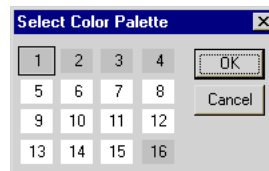


Figure 16-10. Palette selection window.

Each numbered square in the palette window corresponds to a color palette entry in the Synergy runtime and displays the foreground and background color for the entry. (The color of the number is the foreground color. The color of the box is the background color.) The current palette settings determine the initial colors, and the *initial\_palette* argument specifies the initial selection. (A thin-line box surrounds the selected entry. In [figure 16-10](#), for example, entry 1 is selected.)

The user selects the entry and clicks OK or presses ENTER. %U\_SELPALETTE then returns the number for the selected entry.

%U\_SELPALETTE returns 0 if the Cancel button is clicked, if the close button in the caption bar is clicked, or if ESC is pressed while the selection window is active.

*Initial\_palette* must be in the range 1-16. If it isn't, an error message is displayed and the function immediately returns 0.

## Examples

In the following example, the variable **color** refers to the color of a background window (whose ID is **backwnd**) placed within the application window. This section of code enables the user to select a new color and apply it.

```
.align
stack record
    color      ,i4
    newcolor   ,i4
    retvals    ,6d4
    backwnd    ,i4

proc
    xcall w_info(WI_ATTRS, backwnd, retvals) ;Get current window color
    color = retvals(2)                      ;Window color palette
    if ((newcolor = %u_selpalette(color) .and.
        & (newcolor .ne. color))            ;New color selected?
        begin
            color = newcolor                ;Apply the change
            xcall w_area(backwnd, WA_COPY, WAC_WTOP,
                & WA_COLOR, color)         ;Change the window area
            xcall w_disp(backwnd, WD_COLOR, color) ; and the current
                                                ; display color.
        end
```

## See also

- ▶ [U\\_REND](#) on page 16-121.
- ▶ The [WP\\_PALET](#) function for W\_PROC in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ The [WA\\_COLOR](#) function for W\_AREA in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ “[Colors and the color palette](#)” in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.



## U\_START – Initialize the UI Toolkit environment



```
xcall U_START([util_lib], [header_lines], [footer_lines], [pool_size], [screen_rows],
&             [screen_columns], [text_lib], [first_channel], [#env_levels], [last_channel]
&             [, start_method[, elb]])
```

### Arguments

*util\_lib*

(optional) The utility (window) library filename. **(a)**

*header\_lines*

(optional) The number of lines in the screen header section. This value can be in the range 0 to 4. **(n)**

*footer\_lines*

(optional) The number of lines in the screen footer section. This value can be in the range 0 to 4. **(n)**

*pool\_size*

(optional) The size of the windows pool, in bytes. This argument is obsolete for Synergy DBL version 5 and higher. **(n)**

*screen\_rows*

(optional) The number of rows on the screen. **(n)**

*screen\_columns*

(optional) The number of columns on the screen. **(n)**

*text\_lib*

(optional) The text library filename. **(a)**

*first\_channel*

(optional) The number (from 1 to 253) of the first channel available. **(n)**

*#env\_levels*

(optional) The number (from 2 to 32) of allowed environment levels. **(n)**

*last\_channel*

(optional) The number (from 3 to 255) of the last channel available. **(n)**

*start\_method*

(optional) The name of a USTART\_METHOD subroutine you have written. (a)

*elb*

(optional) The name of the library from which *start\_method* will be drawn. (a)

## Discussion

U\_START initializes the UI Toolkit environment. It should be the first call in your application's Toolkit layer. It detects and records, but does not change, any pre-existing environment states. If you want to modify these states, you should use E\_STATE.

If *util\_lib* is present and non-blank, the specified library

- ▶ is opened in **I:I** mode with the “nolock” (**NL**) option set.
- ▶ is promoted to global status.
- ▶ has its allocated channel placed in the **g\_utlib** field (defined in **tools.def**).

If *header\_lines* and *footer\_lines* are not present or are present and 0, their associated screen sections are not created or displayed on the screen.

---

### WIN

If *header\_lines* is specified as 1 (one) line, the Windows environment application “caption” is used to display the header instead of the typical Toolkit header section. If the header is more than one line in size, an area is still allocated within the application window. The text for a Windows application window caption can be explicitly referenced using the D\_CAPTION argument flag in the E\_SECT subroutine.

---

*Pool\_size* is obsolete and, therefore, ignored.

The default value for *screen\_rows* is 24 (25 under Windows). The default value for *screen\_columns* is 80. (You cannot call U\_START to resize the screen.) On Windows, if *screen\_rows* or *screen\_columns* is not passed, UI Toolkit uses the APP\_WIDTH and APP\_HEIGHT initialization settings to determine the screen size. If those are not specified, the size is 25 rows by 80 columns.

The *text\_lib* argument enables you to use translated text in your Toolkit applications by specifying a text message file that contains your translated text. This text message file, or library, is an ISAM file that will be opened in read-only mode. If you don't specify *text\_lib*, UI Toolkit uses **SYNTAX:syntaxt.ism** by default. If not found, UI Toolkit uses **DBLDIR:syntaxt.ism**.

Unless the *first\_channel* and *last\_channel* arguments are set, U\_START closes all channels in use from 1 to 255. If these arguments are set, it closes only channels in use in the range defined by these arguments. Note that if other Synergy programs are simultaneously using the Synergy runtime, Toolkit may close channels used by these other programs. You can use these arguments to prevent this. For information on options for *xfServerPlus*, see “[Removing User Interface Elements](#)” in the “Preparing Your Synergy Server Code” chapter of the *xfNetLink & xfServerPlus User's Guide*.

If you specify the *first\_channel* and *last\_channel* arguments, any channel previously in use within the range specified by these arguments will be purged. If you don't specify these arguments, UI Toolkit defaults to "owning" the entire range (1 to 255).

*First\_channel* is the first channel number available to Toolkit. If you don't pass it, it defaults to 1. This channel also will be the channel used for the terminal unless *W\_INIT* has been called previously and specifies another channel. All channel numbers less than this number will be logged as "system" channels to UI Toolkit, and should not be referenced again through any Toolkit subroutine.

*Last\_channel* is the last channel number available to Toolkit. Since Toolkit requires at least 3 channels, you should never pass a value less than 3 in *last\_channel*. If it is absent or more than 255, it defaults to 255. All channel numbers greater than this number will be logged as "system" channels to UI Toolkit, and should not be referenced again through any Toolkit subroutine.

You can control the number of environment levels allowed using *#env\_levels*. The valid range is 2 through 32. If you don't pass *#env\_levels*, Toolkit uses the default of 16 (to conserve memory).

If *start\_method* is passed, just prior to returning to the calling routine, U\_START calls this method to allow application-specific start-up processing. Note that if *DTKDBG* is set, the Toolkit debugger checks to make sure the method can be invoked (see [DTKDBG](#) in the "Environment Variables" chapter of *Environment Variables & System Options*).

If *elb* is passed, it is the library from which *start\_method* will be drawn. If *elb* is not passed, Toolkit will search for the *start\_method* subroutine in the program image or previously opened ELBs.

## See also

- ▶ The "[Renditions](#)" table on [page 18-29](#) for information on initial rendition settings established by U\_START.
- ▶ [U\\_FINISH](#) on [page 16-45](#) for information about closing and purging channels at application shut down.
- ▶ [U\\_OPEN](#) on [page 16-109](#) for information on opening channels.
- ▶ [U\\_CLOSE](#) on [page 16-18](#) for information on closing or purging channels.
- ▶ [U\\_GETCHN](#) on [page 16-61](#) for information about how to allocate a channel (usually used only to convert applications).
- ▶ [E\\_STATE](#) on [page 7-45](#) for information about modifying the environment states.
- ▶ [E\\_SECT](#) on [page 7-42](#) for information about how to display text in screen sections.
- ▶ [USTART\\_METHOD](#) on [page 16-248](#) for information about writing your application start-up method.

## Examples

In the following example, the U\_START subroutine opens the window library **WND:util** and initializes the UI Toolkit environment. The header section has 3 lines, and the footer section has 2 lines.

```
xcall u_start("WND:util", 3, 2)
```

The following example opens a window library called **WND:util** and initializes the UI Toolkit environment. The header and footer sections are not created.

```
xcall u_start("WND:util")
```

In the third example, the opened window library is also called **WND:util**. The header and footer screen sections are not created, the screen has 25 rows, and text messages are located in **WND:txtlib**.

```
xcall u_start("WND:util",,,, 25,, "WND:txtlib")
```

## U\_STOREND – Store a rendition scheme



```
xcall U_STOREND (channel, [scheme], [status][, flag])
```

### Arguments

*channel*

The channel on which the rendition file is opened. **(n)**

*scheme*

(optional) The name of the rendition scheme (a maximum of 30 characters). **(a)**

*status*

(optional) Returned with zero (0) if the store operation is successful, or a Synergy DBL error number if it is unsuccessful. **(n)**

*flag*

(optional) The true/false flag that tells U\_STOREND whether to issue a warning before replacing an existing rendition scheme name. **(n)**

### Discussion

The U\_STOREND subroutine stores a rendition scheme to an open rendition file.

*Channel* must be open in **U:I** mode.

If *scheme* is not passed or is blank, the currently loaded renditions are stored as the working rendition scheme (blank key).

If *flag* is true (non-zero), U\_STOREND will prompt the user before replacing an existing scheme.

### See also

[“Customizing the Look of Your Application” on page 18-27.](#)

### Examples

The following utility subroutine loads and stores personalized rendition schemes from a rendition file.

```
subroutine pers_rend
  a_scheme      ,a
  a_ldstflg     ,n      ;Load flag: 1=restore, 0=save

  .include "WND:tools.def"
```

```
global data section mygb
  record
    rendchn      ,i4
endglobal

record
  error          ,i4

proc
  if (a_ldflg) then
    xcall u_ldrend(rendchn, a_scheme, error)
  else
    xcall u_storend(rendchn, a_scheme, error, TRUE)
    if (error)
      xcall proc_error
    xreturn
endsubroutine
```

## U\_TEXT – Load and modify text library entries



```
xcall U_TEXT(channel, facility, message#, text, [length], [no_shortcuts], parameter, ...)
```

### Arguments

*channel*

The channel on which the text library is opened. (**n**)

*facility*

The desired facility name. (**a**)

*message#*

The number of the desired message. (**n**)

*text*

Returned with the message text. (**a**)

*length*

(optional) Returned with the length of the message text. (**n**)

*no\_shortcuts*

(optional) The true/false flag that tells U\_TEXT whether to prohibit shortcut text mapping. (**n**)

*parameter*

(optional) One or more S\_BLD parameters. (**a** or **n**)

### Discussion

The U\_TEXT subroutine retrieves a text entry from a text message file, optionally performs an S\_BLD on it, and optionally replaces menu entry names with their shortcut text. (Note that the S\_BLD occurs before the entry name replacement.)

You can pass up to ten *parameters*.

If no *parameters* are passed, Toolkit will not perform an S\_BLD. This avoids errors which might occur if a “%” is in the text.

If *no\_shortcuts* is passed and true, then no mapping of entry names to shortcut text will occur. Otherwise, M\_RPLENT is called with the text after any S\_BLD.

If *length* is passed, it is returned with the trimmed length of the resulting text. The text is returned in *text*.

Text message libraries may be created and maintained by using the Synergy UI Toolkit Control Panel. See [“The Synergy UI Toolkit Control Panel”](#) in the “General Utilities” chapter of *Synergy Tools* for more information.

### See also

- ▶ [S\\_BLD](#) in the “System-Supplied Subroutines and Functions” chapter of the *Synergy DBL Language Reference Manual* for an explanation of various parameters.
- ▶ [M\\_RPLENT](#) on page 10-52 for a description of the replacements which can be performed or avoided.

### Examples

The following example reads the text library which is open on the channel **mylib**, looking for a text message with facility “GEN” and a message number defined by D\_EXITINFO. The text of the message is scanned for any entry names, and if they are found they are replaced by their corresponding shortcut text. The resulting text message is returned in **info**, and its trimmed length is returned in **infoflen**.

```
xcall u_text(mylib, "GEN", D_EXITINFO, info, infoflen)
```

In the second example, the text library is searched for message facility “ERR” and message code D\_CANTWRITE. The text of this message is passed on to S\_BLD, with **chnl** and **%ernum** as additional arguments to S\_BLD. The text will not be scanned for menu entry replacement. The resulting text is returned in **msg**, and its trimmed length is returned in **msglen**.

```
xcall u_text(mylib, "ERR", D_CANTWRITE, msg, msglen,  
&                TRUE, chnl, %ernum)
```



## U\_UPDATE – Update screen



```
xcall U_UPDATE([auto_update])
```

### Arguments

*auto\_update*

(optional, Windows only) The update flag: **(n)**

**TRUE**                      Turns on updates.

**FALSE**                     Turns off updates.

### Discussion

A call to U\_UPDATE() causes an immediate screen update. Because input processing updates the screen, U\_UPDATE is necessary only if you want to update the screen without input. For example, U\_UPDATE can be used to display a “Please wait” message during processing.

On UNIX and OpenVMS, *auto\_update* is ignored. On Windows,

- ▶ a call to U\_UPDATE(TRUE) is equivalent to a call to U\_UPDATE(). Both cause an immediate screen update and reinstate screen updating if it’s been turned off by U\_UPDATE(FALSE).
- ▶ screen updating is the default, so U\_UPDATE(TRUE) isn’t necessary unless you want an immediate update or you’ve turned screen updating off with U\_UPDATE(FALSE).
- ▶ a call to U\_UPDATE(FALSE) suspends screen updating until the next call to U\_UPDATE(), U\_UPDATE(TRUE), W\_UPDT, or a Toolkit or Synergy windows input routine.



Note the following:

- ▶ Use UPDATE(OFF) only if you expect rapid changes to the display and you know an update will soon follow (for example, when entering or exiting environments and placing or removing menu columns and other windows). If updates are turned off for too long, there may be repainting problems—for example, “bleed through”, which may happen if windows for other applications are updated while updates are turned off for your application.
- ▶ To prevent menu flicker on Windows, you can use U\_UPDATE(FALSE) prior to every call made to the E\_EXIT subroutine.

## Examples

The following example prevents menu flicker when the system is removing columns.

```
xcall e_enter
xcall m_1dcol(id1,, "col_1")
xcall m_1dcol(id2,, "col_2")
.
.
.
(processing loop)
.
.
.
xcall u_update(FALSE)
xcall e_exit
```

To set the *auto\_update* flag for all E\_ENTER and E\_EXIT subroutine calls, you can write your own version of the E\_EXIT and E\_ENTER subroutines as follows:

```
subroutine my_enter
    a_shr ,n
proc
    xcall u_update(FALSE)
    xcall e_enter(a_shr)
    xreturn
endsubroutine

subroutine my_exit
proc
    xcall u_update(FALSE)
    xcall e_exit
    xreturn
endsubroutine
```

## U\_UPDATESB – Update a scroll bar window



```
xcall U_UPDATESB (scroll_id, maximum, current)
```

### Arguments

*scroll\_id*

The ID of the scroll bar window. **(n)**

*maximum*

The new maximum value. **(n)**

*current*

The new current value. **(n)**

### Discussion

The U\_UPDATESB subroutine updates a scroll bar window in UNIX and OpenVMS environments. (This routine does work on Windows, but the results are non-standard.)

A scroll bar's progress/regress indicator shows the relationship of what is currently displayed versus the total possible. (For example, you may only be viewing 10 out of a possible 100 entries in a list.) This relationship is referred to as the “ratio of current to maximum.”

The ratio of current to maximum is used to determine the placement of the progress/regress indicator within the scroll bar window. There are a few special cases where this ratio is superseded:

- ▶ If *maximum* is 0, the indicator is not placed.
- ▶ If *current* is 1, the indicator is always placed at position 1.
- ▶ If *current* is equal to *maximum*, the indicator is always placed at the last position.
- ▶ If the ratio of *current* to *maximum* results in an indicator position outside the window (for example, less than 1 or greater than the window size), the indicator's position will be limited to those bounds.

The endpoint indicators, if used, are displayed according to the following rules:

- ▶ If *current* is 1 or less, the “no more at beginning” indicator is displayed, otherwise the “more at beginning” indicator is displayed.
- ▶ If *current* is equal to or greater than *maximum*, the “no more at end” indicator is displayed, otherwise the “more at end” indicator is displayed.

#### See also

- ▶ [U\\_CREATE\\_SB](#) on page 16-22 for information about how to create a scroll bar window.
- ▶ [U\\_CHARSB](#) on page 16-12 for information about how to copy or load scroll bar characters.

#### Examples

The following example would place the indicator at position 1. This could indicate that the user is viewing the first part of the list. If present, the endpoint indicators would be showing “no more at beginning” and “more at end.”

```
xcall u_updatesb(scrlid, 50, 1)
```

The second example updates the indicator which could reflect that the user is viewing approximately the middle of the list. If present, the endpoint indicators would be showing “more at beginning” and “more at end.”

```
xcall u_updatesb(scrlid, 50, 25)
```

## U\_VERSION – Return Toolkit version number



```
xcall U_VERSION([version][, version_full])
```

### Arguments

*version*

(optional) Returned with the current Toolkit version with a one-digit version number. **(a)**

*version\_full*

(optional) Returned with the current Toolkit version with a two-digit version number. **(a)**

### Discussion

The U\_VERSION subroutine returns the current UI Toolkit version. If your application is linked against **tklib.elb**, **tklib\_qcheck.elb**, **TKLIB\_SH.EXE**, or if it uses **Synergex.SynergyDE.tklib.dll**, *version* and *version\_full* reflect the version of the ELB or DLL in use.

*Version* is returned in *v.r.mm* form, where *v* is the version number, *r* is the major revision number, and *mm* is the minor revision number. For the version number (*v*), versions higher than 9 are represented by Latin letters (A, B, etc.).

*Version\_full* is in *vv.r.mm* form, where *vv* is the version number, *r* is the major revision number, and *mm* is the minor revision number. The version number (*vv*) is in decimal notation, so versions higher than 9 are represented by two decimal digits (10, 11, etc.). Version 9 is represented by a single decimal digit preceded by a space (i.e., “ 9”).

### Examples

In the following example, *vers* is returned with the number of the UI Toolkit version currently in use. For example, if the current version is 9.1, *vers* will contain “9.1.1”:

```
xcall u_version(vers)
```

If the current version is 10.1, *vers* in the following will contain “A.1.1”, and *vers\_full* will contain “10.1.1”:

```
xcall u_version(vers, vers_full)
```

## U\_WAIT – Wait for a user response



```
xcall U_WAIT([wait, ...])
```

### Arguments

*wait*

(optional) One of the following wait flags: (**n**)

|                 |                                   |
|-----------------|-----------------------------------|
| <b>D_BELL</b>   | Ring the terminal bell. (default) |
| <b>D_NOBELL</b> | Don't ring the terminal bell.     |
| <b>D_ALERT</b>  | Do alert processing. (default)    |
| <b>D_ERROR</b>  | Do error processing.              |

### Discussion

The U\_WAIT subroutine displays a message in a window and waits for a user response.

#### UNIX, VMS

On UNIX and OpenVMS, U\_WAIT looks for an existing wait window called `u_wait_msg`. If it can't find this window, it looks in the window library opened on `g_utlib`. If it can't find `u_wait_msg` in the library (or a window library is not defined), U\_WAIT creates a one-line window of that name and places it three lines above the bottom of the screen body. The wait message will be displayed in this window.

If you create your own `u_wait_msg` window, you can control the window's vertical placement, but not the horizontal placement. Toolkit recognizes a vertical placement setting for this window but ignores a horizontal placement setting.

The waiting is either alert-style or error-style; therefore, `D_ALERT` and `D_ERROR` are mutually exclusive. The primary difference between the two styles is how you want the message to be acknowledged, which is further explained below.

An alert state is a normal part of processing a given function. (For example, it could be a completion message after some lengthy processing has occurred.) Alert-style processing displays a message ("Press RETURN to continue" by default) and waits for the user to press RETURN (ENTER).

An error state is an exception condition. It does not occur unless some invalid status exists. In this case, you want the user to read the displayed message and then correct the error condition (entry of invalid data, for example). You don't want a simple RETURN (ENTER) to terminate the error state because users often enter data at the terminal before it has actually been requested (which is called "type-ahead"). If the user received an error condition with type-ahead pending, the first RETURN

(ENTER) in the type-ahead data would inadvertently terminate the error condition. The data in any additional type-ahead would then be entered where the error originally occurred, either causing another error or entering valid but incorrect data.

Therefore, error-style processing

- ▶ purges all type-ahead.
- ▶ displays an error message in a wait window.
- ▶ displays a message—by default, “Press ^G to continue” on UNIX and OpenVMS systems or “Press RETURN to continue” on Windows—and then waits for the user to press CTRL+G (UNIX and OpenVMS) or RETURN (Windows).
- ▶ on UNIX and OpenVMS systems, rings the terminal bell each time an incorrect continuation character is entered. Note, however, that the terminal bell will not ring if **g\_beep** is set to false. See “**g\_beep**” on page 18-2.

---

## WIN

In Synergy .NET, Toolkit uses a cell-based-style message box if **g\_netnativemsgbox** (a field in **tools.def**) is set to false, which is the default. If **g\_netnativemsgbox** is set to true, Toolkit uses a native Windows message box.

In traditional Synergy, U\_WAIT creates a Windows-style message box that contains the alert or error message, an icon, and an OK button. If you pass D\_ALERT, the icon is an information icon (i); if you pass D\_ERROR, the icon is an exclamation point (!).

Note that U\_WAIT cannot time out on Windows. And note that **g\_beep** setting has no effect (see “**g\_beep**” on page 18-2).

---

---

## UNIX, VMS

You can redefine the continuation key code and the continuation message for both the error and alert states by changing the contents of **g\_wt\_err\_key**, **g\_wt\_err\_msg**, **g\_wt\_alrt\_key**, and **g\_wt\_alrt\_msg**, respectively, in the **tkctl.def** file.

If a time-out occurs, **g\_select** is set to true and **g\_entnam** is set to the entry name specified in **tkctl.def** for **g\_time\_entry**. By default, **g\_time\_entry** is defined as “O\_TIMEOUT”.

---

## Examples

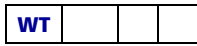
The first example displays a message in an alert state but does not ring the terminal bell.

```
xcall u_wait(D_NOBELL, D_ALERT)
```

The second example displays a message in an error state. It will ring the terminal bell.

```
xcall u_wait(D_ERROR)
```

## %U\_WINCELLS – Convert pixels to fractional rows or columns



```
cells = %U_WINCELLS (rows_or_cols, window_id, pixels)
```

or

```
xcall U_WINCELLS (cells, rows_or_cols, window_id, pixels)
```

### Return value

*cells*

On Windows, %U\_WINCELLS returns the number of rows or columns. This may be fractional (implied decimal). (**d**)

On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (**n**)

### Arguments

*rows\_or\_cols*

A flag that indicates whether the conversion should be to rows or columns. (**n**)

**D\_ROWS**

Interpret *pixels* as a vertical series of pixels. (*Cells* will be returned as the number of rows needed to span these pixels.)

**D\_COLS**

Interpret *pixels* as a horizontal series of pixels. (*Cells* will be returned as the number of columns needed to span these pixels.)

*window\_id*

The window ID or one of the following: (**n**)

**WID\_APP**

The application window (excluding border and caption).

**WID\_CONTAINER**

The container window for the Synergy application (including the border and caption).

*pixels*

The number of pixels to convert. (**n**)



## Discussion

%U\_WINCELLS returns the number of columns or rows needed to span a given number of pixels.

- ▶ If D\_ROWS is specified, *pixels* is interpreted as a vertical series of pixels, and *cells* is returned as the number of rows it takes to span those pixels.
- ▶ If D\_COLS is specified, *pixels* is interpreted as a horizontal series of pixels, and *cells* is returned as the number of columns it takes to span those pixels.

Note that *cells* can be a fractional number. If, for example, the number of columns needed to span 80 pixels is 2.5, cells will be returned as 2.5 (implied decimal).

If *rows\_or\_cols* is not passed as D\_COLS or D\_ROWS, a fatal Toolkit error will occur.

## Examples

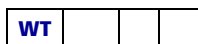
The following example returns the number of rows it takes to span the number of pixels (specified with the *pixels* variable) for the specified window:

```
rows = %u_wincells(D_ROWS, wndid, pixels)
```

The next example returns the number of columns it takes to span the number of pixels (specified with the *pixels* variable) for the specified window:

```
cols = %u_wincells(D_COLS, wndid, pixels)
```

## %U\_WINCOLOR – Perform Windows-specific color operations



*value* = %U\_WINCOLOR (*operation* [, *arg*, ...])

or

xcall U\_WINCOLOR (*operation* [, *arg*, ...])

### Return value

*value*

On Windows, %U\_WINCOLOR returns a value specific to *subfunction*. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*subfunction*

A flag that specifies which operation will be performed. It must be one of the following: (n)

- |                       |                                                                                                                            |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>D_CHOOSSECOLOR</b> | Display the Color dialog box with an initial color selection. See <a href="#">page 16-159</a> .                            |
| <b>D_GETCOLORS</b>    | Return RGB values associated with Synergy colors. See <a href="#">page 16-161</a> .                                        |
| <b>D_HYPER_FG</b>     | Return the RGB value for Toolkit hyperlink prompts. See <a href="#">page 16-163</a> .                                      |
| <b>D_PALETTE_RGB</b>  | Return the foreground and background colors (as RGB values) for a Synergy palette entry. See <a href="#">page 16-164</a> . |
| <b>D_SETCOLOR</b>     | Use an RGB value to set a Synergy color. See <a href="#">page 16-165</a> .                                                 |

*arg*

(optional) One or more arguments if required for *subfunction*.

### Discussion

The %U\_WINCOLOR function performs Windows-specific color operations. The syntax for each of the subfunctions listed under the *subfunction* argument is documented on the following pages.

If a value other than one of those listed above is passed for *subfunction*, a fatal Toolkit error will occur.

## %U\_WINCOLOR (continued)

### D\_CHOOSECOLOR

*value* = %U\_WINCOLOR (D\_CHOOSECOLOR, *color*, [*help\_filename*][, *help\_context\_id*])

#### Return value

*value*

On Windows, this function returns the user selected color or, if the user cancels, the color passed as *color*. (^**VAL**)

#### Arguments

*color*

The color (RGB value) you want initially selected when the Color dialog box opens. (**n**)

*help\_filename*

(optional) The name of the help file. (**a**)

*help\_context\_id*

(optional) The context identifier for help. Required if *help\_filename* is passed. (**n**)

#### Discussion

The D\_CHOOSECOLOR subfunction displays the Color dialog box with an initially selected color (*color*). This function returns either the color selected by the user or, if the user cancels, the color specified by *color*. See the Discussion for GetCellColor on [page 9-24](#) for information on RGB values.

If *help\_filename* is passed, the dialog will have a Help button. *Help\_filename* can be the name of either a WinHelp file (**.hlp**) or an HTML Help file (**.chm**):

- ▶ If the file extension is **.hlp**, *help\_context\_id* is passed as a context number to the HELP\_CONTEXT command for the WinHelp API. See the Microsoft documentation for WinHelp for more information on this command.
- ▶ If the file extension is **.chm**, the HtmlHelp API is used, and *help\_context\_id* is passed on to the HTML Help API command HH\_HELP\_CONTEXT. See the Microsoft documentation for the HTML Help API for more information on this command.

#### Examples

The following example displays a dialog box with the initial value specified by **color (i4)** and returns the color chosen by the user (if any) in **new\_color (i4)**.

```
new_color = %u_wincolor(D_CHOOSECOLOR, color)
```

The next example includes a help button on the dialog box.

```
new_color = %u_wincolor(D_CHOOSECOLOR, color, "helpfile.hlp",  
&select_color_id)
```

## %U\_WINCOLOR (continued)

### D\_GETCOLORS

*value* = %U\_WINCOLOR (D\_GETCOLORS, *color\_array*, [*start*][, *end*])

or

xcall U\_WINCOLOR (D\_GETCOLORS, *color\_array*, [*start*][, *end*])

### Return value

*value*

On Windows, this function returns true. (^VAL)

### Arguments

*color\_array*

The first element in an array of returned RGB values for Synergy colors. If this array is not large enough to store all of the returned colors, a fatal error may result (though results are unpredictable). (n)

*start*

(optional) The index of the first color to return (0 through 511). A value that is less than 0 or greater than 511 will cause a fatal runtime error. (n)

*end*

(optional) The index of the last color to return (0 through 511). A value that is less than 0 or greater than 511 will cause an error. If the value is less than *start*, no colors (or error) will be returned. (n)

### Discussion

The D\_GETCOLORS subfunction returns an array filled with the RGB values for a range of Synergy colors. D\_GETCOLORS gets this information from the current color definitions. These can be the memory-resident defaults, colors defined in **synergy.ini** or **synuser.ini**, or colors set with D\_SETCOLOR.

*Start* and *end* values correspond to numbers for Synergy colors. So if you pass 1 as *start*, for example, the first element in the array will be the value for Synergy color 1. If you don't pass *start*, the array index will be one higher than the accessed color. Element 1 will contain Synergy color 0, element 2 will contain Synergy color 1, and so forth. This is because Synergy DBL arrays start with element 1, but Synergy colors start with color 0.

Note the following:

- ▶ If you don't pass *start* or *end*, `D_GETCOLOR` returns a 256 element array whose first element is Synergy color 0 and whose final element is Synergy color 255.
- ▶ If you don't pass *start*, but do pass *end*, `D_GETCOLOR` returns an array whose first element is Synergy color 0 and whose last element is specified by *end*. (The number of elements in the array will be *end* plus 1.)
- ▶ If you don't pass *end*, but do pass *start*, `D_GETCOLOR` returns an array whose first element is determined by *start* and whose final element is Synergy color 255.

## See also

- ▶ The Discussion for `GetCellColor` on [page 9-24](#) for information on RGB values.
- ▶ “[Colors and the color palette](#)” in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* for information on Synergy colors.

## Examples

The following example returns in **color\_array (256i4)** the RGB values for Synergy colors 0 through 255:

```
success = %u_wincolor(D_GETCOLORS, color_array)
```

The next example returns in **win\_sys\_colors (256i4)** the RGB values for Synergy colors 256 through 511:

```
success = %u_wincolor(D_GETCOLORS, win_sys_colors, 256, 511)
```

## %U\_WINCOLOR (continued)

### D\_HYPER\_FG

*value* = %U\_WINCOLOR (D\_HYPER\_FG)

### Return value

*value*

On Windows, this function returns the color of Toolkit hyperlink prompts as an RGB value. (^VAL)

### Discussion

The D\_HYPER\_FG subfunction returns the color of Toolkit hyperlink prompts as an RGB value. See the Discussion for GetCellColor on [page 9-24](#) for information on RGB values. (n)

### Examples

The following example returns in **hyper\_color (i4)** the RGB value associated with a Toolkit hyperlink prompt.

```
hyper_color = %u_wincolor(D_HYPER_FG)
```

## %U\_WINCOLOR (continued)

### D\_PALETTE\_RGB

```
value = %U_WINCOLOR (D_PALETTE_RGB, palette, fg_color, bg_color[, attr])
```

or

```
xcall U_WINCOLOR (D_PALETTE_RGB, palette, fg_color, bg_color[, attr])
```

### Return value

*value*

On Windows, this function returns true if successful, false if not. (^VAL)

### Arguments

*palette*

A Synergy palette entry number (1-16). (n)

*fg\_color*

The returned foreground color. This is returned as an RGB value. (n)

*bg\_color*

The returned background color. This is returned as an RGB value. (n)

*attr*

Optional attribute to apply. You can supply only one *attr* argument, but its value can be composed by adding together the defined literals in **tools.def** or by using the supplied combination definitions (for example, A\_HR for highlight and reverse). (n)

### Discussion

The D\_PALETTE\_RGB subfunction returns the foreground and background colors associated with a Synergy palette entry. Each is returned as an RGB value. (See the Discussion for GetCellColor on [page 9-24](#) for information on RGB values.) If *attr* is passed, the specified attribute (A\_\* in **tools.def**) are applied before evaluating the colors. (See the table in the Discussion for U\_REND on [page 16-123](#).)

### See also

[“Customizing the Look of Your Application” on page 18-27](#) for information on Synergy palettes.

### Examples

This example returns the foreground and background colors associated with Synergy palette entry 6.

```
success = %u_wincolor(D_PALETTE_RGB, 6, fg_color, bg_color)
```



## %U\_WINCOLOR (continued)

### D\_SETCOLOR

*value* = %U\_WINCOLOR (D\_SETCOLOR, *color*, *rgb*)

or

xcall U\_WINCOLOR (D\_SETCOLOR, *color*, *rgb*)

### Return value

*value*

On Windows, this function returns true if successful, false if not (for example, if *color* is invalid). (^**VAL**)

### Arguments

*color*

A Synergy color (0-255). A value that is less than 0 or greater than 255 will cause a fatal runtime error. (**n**)

*rgb*

An RGB value. (**n**)

### Discussion

The D\_SETCOLOR subfunction sets a Synergy color (specified by *color*) to the RGB value represented by the value passed *rgb*.

D\_SETCOLOR settings override color settings in **synergy.ini** and **synuser.ini**, as well as memory-resident defaults. But D\_SETCOLOR settings last only until the program is exited. (Use the %U\_SAVELOG function if you wish to save this new color to the [colors] section of **synergy.ini** or **synuser.ini**. See [%U\\_SAVELOG on page 16-132](#) for information.)

### See also

- ▶ The Discussion for GetCellColor on [page 9-24](#) for information on RGB values.
- ▶ “[Colors and the color palette](#)” in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual* for information on Synergy colors.

### Examples

The following example sets Synergy color 77 to the RGB value specified in **color** (**i4**).

```
success = %u_wincolor(D_SETCOLOR, 77, color)
```

## U\_WINDOW – Place/move/remove/delete windows



```
xcall U_WINDOW(operation[, ...])
```

### Arguments

*operation*

One or more of the following operations: **(n)**

**D\_PLACE**, *window\_id*, [*row\_placement*], [*col\_placement*]

Places a window.

**D\_MOVE**, *window\_id*, [*row\_movement*], [*col\_movement*]

Moves a window.

**D\_REMOVE**, *remove\_win\_id*, ...

Removes a window.

**D\_DELETE**, *delete\_win\_id*, ...

Deletes a window.

*window\_id*

(optional) The ID of the window to be placed or moved. **(n)**

*row\_placement*

(optional) The row, relative to the screen body, where the window will be placed. **(n)**

*col\_placement*

(optional) The column, relative to the screen body, where the window will be placed. **(n)**

*row\_movement*

(optional) The number of rows up or down that the window will be moved. **(n)**

*col\_movement*

(optional) The number of columns left or right that the window will be moved. **(n)**

*remove\_win\_id*

(optional) Either the ID of the window to remove or one of the following qualifiers: **(n)**

**D\_ALL**            All windows.

**D\_GLOBAL**        All global windows.

**D\_LOCAL**         All local windows.

*delete\_win\_id*

Either the ID of the window to delete or the following qualifier: **(n)**

**D\_LOCAL**      All local windows.

## Discussion

The U\_WINDOW subroutine manipulates windows within the screen body.

You can do more than one *operation* with this subroutine. There is no maximum number of *operations*.

D\_PLACE places a window relative to the screen body, not the entire screen. This means that the position (1,1) is the leftmost position immediately under the menu bar (in the first row). Placement is limited by the menu bar and information line; the window is adjusted so that it doesn't interfere with either of these screen sections. If *row\_placement* or *col\_placement* is not passed, the previous placement value is used. Placing a window that was previously hidden restores the window to its previous state which, by default, is normal.

D\_MOVE moves a window relative to the screen body (rather than the entire screen) and places the window if it is not placed. Negative values move the window up or to the left. Positive values move it down or to the right. Zero specifies the current position (row, column, or both), unless you pass both *row\_movement* and *col\_movement* as zero for an unplaced window. In this case, D\_MOVE places the window at the top of all other placed windows. Note the following:

- ▶ *Row\_movement* and *col\_movement* default to zero.
- ▶ The position is automatically adjusted if necessary to prevent the window from occluding the menu bar or information line.

D\_REMOVE removes one or more windows from the screen. D\_REMOVE used with D\_LOCAL removes only windows that belong to the current environment.

D\_DELETE deletes one or more windows. Note that you cannot delete all global windows as a group. Also keep in mind that you can only delete windows placed at the current display level or windows "unplaced" in any environment. A fatal error occurs if you try to delete a window placed at a prior display level. If you try to delete an unallocated window ID, the deletion will be ignored.

## Examples

The following example places the window whose ID is stored in **custdata** at position (1,1) of the screen body.

```
xcall u_window(D_PLACE, custdata, 1, 1)
```

In this example, the window whose ID is stored in **custdata** is moved to the top of the window pile.

```
xcall u_window(D_REMOVE, custdata, D_MOVE, custdata, 0, 0)
```

The following example removes all local windows.

```
xcall u_window(D_REMOVE, D_LOCAL)
```

The following example deletes the window whose ID is stored in **passid**.

```
xcall u_window(D_DELETE, passid)
```

The following example moves the window whose ID is stored in **custdata** 20 places down and 40 places to the right, places the window whose ID is stored in **empdata** at position (1,1) of the screen body, and removes the windows whose IDs are stored in **taxinfo** and **date**.

```
xcall u_window(D_MOVE, custdata, 20, 40, D_PLACE,  
& empdata, 1, 1, D_REMOVE, taxinfo, date)
```

## %U\_WINHELP – Invoke WinHelp Help



*status* = %U\_WINHELP ([*window\_id*], *filename*, *command*, *data*)

or

xcall U\_WINHELP ([*window\_id*], *filename*, *command*, *data*)

### Return value

*status*

On Windows, this function returns an integer data type. (^VAL)

**TRUE**                      If successful.

**FALSE**                     If unsuccessful.

On UNIX and OpenVMS, this function always returns false.

### Arguments

*window\_id*

(optional) The ID of the window requesting Help. (n)

*filename*

The name of the Help file to invoke. (a)

*command*

The command code that specifies the type of help requested. See the table on [page 16-171](#) for explanations of these codes. (n)

**WHELP\_COMMAND**

**WHELP\_CONTENTS**

**WHELP\_CONTEXT**

**WHELP\_CONTEXTPOPUP**

**WHELP\_FORCEFILE**

**WHELP\_HELPONHELP**

**WHELP\_INDEX**

**WHELP\_KEY**

**WHELP\_MULTIKY**

**WHELP\_PARTIALKEY**

**WHELP\_QUIT**

**WHELP\_SETCONTENTS**

**WHELP\_SETINDEX**

**WHELP\_SETWINPOS**

*data*

The specific data for the command code. (**a** or **n**)

## Discussion

%U\_WINHELP starts the Windows Help application (**winhlp32.exe**) and passes additional data indicating the nature of the help requested.

The API is nearly identical to the Windows SDK “WinHelp” function, with two exceptions:

- ▶ Instead of passing a window handle, you pass a window ID which is translated to a handle. If you don’t pass *window\_id* or if it is zero, the handle of the application window will be used.
- ▶ If you pass a numeric value in *data*, that value is passed directly to WinHelp. If you pass an alphanumeric value, %U\_WINHELP copies and null-terminates *data*’s contents, and the address of the copied string is passed instead. This enables either alphanumeric strings or data structures to be passed in a native Synergy manner.

%U\_WINHELP deactivates your application when it invokes WinHelp Help. Your application will remain suspended until reactivated, which will happen when either

- ▶ help is closed.
- ▶ the user returns to the application (by clicking on the application window with the mouse or by using ALT+TAB to switch back to the application).

If the user reactivates the application without closing Help, the Help will continue running (in a deactivated state) until %U\_MSGBOX is called with the **WHELP\_QUIT** command option or until the user closes Help. The user can keep Help displayed indefinitely while continuing to use the application.

%U\_WINHELP uses *window\_id* to keep track of which applications have requested Help.

*Filename* must end with the **.hlp** extension (for example, **program.hlp**).

You can display the help topic in a secondary window instead of the primary window by using the following syntax for *filename*:

*filename>secondary\_windowname*

where *secondary\_windowname* is the name of the window for displaying the topic. To use the secondary window specified, you must first define its name in the [WINDOWS] section of the Help project (**.hpi**) file.

The *data* value used depends on the value of the *command* argument. The following table shows the possible values for the *command* argument and the corresponding formats of *data*.

| Values for the <i>Command</i> Argument |                                             |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Command</i>                         | <i>Data value</i>                           | <i>Action</i>                                                                                                                                                                                                                                                                                                                                                                                                       |
| WHELP_COMMAND                          | Macro name ( <b>a</b> )                     | Executes a help macro.                                                                                                                                                                                                                                                                                                                                                                                              |
| WHELP_CONTENTS                         | Zero (0)                                    | Displays Help for the topic specified by the CONTENTS setting in the <b>.hbj</b> file.                                                                                                                                                                                                                                                                                                                              |
| WHELP_CONTEXT                          | Context number for the topic ( <b>n</b> )   | Displays Help for a particular topic identified by a context number that has been defined in the [MAP] section of the <b>.hbj</b> file.                                                                                                                                                                                                                                                                             |
| WHELP_CONTEXTPOPUP                     | Context number for a topic ( <b>n</b> )     | Displays Help in a pop-up window for a particular topic identified by a context number that has been defined in the [MAP] section of the <b>.hbj</b> file.                                                                                                                                                                                                                                                          |
| WHELP_FORCEFILE                        | Zero (0)                                    | Ensures that WinHelp is displaying the correct Help file. If the correct Help file is currently displayed, there is no action. If the incorrect Help file is displayed, WinHelp opens the correct file.                                                                                                                                                                                                             |
| WHELP_HELPONHELP                       | Zero (0)                                    | Displays the Help Topics dialog box for Windows Help.                                                                                                                                                                                                                                                                                                                                                               |
| WHELP_INDEX                            | Zero (0)                                    | Displays the Help Contents topic. (See WHELP_CONTENTS.)                                                                                                                                                                                                                                                                                                                                                             |
| WHELP_KEY                              | Keyword ( <b>a</b> )                        | Displays the Index tab of the Help Topics dialog box with the specified keyword in the "Type the first few letters of the word you're looking for" field.                                                                                                                                                                                                                                                           |
| WHELP_MULTIKEY                         | <i>Multikey</i> ( <b>a</b> )<br>(see below) | Displays the structure identified by a keyword in an alternative keyword table.                                                                                                                                                                                                                                                                                                                                     |
| WHELP_PARTIALKEY                       | Keyword ( <b>a</b> )                        | If there is one exact match, displays the topic found in the keyword list that matches the specified keyword.<br><br>If there is more than one match, displays the Search dialog box with the topics listed in the Go To list box.<br><br>If there is no match, displays the Search dialog box. To bring up the Search dialog box without passing a keyword (the third result), you should use a null string (" "). |

| Values for the <i>Command</i> Argument (Continued) |                                                                               |                                                                                                                                                |
|----------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Command</i>                                     | Data value                                                                    | Action                                                                                                                                         |
| WHELP_QUIT                                         | Zero (0)                                                                      | Informs the Help application that Help is no longer needed. If no other applications have asked for Help, Windows closes the Help application. |
| WHELP_SETCONTENTS                                  | Context number for the topic to be designated as the Index topic ( <b>n</b> ) | Determines the Contents topic that Help is to display when a user presses the F1 key.                                                          |
| WHELP_SETINDEX                                     | Context number for the topic ( <b>n</b> )                                     | Specifies the Contents topic.                                                                                                                  |
| WHELP_SETWINPOS                                    | <i>Helpwininfo</i> ( <b>a</b> )<br>(See below)                                | Displays the Help structure, if it is minimized or in memory, and positions it according to the data passed.                                   |

The *multikey* record definition must be defined as follows:

```
record multikey
    mksize      ,i4    ;Length, in bytes, of this structure
    mkkeylist   ,a1    ;Identifies the keyword table to search
    keyphase    ,a*    ;Contains the keyword to be located
```

The *helpwininfo* record definition must be defined as follows:

```
record helpwininfo ;Length, in bytes,
    structsize ,i4  ;of this structure
    x          ,i4  ;Pixel x-coordinate of upper-left corner
    y          ,i4  ;Pixel y-coordinate of upper-left corner
    dx         ,i4  ;Width, in pixels
    dy         ,i4  ;Height, in pixels
    wMax       ,i4  ;Specifies how the window is to be shown
    rgchmember ,a*  ;Unicode window name
```

See also

[%U\\_HTMLHELP](#) on page 16-74 for information on invoking HTML from your application.



## %U\_WININFO – Return Windows-specific information

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

*value* = %U\_WININFO(*info*[, *arg*, ...])

or

xcall U\_WININFO(*info*[, *arg*, ...])

### Return value

*value*

On Windows, %U\_WININFO returns a value that is specific to the requested information. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*info*

A flag that indicates which information will be returned. It must be one of the following: (n)

|                    |                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------|
| <b>D_CURSORPOS</b> | Return the current pixel coordinates for the mouse pointer. See <a href="#">page 16-174</a> .        |
| <b>D_HINSTANCE</b> | Return the instance handle for the Synergy runtime. See <a href="#">page 16-175</a> .                |
| <b>D_VKTOASCII</b> | Return the ASCII character that corresponds to a virtual key code. See <a href="#">page 16-176</a> . |

*arg*

(optional) Up to two arguments if required for *info*.

### Discussion

The %U\_WININFO function returns Windows-specific information. The syntax for each of the subfunctions listed under the *info* argument is documented on the following pages.

If a value other than those listed above is passed for *info*, a fatal Toolkit error will occur.

### See also

[%U\\_WINMETRICS](#) on [page 16-177](#) for Windows-specific metrics information.

## %U\_WININFO (continued)

### D\_CURSORPOS

*value* = %U\_WININFO (D\_CURSORPOS, *x\_coordinate*, *y\_coordinate*)

or

`xcall U_WININFO (D_CURSORPOS, x_coordinate, y_coordinate)`

### Return value

*value*

On Windows, this function returns true. (^**VAL**)

### Arguments

*x\_coordinate*

The returned x-axis pixel coordinate for the mouse cursor. (**n**)

*y\_coordinate*

The returned y-axis pixel coordinate for the mouse cursor. (**n**)

### Discussion

The D\_CURSORPOS subfunction returns the x-axis and y-axis pixel coordinates for the current location of the mouse cursor. Note that these coordinates are relative to the *screen*, not a window.

### Examples

The following example returns in **xpos** and **ypos** (both **i4**) the current pixel coordinates of the mouse cursor relative to the screen.

```
success = %u_wininfo(D_CURSORPOS, xpos, ypos)
```

## %U\_WININFO (continued)

### D\_HINSTANCE

*value* = %U\_WININFO (D\_HINSTANCE)

### Return value

*value*

On Windows, this function returns the instance handle (D\_ADDR) for the Synergy runtime (**dbt**). (^VAL)

### Discussion

The D\_HINSTANCE subfunction returns the instance handle for the Synergy runtime (**dbt**). This could be passed, for example, to a DLL routine to create a window. (The instance handle is one of the required arguments to CreateWindow and CreateWindowEx.)

### Examples

The following example returns in **hinstance** the instance handle of the Synergy runtime (**dbt**).

```
hinstance = %u_wininfo(D_HINSTANCE)
```

## %U\_WININFO (continued)

### D\_VKTOASCII

*value* = %U\_WININFO (D\_VKTOASCII, *vk\_code* [, *key\_state*])

#### Return value

*value*

On Windows, this function returns the ASCII character that corresponds to *vk\_code* if one exists; otherwise it returns zero. (^VAL)

#### Arguments

*vk\_code*

The virtual key code (numeric value) of any alphanumeric character or any function key as defined in **tools.def** (D\_VKINSERT, D\_VK1, and so forth). (n)

*key\_state*

(optional) The key state flags as defined in **tools.def**: D\_KEY\_SHIFT, D\_KEY\_CONTROL, D\_KEY\_ALT, or any combination of these combined using .BOR. or the vertical bar (|) operator. (n)

#### Discussion

The D\_VKTOASCII subfunction returns the ASCII character that corresponds to *vk\_code* or *vk\_code* plus *key\_state*. If this doesn't result in an ASCII value, D\_VKTOASCII returns zero. Note that the numeric values of most printable characters correspond to the ASCII values of the characters. The exceptions are a-z, which use their upper-case values (65-90).

#### Examples

The following example returns in **ascii (i4)** the value that corresponds to the letter “a” (lower-case).

```
ascii = %U_WININFO (D_VKTOASCII, %decml ('A'))
```

The following example returns the value that corresponds to the letter “D” (upper-case).

```
ascii = %U_WININFO (D_VKTOASCII, %decml ('D'), D_KEY_SHIFT)
```

The next example returns the value that corresponds to the F6 key with the ALT and CTRL keys.

```
ascii = %U_WININFO (D_VKTOASCII, D_VKF6, D_KEY_ALT .bor. D_KEY_CONTROL)
```

## %U\_WINMETRICS – Return information about a window



```
return = %U_WINMETRICS (metric[, arg, ...])
```

or

```
xcall U_WINMETRICS (metric[, arg, ...])
```

### Return value

*return*

On Windows, %U\_WINMETRICS returns a value that is specific to the requested metric. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*metric*

A flag that indicates which metric will be used. It must be one of the following: (n)

|                      |                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_CHARHEIGHT</b>  | Return height of characters. See <a href="#">page 16-180</a> .                                                                                       |
| <b>D_CHARWIDTH</b>   | Return width of characters. See <a href="#">page 16-181</a> .                                                                                        |
| <b>D_CHECKBOX_X</b>  | Return width of a check box or radio button. See <a href="#">page 16-182</a> .                                                                       |
| <b>D_CLIENT_RECT</b> | Return coordinates for client area of a window. See <a href="#">page 16-183</a> .                                                                    |
| <b>D_COLTOX</b>      | Return width for a specified number of columns, or return the coordinate for the right side of a specified column. See <a href="#">page 16-185</a> . |
| <b>D_EDITEXTRA_X</b> | Return extra width required for an edit control. See <a href="#">page 16-187</a> .                                                                   |
| <b>D_HSCROLL_Y</b>   | Return height of a horizontal scroll bar. See <a href="#">page 16-188</a> .                                                                          |
| <b>D_MAPPOINTS</b>   | Convert points from the coordinate system of one window to the coordinate system for another window. See <a href="#">page 16-189</a> .               |
| <b>D_ROWHEIGHT</b>   | Return the overall height of a row. See <a href="#">page 16-191</a> .                                                                                |
| <b>D_ROWLEADING</b>  | Return the space between rows. See <a href="#">page 16-192</a> .                                                                                     |
| <b>D_ROWTOY</b>      | Return height for the specified number of rows, or return the coordinate for the bottom of a specified row. See <a href="#">page 16-193</a> .        |
| <b>D_SCREEN_X</b>    | Return screen width. See <a href="#">page 16-195</a> .                                                                                               |

|                       |                                                                                                                     |
|-----------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>D_SCREEN_Y</b>     | Return screen height. See <a href="#">page 16-196</a> .                                                             |
| <b>D_TABHEIGHT</b>    | Return the height of a tab. See <a href="#">page 16-197</a> .                                                       |
| <b>D_TABWIDTH</b>     | Return the width of a tab. See <a href="#">page 16-198</a> .                                                        |
| <b>D_TABXOFFSET</b>   | Return the horizontal offset for a tab set. See <a href="#">page 16-199</a> .                                       |
| <b>D_TABYOFFSET</b>   | Return the vertical offset for a tab set. See <a href="#">page 16-200</a> .                                         |
| <b>D_VISIBLE_RECT</b> | Return coordinates for client area minus any area occupied by standard buttons. See <a href="#">page 16-201</a> .   |
| <b>D_VSCROLL_X</b>    | Return width of a vertical scroll bar. See <a href="#">page 16-202</a> .                                            |
| <b>D_WINDOW_RECT</b>  | Return coordinates for screen rectangle for a window. See <a href="#">page 16-203</a> .                             |
| <b>D_XBORDER</b>      | Return width of a vertical side of a thin border. See <a href="#">page 16-205</a> .                                 |
| <b>D_XFRAME</b>       | Return width of a vertical side of a thick window frame. See <a href="#">page 16-206</a> .                          |
| <b>D_XORIGIN</b>      | Return offset of first visible column from the left side of the client area. See <a href="#">page 16-207</a> .      |
| <b>D_XTOCOL</b>       | Return number for the column that contains pixels with a given x-axis coordinate. See <a href="#">page 16-208</a> . |
| <b>D_YBORDER</b>      | Return thickness (height) of a horizontal side of a thin border. See <a href="#">page 16-209</a> .                  |
| <b>D_YCAPTION</b>     | Return height of a caption bar. See <a href="#">page 16-210</a> .                                                   |
| <b>D_YFRAME</b>       | Return thickness (height) of a horizontal side of a thick window frame. See <a href="#">page 16-211</a> .           |
| <b>D_YORIGIN</b>      | Return offset of first visible row from the top of the client area. See <a href="#">page 16-212</a> .               |
| <b>D_YTOROW</b>       | Return number for the row that contains pixels with a given y-axis coordinate. See <a href="#">page 16-213</a> .    |

*arg*

(optional) One to three arguments as required for the metric.

## Discussion

The %U\_WINMETRICS function returns information about a window or the contents of a window. The syntax for each of the subfunctions listed under the *metrics* argument is documented on the following pages.

If a value other than those listed above is passed for *metric*, a fatal error will occur.

## See also

You can retrieve other types of information about a window by using the W\_INFO and %W\_INFO Synergy DBL routines. See [W\\_INFO](#) and [%W\\_INFO](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.

## Examples

You can combine %U\_WINMETRICS subfunctions to perform additional calculations. For example, the following code displays the size of the screen in characters. It does this by dividing the pixel size of the screen by the size of a character: (Note that this calculation doesn't account for toolbars or scrollbars.)

```
xcall U_MESSAGE("width " + %string(%U_WINMETRICS(D_SCREEN_X) /  
&                %U_WINMETRICS(D_CHARWIDTH, my_window))) ;Width of screen  
                                ; in characters  
xcall U_MESSAGE("height " + %string(%U_WINMETRICS(D_SCREEN_Y) /  
&                %U_WINMETRICS(D_CHARHEIGHT, my_window))) ;Height of screen  
                                ; in characters
```

For a more complete example, see [GetWindowSize.zip](#), available from the Synergy CodeExchange in the Resource Center on the Synergex web site. This example calculates the available area in a window (with some exceptions) when that window is fully expanded.

## %U\_WINMETRICS (continued)

### D\_CHARHEIGHT

*return* = %U\_WINMETRICS (D\_CHARHEIGHT, *window\_id*)

#### Return value

*return*

On Windows, the height, in pixels, of the sizing character for the specified window. (^VAL)

#### Arguments

*window\_id*

The window ID or one of the following: (n)

|                      |                                                                                      |
|----------------------|--------------------------------------------------------------------------------------|
| <b>WID_APP</b>       | The application window (excluding border and caption).                               |
| <b>WID_CONTAINER</b> | The container window for the Synergy application (including the border and caption). |

#### Discussion

The D\_CHARHEIGHT subfunction returns the height, in pixels, of the sizing character for the window specified by *window\_id*. For a definition of sizing character, see the [Glossary](#) in this manual and “Using Fonts on Windows” on page 18-46.

#### Examples

The following example returns in **char\_height (i4)** the pixel height of the sizing character associated with **wndid**.

```
char_height = %U_WINMETRICS (D_CHARHEIGHT, wndid)
```

The next example returns the pixel height of the sizing character associated with the application window.

```
char_height = %U_WINMETRICS (D_CHARHEIGHT, WID_APP)
```

See Examples on [page 16-179](#) for an example that uses D\_CHARHEIGHT as part of a calculation that uses multiple %U\_WINMETRICS subfunctions.



## %U\_WINMETRICS (continued)

### D\_CHARWIDTH

*return* = %U\_WINMETRICS (D\_CHARWIDTH, *window\_id*)

#### Return value

*return*

On Windows, the width, in pixels, of the sizing character for the specified window. (^VAL)

#### Arguments

*window\_id*

The window ID or one of the following: (n)

**WID\_APP**                      The application window (excluding border and caption).

**WID\_CONTAINER**              The container window for the Synergy application (including the border and caption).

#### Discussion

The D\_CHARWIDTH subfunction returns the width, in pixels, of the sizing character for the window specified by *window\_id*. For a definition of sizing character, see the [Glossary](#) in this manual and “Using Fonts on Windows” on page 18-46.

#### Examples

The following example returns in **char\_width (i4)** the pixel width of the sizing character associated with **wndid**.

```
char_width = %U_WINMETRICS (D_CHARWIDTH, wndid)
```

The next example returns the pixel width of the sizing character associated with the application window.

```
char_width = %U_WINMETRICS (D_CHARWIDTH, WID_APP)
```

## %U\_WINMETRICS (continued)

### D\_CHECKBOX\_X

*return* = %U\_WINMETRICS (D\_CHECKBOX\_X)

#### Return value

*return*

On Windows, this function returns the width of a check box or radio button in pixels. (^**VAL**)

#### Discussion

The D\_CHECKBOX\_X subfunction returns the width of a check box or radio button in pixels.

#### Examples

The following example returns in **pixel\_width (i4)** the width of a check box in pixels.

```
pixel_width = %U_WINMETRICS (D_DCHECKBOX_X)
```

## %U\_WINMETRICS (continued)

### D\_CLIENT\_RECT

*return* = %U\_WINMETRICS (D\_CLIENT\_RECT, *h\_wnd*, *rect*)

or

*xcall* U\_WINMETRICS (D\_CLIENT\_RECT, *h\_wnd*, *rect*)

### Return value

*return*

On Windows, this function returns true if successful, false if not. (^VAL)

### Arguments

*h\_wnd*

The handle for the window whose client area coordinates you want to retrieve. This doesn't need to be a Synergy window. For example, this could be the handle for an ActiveX control, a window created by a DLL, or a window created by a different process. (n)

*rect*

The returned rectangle coordinates for the client area of the window. *Rect* is returned as a group of four **i4** values, which are coordinates for the left, top, right, and bottom points (respectively) of the client area. (n)

### Discussion

The D\_CLIENT\_RECT subfunction returns coordinates for the client area of the *h\_wnd* window. (The client area is the inside area of a window minus the frame, captions, information line, and footer.) These coordinates are returned in the *rect* argument, which is a group of **i4** values for the left, top, right, and bottom points of the client area. The left and top coordinates are always zero.

D\_CLIENT\_RECT and D\_VISIBLE\_RECT will always be equal for the application window (WID\_APP).

D\_CLIENT\_RECT and D\_VISIBLE\_RECT will always be equal for the container window (ID\_CONTAINER).

For the application and container windows, however, D\_CLIENT\_RECT may not be equal if, for example, a toolbar is placed. This area would be excluded from D\_CLIENT\_RECT for the application window.

For any other Synergy window, D\_CLIENT\_RECT and D\_VISIBLE\_RECT will be equal if the window does not include buttons.

## Examples

The following example gets the client rectangle for the application window in **rect**.

```
success = %U_WINMETRICS(D_CLIENT_RECT, %W_INFO(WIF_HWND, WID_APP), rect)
```

## %U\_WINMETRICS (continued)

### D\_COLTOX

*return* = %U\_WINMETRICS (D\_COLTOX, *window\_id*, *col\_num*[, *size\_or\_pos*])

### Return value

*return*

On Windows, D\_COLTOX returns one of the following: (^VAL)

- ▶ The width, in pixels, for the specified number of columns if *size\_or\_pos* is D\_SIZE.
- ▶ The x-axis (horizontal) pixel coordinate for the right side of the specified column if *size\_or\_pos* is D\_POSITION.

### Arguments

*window\_id*

The window ID or one of the following: (n)

**WID\_APP**

The application window (excluding border and caption).

**WID\_CONTAINER**

The container window for the Synergy application (including the border and caption).

*col\_num*

If you don't pass *size\_or\_pos*, or if you specify D\_SIZE, use this to specify the number of columns whose width you want to measure. If you specify D\_POSITION for *size\_or\_pos*, use this argument to specify a column number. (n)

*size\_or\_pos*

(optional) One of the following: (n)

**D\_SIZE**

Return the pixel width of the number of columns specified in *col\_num*. (default)

**D\_POSITION**

Return the x-axis (horizontal) pixel coordinate for the right side of the column specified by *col\_num*.

### Discussion

The D\_COLTOX subfunction returns either a width or an x-axis pixel coordinate depending on the *size\_or\_pos* argument.

- ▶ If you don't pass *size\_or\_pos*, or if you specify D\_SIZE, D\_COLTOX returns the width of the number of columns specified in *col\_num*.
- ▶ If you pass D\_POSITION, D\_COLTOX returns an x-axis pixel coordinate for the right side of the column specified by *col\_num*.

When using D\_POSITION, D\_COLTOX returns a value based on the display area origin, a coordinate system in which the 0, 0 pixel is at the top left of the display area.

## Examples

This example returns in **pixel\_width (i4)** the number of pixels that equates to six columns for **wndid**.

```
pixel_width = %U_WINMETRICS(D_COLTOX, wndid, 6, D_SIZE)
```

The next example returns in **pixel\_width** the right-most pixel of column 25 in the application window.

```
pixel_width = %U_WINMETRICS(D_COLTOX, WID_APP, 25, D_POSITION)
```

## %U\_WINMETRICS (continued)

### D\_EDITEXTRA\_X

*return* = %U\_WINMETRICS (D\_EDITEXTRA\_X)

#### Return value

*return*

On Windows, this function returns the extra pixel width required for an edit control. (^VAL)

#### Discussion

The D\_EDITEXTRA\_X subfunction returns the extra pixel width required for an edit control to be placed over a specific set of characters. This is in addition to the number of characters times the character width.

#### Examples

The following example returns in **pixel\_width (i4)** the number of extra pixels required for an edit control.

```
pixel_width = %U_WINMETRICS (D_EDITEXTRA_X)
```

## %U\_WINMETRICS (continued)

### D\_HSCROLL\_Y

*return* = %U\_WINMETRICS (D\_HSCROLL\_Y)

### Return value

*return*

On Windows, this function returns the height of a horizontal scroll bar in pixels. (^**VAL**)

### Discussion

The D\_HSCROLL\_Y subfunction returns the height of a horizontal scroll bar in pixels.

### Examples

The following example returns in **pixel\_height (i4)** the height of a horizontal scroll bar in pixels.

```
pixel_height = %U_WINMETRICS (D_HSCROLL_Y)
```



## %U\_WINMETRICS (continued)

### D\_MAPPOINTS

*return* = %U\_WINMETRICS (*D\_MAPPOINTS*, *h\_from*, *h\_to*, *x\_y\_pair*)

or

*xcall* U\_WINMETRICS (*D\_MAPPOINTS*, *h\_from*, *h\_to*, *x\_y\_pair*)

### Return value

*return*

On Windows, this function returns a 32-bit value that contains the addends used to convert coordinates. The low-order 16 bits contain the x-axis addend, and the high-order 16 bits contain the y-axis addend. Each value can be a negative number. (See the Discussion below for information on extracting these values.) (^**VAL**)

### Arguments

*h\_from*

A handle for the window whose coordinate system you want *x\_y\_pair* converted from. (**n**)

*h\_to*

A handle for the window whose coordinate system you want *x\_y\_pair* converted to. (**n**)

*x\_y\_pair*

A set (or sets) of coordinates (*x*, *y*) for a point (or points) in the *h\_from* window. Each 8 bytes of this argument is interpreted as a pair of **i4** values that represent x- and y- axis coordinates, so the value you pass must have a size that's a multiple of 8 bytes (8 bytes for a single point, 16 bytes for two points, and so forth). The converted coordinates are returned in this argument, so it must be writable. (**n**)

### Discussion

The *D\_MAPPOINTS* function converts the *x\_y\_pair* set (or sets) of coordinates from the coordinate system of the *h\_from* window to the coordinate system of the *h\_to* window. In other words, it converts coordinates that are relative to the upper-left corner of the *h\_from* window to coordinates that are relative to the upper-left corner of the *h\_to* window. (Note that these windows can be in different processes.) This could be useful, for example, if you have an ActiveX control that has no border and acts as a background or pointer within a larger window. When a user clicks on the control, your event routine may need to convert the coordinates of the click location to coordinates in the same location in the parent window.

The converted coordinates are returned in the *x\_y\_pair* argument in the same order they were passed.

The addends used to calculate the new set(s) of coordinates are returned in *return*, which is a 32-bit value. The low-order 16 bits contain the x-axis addend, and the high-order 16 bits contain the y-axis addend. For example, if *h\_from* is a window positioned at 100, 200 and *h\_to* is a window positioned at 500, 50, *return* will contain the x-axis addend (decimal 400, hex 190) in the low-order word and the y-axis addend (decimal -150, hex FF6A in 16-bit twos complement) in the high-order word. In this case, *return* will be returned as FF6A0190.

To extract the x- and y-axis addends from *return*, use the following:

```
cx = rval .band. ^x(FFFF)
cy = (rval .band. ^x(FFFF0000)) / ^x(1000)
```

where *cx* (**i2** or **i4**) is the addend used to calculate the x-axis coordinates, *cy* (**i2** or **i4**) is the addend used to calculate the y-axis coordinates, and *rval* (**i4**) is the returned value (*return*). (*Rval* can be a group of *cx*, **i2** and *cy*, **i2** values on little endian architectures.)

## Examples

The following example first gets the visible rectangle for **wndid**, and then converts these points to their corresponding values in the application window.

```
if (%U_WINMETRICS(D_VISIBLE_RECT, wndid, rect)) then
    pts = %U_WINMETRICS(D_MAPPOINTS, %W_INFO(WIF_HWND, wndid),
&                                     %W_INFO(WIF_HWND, WID_APP), rect)
```

## %U\_WINMETRICS (continued)

### D\_ROWHEIGHT

*return* = %U\_WINMETRICS (D\_ROWHEIGHT, *window\_id*)

#### Return value

*return*

On Windows, the overall height, in pixels, of a row in the specified window. (^VAL)

#### Arguments

*window\_id*

The window ID or one of the following: (**n**)

**WID\_APP** The application window (excluding border and caption).

**WID\_CONTAINER** The container window for the Synergy application (including the border and caption).

#### Discussion

The D\_ROWHEIGHT subfunction returns the overall height (character height plus leading), in pixels, of a row in the window specified by *window\_id*.

#### Examples

The following example returns in **row\_height** (**i4**) the pixel height of a row in **wndid**.

```
row_height = %U_WINMETRICS (D_ROWHEIGHT, wndid)
```

## %U\_WINMETRICS (continued)

### D\_ROWLEADING

*return* = %U\_WINMETRICS (D\_ROWLEADING, *window\_id*)

#### Return value

*return*

On Windows, this function returns the space between rows, in pixels, for the specified window. (^VAL)

#### Arguments

*window\_id*

The window ID or one of the following: (**n**)

|                      |                                                                                      |
|----------------------|--------------------------------------------------------------------------------------|
| <b>WID_APP</b>       | The application window (excluding border and caption).                               |
| <b>WID_CONTAINER</b> | The container window for the Synergy application (including the border and caption). |

#### Discussion

The D\_ROWLEADING subfunction returns the leading (the space between rows) in pixels for the window specified by *window\_id*.

#### See also

- ▶ [%U\\_WNDSTYLE](#) on page 16-244.
- ▶ [MINIMIZE\\_LEADING](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.

#### Examples

The following example returns in **row\_leading (i4)** the number of pixels between rows for **wndid**.

```
row_leading = %U_WINMETRICS (D_ROWLEADING, wndid)
```

## %U\_WINMETRICS (continued)

### D\_ROWTOY

*return* = %U\_WINMETRICS (D\_ROWTOY, *window\_id*, *row\_num*[, *size\_or\_pos*])

### Return value

*return*

On Windows, D\_ROWTOY returns one of the following: (^VAL)

- ▶ The height, in pixels, for the specified number of rows if *size\_or\_pos* is D\_SIZE.
- ▶ The y-axis (vertical) pixel coordinate for the bottom of the specified row if *size\_or\_pos* is D\_POSITION.

### Arguments

*window\_id*

The window ID or one of the following: (n)

**WID\_APP**                      The application window (excluding border and caption).

**WID\_CONTAINER**              The container window for the Synergy application (including the border and caption).

*row\_num*

If you don't pass *size\_or\_pos*, or if you specify D\_SIZE, use this to specify the number of rows whose height, you want to measure. If you specify D\_POSITION for *size\_or\_pos*, use this argument to specify a row number. (n)

*size\_or\_pos*

(optional) One of the following: (n)

**D\_SIZE**                        Return the pixel height of the number of rows specified in *row\_num*. (default)

**D\_POSITION**                Return the y-axis (vertical) pixel coordinate for the bottom of the row specified by *row\_num*.

### Discussion

The D\_ROWTOY subfunction returns either a height or a y-axis pixel coordinate depending on the *size\_or\_pos* argument.

- ▶ If you don't pass *size\_or\_pos*, or if you specify D\_SIZE, D\_ROWTOY returns the height of the number of rows specified in *row\_num*.
- ▶ If you pass D\_POSITION, D\_ROWTOY returns a y-axis pixel coordinate for the bottom of the row specified by *row\_num*.

## Examples

This example returns in **pixel\_height (i4)** the number of pixels that equates to six rows for **wndid**.

```
pixel_height = %U_WINMETRICS(D_ROWTOY, wndid, 6, D_SIZE)
```

The next example returns in **pixel\_height** the bottom pixel of row 17 in the application window.

```
pixel_height = %U_WINMETRICS(D_ROWTOY, WID_APP, 17, D_POSITION)
```

## %U\_WINMETRICS (continued)

### D\_SCREEN\_X

*return* = %U\_WINMETRICS (D\_SCREEN\_X)

### Return value

*return*

On Windows, this function returns the width of the screen in pixels. (^VAL)

### Discussion

The D\_SCREEN\_X subfunction returns the width of the screen in pixels.

### Examples

The following example returns in **pixel\_width (i4)** the width of the screen (the monitor's display area) in pixels.

```
pixel_width = %U_WINMETRICS (D_SCREEN_X)
```

See Examples on [page 16-179](#) for an example that uses D\_SCREEN\_X as part of a calculation that uses multiple %U\_WINMETRICS subfunctions.

## %U\_WINMETRICS (continued)

### D\_SCREEN\_Y

*return* = %U\_WINMETRICS (D\_SCREEN\_Y)

### Return value

*return*

On Windows, this function returns the height of the screen in pixels. (^**VAL**)

### Discussion

The D\_SCREEN\_Y subfunction returns the height of the screen in pixels.

### Examples

The following example returns in **pixel\_height (i4)** the height of the screen (the monitor's display area) in pixels.

```
pixel_height = %U_WINMETRICS (D_SCREEN_Y)
```

See Examples on [page 16-179](#) for an example that uses D\_SCREEN\_Y as part of a calculation that uses multiple %U\_WINMETRICS subfunctions.



## %U\_WINMETRICS (continued)

### D\_TABHEIGHT

*height* = %U\_WINMETRICS (D\_TABHEIGHT, *tabset\_id*, *index*)

#### Return value

*height*

On Windows, this function returns the height in pixels of a tab. (^VAL)

#### Arguments

*tabset\_id*

The ID of a tab set container window (the ID returned by the DTS\_CREATE subfunction to %TS\_TABSET). (n)

*index*

The index of the tab whose height you want returned. (n)

#### Discussion

The D\_TABHEIGHT subfunction returns the height, in pixels, of the tab specified by the *tabset\_id* and *index* arguments. *Height* is the y-axis measurement of the tab (so *height* will vary depending on whether the tab is part of a horizontal or vertical tab set).

If *index* is less than 1 or greater than the number of tabs in the specified tab set (*tabset\_id*), Toolkit generates an error.

#### Examples

The following example returns the number of pixels that make up the height of the tab specified by **tabset\_id** and **tab\_index**.

```
tab_height = %U_WINMETRICS(D_TABHEIGHT, tabset_id, tab_index)
```

## %U\_WINMETRICS (continued)

### D\_TABWIDTH

*width* = %U\_WINMETRICS (D\_TABWIDTH, *tabset\_id*, *index*)

#### Return value

*width*

On Windows, this function returns the width in pixels of a tab. (^VAL)

#### Arguments

*tabset\_id*

The ID of a tab set container window (the ID returned by the DTS\_CREATE subfunction to %TS\_TABSET). (n)

*index*

The index of the tab whose width you want returned. (n)

#### Discussion

The D\_TABWIDTH subfunction returns the width, in pixels, of the tab specified by the *tabset\_id* and *index* arguments. *Width* is the x-axis measurement of the tab (so *width* will vary depending on whether the tab is part of a horizontal or vertical tab set).

If *index* is less than 1 or greater than the number of tabs in the specified tab set (*tabset\_id*), Toolkit generates an error.

#### Examples

The following example returns the number of pixels that make up the width of the tab specified by **tabset\_id** and **tab\_index**.

```
tab_width = %U_WINMETRICS(D_TABWIDTH, tabset_id, tab_index)
```

## %U\_WINMETRICS (continued)

### D\_TABXOFFSET

*x\_offset* = %U\_WINMETRICS (D\_TABXOFFSET, *tabset\_id*)

#### Return value

*x\_offset*

On Windows, this function returns a tab set's horizontal offset in pixels. (^VAL)

#### Arguments

*tabset\_id*

The ID of a tab set container window (the ID returned by the DTS\_CREATE subfunction to %TS\_TABSET). (n)

#### Discussion

The D\_TABXOFFSET subfunction returns the distance, in pixels, from the left side of the client area of the tab set container window to the left side of the windows on the tabs. This distance includes the edge around the tab area and, if tabs are on the left, the width (x-axis measurement) of tabs.

#### Examples

The following example returns in **x\_offset (i4)** the horizontal offset for the tab set specified by **tabset\_id**.

```
x_offset = %U_WINMETRICS (D_TABXOFFSET, tabset_id)
```

## **%U\_WINMETRICS (continued)**

### **D\_TABYOFFSET**

*y\_offset* = %U\_WINMETRICS (D\_TABYOFFSET, *tabset\_id*)

#### **Return value**

*y\_offset*

On Windows, this function returns a tab set's vertical offset in pixels. (^VAL)

#### **Arguments**

*tabset\_id*

The ID of a tab set container window (the ID returned by the DTS\_CREATE subfunction to %TS\_TABSET). (**n**)

#### **Discussion**

The D\_TABYOFFSET subfunction returns the distance, in pixels, from the top of the client area of the tab set container window to the top of the windows on the tabs. This distance includes the edge around the tab area and, if tabs are on the top, the height (y-axis measurement) of tabs.

#### **Examples**

The following example returns in **y\_offset (i4)** the vertical offset for the tab set specified by **tabset\_id**.

```
y_offset = %U_WINMETRICS (D_TABYOFFSET, tabset_id)
```

## %U\_WINMETRICS (continued)

### D\_VISIBLE\_RECT

```
return = %U_WINMETRICS (D_VISIBLE_RECT, window_id, rect)
```

or

```
xcall U_WINMETRICS (D_VISIBLE_RECT, window_id, rect)
```

### Return value

*return*

On Windows, this function returns true if successful, false if not. (^VAL)

### Arguments

*window\_id*

The window ID or one of the following: (n)

**WID\_APP**

The application window (excluding border and caption).

**WID\_CONTAINER**

The container window for the Synergy application (including the border and caption).

*rect*

The returned rectangle coordinates for the points of the client area of the window, minus any area occupied by standard buttons. *Rect* is returned as a group of four **i4** values, which are coordinates for the left, top, right, and bottom points (respectively) of the client area. (n)

### Discussion

The D\_VISIBLE\_RECT subfunction returns coordinates for the client area of a window, minus any area occupied by standard buttons. (The client area is the inside area of a window minus the frame, captions, information line, and footer.) These coordinates are returned in the *rect* argument, which is a group of **i4** values for the left, top, right, and bottom points of the client area.

See the Discussion for D\_CLIENT\_RECT on [page 16-183](#) for information on when D\_CLIENT\_RECT and D\_VISIBLE\_RECT must agree or differ.

### Examples

The following example gets the visible rectangle for *wndid* in **rect**.

```
success = %U_WINMETRICS (D_VISIBLE_RECT, wndid, rect)
```

## %U\_WINMETRICS (continued)

### D\_VSCROLL\_X

*return* = %U\_WINMETRICS (D\_VSCROLL\_X)

### Return value

*return*

On Windows, this function returns the width of a vertical scroll bar in pixels. (^VAL)

### Discussion

The D\_VSCROLL\_X subfunction returns the width of a vertical scroll bar in pixels.

### Examples

The following example returns in **pixel\_width (i4)** the width of a vertical scroll bar in pixels.

```
pixel_width = %U_WINMETRICS (D_VSCROLL_X)
```

## %U\_WINMETRICS (continued)

### D\_WINDOW\_RECT

*return* = %U\_WINMETRICS (D\_WINDOW\_RECT, *h\_wnd*, *rect*[, *rel\_pos*])

or

xcall U\_WINMETRICS (D\_WINDOW\_RECT, *h\_wnd*, *rect*[, *rel\_pos*])

### Return value

*return*

On Windows, this function returns true if successful, false if not. (^VAL)

### Arguments

*h\_wnd*

The handle for the window whose screen rectangle you want to retrieve. This doesn't need to be a Synergy window. For example, this could be the handle for an ActiveX control, a window created by a DLL, or a window created by a different process. (n)

*rect*

The returned screen coordinates for the window. *Rect* is returned as a group of four **i4** values, which contain the coordinates for the left, top, right, and bottom points (respectively) of the window. (n)

*rel\_pos*

(optional) Determines whether the *rect* coordinates are relative to the screen or to the client area of the parent window. (n)

**TRUE**

Coordinates are relative to the upper-left corner of the screen.

**FALSE**

Coordinates are relative to the upper-left corner of the client area of the parent window. (default)

### Discussion

The D\_WINDOW\_RECT subfunction returns coordinates for the outside edges of the screen rectangle for the *h\_wnd* window. This includes frames, borders, captions, and so forth. If *rel\_pos* is passed and true, these coordinates are relative to the upper-left corner of the screen. If *rel\_pos* is not passed or is false, these coordinates are relative to the upper-left corner of the client area of the parent window.

## Examples

The following example returns the screen rectangle for **wndid** in `rect`. The returned coordinates will be relative to the screen.

```
success = %U_WINMETRICS(D_WINDOW_RECT, %w_info(WIF_HWND, wndid),  
&rect, TRUE)
```



## %U\_WINMETRICS (continued)

### D\_XBORDER

*return* = %U\_WINMETRICS (D\_XBORDER)

#### Return value

*return*

On Windows, D\_XBORDER returns the width, in pixels, of a vertical thin border. (^VAL)

#### Discussion

The D\_XBORDER subfunction returns the width, in pixels, of a vertical thin border.

#### Examples

The following example returns in **pixel\_width (i4)** the width of the vertical side of a thin border.

```
pixel_width = %U_WINMETRICS (D_XBORDER)
```

## %U\_WINMETRICS (continued)

### D\_XFRAME

*return* = %U\_WINMETRICS (D\_XFRAME)

### Return value

*return*

On Windows, D\_XFRAME returns the width, in pixels, of a vertical side of a thick window frame. (^**VAL**)

### Discussion

The D\_XFRAME subfunction returns the width, in pixels, of a vertical side of a thick window frame.

### Examples

The following example returns in **pixel\_width (i4)** the width of the vertical side of a thick window frame.

```
pixel_width = %U_WINMETRICS (D_XFRAME)
```

## %U\_WINMETRICS (continued)

### D\_XORIGIN

*return* = %U\_WINMETRICS (D\_XORIGIN, *window\_id*)

#### Return value

*return*

On Windows, the offset, in pixels, of the first visible column from the left side of the client area for the specified window. (^VAL)

#### Arguments

*window\_id*

The window ID or one of the following: (**n**)

**WID\_APP**                      The application window (excluding border and caption).

**WID\_CONTAINER**              The container window for the Synergy application (including the border and caption).

#### Discussion

The D\_XORIGIN subfunction returns the offset, in pixels, of the first visible column from the left side of the client area of the window specified by *window\_id*.

#### Examples

The following example returns in **offset (i4)** the number of pixels between the first visible column and the left side of the client area for **wndid**.

```
offset = %U_WINMETRICS(D_XORIGIN, wndid)
```

## %U\_WINMETRICS (continued)

### D\_XTOCOL

*return* = %U\_WINMETRICS (D\_XTOCOL, *window\_id*, *x\_value*)

#### Return value

*return*

On Windows, the number of the column that contains a given x-axis (horizontal) coordinate for a pixel. (^VAL)

#### Arguments

*window\_id*

The window ID or one of the following: (n)

**WID\_APP**

The application window (excluding border and caption).

**WID\_CONTAINER**

The container window for the Synergy application (including the border and caption).

*x\_value*

The x-axis (horizontal) coordinate for a pixel. This number must be based on the display area origin (where the 0, 0 pixel is at the top left of the display area). (n)

#### Discussion

The D\_XTOCOL subfunction returns the number of the column that contains the pixel whose x-axis coordinate is *x\_value* in the window specified by *window\_id*. This subfunction assumes *x\_value* is based on the display area origin, a coordinate system in which the 0, 0 pixel is at the top left of the display area.

When using proportional fonts in conjunction with D\_XTOCOL, the returned column value may not be correct. This value is based on the sizing character for the window, not any actual text.

#### Examples

This example returns in **column\_num** (i4) the number of the column with the specified pixel.

```
column_num = %U_WINMETRICS(D_XTOCOL, wndid, xpos)
```

## %U\_WINMETRICS (continued)

### D\_YBORDER

*return* = %U\_WINMETRICS (D\_YBORDER)

#### Return value

*return*

On Windows, D\_YBORDER returns the height (thickness), in pixels, of a horizontal thin border. (^VAL)

#### Discussion

The D\_YBORDER subfunction returns the height (thickness), in pixels, of a horizontal thin border.

#### Examples

The following example returns in **pixel\_height (i4)** the height of the horizontal side of a thin border.

```
pixel_height = %U_WINMETRICS (D_YBORDER)
```

## %U\_WINMETRICS (continued)

### D\_YCAPTION

*return* = %U\_WINMETRICS (D\_YCAPTION)

#### Return value

*return*

On Windows, D\_YCAPTION returns the height, in pixels, of a caption bar. This includes the height of the upper frame. (^**VAL**)

#### Discussion

The D\_YCAPTION subfunction returns the height, in pixels, of a caption bar. This height includes the height of the upper frame.

#### Examples

The following example returns in **pixel\_height (i4)** the height of the caption bar.

```
pixel_height = %U_WINMETRICS (D_YCAPTION)
```

## %U\_WINMETRICS (continued)

### D\_YFRAME

*return* = %U\_WINMETRICS (D\_YFRAME)

#### Return value

*return*

On Windows, D\_YFRAME returns the thickness (height), in pixels, of a horizontal side of a thick window frame. (^VAL)

#### Discussion

The D\_YFRAME subfunction returns the thickness (height), in pixels, of a horizontal side of a thick window frame.

#### Examples

The following example returns in **pixel\_height (i4)** the height of the horizontal side of a thick window frame.

```
pixel_height = %U_WINMETRICS (D_YFRAME)
```

## %U\_WINMETRICS (continued)

### D\_YORIGIN

*return* = %U\_WINMETRICS (D\_YORIGIN, *window\_id*)

#### Return value

*return*

On Windows, the offset, in pixels, of the first visible row from the top of the client area for the specified window. (^VAL)

#### Arguments

*window\_id*

The window ID or one of the following: (**n**)

**WID\_APP**                      The application window (excluding border and caption).

**WID\_CONTAINER**              The container window for the Synergy application (including the border and caption).

#### Discussion

The D\_YORIGIN subfunction returns the offset, in pixels, of the first visible row from the top of the client area of the window specified by *window\_id*.

#### Examples

The following example returns in **offset (i4)** the number of pixels between the first visible row and the top of the client area for **wndid**.

```
offset = %U_WINMETRICS(D_YORIGIN, wndid)
```



## %U\_WINMETRICS (continued)

### D\_YTOROW

*return* = %U\_WINMETRICS (D\_YTOROW, *window\_id*, *y\_value*)

### Return value

*return*

On Windows, the number of the row that contains a given y-axis (vertical) coordinate for a pixel. (^VAL)

### Arguments

*window\_id*

The window ID or one of the following: (n)

**WID\_APP**

The application window (excluding border and caption).

**WID\_CONTAINER**

The container window for the Synergy application (including the border and caption).

*y\_value*

The y-axis (vertical) coordinate for a pixel. This number must be based on the display area origin (where the 0,0 pixel is at the top left of the display area). (n)

### Discussion

The D\_YTOROW subfunction returns the number of the row that contains the pixel whose y-axis coordinate is *y\_value* in the window specified by *window\_id*. This subfunction assumes *y\_value* is based on the display area origin, a coordinate system in which the 0, 0 pixel is at the top left of the display area.

### Examples

The following example returns in **row\_num** (i4) the row number that contains the specified pixel for **wndid**.

```
row_num = %U_WINMETRICS(D_YTOROW, wndid, ypos)
```

## %U\_WNDEVENTS – Associate methods with mouse events



```
return = %U_WNDEVENTS (subfunction[, arg, ...])
```

or

```
xcall U_WNDEVENTS (subfunction[, arg, ...])
```

### Return value

*return*

On Windows, the return value of %U\_WNDEVENTS depends on *subfunction*. Refer to [page 16-216](#) through [page 16-221](#) for the specific return values. On UNIX and OpenVMS, this function always returns false. (^VAL)

### Arguments

*subfunction*

The specific function to perform. It must be one of the following: (n)

- |                    |                                                                                                                                                     |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_CREATE</b>    | Create a new method set. See <a href="#">page 16-216</a> .                                                                                          |
| <b>D_ASSIGN</b>    | Assign a method set to one or more windows. See <a href="#">page 16-220</a> .                                                                       |
| <b>D_SIGNAL</b>    | Call a routine registered as part of a method set for a Toolkit window. See <a href="#">page 16-221</a> .                                           |
| <b>D_GETEVENT</b>  | Return the address of a method routine for a specified event. See <a href="#">page 16-222</a> .                                                     |
| <b>D_GETEVENTS</b> | Determine whether a method set has been registered for a Toolkit window and, if it has, return the method set ID. See <a href="#">page 16-223</a> . |

*arg*

One or more arguments, depending on *subfunction*.

### Discussion

The %U\_WNDEVENTS function can be used to create an event method set, to assign an event method set to one or more windows for handling various mouse events, and to trigger a routine that is registered as part of a method set for a Toolkit window. The syntax for each of these operations is documented on the following pages.

Note: Don't use this function for event methods for ActiveX controls or for composite windows. Instead,

- ▶ for ActiveX controls, use the *prefix* argument for %AX\_TKSINGLE and %GRID\_CREATE to register extensions to the event method set that Toolkit automatically uses for these.
- ▶ for composite windows, use the DC\_EVENT subfunction for %C\_CONTAINER to register extensions to the event method set that Toolkit automatically uses for these windows.

See also

[“Appendix D: Methods”](#).

## %U\_WNDEVENTS (continued)

### D\_CREATE

```
method_set_id = %U_WNDEVENTS (D_CREATE, [elb], event, event_method,
&                                     [event, event_method][, ...])
```

or

```
xcall U_WNDEVENTS (D_CREATE, [elb], event, event_method, [event, event_method][, ...])
```

### Return value

*method\_set\_id*

The return value of D\_CREATE will be a method set ID if successful, or false (0) if not. (**^VAL**)

### Arguments

*elb*

(optional) The name of the library from which to draw the *event\_method* routines. (**a**)

*event*

The ID of the event. (**n**)

|                              |                                   |
|------------------------------|-----------------------------------|
| <b>D_EVENT_LEFT_CLICK</b>    | Left mouse button event.          |
| <b>D_EVENT_MIDDLE_CLICK</b>  | Middle mouse button event.        |
| <b>D_EVENT_RIGHT_CLICK</b>   | Right mouse button event.         |
| <b>D_EVENT_LEFT_DBLCLK</b>   | Double-click left mouse button.   |
| <b>D_EVENT_MIDDLE_DBLCLK</b> | Double-click middle mouse button. |
| <b>D_EVENT_RIGHT_DBLCLK</b>  | Double-click right mouse button.  |
| <b>D_EVENT_MOVE</b>          | Move window event.                |
| <b>D_EVENT_SIZE</b>          | Size window event.                |
| <b>D_EVENT_MINIMIZE</b>      | Minimize window event.            |
| <b>D_EVENT_MAXIMIZE</b>      | Maximize window event.            |
| <b>D_EVENT_RESTORE</b>       | Restore window event.             |
| <b>D_EVENT_SCROLL</b>        | Scroll window event.              |
| <b>D_EVENT_CLOSE</b>         | Close window event.               |

*event\_method*

The name of the %UWNDEVENTS\_METHOD function that will handle the event. (**a**)

## Discussion

The `D_CREATE` subfunction of `%U_WNDEVENTS` is used to define which `%UWNDEVENTS_METHOD` should be invoked for a specific event. You can specify the same `%UWNDEVENTS_METHOD` for more than one event, or for all events.

*Event* and *event\_method* must be specified as a pair. You can specify more than one event pair to `%U_WNDEVENTS`. All event pairs specified within one `D_CREATE` call to `%U_WNDEVENTS` are referred to as a method set and will be identified by a method set ID, which is returned by this function.

Only the events specified in the method set will invoke a call to `%UWNDEVENTS_METHOD`. The method set must also be associated with a window. See [D\\_ASSIGN on page 16-220](#) for information on associating methods with windows.



Once defined, method sets continue to exist for the life of your program. Each method set requires a small amount of memory. Be careful to avoid creating more method sets than you need, and try to reuse each method set for multiple windows. Creating too many method sets could result in performance degradation or program termination.

---

If `D_EVENT_SIZE` is specified, the frame of the window is changed to one that the user can “grab” by clicking and dragging the border to designate the new size. Also, a “Size” menu entry is placed on the window’s system menu to allow for the use of the keyboard when resizing. If this method is removed from the window, its corresponding menu entry is also removed. *Argument\_5* and *argument\_6* refer to the width and height of the logical window. The logical window is defined as the rows and columns used by Synergy/DE™. *Argument\_7* and *argument\_8* refer to the width and height of the client area. The client area is defined as the visible area within the window (inside the frame and scroll bars) in which client objects can be placed.

Resizing is snapped to the nearest row/column boundary. A window can be resized no smaller than the minimum size required for buttons plus one row and column of window space. When a window is resized, the display area of the window is modified, rather than the actual window size. If the window has a display area smaller than the total window area and scroll bars are enabled, scroll bars are displayed. When the scroll bars are moved, the display area origin changes. If scroll bars are disabled, they are not displayed. In certain instances, scroll bars may not be desirable, such as when the resizable window contains only one resizable component that shows scroll bars. Scroll bars are enabled and disabled using the `WB_SBON` and `WB_SBOFF` subfunctions of `W_BRDR`.

When a tab set container is resized smaller, the tabbed dialogs inside the container are also resized. If a window on a tab is resizable and scroll bars have not been disabled for that window, then scroll bars will be shown on the contained window if the tab is no longer large enough to display the entire window. Because the border of a contained window is turned off when it is placed on a tab, you must assign the window method set (with `D_ASSIGN`) prior to placing the window in the tab set. If a contained window does not show scroll bars (either because it is not resizable or because

scroll bars have been disabled with `W_BRDR`), then resizing the tab set smaller may clip the contained window so that it cannot all be viewed by the user. If a tab set container is sized larger than its logical window size, the tab set is still only as large as the logical window size.

For a list, horizontal resizing is limited to between 1 and the number of columns in the associated input window, and vertical resizing is limited at 1 and has no logical upper limit.

With the “full drag mode” enabled in Windows, resize events may occur rapidly. Therefore, actions performed in the resize method should be minimal and quick, otherwise the message queue may fill up. See the [“Implementing Your User Interface with UI Toolkit”](#) chapter of *Getting Started with Synergy/DE* for more information.

If `D_EVENT_MINIMIZE` is specified, a minimize button is added to the right side of the window’s frame, as well as a “Minimize” menu entry on the window’s system menu. A “Restore” menu entry is also added. The minimize button changes to a restore button when the window is minimized. A `%UWNDEVENTS_METHOD` must be written to enable this functionality; however, the method need not actually do anything. If this method is removed from the window, its corresponding button and menu entry are also removed.

When a window is minimized, a minimal title bar is displayed along the bottom border of the application window. The display area of a minimized window remains unaffected.

If `D_EVENT_MAXIMIZE` is specified, a maximize button is added to the right side of the window’s frame, as well as a “Maximize” menu entry on the window’s system menu. A “Restore” menu entry is also added. The maximize button changes to a restore button when the window is maximized. A `%UWNDEVENTS_METHOD` must be written to enable this functionality; however, the method need not actually do anything. If this method is removed from the window, its corresponding button and menu entry are also removed.

When a maximize event occurs, a resize event also occurs so that the application can respond to the change in size.

If a window is maximized, the display area is set to the number of visible rows and columns, or the maximum number of rows and columns, whichever is smaller. The frame of the window occupies the entire desktop, even if part of the contained area lies outside of the window’s logical size. In this case, the excess area is painted with the application background color defined by Windows.

When a window is restored, the display area is set to the number of rows and columns that fit into the restored rectangle. Note that when a restore event occurs, a resize event also occurs so that the application can respond to the change in size.

The `D_EVENT_MOVE`, `D_EVENT_SIZE`, `D_EVENT_MINIMIZE`, `D_EVENT_MAXIMIZE`, `D_EVENT_RESTORE`, `D_EVENT_SCROLL`, and `D_EVENT_CLOSE` events occur in response to both user action and programmatic changes to the window. For instance, a window can be programmatically maximized, minimized, or restored even if it doesn’t have a corresponding

method, by using the `W_PROC(WP_STATE)` subroutine. The application should not assume that an event is always fired in response to a user's action. For instance, if a resize method resizes the window, an infinite loop of method invocation can occur.



Selection windows do not support the minimize, maximize, or restore buttons, and they don't support the sizing arrow you see when you drag the edge or corner of a window. Because of this, users aren't able to minimize, maximize, restore, or size selection windows. However, you can do these things programmatically by using `W_PROC`. If you use `W_PROC`, events associated with the selection window will be called.

---

## **%U\_WNDEVENTS (continued)**

### **D\_ASSIGN**

*status* = %U\_WNDEVENTS (D\_ASSIGN, *method\_set\_id*, *window\_id*[, ...])

or

xcall U\_WNDEVENTS (D\_ASSIGN, *method\_set\_id*, *window\_id*[, ...])

### **Return value**

*status*

The return value of D\_ASSIGN is true or false depending upon success of the assignment. (^VAL)

### **Arguments**

*method\_set\_id*

The method set ID returned from the D\_CREATE subfunction. (n)

*window\_id*

The window ID that will produce those events. (n)

### **Discussion**

The method set ID obtained from the D\_CREATE subfunction of %U\_WNDEVENTS must be associated with at least one window before the methods associated with mouse events are ever called. The D\_ASSIGN subfunction associates the method set ID with one or more windows.

If you have at least one method set created, you can start handling mouse events specified in the method set by associating the method set ID with windows. The same method set may be associated with one or more windows in your Synergy application. Or, you could define and assign a different method set to each window.

Once you associate your application windows with a method set ID, event methods will start receiving calls as mouse events occur.

Only one method set may be assigned to a window; therefore if you call %U\_WNDEVENTS with the D\_ASSIGN subfunction more than once for the same window, the last method set assigned is the one that will be retained. Any previous one will be ignored.

%U\_WNDEVENTS cannot be used to associate method sets with lists. To associate a method set with a list, use the D\_LWNDEVENT function in L\_METHOD.



## %U\_WNDEVENTS (continued)

### D\_SIGNAL

*rval* = %U\_WNDEVENTS (D\_SIGNAL, *window\_id*, *event*[, *arg*, ...])

or

xcall U\_WNDEVENTS (D\_SIGNAL, *window\_id*, *event*[, *arg*, ...])

### Return value

*rval*

The value returned by the triggered event routine. (^VAL)

### Arguments

*window\_id*

The ID of the Toolkit window whose method set contains the routine you want to trigger. (n)

*event*

The %UWNDEVENTS\_METHOD event code for the routine to be triggered. (n)

*arg*

(optional) One or more arguments required for the routine. (n)

### Discussion

The D\_SIGNAL subfunction triggers a routine that is registered as part of a method set for a Toolkit window. You specify the routine by passing the %UWNDEVENTS\_METHOD event code for the routine as the *event* argument. For example, to trigger the D\_EVENT\_SIZE method for a window, pass D\_EVENT\_SIZE as *event*. Note that if no method is registered for the window for the specified event, the signal is ignored. For a list of these method codes (which are defined in **tools.def**), see [%UWNDEVENTS\\_METHOD on page 16-249](#).

## %U\_WNDEVENTS (continued)

### D\_GETEVENT

*method\_addr* = %U\_WNDEVENTS (D\_GETEVENT, *method\_set*, *event*)

#### Return value

*method\_addr*

The address (D\_ADDR) for the method for the event passed as *event* or a value of 0 if no routine is registered for this event. (^VAL)

#### Arguments

*method\_set*

The method set ID. (**n**)

*event*

The event code for the routine whose address you want to retrieve. (**n**)

#### Discussion

The D\_GETEVENT subfunction enables you to determine if a method is registered for a given event in a method set and, if so, what the address for the method routine is. For example, the following returns the address of the method for D\_EVENT\_LEFT\_CLICK, or it returns 0 if no method is registered for D\_EVENT\_LEFT\_CLICK. (Note how D\_GETEVENTS enables us to use the window ID to get this information.)

```
method_address=%u_wndevents (D_GETEVENT, %u_wndevents (D_GETEVENTS, wndid),  
& D_EVENT_LEFT_CLICK)
```

For a list of the method codes you can pass as *event*, see [%UWNDEVENTS\\_METHOD](#) on [page 16-249](#).

## %U\_WNDEVENTS (continued)

### D\_GETEVENTS

*method\_set* = %U\_WNDEVENTS (D\_GETEVENTS, *window\_id*)

#### Return value

*method\_set*

The method set ID or a value of 0 if there is no method set associated with the specified window. (^**VAL**)

#### Arguments

*window\_id*

The ID of the window whose method set ID you want to retrieve. (**n**)

#### Discussion

The D\_GETEVENTS subfunction enables you to determine if a method set has been registered for a UI Toolkit window and, if it has, what the ID for the method set is.

## %U\_WNDFONT – Set/retrieve font information on Windows



```
return = %U_WNDFONT (subfunction, arg[, ...])
```

or

```
xcall U_WNDFONT (subfunction, arg[, ...])
```

### Return value

*return*

On Windows, the return value of %U\_WNDFONT depends on *subfunction*. (See the subfunction documentation on [page 16-226](#) through [page 16-243](#) for information.) On UNIX and OpenVMS, %U\_WNDFONT always returns false, except for D\_SETWNDFONT, where it returns true when successful. (^VAL)

### Arguments

*subfunction*

The specific font function to perform. It must be one of the following: (n)

|                     |                                                                                                               |
|---------------------|---------------------------------------------------------------------------------------------------------------|
| <b>D_ALTFONT132</b> | Enable/disable automatic font switching. See <a href="#">page 16-226</a> .                                    |
| <b>D_CHOOSEFONT</b> | Display font selection dialog. See <a href="#">page 16-227</a> .                                              |
| <b>D_ENUMFONTS</b>  | Enumerate font palette entries. See <a href="#">page 16-229</a> .                                             |
| <b>D_FONTHANDLE</b> | Retrieve the font handle for a font palette entry. See <a href="#">page 16-231</a> .                          |
| <b>D_FONTNAME</b>   | Retrieve the font palette entry for a font handle. See <a href="#">page 16-232</a> .                          |
| <b>D_FONTSIZE</b>   | Retrieve font size information. See <a href="#">page 16-233</a> .                                             |
| <b>D_GETFONT</b>    | Retrieve font palette information. See <a href="#">page 16-234</a> .                                          |
| <b>D_GETSCALE</b>   | Retrieve the application scaling percentage. See <a href="#">page 16-236</a> .                                |
| <b>D_GETWNDFONT</b> | Retrieve the font palette entry for a window. See <a href="#">page 16-237</a> .                               |
| <b>D_SAVEFONT</b>   | Save font palette information in <b>synergy.ini</b> or <b>synuser.ini</b> . See <a href="#">page 16-238</a> . |
| <b>D_SETFONT</b>    | Set font palette information. See <a href="#">page 16-239</a> .                                               |
| <b>D_SETSCALE</b>   | Set the application scaling percentage. See <a href="#">page 16-241</a> .                                     |
| <b>D_SETWNDFONT</b> | Set the font palette entry for a window. See <a href="#">page 16-242</a> .                                    |

*arg*

One or more arguments, depending on *subfunction*.

## Discussion

The %U\_WNDFONT function sets or retrieves font information in a Windows environment. It also enables you to display a standard Microsoft Font dialog box.

The Synergy runtime manages font information by maintaining a font palette. A font palette consists of font palette entries, each of which associates a font name with a typeface, point size, and sizing character combination. Font palette entries can be added or modified using %U\_WNDFONT.

%U\_WNDFONT can be used to change the font for an application by assigning a different font palette entry name to the global and/or alternate fonts.

An application window defined as less than 132 columns uses the “global font.” An application window defined as 132 columns or more, or one changed to this size, uses the “alternate font.” This enables an application window having a greater number of columns to use a different font and, consequently, still fit the entire window on the screen.

%U\_WNDFONT can also be used to change the font for a specific window.

Each time the font is changed, the application (or window) is completely updated to use the new font.

## See also

- ▶ The %U\_WNDFONT subfunctions described in detail on [page 16-226](#) through [page 16-243](#).
- ▶ “Using Fonts on Windows” on [page 18-46](#) for information on fonts and font palettes.
- ▶ [I\\_FLDMOD](#) on [page 8-27](#) and [IB\\_FIELD](#) on [page 8-99](#) for information on changing a field or prompt font.

## %U\_WNDFONT (continued)

### D\_ALTFONT132

*prev\_flag* = %U\_WNDFONT (D\_ALTFONT132, *alt\_font\_flag*)

or

xcall U\_WNDFONT (D\_ALTFONT132, *alt\_font\_flag*)

### Return value

*prev\_flag*

D\_ALTFONT132 returns the previous value of *alt\_font\_flag*. (^VAL)

### Arguments

*alt\_font\_flag*

A flag that specifies if automatic switching to/from the alternate font is enabled. (**n**)

**TRUE**                      Enable automatic font switching. (default)

**FALSE**                     Disable automatic font switching.

### Discussion

The D\_ALTFONT132 subfunction of %U\_WNDFONT enables/disables automatic font switching.

If *alt\_font\_flag* is true, then whenever the number of columns in the application window crosses the 132 column boundary, the font will automatically switch to or from the “alternate” font. If *alt\_font\_flag* is false, automatic font switching will not occur.

### See also

[“Using Fonts on Windows” on page 18-46.](#)

## %U\_WNDFONT (continued)

### D\_CHOOSEFONT

```
status = %U_WNDFONT (D_CHOOSEFONT, face_name, point_size, [sizing_char], [include_prop],  
&                                     [help_filename], [help_context_id][, title])  
  
or  
  
xcall %U_WNDFONT (D_CHOOSEFONT, face_name, point_size, [sizing_char], [include_prop],  
&                                     [help_filename], [help_context_id][, title])
```

### Return value

*status*

D\_CHOOSEFONT returns true if the user selected a font, otherwise it returns false. (^VAL)

### Arguments

*face\_name*

The name of the Windows font. (a)

*point\_size*

The size of the Windows font. (n)

*sizing\_char*

(optional) The sizing character. (a)

*include\_prop*

(optional) The flag to include proportional fonts. (n)

*help\_filename*

(optional) The name of the help file. (a)

*help\_context\_id*

(optional) The context identifier for help. Required if *help\_filename* is passed. (n)

*title*

(optional) The title for the dialog box. (a)

### Discussion

The D\_CHOOSEFONT subfunction of %U\_WNDFONT displays a Microsoft Windows Font dialog box. Any values passed in *face\_name*, *point\_size*, and *sizing\_char* are used as the typeface, point size, and sizing character initially displayed in the dialog box. *Face\_name* and *sizing\_char* are case sensitive.

If the user makes a selection, *face\_name*, *point\_size*, and *sizing\_char* are returned with the typeface name, size, and sizing character values.

D\_CHOOSEFONT does *not* set the new font or update **synergy.ini** or **synuser.ini**. To set the new font, use D\_SETFONT. To explicitly update **synergy.ini** or **synuser.ini**, use D\_SAVEFONT.

If *sizing\_char* is not present, the sizing character cannot be modified and defaults to an uppercase “A”. The sizing character is a single letter used to determine the cell size for proportional fonts within a visual object for the purposes of positioning. When you specify *sizing\_char* to be “W”, for example, the object will be significantly wider than an object with a sizing character of “i”. The sizing character is case sensitive.

If *include\_prop* is true, proportional fonts are included in the list of available typefaces for the dialog box. The default *include\_prop* value is false.

If *help\_filename* is passed, the dialog will have a Help button. *Help\_filename* can be the name of either a WinHelp file (**.hlp**) or an HTML Help file (**.chm**):

- ▶ If the file extension is **.hlp**, *help\_context\_id* is passed as a context number to the HELP\_CONTEXT command for the WinHelp API. See the Microsoft documentation for WinHelp for more information on this command.
- ▶ If the file extension is **.chm**, the HtmlHelp API is used, and *help\_context\_id* is passed on to the HTML Help API command HH\_HELP\_CONTEXT. See the Microsoft documentation for the HTML Help API for more information on this command.

If *title* is not passed, the default title for the dialog box is “Font.”

## Examples

The following example displays a dialog box, entitled “Select Font,” with the font name **typeface**, the font size **size**, and sizing character **char**, specified.

```
success = %u_wndfont(D_CHOOSEFONT, typeface, size, char, TRUE,,,
    & "Select Font")
```

Compare the previous example with the following example, which neither includes proportional fonts nor prompts for a sizing character, but includes a help button on the dialog box.

```
success = %u_wndfont(D_CHOOSEFONT, font, size,,, "helpfile.hlp",
    & select_font_id, "Select Font")
```



## %U\_WNDFONT (continued)

### D\_ENUMFONTS

```
num_palette = %U_WNDFONT (D_ENUMFONTS, [order], [maximum], [hdl_array]  
&                                     [, name_array])  
  
or  
  
xcall U_WNDFONT (D_ENUMFONTS, [order], [maximum], [hdl_array]  
&                                     [, name_array])
```

### Return value

*num\_palette*

The total number of defined font palette entries. (^VAL)

### Arguments

*order*

(optional) The order of enumeration: (n)

**DF\_BY\_HANDLE** Ordered by handle. (default)

**DF\_BY\_NAME** Ordered by name.

*maximum*

(optional) The maximum number of fonts to return in the arrays. (n)

*hdl\_array*

(optional) First element of the returned array of font handles. (n)

*name\_array*

(optional) First element of the returned array of font palette entry names. (n)

### Discussion

The D\_ENUMFONTS subfunction of %U\_WNDFONT returns font information for the fonts that are currently defined.

If *maximum* is not passed, it defaults to zero. When *maximum* is zero, the number of font palette entries is returned and any arrays that might be passed are ignored.

Because the number of defined fonts has no logical limit, D\_ENUMFONTS can be first called with *maximum* not passed or set to 0 to retrieve the number of font palette entries first. Then the desired array(s) can be allocated accordingly.

The return value of this subfunction is always the total number of defined fonts, even if *maximum* is less than this value. In any case, the number of items returned in the arrays is the lesser of the return value or *maximum*.

We recommend that the size of each array entry in *hndl\_array* be an **i4** for efficiency and to guarantee that the full handle value will be returned.

If the size of each array entry in *name\_array* is less than 60 characters, some font palette entry names may be truncated.

## Examples

The following example returns the total number of fonts defined in **numfonts** and the first 100 palette entry names in **font\_array**.

```
numfonts = %u_wndfont(D_ENUMFONTS, DF_BY_NAME, 100,, font_array)
```

## %U\_WNDFONT (continued)

### D\_FONTHANDLE

*font\_hndl* = %U\_WNDFONT (D\_FONTHANDLE, *palette\_name*)

#### Return value

*font\_hndl*

D\_FONTHANDLE returns the handle to the specified font. (^VAL)

#### Arguments

*palette\_name*

The name of a font palette entry or one of the following: (**a** or **n**)

**DF\_CURRENT**      Current font.

**DF\_DEFAULT**      Global font.

**DF\_ALTERNATE**    Alternate global font.

**DF\_DEBUGGER**    Debugger font.

#### Discussion

The D\_FONTHANDLE subfunction of %U\_WNDFONT returns the font handle for a specified font palette entry name. Using handles is more efficient than using font palette entry names, however, font names are more persistent.

#### See also

The D\_FONTNAME subfunction on [page 16-232](#) for more information on retrieving a font palette entry name.

#### Examples

The following example returns the font handle in **hndl** for the font “font\_name.”

```
hndl = %u_wndfont (D_FONTHANDLE, "font_name")
```

## %U\_WNDFONT (continued)

### D\_FONTNAME

*status* = %U\_WNDFONT (D\_FONTNAME, *font\_hndl*, *palette\_name*)

or

`xcall U_WNDFONT (D_FONTNAME, font_hndl, palette_name)`

### Return value

*status*

D\_FONTNAME returns true if successful; otherwise, it returns false. (^VAL)

### Arguments

*font\_hndl*

The handle to the font. (**n**)

*palette\_name*

The returned font palette entry name. (**a**)

### Discussion

The D\_FONTNAME subfunction of %U\_WNDFONT retrieves the font palette entry name for a specified font handle. Font palette entry names are more persistent than font handles, however, using font handles is more efficient.

### See also

The D\_FONTHANDLE subfunction on [page 16-231](#) for more information on returning a font handle.

### Examples

The following example returns the name of the font in **name** that is specified by the font handle **hndl**.

```
success = %u_wndfont(D_FONTNAME, hndl, name)
```

## %U\_WNDFONT (continued)

### D\_FONTSIZE

*status* = %U\_WNDFONT (D\_FONTSIZE, *font\_name*, *width*, *height*)

or

xcall U\_WNDFONT (D\_FONTSIZE, *font\_name*, *width*, *height*)

### Return value

*status*

On Windows, this function returns true. On UNIX and OpenVMS, it returns false. (^VAL)

### Arguments

*font\_name*

The name of a font palette entry, a font handle, or one of the following: (**a** or **n**)

**DF\_CURRENT**      Current font.

**DF\_DEFAULT**      Global font.

**DF\_ALTERNATE**    Alternate global font.

**DF\_DEBUGGER**    Debugger font.

*width*

The returned width of the sizing character for the font palette entry. (**n**)

*height*

The returned height of the sizing character for the font palette entry. (**n**)

### Discussion

The D\_FONTSIZE subfunction returns font size information (height and width) for a given Synergy font palette entry. This size is given as the number of pixels used on the screen. Note that this may differ from the same font's size when sent to a printer.

### Examples

The following example returns the width and height of the font palette entry specified by **font\_entry**.

```
success = %u_wndfont(D_FONTSIZE, font_entry, font_width, font_height)
```

## %U\_WNDFONT (continued)

### D\_GETFONT

```
font_hndl = %U_WNDFONT (D_GETFONT, font_id, [face_name], [point_size], [sizing_char]
&                                     [, palette_name])
```

or

```
xcall U_WNDFONT (D_GETFONT, font_id, [face_name], [point_size], [sizing_char]
&                                     [, palette_name])
```

### Return value

*font\_hndl*

D\_GETFONT returns the font handle if the font request was successful; otherwise, it returns false. (^VAL)

### Arguments

*font\_id*

The name of a font palette entry, a font handle, or one of the following: (**a** or **n**)

**DF\_CURRENT**      Current font.

**DF\_DEFAULT**      Global font.

**DF\_ALTERNATE**    Alternate global font.

**DF\_DEBUGGER**    Debugger font.

*face\_name*

(optional) The name of the Windows font. (**a**)

*point\_size*

(optional) The size of the Windows font. (**n**)

*sizing\_char*

(optional) The sizing character. (**a**)

*palette\_name*

(optional) The returned font palette entry name. (**a**)

### Discussion

The D\_GETFONT subfunction of %U\_WNDFONT retrieves the current typeface, point size, and sizing character of a specific font palette entry or of the current, global, alternate, or debugger font.

Note that D\_GETFONT does not use the application scaling percentage (see [D\\_GETSCALE](#) on [page 16-236](#)). To get the approximate visual point size for a font used in an application, multiply the point size (returned by D\_GETFONT) by the application scaling percentage (returned by D\_GETSCALE) and then divide by 100. For example if the size returned by D\_GETFONT is 12, and the application scaling percentage is 150, the visual point size is 18 (that is,  $12 * 150 / 100 = 18$ ).

## See also

[D\\_SETFONT](#) on [page 16-239](#) for a description of *sizing\_char*.

## Examples

The following example returns the name and size of the font specified by **fontid** in **face\_name** and **point\_size**. The font palette entry name is returned in **palette\_name**, and the default sizing character is returned in **size\_char**.

```
sts = %u_wndfont(D_GETFONT, fontid, face_name, point_size, size_char,  
& palette_name)
```

## %U\_WNDFONT (continued)

### D\_GETSCALE

*scaling\_percentage* = %U\_WNDFONT (D\_GETSCALE)

#### Return value

*scaling\_percentage*

On Windows, D\_GETSCALE returns the application scaling percentage. (^VAL)

#### Discussion

The D\_GETSCALE subfunction returns the application scaling percentage, which is a percentage of the default size of the application. See [D\\_SETSCALE on page 16-241](#) for more information.

Note that when using a proportionally spaced font for the application window, D\_GETSCALE may not return 100 initially when SYN\_RESIZE\_SCALE is set.



## %U\_WNDFONT (continued)

### D\_GETWNDFONT

```
status = %U_WNDFONT (D_GETWNDFONT, window_id[, palette_name])
```

or

```
xcall U_WNDFONT (D_GETWNDFONT, window_id[, palette_name])
```

### Return value

*status*

On Windows, D\_GETWNDFONT returns the handle of the font requested if successful; otherwise, it returns false. On UNIX and OpenVMS, D\_GETWNDFONT always returns false (0). (^VAL)

### Arguments

*window\_id*

The ID of the window whose font is being retrieved. (**n**)

*palette\_name*

(optional) The returned font palette entry name. (**a**)

### Discussion

The D\_GETWNDFONT subfunction of %U\_WNDFONT retrieves the name of the font palette entry applied to a general window or input window.

On UNIX and OpenVMS, D\_GETWNDFONT, *palette\_name* returns the name of the font palette entry if it is defined.

### See also

[“Using Fonts on Windows” on page 18-46.](#)

### Examples

The following example returns the font handle and font palette entry name for the window specified by **wndid**.

```
hndl = %u_wndfont (D_GETWNDFONT, wndid, name)
```

## %U\_WNDFONT (continued)

### D\_SAVEFONT

```
status = %U_WNDFONT (D_SAVEFONT, [font_id][, all_users])
```

or

```
xcall U_WNDFONT (D_SAVEFONT, [font_id][, all_users])
```

### Return value

*status*

On Windows, D\_SAVEFONT returns true if the function is successful; otherwise, it returns false. On UNIX and OpenVMS, D\_SAVEFONT always returns false. (^VAL)

### Arguments

*font\_id*

(optional) The name of a font palette entry, a font handle, or one of the following: (**a** or **n**)

**DF\_CURRENT**      Current font.

**DF\_DEFAULT**      Global font.

**DF\_ALTERNATE**    Alternate global font.

**DF\_DEBUGGER**    Debugger font.

*all\_users*

(optional) One of the following: (**n**)

**TRUE**              Save font palette entry information to **synergy.ini**.

**FALSE**             Save font palette entry information to **synuser.ini**. (default)

### Discussion

The D\_SAVEFONT subfunction of %U\_WNDFONT saves the current font palette entry information for the specified *font\_id* by writing it to the [fonts] section of **synergy.ini** or **synuser.ini**. If the function fails, which causes *status* to be returned as false, you can use %SYSError to retrieve the system-specific error code.

If *font\_id* is not passed, all font palette entries are saved.

If automatic font switching has been turned off using the D\_ALTFONT132 subfunction, then DF\_CURRENT is the same as DF\_DEFAULT.

## %U\_WNDFONT (continued)

### D\_SETFONT

```
font_hndl = %U_WNDFONT (D_SETFONT, font_id, [face_name], [point_size][, sizing_char])
```

or

```
xcall U_WNDFONT (D_SETFONT, font_id, [face_name], [point_size][, sizing_char])
```

### Return value

*font\_hndl*

D\_SETFONT returns the font handle if the font request was successful; otherwise, it returns false. (^VAL)

### Arguments

*font\_id*

The name of a font palette entry, a font handle, or one of the following: (**a** or **n**)

**DF\_CURRENT**      Current font.

**DF\_DEFAULT**      Global font.

**DF\_ALTERNATE**    Alternate global font.

**DF\_DEBUGGER**    Debugger font.

*face\_name*

(optional) The name of the Windows font. (**a**)

*point\_size*

(optional) The size of the Windows font. (**n**)

*sizing\_char*

(optional) The sizing character. (**a**)

### Discussion

The D\_SETFONT subfunction of %U\_WNDFONT defines or modifies a font palette entry at runtime. This font information is not saved in **synergy.ini** until the %U\_WNDFONT subfunction, D\_SAVEFONT, is called.

When defining a new font palette entry, specify *font\_id* as either the font palette entry name or one of the literals listed above. You are returned the font handle. When modifying an existing font palette entry, you can refer to it (using *font\_id*) by font handle.

*Face\_name* is case sensitive. If it is omitted or is passed as blank, it defaults to the name of the current default font. If a proportional font is passed as *face\_name*, *sizing\_char* (a single letter) is used to determine the cell size within a visual object for the purposes of positioning. For example, “W” results in a cell size that is significantly wider than with “i”. The sizing character is case sensitive and, if omitted or passed as %char(0), defaults to “A”.

If *point\_size* is omitted or passed as 0, it defaults to 10.

## Examples

The following examples set the font palette entry specified by “my\_font” to 10-point Courier typeface.

```
sts = %u_wndfont(D_SETFONT, "my_font", Courier, 10)
```

```
sts = %u_wndfont(D_SETFONT, "my_font", Courier)
```

The following sets the current font to 12-point Arial typeface with a “q” sizing character.

```
sts = %u_wndfont(D_SETFONT, DF_CURRENT, "Arial", 12, "q")
```

## %U\_WNDFONT (continued)

### D\_SETSCALE

```
status = %U_WNDFONT (D_SETSCALE, scaling_percentage)
```

or

```
xcall U_WNDFONT (D_SETSCALE, scaling_percentage)
```

### Return value

*status*

On Windows, D\_SETSCALE returns true. On UNIX and OpenVMS, it returns false. (^VAL)

### Arguments

*scaling\_percentage*

The application scaling percentage. This can be specified as a whole number or with fractional precision (e.g., 176 or 50.95). Passing 100 sets the scaling percentage to 100 (no scaling). (n)

### Discussion

The D\_SETSCALE subfunction changes the size of the application display screen, windows for the application, and characters in those windows. It changes the height and the width of these items by the percentage passed as *scaling\_percentage*. For example, passing 200 increases the height and width of these items by 200%. Note, however, that characters don't always scale evenly; they are sized as large as possible without exceeding the specified percentage in either direction.



Note the following:

- ▶ For best results, use OpenType or TrueType fonts. D\_SETSCALE's effectiveness is dependent on how well the font used for windows in the application can be scaled. If the font doesn't scale well, D\_SETSCALE will not be able to correctly scale the display screen, windows for the application, or characters on those windows. For example, Fixedsys (which is the default font for Toolkit applications on Windows in traditional Synergy) doesn't scale well and will prevent D\_SETSCALE from working correctly.
  - ▶ The following will not scale: message boxes, menu bars, toolbars, buttons, ActiveX controls, and Windows common controls (e.g., the Color, Font, Open, and Print Preview dialog boxes).
- 

### See also

- ▶ [APP\\_SCALE](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for information on the default scaling percentage.
- ▶ [D\\_GETSCALE](#) on page 16-236.
- ▶ “Resizing the application” on page 1-21

## %U\_WNDFONT (continued)

### D\_SETWNDFONT

```
status = %U_WNDFONT (D_SETWNDFONT, window_id, font_id)
```

or

```
xcall U_WNDFONT (D_SETWNDFONT, window_id, font_id)
```

### Return value

*status*

D\_SETWNDFONT returns true if the font request was successful; otherwise, it returns false. (^VAL)

### Arguments

*window\_id*

The ID of the window whose font is being set. (**n**)

*font\_id*

The name of a font palette entry, a font handle, or one of the following: (**a** or **n**)

**DF\_CURRENT**      Current font.

**DF\_DEFAULT**      Global font.

**DF\_ALTERNATE**    Alternate global font.

**DF\_DEBUGGER**     Debugger font.

### Discussion

The D\_SETWNDFONT subfunction of %U\_WNDFONT modifies the font for a general window or input window at runtime.

If *font\_id* is invalid, the behavior of D\_SETWNDFONT depends on the argument type. If *font\_id* is numeric, an “invalid font id” error is generated. If *font\_id* is alphanumeric, no error is generated, and the application window’s font is used.

While it does not visually render the font on UNIX or OpenVMS systems, D\_SETWNDFONT does preserve the font information in the window (when the window is saved with U\_SAVE) so that it can be used later on Windows.

If a proportional font is specified for a window, objects within that window that do not support proportional fonts may not display as expected.

### See also

[“Using Fonts on Windows” on page 18-46.](#)

## Examples

The following example sets the font for the window specified by **wndid** to be “my\_input\_font.”

```
success = %u_wndfont(D_SETWNDFONT, wndid, "my_input_font")
```

## %U\_WNDSTYLE – Change the style of a list or window

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
status = %U_WNDSTYLE (style, id[, option])
```

or

```
xcall U_WNDSTYLE (style, id[, option])
```

### Return value

*status*

On Windows, %U\_WNDSTYLE returns true if successful, and false if *id* does not exist. On UNIX, this routine always returns false. On OpenVMS, this routine always returns true. (^VAL)

### Arguments

*style*

One of the following: (n)

**D\_LST\_STYLE**      Change a list style.

**D\_WND\_STYLE**      Change a window style.

*id*

The ID of the list or window. (n)

*option*

(optional) One of the following: (n)

**D\_LEADING**      Windows are spaced to allow edit control frames. (default)

**D\_NO\_LEADING**   Windows are spaced according to font height.

### Discussion

The %U\_WNDSTYLE function changes vertical spacing (leading) on a window-by-window and list-by-list basis. By default, leading is added to all windows, lists, and the application window, to allow for input windows and lists to incorporate edit controls with frames without clipping text. Calling %U\_WNDSTYLE with D\_NO\_LEADING eliminates this extra vertical space. We do not recommend using this style on windows processed using I\_INPUT, as any fields that are vertically adjacent will occlude each other.



## %U\_WNDTYPE – Return a window’s type



*window\_type* = %U\_WNDTYPE (*window\_id*)

### Return value

*window\_type*

The type of the window: (^VAL)

|                          |                                                                                                                                                                        |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>D_WTYPE_ACTIVEX</b>   | Container window for an ActiveX control (i.e., window created by calling %AX_TKWIN or %AX_TKSINGLE).                                                                   |
| <b>D_WTYPE_COLUMN</b>    | Menu column (i.e., window created by the .COLUMN script command or by calling MB_END).                                                                                 |
| <b>D_WTYPE_CONTAINER</b> | Composite container window (i.e., window created by calling %C_CONTAINER with DC_CREATE).                                                                              |
| <b>D_WTYPE_DOTNET</b>    | Container window for a .NET form, .NET control, or WPF element (i.e., window created by %DOTNET_TKWIN).                                                                |
| <b>D_WTYPE_INPUT</b>     | Input window (i.e., window created by the .INPUT script command or by calling the IB_END routine).                                                                     |
| <b>D_WTYPE_LISTCLASS</b> | List class (i.e., window created by the .LISTCLASS script command or by calling L_CLASS).                                                                              |
| <b>D_WTYPE_SELECT</b>    | Selection window (i.e., window created by the .SELECT script command, by calling S_SELBLD, or by calling I_LDINP for a .FIELD script command with a SELECT qualifier). |
| <b>D_WTYPE_TABS</b>      | Tabbed window (i.e., window created by %TS_TABSET).                                                                                                                    |
| <b>D_WTYPE_TEXT</b>      | Text window (i.e., window for which T_SETUP has been called—there’s no other distinction in Toolkit between a text window and a general window).                       |
| <b>D_WTYPE_OTHER</b>     | None of the above.                                                                                                                                                     |

### Arguments

*window\_id*

The window ID whose type you want to retrieve. (n)

## Discussion

The %U\_WNDTYPE function returns a window's type, regardless of the routine used to load the window. (The D\_WINDOW\_TYPE subfunction of %E\_INFO also returns a window's type. However, if U\_DLWND was used to load the window, D\_WINDOW\_TYPE returns D\_WTYPE\_OTHER, so it's useful only for windows loaded with a type-specific routine—for example, I\_LDINP for an input window.)

Note that in the future more window types may be added to the list of possible window types, so D\_WTYPE\_OTHER could at some point encompass different types of windows and should only be used as an “else” case.

## Examples

The following example uses %U\_WNDTYPE to determine how to process the windows in a window library.

```
count = %u_enumwnds(channel, max, window)
for ndx from 1 thru count
  begin
    xcall u_ldwnd(id, channel, window(ndx))
    using %u_wndtype(id) select
      (D_WTYPE_LISTCLASS),    call process_listclass
      (D_WTYPE_INPUT),       call process_input
    .
    .
    .
  endusing
end
```

## The Utility Methods

This section discusses the syntax and arguments for each of the utility method subroutines. To use these methods, you write these subroutines and specify them as methods in Toolkit subroutines. UI Toolkit will then call them at the appropriate time.

## USTART\_METHOD – Perform application start-up processing



```
subroutine USTART_METHOD
```

### Arguments

This subroutine has no arguments.

### Discussion

USTART\_METHOD is a subroutine you write (and name) when you want your program to perform application-specific start-up processing.

This subroutine is called by U\_START (just prior to returning to the calling routine) if a start method was passed.

### See also

- ▶ [U\\_START on page 16-141](#) for information about application start-up.
- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this subroutine.

## %UWNDEVENTS\_METHOD – Perform window event processing

|    |  |  |  |
|----|--|--|--|
| WT |  |  |  |
|----|--|--|--|

```
function UWNDEVENTS_METHOD, ^val
{reserved1}          , a
{reserved2}          , a
^val (window_id)      , i
^val (event)          , i
[arguments]           , type
```

### Return value

%UWNDEVENTS\_METHOD returns false when a mouse click is not passed to the target window on a mouse click event, otherwise true. (n)

### Arguments

*{reserved1}*

Reserved for internal use. (a)

*{reserved2}*

Reserved for internal use. (a)

*window\_id*

The ID of the window receiving the event. This must be declared as ^VAL(*window\_id*). (i)

*event*

The ID of the event that occurred. This must be declared as ^VAL(*event*). (i)

|                              |                                         |
|------------------------------|-----------------------------------------|
| <b>D_EVENT_LEFT_CLICK</b>    | Left mouse button event.                |
| <b>D_EVENT_MIDDLE_CLICK</b>  | Middle mouse button event.              |
| <b>D_EVENT_RIGHT_CLICK</b>   | Right mouse button event.               |
| <b>D_EVENT_LEFT_DBLCLK</b>   | Double-click left mouse button event.   |
| <b>D_EVENT_MIDDLE_DBLCLK</b> | Double-click middle mouse button event. |
| <b>D_EVENT_RIGHT_DBLCLK</b>  | Double-click right mouse button event.  |
| <b>D_EVENT_MOVE</b>          | Move window event.                      |
| <b>D_EVENT_SIZE</b>          | Size window event.                      |
| <b>D_EVENT_MINIMIZE</b>      | Minimize window event.                  |
| <b>D_EVENT_MAXIMIZE</b>      | Maximize window event.                  |

|                        |                       |
|------------------------|-----------------------|
| <b>D_EVENT_RESTORE</b> | Restore window event. |
| <b>D_EVENT_SCROLL</b>  | Scroll window event.  |
| <b>D_EVENT_CLOSE</b>   | Close window event.   |

*arguments*

One or more arguments specific to the *event*. (See the *arguments* for each event below.)

|                           |                          |
|---------------------------|--------------------------|
| <b>D_EVENT_LEFT_CLICK</b> | Left mouse button event. |
|---------------------------|--------------------------|

(^VAL) *argument\_5* Position in x-direction (column in cells).

(^VAL) *argument\_6* Position in y-direction (row in cells).

(^VAL) *argument\_7* Position in x-direction (column in pixels).

(^VAL) *argument\_8* Position in y-direction (row in pixels).

(^VAL) *argument\_9* Additional mouse click information:

|                         |                                            |
|-------------------------|--------------------------------------------|
| <b>D_AREA_CLIENT</b>    | Click was in client area.                  |
| <b>D_AREA_NONCLIENT</b> | Click was in non-client area.              |
| <b>D_BUTTON_LEFT</b>    | Left mouse button was down during click.   |
| <b>D_BUTTON_MIDDLE</b>  | Middle mouse button was down during click. |
| <b>D_BUTTON_RIGHT</b>   | Right mouse button was down during click.  |
| <b>D_KEY_CONTROL</b>    | Control key was down during click.         |
| <b>D_KEY_SHIFT</b>      | Shift key was down during click.           |
| <b>D_LSTCLK_FOOTER</b>  | Click was in footer section.               |
| <b>D_LSTCLK_HEADER</b>  | Click was in header section.               |
| <b>D_LSTCLK_ONLINE</b>  | Click was on a line.                       |

|                             |                            |
|-----------------------------|----------------------------|
| <b>D_EVENT_MIDDLE_CLICK</b> | Middle mouse button event. |
|-----------------------------|----------------------------|

(^VAL) *argument\_5* Position in x-direction (column in cells).

(^VAL) *argument\_6* Position in y-direction (row in cells).

(^VAL) *argument\_7* Position in x-direction (column in pixels).

(^VAL) *argument\_8* Position in y-direction (row in pixels).

(^VAL) *argument\_9* Additional mouse click information (see above).

**D\_EVENT\_RIGHT\_CLICK** Right mouse button event.

(^VAL) *argument\_5* Position in x-direction (column in cells).

(^VAL) *argument\_6* Position in y-direction (row in cells).

(^VAL) *argument\_7* Position in x-direction (column in pixels).

(^VAL) *argument\_8* Position in y-direction (row in pixels).

(^VAL) *argument\_9* Additional mouse click information (see above).

**D\_EVENT\_LEFT\_DBLCLK** Double-click with left mouse button event.

(^VAL) *argument\_5* Position in x-direction (column in cells).

(^VAL) *argument\_6* Position in y-direction (row in cells).

(^VAL) *argument\_7* Position in x-direction (column in pixels).

(^VAL) *argument\_8* Position in y-direction (row in pixels).

(^VAL) *argument\_9* Additional mouse click information (see above).

**D\_EVENT\_MIDDLE\_DBLCLK** Double-click with middle mouse button event.

(^VAL) *argument\_5* Position in x-direction (column in cells).

(^VAL) *argument\_6* Position in y-direction (row in cells).

(^VAL) *argument\_7* Position in x-direction (column in pixels).

(^VAL) *argument\_8* Position in y-direction (row in pixels).

(^VAL) *argument\_9* Additional mouse click information (see above).

**D\_EVENT\_RIGHT\_DBLCLK** Double-click with right mouse button event.

(^VAL) *argument\_5* Position in x-direction (column in cells).

(^VAL) *argument\_6* Position in y-direction (row in cells).

(^VAL) *argument\_7* Position in x-direction (column in pixels).

(^VAL) *argument\_8* Position in y-direction (row in pixels).

(^VAL) *argument\_9* Additional mouse click information (see above).

**D\_EVENT\_MOVE**                      Move window event.

(^VAL) *argument\_5*    Position in x-direction (column in cells).

(^VAL) *argument\_6*    Position in y-direction (row in cells).

(^VAL) *argument\_7*    Position in x-direction (column in pixels).

(^VAL) *argument\_8*    Position in y-direction (row in pixels).

**D\_EVENT\_SIZE**                      Size window event.

(^VAL) *argument\_5*    Width of logical window (number of columns).

(^VAL) *argument\_6*    Height of logical window (number of rows).

(^VAL) *argument\_7*    Width of client area (number of pixels).

(^VAL) *argument\_8*    Height of client area (number of pixels).

**D\_EVENT\_MINIMIZE**                Minimize window event.

No additional arguments.

**D\_EVENT\_MAXIMIZE**                Maximize window event.

No additional arguments.

**D\_EVENT\_RESTORE**                Restore window event.

No additional arguments.

**D\_EVENT\_SCROLL**                    Scroll window event.

(^VAL) *argument\_5*    Display area position in x-direction (column in cells).

(^VAL) *argument\_6*    Display area position in y-direction (row in cells).

(^VAL) *argument\_7*    Offset between window position and display area position in x-direction (number of pixels).

(^VAL) *argument\_8*    Offset between window position and display area position in y-direction (number of pixels).

**D\_EVENT\_CLOSE**                    Close window event.

No additional arguments.



## Discussion

%UWNDEVENTS\_METHOD is a function that you write and name. You do not call it. Instead UI Toolkit will call it when a mouse event, which you have assigned to the method, occurs.

To suppress a mouse click from being passed through to the target window, return a value of false for the %UWNDEVENTS\_METHOD, otherwise always return true.



It is vital that the argument types be declared exactly as documented above. Incorrect definition of the arguments to your event method routine will cause undefined results.

---

When using a list with all of the D\_EVENT\_XXX\_CLICK and D\_EVENT\_XXX\_DBLCLK events, *argument\_5* returns the column number clicked, and *argument\_6* returns the row number clicked. For ActiveX Toolkit lists, the row number specifies the item's position in the currently loaded rows, both visible rows and those that don't fit in the window. For standard Toolkit lists, the row number specifies the item's position in the currently visible set of rows. However, note the following:

- ▶ When clicking on the header or footer in an ActiveX Toolkit list, *argument\_5* returns the column number clicked, unless the header or footer is static, in which case it returns 1. *Argument\_6* returns zero.
- ▶ When clicking on the header or footer for a standard Toolkit list, *argument\_5* and *argument\_6* return zero.
- ▶ When clicking on a line in an ActiveX Toolkit list, *argument\_5* returns the column number to the left of the line that was clicked.

When using a list with the D\_EVENT\_SIZE method, *argument\_6* refers to the number of visible list items.

When using a list with the D\_EVENT\_SCROLL method, *argument\_6* refers to the item number of the display area position, and *argument\_8* is always 0.

When using proportional fonts in conjunction with %UWNDEVENTS\_METHOD, note that the column (x-direction) argument may not be correct. The column argument is based on the sizing character for the window, and not the actual text.

## See also

- ▶ [“Overloading a Toolkit routine” on page 18-8](#) for more information on creating this function.
- ▶ [“Appendix D: Methods”](#).



# 17

## Debugger

### **What is the Window Debugger? 17-2**

Explains what the debugger enables you to do, lists the debugger commands, and tells you how to access online help for the debugger.

### **Using the Debugger 17-3**

Gives you the proper format for each debugger command and discusses what each command does.

## What is the Window Debugger?

The window debugger is a feature of UI Toolkit that enables you to look into the windowing environment and determine what is really happening in the windows you've created.

The debugger consists of the following commands:

|                        |                                         |
|------------------------|-----------------------------------------|
| <b>CLEAR or CLS</b>    | Clear the display screen.               |
| <b>DISPLAY</b>         | Display windows or lists.               |
| <b>EXAMINE or SHOW</b> | Provide status information.             |
| <b>QUIT</b>            | Exit the debugger.                      |
| <b>REDRAW</b>          | Redisplay debugger system output lines. |
| <b>WINDOW</b>          | Display information about a window.     |
| <b>LIST</b>            | Display information about a list.       |
| <b>FILESTACK</b>       | Display information about a file stack. |

The commands and their arguments are not case sensitive and can be abbreviated. You can place more than one command on a line if you separate the commands with commas.

For online help on a particular command, type the following:

```
help command
```

where *command* is the name of the debugger command for which you want more information.

## Using the Debugger

Before you can run the debugger, you must enable it. There are three ways to do this:

- ▶ Set the logical or environment variable DTKDBG to any value.  
If UI Toolkit generates an error while this environment variable is set, a window is displayed that asks if you want to examine the window system. If you answer **Y**, the UI Toolkit debugger opens. Note that when DTKDBG is set, the debugger checks for any %M\_SIGNAL call that supersedes a pending menu entry, and it makes sure that a method passed to U\_START can be invoked. For more information, see [DTKDBG](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.  
  
When you’re running a Toolkit program, you can explicitly enter debug mode by pressing CTRL+R while performing any Toolkit input. Neither the environment nor window system resources are affected while you are in debug mode. If DTKDBG is not in the logical table or environment, CTRL+R will never enter the debugger.
- ▶ Explicitly invoke the debugger without setting DTKDBG by using the U\_DEBUG subroutine. See [U\\_DEBUG on page 16-30](#) for more information.
- ▶ Call the UI Toolkit window debugger from the Synergy debugger prompt.  
At the debug prompt, type “windbg” to invoke the UI Toolkit window debugger. If UI Toolkit is not initialized (for example, before U\_START or after U\_FINISH), the command simply returns without doing anything. If the program was not linked with UI Toolkit, a “Cannot access external routine” error is generated. Otherwise, the UI Toolkit debugger takes over input until a QUIT command is issued. At that point, the Synergy debugger resumes control with a new prompt.

---

### VMS

If your application is linked against the UI Toolkit shared image (**TKLIB.SH.EXE**), you must invoke OPENELB for the shared image in your application before this feature is enabled. Execute this statement prior to using this feature:

```
XCALL OPENELB ( "TKLIB_SH" )
```

where “**TKLIB\_SH**” is the name of a logical symbol assigned to the UI Toolkit’s shared image file. We do not perform this OPENELB automatically because it slows every XSUBR call. Your program should include it only if needed.

---

If you need to repaint the screen while you are in debug mode, press CTRL+R, CTRL+D. (On OpenVMS, press CTRL+R, CTRL+Z.)

---

**WIN**

---

In Windows environments, the debugger runs in a separate application window. The initial size and location of this window is user-definable. See the “[Environment Variables](#)” chapter of *Environment Variables & System Options* for more information.

---

## Clearing the display screen

The CLEAR or CLS command clears the display screen and redisplay the debugger command prompt.

## Displaying windows or lists

The DISPLAY command shows the screen displays for components of the UI Toolkit environment. It can have one of the following formats:

```
display environment [level]
```

```
display windows [n,...]
```

```
display lists n[n,...]
```

*Level* is the environment to be displayed and *n* is the ID of a window or list to be displayed.

DISPLAY ENVIRONMENT shows the screen display of the specified environment. DISPLAYing an environment level re-creates that level’s display. If *level* is not specified, the current environment level is displayed.

DISPLAY WINDOWS shows the screen display of the specified window(s). When you DISPLAY windows, they are placed on the screen in the order that you’ve specified them. If no windows are specified, the current list of windows is redisplayed.

DISPLAY LISTS shows the screen display of the specified list(s). When you DISPLAY lists, they are placed on the screen in the order you’ve specified them. You must specify at least one list ID for this command.

Once a display of any kind has been generated, you can press any keyboard key to continue. All windows are then removed and you return to the debugger command prompt.

## Providing status information

The EXAMINE command provides status information about components of the UI Toolkit environment.

EXAMINE can have any of the following formats, where *level* is the environment level to be examined and *n* is the ID of the window or list to be examined:

```
examine defines
examine environment [level]
examine system
examine window n [fields] [user]
examine list n
```

The EXAMINE DEFINES command outputs status information about the current system definitions. The definitions are the following:

- ▶ Toolkit version being used
- ▶ Maximum allowable number of the following items:
  - ▶ Channels
  - ▶ Windows
  - ▶ Header and footer lines
  - ▶ Lists
  - ▶ Environment levels
  - ▶ Placed windows in all environments
  - ▶ Entries per column
  - ▶ Fields per input window
  - ▶ Sets per input window
  - ▶ Information text per window field
  - ▶ Characters per text row

The EXAMINE ENVIRONMENT command outputs status information about the specified environment level. If no environment level is specified, the debugger examines the current environment level. The environment status includes the following:

- ▶ Lists of local channels
- ▶ Windows, lists, and columns
- ▶ Placed windows, lists, and columns
- ▶ Terminal states (echo, cursor, lowercase, interrupt)
- ▶ Program states (wait on lock, wait on message)

EXAMINE SYSTEM outputs status information about the current system state. The system-wide information includes a list of all loaded columns and windows, channels in use, all lists, and all file stacks.

EXAMINE WINDOW outputs status information about the specified window. If the optional **fields** parameter is specified, the “raw” information about the window’s fields will also be output. If the optional **user** parameter is specified, the contents of the window’s user data set are also output. This command is identical to the WINDOW command described later in this chapter.

EXAMINE LIST outputs status information about the specified list. This command is identical to the LIST command described later in this chapter.

EXAMINE FILESTACK outputs status information about a file stack. This command is identical to the FILESTACK command described later in this chapter.

## Exiting the debugger

The QUIT command exits the window debugger. If you entered the debugger from a screen input field, that field’s input will be redisplayed. If you entered the debugger after a fatal error was generated, your program will terminate.

## Redisplaying lines of debugger output

On Windows, by default you can access 300 lines of output by scrolling. You can change the number of available lines by setting the DBG\_BUFFER environment variable in **synergy.ini** or **synuser.ini** to a different value.

On UNIX and OpenVMS, The REDRAW command redisplay the last full screen (24 lines) of output produced by the debugger system.

## Displaying information about a window

The WINDOW command displays detailed windowing system information for a specific window.

```
window n [environment level] [fields] [user]
```

where *level* is the environment level at which the window should be examined and *n* is the ID of the window for which information should be displayed. **Fields** specifies that the parameters of all window fields are to be displayed, and **user** specifies that information in any user data set is to be displayed. If you don’t specify an environment *level*, the window is examined at the current level.

The WINDOW command always displays the following information about the window:

- ▶ Window name
- ▶ Size
- ▶ Placement
- ▶ Title



- ▶ Cursor position
- ▶ Display area
- ▶ Processing area
- ▶ Characteristics (whether or not it is placed, occluded, border is on or off, title is displayed)
- ▶ Renditions (for window, border, and title)
- ▶ Number of fields
- ▶ Current field
- ▶ Number of user-data entries
- ▶ Size of user-data entries
- ▶ Current user-data entry

If **fields** is specified, the WINDOW command also displays the following for each field:

*fld* = (*row: col: len*)

where *fld* is the field number, *row* and *col* are the window-relative placement coordinates for the field, and *len* is the field's length.

If **user** is specified, for each user-data entry, the WINDOW command displays the entry number followed by the data itself. WINDOW displays this data up to 50 characters per line and, if needed, continued on subsequent lines. Any non-printable character in the data is replaced by a period (.).

## Displaying information about a list

The LIST command displays information for a specific list. It has the following format:

`list n`

where *n* is the ID of the list for which you want information. This command displays the following:

- ▶ Current item number
- ▶ Last item number (highest loaded)
- ▶ Current row (ordinal item number in visible portion of the list)
- ▶ Current item status (whether or not it is null or if it is at the top or bottom of list)
- ▶ Associated input window ID
- ▶ List status (enabled or disabled)
- ▶ Current find parameters (case sensitivity, direction, search type, area of the optional data to be searched, the search string, and the length of the string)
- ▶ Find status (whether the last find was successful)

## Displaying information about a file stack

The FILESTACK command displays information for a file stack. It has the format:

```
filestack [n] [level l] [record r]
```

where *n* is the file-stack channel, *l* is the level of the file stack, and *r* is the record within that level.

If the channel (*n*) is not specified, the default file stack is accessed. If the level (*l*) is not specified, the highest level on the file stack is used. If record (*r*) is not specified, none is assumed.

The following information is always displayed:

- ▶ File-stack channel
- ▶ Level
- ▶ Record size
- ▶ Highest record written at that level

If **record** is specified, the FILESTACK command also displays the contents of that record. Any non-printable character is replaced by a period (.).

# 18

## Customizing UI Toolkit

### **Customizing Configuration Fields 18-2**

Discusses the `tkctl.def` and `tools.def` fields you can change.

### **Customizing UI Toolkit Routines 18-8**

Defines user-overloadable routines and explains how to invoke them.

### **Customizing Key Mapping for Menu Shortcuts 18-11**

Explains what key mapping is, how key mapping works with your system, and how and why you might want to change the key maps.

### **Customizing the Look of Your Application 18-27**

Explains renditions and rendition schemes, and explains how they work with the color palette and, on Windows, Synergy colors.

### **Using Fonts on Windows 18-46**

Explains how to define font palette entries, set the font for an application, set the font for an object, and use proportional fonts on Windows.

# Customizing Configuration Fields

The **tkctl.def** and **tools.def** files contain a number of configuration fields that you can modify from within your program to change operational characteristics of UI Toolkit. These fields are listed below. In the sections below, “false” indicates a value of zero; “true” indicates a nonzero value.



Note the following:

- ▶ If you want to modify any of these fields, you must first **.INCLUDE** the corresponding file(s) in your program.
  - ▶ When using Toolkit code in Synergy .NET, there are some limitations to the ways you can use these configuration fields. See [“Restrictions for global fields” on page 1-23](#).
- 

## tkctl.def

**Tkctl.def** includes the following fields, which are initialized by U\_START.

### **g\_ActiveX\_list**

Specifies whether Toolkit will use the ActiveX list control for lists (true/false). See [“Specifying and determining the list type” on page 9-5](#) for more information. This field is initialized to true if the environment variable **ACTIVEX\_LIST** is set to 1. Otherwise, it is initialized to false.

### **g\_beep**

Turns on or turns off the terminal bell (on all platforms) and MessageBeep (on Windows). If **g\_beep** is set to true, the terminal bell and MessageBeep are enabled. If it is set to false,

- ▶ calls to **U\_BEEP** have no effect.
- ▶ runtime routines other than **%U\_MSGBOX** suppress the terminal bell and MessageBeep. Note that on Windows, the **g\_beep** setting does not affect beeps for message boxes or other sounds associated with message box icons.

U\_START initializes this field to false if the **DTK\_BEEP** environment variable is set to 0 or “off” (case-insensitive) in **synuser.ini**, **synergy.ini**, or the environment. Otherwise U\_START initializes it to true (the default). Note that an application can set **g\_beep**, and the setting will determine subsequent behavior.

### **g\_chk\_char**

Specifies the check mark character to be used by **S\_SELECTCB**, **S\_UPDATECB**, and **U\_MODREND**. Note the following:

- ▶ On Windows, this field affects only check marks for check boxes that aren’t framed (using **I\_FRAMES**, **I\_INPUT**, or **I\_INPFLD**). Framed check boxes always use the Windows standard check mark character.
- ▶ This field is initialized to “X” on most environments.

### **g\_date\_order**

Defines date input and display. See “[DATE\(\[TODAY\]\[, PERIOD\]\[, SHORT\]\)](#)” on page 2-54 for information. This field is initialized to 0.

### **g\_date\_sep**

Specifies the character to be used to separate parts of a date when displayed. This field is initialized to a forward slash (/).

### **g\_dtkbounds**

Controls DTK\_BOUNDS checking behavior after U\_START is called. See [DTK\\_BOUNDS](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for information. This field is initialized to 1 if the DTK\_BOUNDS environment variable is set to 1. It is initialized to 2 if DTK\_BOUNDS is set to 2. Otherwise, it is initialized to 0, which turns off bounds checking. In **tools.def**, there are defines for 1 (D\_BOUNDS\_OVERRUN) and 2 (D\_BOUNDS\_EXACT).

### **g\_edt\_fwrd\_msg**

Defines the edit forward direction message. This field is initialized to “Forward”. (The message string is read from the Synergy/DE text message file.)

### **g\_edt\_ins\_msg**

Defines the edit insert mode message. This field is initialized to “Insert”. (The message string is read from the Synergy/DE text message file.)

### **g\_edt\_ovr\_msg**

Defines the edit overstrike mode message. This field is initialized to “Overstrike”. (The message string is read from the Synergy/DE text message file.)

### **g\_edt\_rev\_msg**

Defines the edit reverse direction message. This field is initialized to “Reverse”. (The message string is read from the Synergy/DE text message file.)

### **g\_entnamctab (Windows only)**

Specifies the name of the menu entry to be activated when CTRL+TAB is pressed. This field is initialized to blank (no entry).

### **g\_entnamcstab (Windows only)**

Specifies the name of the menu entry to be activated when CTRL+SHIFT+TAB is pressed. This field is initialized to blank (no entry).

### **g\_entnamtab (Windows only)**

Specifies the name of the menu entry to be activated with TAB is pressed. This is initialized to blank (no entry).

#### **g\_entnamstab (Windows only)**

Specifies the name of the menu entry to be activated when SHIFT+TAB is pressed. This is initialized to blank (no entry).

#### **g\_eof\_max**

To facilitate redirection of input, this field specifies the maximum number of successive end-of-file (EOF) characters to allow on input. (On UNIX, these are CTRL+D. On OpenVMS, these are CTRL+Z.) After the specified maximum number of EOF characters are encountered, the program will stop and display a message saying that too many EOF characters were encountered.

This is initialized to 100. To disable the behavior described above, set it to 0.

#### **g\_inp\_trm\_key**

Defines the completion key code for the I\_INPUT subroutine. This field is initialized to RETURN\_KEY. (RETURN\_KEY is defined in **inpctl.def**.)

#### **g\_inp\_trm\_msg**

Defines the I\_INPUT termination processing message. This field is initialized to “Make corrections or press RETURN to complete input”. (The message string is read from the Synergy/DE text message file.)

#### **g\_periods**

Defines the maximum value for period-style dates. This field is initialized to 12.

#### **g\_plc\_col\_args**

Determines whether Toolkit will place menu columns that are passed as arguments to Toolkit routines (true/false). When set to true, Toolkit places and removes menu columns as needed. When set to false, Toolkit ignores menu column arguments. This field is initialized to false for Windows and true for UNIX and OpenVMS.



Note that although you can change the value of **g\_plc\_col\_args** on any supported platform after U\_START is called, we recommend leaving it set to true for UNIX and OpenVMS because on these platforms menu columns must be placed to make their functions available to users.

---

#### **g\_retaincontext (Windows)**

Determines how context is handled when a menu entry is signaled from a change, display, or leave method and a user action (mouse click, ENTER, TAB, SHIFT+TAB, etc.) moves input context to a subsequent field or button. Prior to UI Toolkit version 8.3, if a menu entry was signaled in this situation, Toolkit would incorrectly apply the menu entry processing to the subsequent field or button rather than to the field whose method called %M\_SIGNAL. This was corrected in Toolkit version 8.3. By default, context now remains on the field whose method signaled the menu entry,

which matches Toolkit behavior on UNIX and OpenVMS. You can, however, restore the previous behavior. If **g\_retaincontext** is set to true, Toolkit emulates Windows behavior for Toolkit versions prior to 8.3 (it moves input context to the subsequent field or button). If **g\_retaincontext** is set to false (the default), context remains on the field whose method signaled the menu entry. Note the following:

- ▶ The **g\_retaincontext** field applies only when using I\_INPUT. It does not apply to any menu entry signaled from outside of the input routine.
- ▶ If you set **g\_retaincontext**, set it from the method that signals the menu entry, or set it before calling that method. If you don't, the setting won't apply until the next such situation (the next time a menu entry is signaled from a method and a user action moves input context to a subsequent field or button).

This field is initialized to true if the RETAIN\_CONTEXT\_CHANGE\_ON\_SIGNAL environment variable is set to 1. If RETAIN\_CONTEXT\_CHANGE\_ON\_SIGNAL is set to any other value or is undefined, **g\_retaincontext** is initialized to false.

## g\_tabfacecolor

Determines which color palette entry will be applied to a window when the window is added to a tab set. If this field is set to 0 (or a value greater than 16), no color palette entry is applied to a window when it is added to a tab set; the window's color remains as is. This field is

- ▶ initialized to 9 on Windows if themes are enabled. Otherwise, **g\_tabfacecolor** is initialized to 0 on Windows.
- ▶ initialized to 0 on UNIX and OpenVMS.

## g\_throwabort

Determines the behavior of U\_ABORT. If **g\_throwabort** is set to zero, U\_ABORT pops up a message box and performs a STOP. If **g\_throwabort** is set to a non-zero value, U\_ABORT will instead call U\_FINISH to shut down Toolkit and then use EXITE to throw a trappable error.

This field is initialized to true (1) if the environment variable DTK\_THROW\_ABORT is set to 1. Otherwise, this is initialized to false (0).

## g\_time\_entry

Specifies the name of the time-out menu entry. This field is initialized to O\_TIMEOUT.

## g\_time\_sep

Defines the character used to separate parts of a time field when displayed. This field is initialized to a colon (:).

#### g\_wait\_time

Specifies a default time-out value. This field is initialized by U\_START to Q\_WAIT, which is equivalent to D\_FOREVER, -1, or FOREVER (for .FIELD), but can be any one of the following:

- ▶ D\_FOREVER (or -1), which instructs Toolkit to wait until I/O processing is complete (i.e., no time-out).
- ▶ D\_IMMEDIATE (or 0), which instructs Toolkit to immediately time out.
- ▶ *n* (a positive number), which instructs Toolkit to wait *n* seconds before timing out.

See the following for more information:

- ▶ [AX\\_TIMEOUT](#) on page 4-12.
- ▶ [AX\\_INPUT](#) on page 4-8.
- ▶ [WAIT](#) in the “Synergy DBL Statements” chapter of the *Synergy DBL Language Reference Manual*.

#### g\_wt\_alrt\_key

Defines the completion key code for the alert state of the U\_WAIT subroutine. This field is initialized to RETURN\_KEY. (RETURN\_KEY is defined in **inpctl.def**.)

#### g\_wt\_alrt\_msg

Defines the display message for the alert state of the U\_WAIT subroutine. This field is initialized to “Press RETURN to continue”. (This message string is read from the Synergy/DE text message file.)

#### g\_wt\_err\_key

Defines the completion key code for the error state of the U\_WAIT subroutine. This field is initialized to CTRL\_G\_KEY. (CTRL\_G\_KEY is defined in **inpctl.def**.)

#### g\_wt\_err\_msg

Defines the display message for the error state of the U\_WAIT subroutine. This field is initialized to “Press ^G to continue”. (The message string is read from the Synergy/DE text message file.)



## tools.def

**Tools.def** includes the following fields.

### g\_netnativemsgbox

In Synergy .NET, Toolkit uses native Windows message boxes for the following routines if **g\_netnativemsgbox** is set to true: U\_MESSAGE, %U\_MSGBOX, and U\_WAIT. If this field is set to false, which is the default, Toolkit uses cell-based-style message boxes for these routines in Synergy .NET.

### g\_txt\_rtrn

When set to false, pressing ENTER while in an input window text field will be interpreted as completion of input. If you want ENTER to insert a new line, set the variable to true. This field is initialized to false.

### g\_txt\_softreturn

Controls the way Toolkit handles line ends on Windows when using T\_EDIT or when using I\_INPUT with multi-line text fields. When set to 0, Toolkit retains line ends in incoming data and uses those line ends when displaying the data. When set to a non-zero value, Toolkit assumes that line ends are the result of wrapping and discards them, rewrapping lines as needed when displaying the data. This field is initialized to 0.

### g\_updt\_fld

When performing “DONE” processing (passing **\*DONE\*** to I\_NEXT or selecting an I\_DONE menu entry), UI Toolkit updates the window system as each field in the input set is processed. If you have a lot of input fields being set by the DONE processing, and you want to improve performance, set this variable to false. This field is initialized to true.

### g\_updt\_set

When performing “DONE” processing (passing **\*DONE\*** to I\_NEXT or selecting an I\_DONE menu entry), UI Toolkit does not update the window system until the next input occurs (unless **g\_updt\_fld** is set). If you want to force a window system update after DONE processing (for instance if your program does some lengthy processing before the next input might normally occur), set this variable to true. This field is initialized to false.

## Customizing UI Toolkit Routines

This section explains how to overload a Toolkit subroutine and to name customized subroutines.

### Overloading a Toolkit routine

UI Toolkit includes many subroutines that you can overload. At runtime, you register the name of your customized routine, and UI Toolkit will call it at the appropriate time. If you do not register your routine, Toolkit will use its default implementation. The following routines can be overloaded at runtime:

|                   |                    |
|-------------------|--------------------|
| %EAPPMOVE_METHOD  | IARRIVE_METHOD     |
| %EAPPSIZE_METHOD  | %ICHANGE_METHOD    |
| %EAPPSTATE_METHOD | %IDISPLAY_METHOD   |
| %ECENTURY_METHOD  | IDRILL_METHOD      |
| ECHKFLD_METHOD    | %IEDITFMT_METHOD   |
| ECLOSE_METHOD     | IHYPER_METHOD      |
| EDSPFLD_METHOD    | ILEAVE_METHOD      |
| EEDTDSP_METHOD    | LARRIVE_METHOD     |
| EENTRST_METHOD    | LDBLCLICK_METHOD   |
| EFKEY_METHOD      | LLEAVE_METHOD      |
| EHELP_METHOD      | LLOAD_METHOD       |
| ESCRPTERR_METHOD  | USTART_METHOD      |
| EUTILS_METHOD     | %UWNDEVENTS_METHOD |

There are various ways to overload one of the above subroutines. In general, you need to do the following:

1. Write your customized subroutine.
2. Register your routine.
3. Make sure your customized subroutine is available to UI Toolkit. See [“Making your subroutine available to UI Toolkit”](#) below.

Refer to the specific user-overloadable subroutines for more detailed information.

## Making your subroutine available to UI Toolkit

In order for Toolkit to be able to locate your customized subroutine, one of the following must be true:

- ▶ The subroutine resides in your application's main routine.
- ▶ The subroutine resides in an ELB that's linked with your application, which you have previously opened with OPENELB or specified when you registered the routine.
- ▶ The subroutine resides in an OpenVMS shared image file you have previously opened with OPENELB or specified when you registered the routine.
- ▶ The subroutine is explicitly linked into your application. (Even if you do not call these routines yourself, you still need to reference them explicitly in order for them to be linked into your application. A tactic for creating an explicit reference to a customized routine is to include "dummy" calls after the XRETURN or FRETURN in a routine you know will be explicitly referenced, such as a start-up routine, or after the STOP in a main routine. This method is required if you use OpenVMS object libraries.)

## Examples of overloading

### Example 1: Creating explicit references

In the following example, the subroutines **my\_help** and **my\_utils** are explicitly linked into the application by specifying dummy references to them within the application but outside of the code sequence. The routine **my\_help** is registered as the help method, and the routine **my\_utils** is the utility method. They are drawn from an ELB or shared image that's linked with the application.

```
subroutine my_startup

proc
    xcall u_start(...)

    xcall e_method(D_METH_HELP, "my_help", D_METH_UTILS, "my_utils")
    .
    .    (other application-specific start-up code)
    .
xreturn

xcall my_help           ;Dummy references to ensure availability.
xcall my_utils          ;Note that no arguments are required because these
                        ; statements are never actually invoked.

endsubroutine
```

#### Example 2: Specifying the library

In the example below, the routine **myhelp** is registered as the help method and will be drawn from whatever source is available (program image or most recently opened ELB). The utility method will be the routine **myutils**, and the function key mapping method will be **myfkey**, both of which are drawn from the ELB or shared image pointed to by the logical symbol USRLIB. A different library, pointed to by the logical symbol APPLIB, is used to supply the user-defined field support methods **mychkfld**, **mydspfld**, and **myedtdsp**. The routine **myclose** is used for the application close method, but no specific library will be used (as with **myhelp** above). The Toolkit is initialized with the window library **mywnds**, with one header and one footer line.

```
xcall u_start("mywnds", 1, 1,,,,,,,,, "mystart", "USRLIB:") ;Start Toolkit

subroutine mystart
;
; User start-up routine example which also registers other methods
;
.include "WND:tools.def"

proc
  xcall e_method(D_METH_HELP, "myhelp",
    &          D_METH_LIBRARY, "USRLIB:",
    &          D_METH_UTILS, "myutils",
    &          D_METH_FKEY, "myfkey",
    &          D_METH_LIBRARY, "APPLIB:",
    &          D_METH_CHKFLD, "mychkfld",
    &          D_METH_DSPFLD, "mydspfld",
    &          D_METH_EDTDSP, "myedtdsp",
    &          D_METH_LIBRARY,,
    &          D_METH_APPCLOSE, "myclose")
  xreturn
endsubroutine
```

## Naming customized subroutines

You can name your subroutines almost anything you want (following general subroutine naming conventions). However, do not use the prefix “TKP\_”, which is used internally by UI Toolkit for its default implementation of the various customizable subroutines.

## Customizing Key Mapping for Menu Shortcuts

Toolkit enables you to create menu shortcuts by mapping keys and key sequences to menu entries. As distributed, Toolkit contains default key mappings for most terminal types, but you can create custom mappings for individual keys and key sequences, and you can create sets of mappings (called *key maps*) for terminals and for users.

When a user presses a nonstandard key or key sequence during an input routine, Toolkit consults the key map, which is a set of shortcuts for the terminal or user, to see if there's a mapping for the escape sequence it received. We call this *runtime terminal binding*. If there is, Toolkit then looks at the menu definitions created by `MB_ENTRY` or `.ENTRY` to find a match. If there is a match, Toolkit loads the menu entry name into the `g_entnam` global variable and returns control to your application. If there is no key mapping for the escape sequence or match for the key mapping, Toolkit rings the keyboard bell and ignores the escape sequence.

Because of runtime terminal binding, your application can be made to handle input from various types of terminals and keyboards. In addition, you can enable your users to create their own shortcuts by including a call to the `U_EDITKEYS` routine in your application.

You can create shortcuts by doing the following:

- ▶ **Specifying shortcuts in menu entry definitions.** If you use `.ENTRY` or `MB_ENTRY` and use the `^key` form to specify a shortcut, your shortcut is complete. (See [.ENTRY on page 2-29](#) or [MB\\_ENTRY on page 10-70](#) for more information.) On UNIX and OpenVMS, however, if you use `.ENTRY` and specify an arrow key or use the `f#` form for a shortcut, you must make sure the function code is mapped to a key or key sequence in the key map(s) that will be used with the application. (On Windows, functions codes are automatically mapped to a native Windows accelerator table.)
- ▶ **Mapping keys in key maps.** A key map is a set of shortcuts for a terminal or keyboard type. Key maps are stored in a Synergy database called a key map file (which is `dtkmap.ism` by default). The key map file as it's distributed includes several key maps, but you can use the key mapping utility to add your own key maps, modify key maps, and delete key maps. See ["Customizing key maps" on page 18-14](#) for more information.
- ▶ **Defining identifiers in the key mapping script file.** Identifiers defined in the key mapping script file (which is `keymap.ctl` by default) can be used as the *shortcut* argument in `.ENTRY` definitions. This can make shortcut definitions in script files easier to understand. See ["Modifying shortcut identifiers for menu entries defined in a script" on page 18-21](#) for more information.

#### WIN

---

In Windows environments, key mappings are fixed. Only the text for a key map can be changed (the text that's displayed next to the menu entry). This is because function codes on Windows are mapped to a native Windows accelerator table. If you use the key mapping utility to view the key map for Windows, you'll see both the shortcuts and the shortcut text, but only the shortcut text can be changed.

---

Note the following:

- ▶ Some keys and key sequences are reserved. CTRL+M, for example, is reserved for carriage return, and it can't be mapped to any other function. The other reserved keys and key sequences, which are listed in [“Customizing reserved keys” on page 18-25](#) can be mapped to other functions.
- ▶ If there are conflicts, entries in key maps override entries in the key mapping script file and shortcuts specified with .ENTRY or MB\_ENTRY. Shortcuts specified with .ENTRY must not conflict with entries in the key mapping script file. If they do, errors will be generated when you generate the window libraries.
- ▶ Shortcut text (text displayed next to a menu entry) can be specified only in key maps. (Shortcut text specified with MB\_ENTRY or the key mapping script file is ignored.)

## Files and environment variables used for key mapping

The following files are used for key mapping:

|                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>inpctl.def</b>                                          | Defines identifiers passed as the <i>shortcut</i> argument to MB_ENTRY.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| key map file<br>( <b>dtkmap.ism</b> by default)            | Associates keys (escape sequences) with internal function codes. To locate this file, Toolkit looks first for the file and directory specified by DTKMAPFIL if that environment variable is set. Toolkit then looks for <b>dtkmap.ism</b> in the directory specified by DTKMAP if that's set. If the file isn't there or can't be opened, Toolkit looks in the WND directory.                                                                                                                                                                                                                                                                                                                |
| key mapping script file<br>( <b>keymap.ctl</b> by default) | As distributed, this file contains a copy of <b>keymap.msw</b> or <b>keymap.vt</b> depending on the operating system or terminal type. (See <a href="#">“Modifying shortcut identifiers for menu entries defined in a script” on page 18-21.</a> ) To locate the key mapping script file, Toolkit looks first for the directory and filename specified by DTKKEYCTLFIL if it's set. If DTKKEYCTLFIL isn't set, Toolkit looks for <b>keymap.ctl</b> in the current working directory. And if the file isn't there, Toolkit looks for <b>keymap.ctl</b> in the WND directory. If Toolkit can't find a key mapping script file, the only shortcuts supported by scripts are “F1” through “F63”. |

|                   |                                                                                                                                   |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>keymap.msw</b> | Contains shortcut identifier definitions for Windows systems. On Windows systems, <b>keymap.ctl</b> is a copy of this file.       |
| <b>keymap.vt</b>  | Contains shortcut identifier definitions for VT-style keyboards. On UNIX and OpenVMS, <b>keymap.ctl</b> is a copy of this file.   |
| <b>keys.dbl</b>   | Enables you to test menu shortcuts. See <a href="#">“Using keys.dbl to test shortcuts (UNIX and OpenVMS)”</a> on page 18-23.      |
| script file       | Assigns shortcuts or function codes to menu entries. (You create this. See <a href="#">chapter 2, “Script,”</a> for information.) |
| window library    | Contains the shortcuts for menu entries. Proto and Script generate this from the script file and <b>keymap.ctl</b> .              |

The following environment variables are used in key mapping:

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DTKKEYCTLFIL | Optionally defines the location and name of the key mapping script file. If this environment variable is not set, Toolkit looks for the default key mapping script file ( <b>keymap.ctl</b> ) in the current working directory and, if Toolkit can’t find it there, in the WND directory. To specify a different name or location, set DTKKEYCTLFIL to the full path and name of the file. See <a href="#">DTKKEYCTLFIL</a> in the “Environment Variables” chapter of <i>Environment Variables &amp; System Options</i> for more information. |
| DTKMAP       | Optionally defines the location of the default key map file, <b>dtkmap.ism</b> . Use this environment variable if you want to change the location (but not the name) of the key map file. This setting is ignored if DTKMAPFIL is set. See <a href="#">DTKMAP</a> in the “Environment Variables” chapter of <i>Environment Variables &amp; System Options</i> for more information.                                                                                                                                                           |
| DTKMAPFIL    | Optionally defines the location <i>and</i> name of the key map file. By default, the key mapping file is named <b>dtkmap.ism</b> and is located in the WND directory. To specify a key map file with a different name or in a different location, set DTKMAPFIL to the path and name of the file. Note that environment variable overrides DTKMAP. See <a href="#">DTKMAPFIL</a> in the “Environment Variables” chapter of <i>Environment Variables &amp; System Options</i> for more information.                                            |
| DTKTERM      | Specifies a key map for a terminal. The value of DTKTERM is used as the database key to locate the appropriate key map in the key map file (which is a database). For this purpose, DTKTERM overrides TERM. (It doesn’t override TERM as a setting for terminal capabilities on UNIX systems.) See <a href="#">DTKTERM</a> in the “Environment Variables” chapter of <i>Environment Variables &amp; System Options</i> for more information.                                                                                                  |

- TERM** Specifies a key map for a terminal if DTKTERM is not defined. See [TERM](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for more information.
- WND** Specifies the default location of **dtkmap.ism** and **keymap.ctl**, among other things. See [WND](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for more information.

If neither DTKTERM nor TERM is defined, Toolkit uses MSWINDOWS in Windows environments and VT100 elsewhere.

As distributed, the key map file (**dtkmap.ism**) includes the following key maps:

| Key map name | Terminal type              |
|--------------|----------------------------|
| ANSI         | UNIX console               |
| GENERIC      | Unknown terminal type      |
| HFT          | IBM high-function terminal |
| IBMPC        | PC                         |
| MSWINDOWS    | Windows                    |
| VT100        | VTxxx terminal             |
| WY60         | Wyse-60 and compatibles    |
| XTERM        | X-Windows terminals        |

## Customizing key maps

The procedures in this section use the key mapping utility. Because this utility modifies key maps for all Toolkit applications on UNIX and OpenVMS, *including the key map utility itself*, we recommend saving a copy of the original default key map file (**WND:dtkmap.ism**) with a different name before you open the key map utility or modify a key map. Then, if you make unwanted changes that you can’t undo, you can go back to the original key maps and start again.

### Adding a key map for a terminal or user (UNIX and OpenVMS)

Most terminals on UNIX and OpenVMS systems can emulate VT-style keyboards. If you use a terminal that doesn’t, you need to create a key map for that specific terminal type. You can also create a key map for a specific user.

You can create a key map from scratch (see below), or you can copy an existing key map, customize it, and then save it with a new name. (See [page 18-17](#).)



### Creating a key map from scratch

1. Set the DTKTERM environment variable to the GENERIC key map. For example, at a DOS prompt, enter

```
SET DTKTERM=GENERIC
```

2. Open the key mapping utility by running
  - ▶ Proto and selecting Key mapping from the General menu.
  - ▶ Synergy UI Toolkit Control Panel and selecting Key mapping from the Preferences menu.

(You can also run this utility from your application by calling U\_EDITKEYS.)



If you set DTKTERM for an environment, rather than setting it for the system, open the key mapping utility in the same environment.

---

The GENERIC (blank) key map is displayed.

3. From the Key mapping menu, select “Add or change terminal type”.
4. Enter a name for the new key map at the “Enter New Terminal Type to Modify” prompt. You can use up to 10 characters.

For example, if you are creating a key map for the IBM 3151 terminal, you could enter IBM3151. If you are creating a key map for a specific user, you could enter something like SMITH\_W\_H.

5. If a key map with that name
  - ▶ doesn’t exist, enter **Y** at the “Do you wish to add it?” prompt, and press ENTER. An empty key map layout is displayed.
  - ▶ already exists, it is displayed. Select Exit from the General menu. Then select Key mapping from the General or Preferences menu and start again at [step 3](#).
6. Highlight the entry you want to modify. (Use the arrow keys to move around the key map and highlight key map entries.) Then press ENTER.
7. In the Key Definition window, enter key map information. All of the fields in this window are optional.
  - ▶ If the key map is for a keyboard type that is different than the type you are using, use the Codes fields to enter the ASCII code(s) for the key or key sequence you want to associate with the function.
  - ▶ If the key map is for the type of keyboard you are now using, select “Accept key sequence” from the Key mapping menu. This moves you to fields above the Codes fields. Here you can define the entry by pressing the actual key sequence (rather than by entering the ASCII code for the key sequence).
  - ▶ To clear an entry in one of the Codes fields, press the space bar when the entry is highlighted, and then press ENTER to move to the next field.

- ▶ To clear an entry in the Key Sequence, Alternate #1, or Alternate #2 fields, press ENTER when the entry is highlighted.
- ▶ To cancel changes in this window, select “Cancel current changes” from the Key mapping menu.

**Key Sequence/Codes.** If you are on the Key Sequence line (rather than Codes), press the key or key sequence you want to associate with the function. (The key mapping utility automatically fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for the key or key sequence you want to associate with the function.

**Alternate #1/Codes.** If you are on the Alternate #1 line (rather than Codes), press the key or key sequence you want to use as the alternate for the function. (The key mapping utility fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for an alternate key or key sequence you want associated with the function.

**Alternate #2/Codes.** If you are on the Alternate #2 line (rather than Codes), press the key or key sequence you want to use as the second alternate for the function. (The key mapping utility fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for a second alternate key or key sequence you want associated with the function.

**Menu Shortcut Text.** Enter the text you want to display in the menu column for the shortcut.

Note that for the Submenu Flag entry, you can edit only the Menu Shortcut Text field. This is because this entry defines the characters on UNIX and OpenVMS systems that mark a menu entry as having submenus. By default, the submenu flag is set to a dash and a greater-than symbol (->). (On Windows, this setting has no effect. Windows has its own, fixed submenu indicator.)

8. Close the Key Definition window by selecting Exit from the General menu or by pressing ENTER while you are on the Menu Shortcut Text field.
9. Continue mapping key sequences to functions by repeating [step 6](#) through [step 8](#). When you're finished assigning function codes, exit the key mapping utility by selecting Exit from the General menu.
10. Enter Y at the “Save current changes to ...?” prompt to save the key map with the specified name, or enter N to save it with a different name. Note that you can't cancel changes at this point; you must save the key map. If you don't want the key map, go ahead and save it; then follow the instructions in [“Deleting a key map for a terminal or user \(UNIX and OpenVMS\)”](#) on page 18-20 to delete it.
11. Test the key map by setting DTKTERM to the key map name (specified in [step 4](#)) and then running your application from a machine with a keyboard that the key map was designed for.

If you created a key map for a specific user, set DTKTERM in the user's environment before you test.

### Creating a new key map from an existing key map

1. Open the key mapping utility by running
  - ▶ Proto and selecting Key mapping from the General menu.
  - ▶ Synergy UI Toolkit Control Panel and selecting Key mapping from the Preferences menu.(You can also run this utility from your application by calling `U_EDITKEYS`.)
2. From the Key mapping menu, select “Add or change terminal type”.
3. Enter a name for the new key map at the “Enter New Terminal Type to Modify” prompt. You can use up to 10 characters.

For example, if you are creating a key map for the IBM 3151 terminal, you could enter `IBM3151`. If you’re creating a key map for a specific user, you could enter something like `SMITH_W_H`.
4. If a key map with that name
  - ▶ doesn’t already exist, enter **Y** at the “Do you wish to add it?” prompt, and press **ENTER**. An empty key map layout is displayed.
  - ▶ already exists, it is displayed. Unless you want to overwrite this key map, select **Exit** from the General menu, and then select Key mapping from the General or Preferences menu and start again at [step 2](#).
5. From the Key mapping menu, select **Copy terminal definition**.
6. At the “Enter terminal type to copy from:” prompt, enter the name of the key map you want to use as the basis for the key map you are creating.

The key map is displayed.
7. Highlight an entry you want to modify. (Use the arrow keys to move around the key map and highlight key map entries.) Then press **ENTER**.
8. In the Key Definition window, enter key map information. All of the fields in this window are optional.
  - ▶ If the key map is for a keyboard type that is different than the type you’re using, use the Codes fields to enter the ASCII code(s) for the key or key sequence you want to associate with the function.
  - ▶ If the key map is for the type of keyboard you are now using, select “Accept key sequence” from the Key mapping menu. This moves you to fields above the Codes fields. Here you can define the entry by pressing the actual key sequence (rather than entering the ASCII code for the key sequence).
  - ▶ To clear an entry in one of the Codes fields, press the space bar when the entry is highlighted, and then press **ENTER** to move to the next field.

- ▶ To clear an entry on the Key Sequence, Alternate #1, or Alternate #2 lines, press ENTER when the entry is highlighted.
- ▶ To cancel changes in this window, select “Cancel current changes” from the Key mapping menu.

**Key Sequence/Codes.** If you’re on the Key Sequence line (rather than Codes), press the key or key sequence you want to associate with the function. (The key mapping utility automatically fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for the key or key sequence you want to associate with the function.

**Alternate #1/Codes.** If you’re on the Alternate #1 line (rather than Codes), press the key or key sequence you want to use as the alternate for the function. (The key mapping utility fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for an alternate key or key sequence you want associated with the function.

**Alternate #2/Codes.** If you’re on the Alternate #2 line (rather than Codes), press the key or key sequence you want to use as the second alternate for the function. (The key mapping utility fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for a second alternate key or key sequence you want associated with the function.

**Menu Shortcut Text.** Enter the text you want to display in the menu column for the shortcut.

Note that for the Submenu Flag entry, you can edit only the Menu Shortcut Text field. This is because this entry defines the characters on UNIX and OpenVMS systems that mark a menu entry as having submenus. By default, the submenu flag is set to a dash and a greater-than symbol (->). (On Windows, this setting has no effect. Windows has its own, fixed submenu indicator.)

9. Close the Key Definition window by selecting Exit from the General menu or by pressing ENTER while you’re on the Menu Shortcut Text field.
10. Continue mapping key sequences to functions by repeating [step 7](#) through [step 9](#). When you’re finished assigning function codes, exit the key mapping utility by selecting Exit from the General menu.
11. Enter N at the “Save current changes to ...?” prompt. Then, enter a name for your new key map at the “Enter name of terminal to save current changes” prompt. You can use up to 10 characters.
12. Test the key map by setting DTKTERM to the key map name (specified in [step 11](#)) and then running your application from a machine with a keyboard that the key map was designed for.

If you created a key map for a specific user, set DTKTERM in the user’s environment before you test.

## Modifying an entry in a key map (UNIX and OpenVMS)

1. Open the key mapping utility by running
  - ▶ Proto and selecting Key mapping from the General menu.
  - ▶ Synergy UI Toolkit Control Panel and selecting Key mapping from the Preferences menu.(You can also run this utility from your application by calling `U_EDITKEYS`.)
2. The default key map for your operating system or terminal is displayed. If you want to modify an entry in another key map, select “Add or change terminal type” from the Key mapping menu. Then, at the “Enter New Terminal Type to Modify:” prompt, enter the name of the key map you want to modify.
3. Highlight the entry you want to modify. (Use the arrow keys to move around the key map and highlight key map entries.) Then, press ENTER.
4. In the Key Definition window, enter key map information. All of the fields in this window are optional.
  - ▶ If the key map is for a keyboard type that’s different than the type you’re using, use the Codes fields to enter the ASCII code(s) for the key or key sequence you want to associate with the function.
  - ▶ If the key map is for the type of keyboard you are now using, select “Accept key sequence” from the Key mapping menu. This moves you to fields above the Codes fields. Here you can define the entry by pressing the actual key sequence (rather than entering the ASCII code for the key sequence).
  - ▶ To clear an entry in one of the Codes fields, press the space bar when the entry is highlighted, and then press ENTER to move to the next field.
  - ▶ To clear an entry on the Key Sequence, Alternate #1, or Alternate #2 lines, press ENTER when the entry is highlighted.
  - ▶ To cancel changes in this window, select “Cancel current changes” from the Key mapping menu.

**Key Sequence/Codes.** If you’re on the Key Sequence line (rather than Codes), press the key or key sequence you want to associate with the function. (The key mapping utility automatically fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for the key or key sequence you want to associate with the function.

**Alternate #1/Codes.** If you’re on the Alternate #1 line (rather than Codes), press the key or key sequence you want to use as the alternate for the function. (The key mapping utility fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for an alternate key or key sequence you want associated with the function.

**Alternate #2/Codes.** If you're on the Alternate #2 line (rather than Codes), press the key or key sequence you want to use as the second alternate for the function. (The key mapping utility fills the Codes field with the characters for the corresponding ASCII codes.) Otherwise, in the Codes field, enter the ASCII code(s) for a second alternate key or key sequence you want associated with the function.

**Menu Shortcut Text.** Enter the text you want to display in the menu column for the shortcut.

Note that for the Submenu Flag entry, you can edit only the Menu Shortcut Text field. This is because this entry defines the characters on UNIX and OpenVMS systems that mark a menu entry as having submenus. By default, the submenu flag is set to a dash and a greater-than symbol (->). (On Windows, this setting has no effect. Windows has its own, fixed submenu indicator.)

5. Close the Key Definition window by selecting Exit from the General menu or by pressing ENTER while you're on the Menu Shortcut Text field.
6. Continue mapping key sequences to functions by repeating [step 3](#) through [step 5](#). When you're finished assigning function codes, exit the key mapping utility by selecting Exit from the General menu.
7. Enter Y at the "Save current changes to ...?" prompt to save the key map with the specified name, or enter N to save it with a different name. You can't cancel changes at this point; you must save the key map. If you don't want the key map, go ahead and save it; then follow the instructions in ["Deleting a key map for a terminal or user \(UNIX and OpenVMS\)"](#) below to delete it.
8. Test the key map by setting DTKTERM to the key map you specified in [step 3](#) and then running your application from a machine with a keyboard that the key map was designed for.

### Deleting a key map for a terminal or user (UNIX and OpenVMS)

1. Open the key mapping utility by running
  - ▶ Proto and selecting Key mapping from the General menu.
  - ▶ Synergy UI Toolkit Control Panel and selecting Key mapping from the Preferences menu.(You can also run this utility from your application by calling U\_EDITKEYS.)
2. If you want to delete a key map other than the one that's displayed in the Select Functions for... window, select "Add or change terminal type" from the Key mapping menu. Then, at the "Enter New Terminal Type to Modify:" prompt, enter the name of the key map you want to modify.
3. Select "Delete terminal definition" from the Key mapping menu.
4. Enter Y at the "Delete key map for..." prompt to delete the current key map or N to cancel.
5. To exit the "Enter New Terminal Type to Modify" prompt, select Exit from the General menu. Select Exit from the General menu a second time to exit the Key mapping utility.

## Customizing the submenu flag (UNIX and OpenVMS)

By default on UNIX and OpenVMS systems, a right arrow symbol (->) is displayed next to menu entries that have submenu columns. (On Windows, the submenu flag setting has no effect. Windows has its own, fixed submenu indicator.)

1. Open the key mapping utility by running one of the following. (You can also run this utility from your application by calling U\_EDITKEYS.)
  - ▶ Proto and selecting Key mapping from the General menu.
  - ▶ Synergy UI Toolkit Control Panel and selecting Key mapping from the Preferences menu.
2. Use the arrow keys to move to the “Submenu Flag” entry. And then press ENTER.
3. In the Key Definition input window, enter the menu text you want to use for the submenu flag, and then press ENTER.
4. Select Exit from the General menu to exit the Key mapping utility.

## Modifying shortcut identifiers for menu entries defined in a script

If you use script files to create menus, you can customize the way shortcuts for menu entries are defined in scripts by adding, deleting, or changing shortcut identifiers, which are defined in **keymap.ctl**. For example, to specify the CTRL+I key combination as a shortcut, you use KEY(^i) because it adheres to one of the forms for *shortcut* definitions for KEY (listed in the Discussion for .ENTRY on [page 2-30](#)). But what if you wanted to use KEY(inv) instead because the shortcut was for a menu entry that opened an inventory listing? You could do this by adding an identifier for the shortcut to **keymap.ctl**. In this case, you would add ^i=inv.

Note that if an identifier is defined for a shortcut in **keymap.ctl**, you can’t use that shortcut, rather than the identifier, in a KEY(*shortcut*) definition. For example, if you add ^i=inv to **keymap.ctl**, you can’t use KEY(^i) in a script; you must use KEY(inv) instead to assign the CTRL+I key combination as a menu entry shortcut.



If you change **keymap.ctl** and leave it in the synergy\toolkit directory, be sure to make a copy of it with a different name or in a different location. UI Toolkit distributions install a **keymap.ctl** file to this directory, so installing a new version of Toolkit will overwrite any **keymap.ctl** file in this directory.

---

1. Open the **keymap.\*** file you want to modify in a text editor. You can modify **keymap.ctl** directly, or you can modify **keymap.msw** (for Windows) or **keymap.vt** (for UNIX and OpenVMS) and then save the file as **keymap.ctl** or another name of your choosing (in [step 3](#)).
2. Add, change, or delete entries as needed. If you add or change entries, use the following format:

*shortcut*=*identifier*

where *shortcut* is the internal function code and *identifier* is the identifier to use in KEY(*shortcut*) definitions for .ENTRY. *Identifier* must be unique and have no more than five characters.

Note that as distributed, **keymap.\*** files also contain definitions with the following formats:

| Deprecated format                | Example            |
|----------------------------------|--------------------|
| <i>shortcut=(identifier)</i>     | f1=(PF1)           |
| <i>shortcut=identifier(text)</i> | f31=alt_q("Alt-Q") |

where *text* is ignored by Toolkit. (In early versions of Toolkit, *text* was used as shortcut text, which is the text that appears next to the menu entry. But now shortcut text can be defined only in key maps. For the first deprecated format above, *identifier* doubled as the shortcut text and the shortcut identifier.)

Note the following, which are true of all three formats:

- ▶ If you place multiple specifications on a single line, you must separate them with commas.
  - ▶ Blank lines and lines that begin with a semicolon are ignored.
  - ▶ If an *identifier* specification contains a blank or non-alphanumeric character, you must enclose *identifier* in quotation marks.
3. Save the file as **keymap.ctl** or another name of your choosing. If you save it as **keymap.ctl** (the default name) in the current working directory or the WND directory (the default location), Toolkit will automatically be able to find it. If you save it to another location or give it another name, you'll need to set the DTKKEYCTLFIL environment variable to its name and location.

## Redefining identifiers for shortcuts specified with MB\_ENTRY

You can customize the way shortcuts for menu entries are defined in MB\_ENTRY calls by creating and including a **.def** file that redefines and/or adds to the shortcut identifiers defined in **inpctl.def**. For example, if you use only the distributed version of **inpctl.def** and want to specify the CTRL+I key combination as a shortcut, you must pass CTRL\_I\_KEY as the *shortcut* argument for MB\_ENTRY, because that's the identifier defined in **inpctl.def** for this key combination. But what if you are assigning this key combination to a menu entry that opens an inventory list, for example, and for more readable code you want to instead pass "INVENTORY\_KEY" as the shortcut argument? You can do this by creating a **.def** file that includes the following definition and which could, in turn, include **inpctl.def**.

```
.define INVENTORY_KEY, CTRL_I_KEY
```

Note that on UNIX and OpenVMS, identifiers defined in **inpctl.def** must be set to function values defined in a key map file (**dtkmap.ism** by default). On Windows, use only the function values used in the distributed version of **inpctl.def**. These correspond to function values defined in the accelerator table for Toolkit on Windows.



## Using **keys.dbl** to test shortcuts (UNIX and OpenVMS)

To verify that your key mapping is working correctly, use the **keys.dbl** file. **Keys.dbl** enables you to test your key mapping. To create the test program,

1. Compile **keys.dbl**.
2. Link the resulting file with **tklib.elb** (**TKLIB.SH.EXE** on OpenVMS).
3. If you made changes to **keymap.ctl**, make the same shortcut changes **vtkeys.wsc**.
4. Run Script to create a file called **keys.ism** from **vtkeys.wsc**.
5. Run the **keys** program by entering the following at the command prompt:

```
dbr keys
```

Each of the menu entries in this program has a different shortcut key, and all 98 shortcuts are represented. You can use this program to test each shortcut.

## Example

If your application runs on VT-style terminals, your script file could assign the HELP key to the menu entry **O\_HELP** as follows:

```
.entry o_help, Help, key(help)
```

**Keymap.ctl** defines the following function code for the HELP key:

```
f15=Help
```

When you process the script file with Proto, Script, or Composer, the menu column is stored in a window library. The menu entry **O\_HELP** is associated with the function code **f15**.

Because your application runs on VT-style terminals, you've set the **DTKTERM** environment variable to **VT100**. When your application calls the **U\_START** subroutine, Toolkit opens the key map file and loads the key map for VT-style keyboards.

When you press the Help key during UI Toolkit input, the escape sequence **^[28~** is generated. Toolkit searches the **VT100** key map for this escape sequence. The key map associates this sequence with **f15**. Toolkit then looks through its list of placed menu entries to see if any of them use **f15** (Help) as a shortcut. The shortcut for **O\_HELP** matches, and **O\_HELP** is returned in **g\_entnam**. [Figure 18-1 on page 18-24](#) illustrates how the Help key would be mapped.

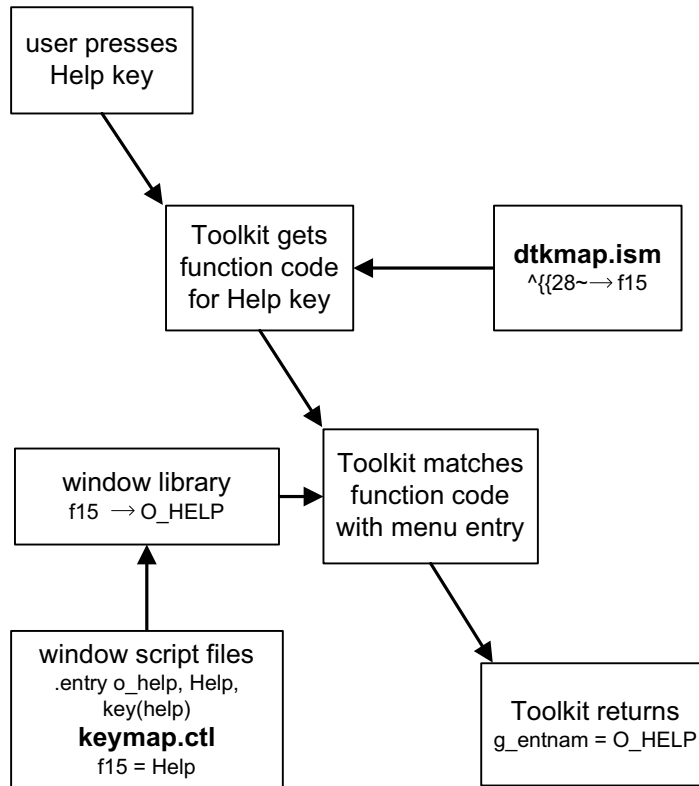


Figure 18-1. Key map processing for the *HELP* key.

## Customizing reserved keys

This section explains how to assign reserved keys to other functions and how to assign new keys for reserved functions.

UI Toolkit’s input processing uses four reserved functions. Each of these functions is tied to a specific key, as shown in the table below.

| Reserved Keys    |                                   |
|------------------|-----------------------------------|
| Function         | Key                               |
| Process Menu     | CTRL+P or ALT (Windows)           |
| Screen Redraw    | CTRL+R                            |
| Delete Character | BACKSPACE (CTRL+H) or DELETE      |
| End of File      | CTRL+D (UNIX) or CTRL+Z (OpenVMS) |

### Assigning reserved keys to other functions

You can use a reserved key for some other function either by assigning it directly as a shortcut or by entering it as the sequence for the function code in the key map. However, you will need to assign a new key to the reserved function.

### Assigning new keys for reserved functions

If you want to use a different key for a reserved function, you need to write your own version of the EFKEY\_METHOD subroutine. (See [“EFKEY\\_METHOD” on page 7-77](#) for syntax information.) This subroutine enables you to remap any function codes, and you can name the subroutine anything you want. After you register it with the E\_METHOD subroutine, UI Toolkit will call your subroutine whenever the user presses a function key or control character. (See [“Overloading a Toolkit routine” on page 18-8](#) for more information on overloading a user-overloadable subroutine.)

The distributed include file **inpctl.def** defines the function codes for key mapping. EFKEY\_METHOD is passed the function code that resulted from any interpretation of the key map. You can modify this function code and change it to any other code defined in **inpctl.def**. At the end of the list of defined codes, you may notice definitions for DELETE\_KEY, PROCESS\_MENU, SCREEN\_REDRAW, and EOF\_KEY. To assign these functions to a different key, you need to change the usual code generated by the desired keystroke to one of these codes in your EFKEY\_METHOD subroutine.

## Customizing UI Toolkit

### Customizing Key Mapping for Menu Shortcuts

For example, to make the F10 key process the menu and CTRL+L redraw the screen, you'd write EFKEY\_METHOD as follows:

```
subroutine efkey_method
  a_sts      ,n          ;Function code (incoming and returned)
  .include "WND:inpctl.def"
proc
  case a_sts of
    begincase
F10_KEY:      a_sts = PROCESS_MENU   ;Make F10 process the menu
CTRL_L_KEY:   a_sts = SCREEN_REDRAW ;Make ^L redraw the screen
    endcase
  xreturn
endsubroutine
```

# Customizing the Look of Your Application

To enable you to control the look of your application, UI Toolkit uses the following:

- ▶ The *color palette*, a set of color settings used to specify colors for renditions. On Windows, these settings correspond to *Synergy colors*, which are RGB triplets assigned to color numbers. On UNIX and OpenVMS, they correspond to color codes (for WNDC) or system-specific color numbers (for other routines).
- ▶ *Renditions*, combinations of colors and attributes—boldface, blinking (which is italic on Windows), reverse video, and underscore—for UI elements. You can set Toolkit renditions for types of UI elements, and in many cases, you can set renditions for a specific UI element.
- ▶ *Rendition schemes*, sets of Toolkit renditions that you can modify, create, save, and restore. You can create, change, and delete rendition schemes, and you can save them to and load them from a *rendition file*.

## Synergy colors and the color palette

The color palette consists of 16 pairs of color settings called *color palette entries*, which are used to specify colors for renditions. Color palette entries are numbered 1 through 16, include a foreground setting (used for text) and a background setting. On UNIX and OpenVMS, the foreground and background settings correspond to color codes (for WNDC) or system-specific color numbers (for other routines). On Windows, however, these settings correspond to Synergy colors, which are RGB triplets assigned to color numbers.

There are three types of Synergy colors:

- ▶ *User colors* (color 0 through color 255), which are colors you can change by using `U_EDITREND`, `U_MODREND`, `U_REND`, the `COLORn` setting, or the Renditions option for Proto or Synergy UI Toolkit Control Panel (which, in both cases, call `U_EDITREND`). See “[Redefining user colors \(Windows\)](#)” below.
- ▶ *System colors* (color 256 through color 285), which correspond to Windows system colors and can be changed only through Windows mechanisms (Windows Control Panel, for example).
- ▶ *Reserved colors* (color 286 through color 511), which are reserved for future Windows system colors. These are set to black (0,0,0) and cannot be changed.

On Windows, the Synergy runtime loads default Synergy colors and a default color palette when it starts. On UNIX and OpenVMS, there is no default color palette; you must define the initial color palette with the WNDC environment variable.

Note that the color palette and Synergy color definitions, which are also used by the Synergy Windowing Subroutines, are more fully described in “[Colors and the color palette](#)” in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*. The sections below list methods you can use with Toolkit applications to change or define the color palette and to change user colors.

## Defining and modifying the color palette

You can override one or more of the Synergy color palette entries by doing one of the following:

- ▶ (Windows only) Use the PALETTE setting in **synergy.ini** or **synuser.ini**. See [PALETTE](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.
- ▶ Use U\_EDITREND or the Renditions option for Proto or Synergy UI Toolkit Control Panel (both use U\_EDITREND). See [“Using the Palette Entry window \(Windows\)”](#) on page 18-42.
- ▶ Use the WP\_PALET function for W\_PROC. See [W\\_PROC](#) in the “Synergy Windowing API” chapter of the *Synergy DBL Language Reference Manual*.
- ▶ (UNIX and OpenVMS only) Use the WNDC environment variable to define color palette entries. See [WNDC](#) in the “Environment Variables” chapter of *Environment Variables & System Options* for information.

## Redefining user colors (Windows)

You can redefine Synergy color 0 through Synergy color 255, which are user colors, by doing one of the following:

- ▶ Use the D\_SETCOLOR operation for the %U\_WINCOLOR function. See [“%U\\_WINCOLOR”](#) on page 16-158.
- ▶ Use the %U\_SAVELOG function to save a color to **synergy.ini** or **synuser.ini**. See [“%U\\_SAVELOG”](#) on page 16-132.
- ▶ Use the COLOR<sub>n</sub> setting in the **synergy.ini** or **synuser.ini** file. See [COLOR<sub>n</sub>](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.
- ▶ Use U\_EDITREND or the Renditions option for Proto or Synergy UI Toolkit Control Panel (both use U\_EDITREND). See [“Using the Palette Entry window \(Windows\)”](#) on page 18-42.

## Renditions

Renditions are combinations of colors and attributes (boldface, blinking, reverse video, and underscore) for UI elements, which make up the visible part of an application, such as backgrounds, scroll bars, borders, titles, and so forth. You can set renditions for a specific UI element in many cases (e.g., for a particular field on a particular window), and you can set renditions for some types of elements. For example, Input Field Display is a set of color and attribute settings that apply to input fields. For a list of renditions, see the [“Renditions”](#) table below.

You can set renditions with the following. Note that these are listed in order of precedence: settings in input methods override field-level settings, and so forth. For more information on methods for setting renditions, see [“Renditions for specific UI elements”](#) on page 18-36 and [“Rendition schemes and Toolkit renditions for types of UI elements”](#) on page 18-36.

1. Input methods (%IDISPLAY\_METHOD or %IEDITFMT\_METHOD) or published properties for ActiveX Toolkit lists.
2. Field-level settings. These are set with .FIELD, IB\_FIELD, I\_FLDMOD, or U\_HELPREND.

3. U\_REND, U\_START, U\_MODREND, or U\_EDITREND. These set renditions for types of UI elements.
4. Other script settings (.FILL, .TEXT, .BORDER, and so forth).

You can also use the Synergy windowing routines, such as W\_DISP, to set colors and attributes, and these changes generally have precedence for screen updates that occur immediately after they are set. But note that settings made with windowing routines can later be overridden by calls to Toolkit routines.

Note the following:

- ▶ On Windows, most renditions are controlled by Windows and cannot be set by Toolkit applications. (For example, on Windows 7 and earlier, the background and text color for buttons are controlled by the Windows Control Panel’s “3D Objects” setting.)
- ▶ When a Toolkit application starts, the U\_START subroutine sets default Toolkit renditions for types of UI elements as listed in the table below. Renditions set by U\_START override most renditions specified in window scripts except for those marked as “No” in the “Override script?” column. (Note that the U\_INITREND subroutine enables you to reset Toolkit renditions to these initial settings. See [U\\_INITREND on page 16-92](#).)
- ▶ You can instruct Toolkit to override field-level rendition settings for the active input field with the Input Field Processing renditions during I\_INPUT and I\_INPFLD processing. See [E\\_STATE on page 7-45](#) for information.

| Renditions                           |                        |            |         |                    |                                                                                                                                                                                |
|--------------------------------------|------------------------|------------|---------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toolkit Rendition<br>U_REND argument | U_START initialization |            |         | Affected platforms | Corresponding Windows Control Panel items <sup>a</sup>                                                                                                                         |
|                                      | Override script?       | Attributes | Palette |                    |                                                                                                                                                                                |
| D_RND_DLG_BDR<br>Dialog Box Border   | Yes                    | n/a        | 1       | UNIX,<br>OpenVMS   | <i>Windows 7 and lower:</i><br>Active Window Border,<br>Inactive Window Border<br><br><i>Windows 8:</i><br>Active window title background,<br>Inactive window title background |
| D_RND_DLG<br>Dialog Box Body         | Yes                    | n/a        | 1       | All                | n/a                                                                                                                                                                            |
| D_RND_FTR<br>Screen Footer           | Yes                    | Bold       | 5       | UNIX,<br>OpenVMS   | <i>Windows 7 and lower:</i> 3D Objects<br><i>Windows 8:</i> n/a                                                                                                                |

## Customizing UI Toolkit

### Customizing the Look of Your Application

| Renditions (Continued)                                                                                     |                        |            |         |                       |                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------|------------------------|------------|---------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toolkit Rendition<br>U_REND argument                                                                       | U_START initialization |            |         | Affected<br>platforms | Corresponding Windows Control<br>Panel items <sup>a</sup>                                                                                                                      |
|                                                                                                            | Override<br>script?    | Attributes | Palette |                       |                                                                                                                                                                                |
| D_RND_HDR<br>Screen Header <sup>b</sup>                                                                    | Yes                    | Bold       | 5       | All                   | <i>Windows 7 and lower:</i><br>Active Title Bar,<br>Inactive Title Bar<br><br><i>Windows 8:</i><br>Active window title,<br>Inactive window title                               |
| D_RND_HLP_BCK<br>Help Window Body                                                                          | No                     | n/a        | n/a     | All                   | <i>Windows 7 and lower:</i> n/a<br><i>Windows 8:</i> Text                                                                                                                      |
| D_RND_HLP_BRDR<br>Help Window Border                                                                       | No                     | n/a        | n/a     | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i><br>Active Window Border,<br>Inactive Window Border<br><br><i>Windows 8:</i><br>Active window title background,<br>Inactive window title background |
| D_RND_HLP_TTL<br>Help Window Title                                                                         | No                     | n/a        | n/a     | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i><br>Active Title Bar,<br>Inactive Title Bar<br><br><i>Windows 8:</i><br>Active window title,<br>Inactive window title                               |
| D_RND_INF<br>Information Line                                                                              | Yes                    | Reverse    | 6       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i> 3D Objects<br><i>Windows 8:</i> n/a                                                                                                                |
| D_RND_INP_BCK<br>Input Window<br>Background <sup>c</sup><br>(includes prompts and<br>other non-field text) | No                     | n/a        | n/a     | All                   | n/a                                                                                                                                                                            |



| <b>Renditions (Continued)</b>                                                                                |                               |                   |                |                               |                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------|----------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Toolkit Rendition<br/>U_REND argument</b>                                                                 | <b>U_START initialization</b> |                   |                | <b>Affected<br/>platforms</b> | <b>Corresponding Windows Control<br/>Panel items<sup>a</sup></b>                                                                                                                |
|                                                                                                              | <b>Override<br/>script?</b>   | <b>Attributes</b> | <b>Palette</b> |                               |                                                                                                                                                                                 |
| D_RND_INP_BDR<br>Input Window Border                                                                         | No                            | n/a               | n/a            | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i><br>Active Window Border,<br>Inactive Window Border<br><br><i>Windows 8:</i><br>Active window title background,<br>Inactive window title background. |
| D_RND_INP_CLR<br>Cleared Input Field<br>(for non-active cleared<br>input fields)                             | Yes                           | n/a               | 3              | All                           | <i>Windows 7 and lower:</i> Window<br><i>Windows 8:</i> Text                                                                                                                    |
| D_RND_INP_DSA<br>Disabled Input Field <sup>d</sup>                                                           | Yes                           | n/a               | 3              | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i><br>3D Objects (with Windows themes),<br>Window (without Windows themes)<br><i>Windows 8:</i> Disabled text                                          |
| D_RND_INP_DSP<br>Input Field Display<br>(for non-active read/<br>write input fields)                         | Yes                           | Bold              | 3              | All                           | <i>Windows 7 and lower:</i> Window<br><i>Windows 8:</i> Text                                                                                                                    |
| D_RND_INP_PRC<br>Input Field Processing <sup>e</sup><br>(for active input read/<br>write input field)        | Yes                           | Reverse           | 3              | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i><br>Window,<br>Selected Items<br><i>Windows 8:</i><br>Window background,<br>Text                                                                     |
| D_RND_INP_ROD<br>Read-Only Input Field<br>Display <sup>d</sup><br>(for non-active<br>read-only input fields) | Yes                           | Normal            | 3              | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i> 3D Objects<br><i>Windows 8:</i> n/a                                                                                                                 |

## Customizing UI Toolkit

Customizing the Look of Your Application

| Renditions (Continued)                                                                                              |                        |            |         |                       |                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------|------------------------|------------|---------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toolkit Rendition<br>U_REND argument                                                                                | U_START initialization |            |         | Affected<br>platforms | Corresponding Windows Control<br>Panel items <sup>a</sup>                                                                                                                  |
|                                                                                                                     | Override<br>script?    | Attributes | Palette |                       |                                                                                                                                                                            |
| D_RND_INP_ROP<br>Read-Only Input Field<br>Processing <sup>d</sup><br>(for active input field if it<br>is read-only) | Yes                    | Reverse    | 3       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i> 3D Objects<br><i>Windows 8:</i> n/a                                                                                                            |
| D_RND_INP_TTL<br>Input Window Title                                                                                 | No                     | n/a        | n/a     | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i><br>Active Title Bar,<br>Inactive Title Bar<br><i>Windows 8:</i><br>Active window title foreground,<br>Inactive window title foreground         |
| D_RND_LST_DSA_S<br>Disabled Selected Item                                                                           | Yes                    | Reverse    | 7       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i> Selected Items<br><i>Windows 8:</i> Disabled text                                                                                              |
| D_RND_LST_ENA_B<br>Enabled List Border                                                                              | Yes                    | Bold       | 7       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i><br>Active Window Border,<br>Inactive Window Border<br><i>Windows 8:</i><br>Active window title background,<br>Inactive window title background |
| D_RND_LST_ENA_T<br>Enabled List Title                                                                               | Yes                    | Bold       | 7       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i><br>Active Title Bar,<br>Inactive Title Bar<br><i>Windows 8:</i><br>Active window title,<br>Inactive window title                               |
| D_RND_LST_ENA<br>Enabled List                                                                                       | Yes                    | Bold       | 7       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i> Window<br><i>Windows 8:</i><br>Window background,<br>Text                                                                                      |
| D_RND_LST_HDR<br>Enabled List Header <sup>f</sup>                                                                   | Yes                    | Reverse    | 7       | All                   | n/a                                                                                                                                                                        |

| <b>Renditions (Continued)</b>                |                               |                                |                |                               |                                                                                                              |
|----------------------------------------------|-------------------------------|--------------------------------|----------------|-------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Toolkit Rendition<br/>U_REND argument</b> | <b>U_START initialization</b> |                                |                | <b>Affected<br/>platforms</b> | <b>Corresponding Windows Control<br/>Panel items<sup>a</sup></b>                                             |
|                                              | <b>Override<br/>script?</b>   | <b>Attributes</b>              | <b>Palette</b> |                               |                                                                                                              |
| D_RND_MNU_DSA<br>Disabled Menu Entry         | Yes                           | Reverse                        | 2              | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i> Menu<br><i>Windows 8:</i> n/a                                                    |
| D_RND_MNU_ENA<br>Enabled Menu Entry          | Yes                           | Bold,<br>reverse               | 2              | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i> Menu<br><i>Windows 8:</i> n/a                                                    |
| D_RND_MNU_EQS<br>Menu Entry<br>Quick-Select  | Yes                           | Bold,<br>reverse,<br>underline | 10             | UNIX,<br>OpenVMS              | n/a                                                                                                          |
| D_RND_MNU_HQS<br>Menu Header<br>Quick-Select | Yes                           | Bold,<br>reverse,<br>underline | 10             | UNIX,<br>OpenVMS              | n/a                                                                                                          |
| D_RND_MNU_SEL<br>Selected Menu Entry         | Yes                           | Bold                           | 2              | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i><br>Window,<br>Selected Items<br><i>Windows 8:</i> Selected text                  |
| D_RND_MSG_BDR<br>Message Window<br>Border    | Yes                           | Reverse                        | 4              | UNIX,<br>OpenVMS              | <i>Window 7 and lower:</i> Message Box<br><i>Windows 8:</i><br>Active window title,<br>Inactive window title |
| D_RND_MSG<br>Message Window Body             | Yes                           | Reverse                        | 4              | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i> Message Box<br><i>Windows 8:</i><br>Window background,<br>Text                   |
| D_RND_SCR_BAR<br>Scroll Bar                  | Yes                           | Reverse                        | 8              | UNIX,<br>OpenVMS              | <i>Window 7 and lower:</i> Scrollbar<br><i>Windows 8:</i> n/a                                                |
| D_RND_SEL_BCK<br>Selection Window Body       | Yes                           | Remove<br>reverse              | n/a            | UNIX,<br>OpenVMS              | <i>Windows 7 and lower:</i> Window<br><i>Windows 8:</i><br>Window background,<br>Text                        |

## Customizing UI Toolkit

Customizing the Look of Your Application

| Renditions (Continued)                     |                        |             |         |                    |                                                                                                                                                                            |
|--------------------------------------------|------------------------|-------------|---------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toolkit Rendition<br>U_REND argument       | U_START initialization |             |         | Affected platforms | Corresponding Windows Control Panel items <sup>a</sup>                                                                                                                     |
|                                            | Override script?       | Attributes  | Palette |                    |                                                                                                                                                                            |
| D_RND_SEL_BDR<br>Selection Window Border   | No                     | n/a         | n/a     | UNIX,<br>OpenVMS   | <i>Windows 7 and lower:</i><br>Active Window Border,<br>Inactive Window Border<br><i>Windows 8:</i> n/a                                                                    |
| D_RND_SEL_EQS<br>Sel Wnd Quick-Selects     | Yes                    | Underline   | 10      | UNIX,<br>OpenVMS   | n/a                                                                                                                                                                        |
| D_RND_SEL_SEL<br>Select Wnd Selected Item  | Yes                    | Add reverse | n/a     | UNIX,<br>OpenVMS   | <i>Windows 7 and lower:</i><br>Window,<br>Selected Items<br><i>Windows 8:</i> Selected text                                                                                |
| D_RND_SEL_TTL<br>Selection Window Title    | No                     | n/a         | n/a     | UNIX,<br>OpenVMS   | <i>Windows 7 and lower:</i><br>Active Title Bar,<br>Inactive Title Bar<br><i>Windows 8:</i><br>Active window title,<br>Inactive window title                               |
| D_RND_WIN_BCK<br>Generic Window Background | No                     | n/a         | n/a     | All                | n/a                                                                                                                                                                        |
| D_RND_WIN_BDR<br>General Window Border     | No                     | n/a         | n/a     | UNIX,<br>OpenVMS   | <i>Windows 7 and lower:</i><br>Active Window Border,<br>Inactive Window Border<br><i>Windows 8:</i><br>Active window title background,<br>Inactive window title background |
| D_RND_WIN_TTL<br>General Window Title      | No                     | n/a         | n/a     | UNIX,<br>OpenVMS   | <i>Windows 7 and lower:</i><br>Active Title Bar,<br>Inactive Title Bar<br><i>Windows 8:</i><br>Active window title,<br>Inactive window title                               |

| Renditions (Continued)                            |                        |                  |         |                       |                                                                                          |
|---------------------------------------------------|------------------------|------------------|---------|-----------------------|------------------------------------------------------------------------------------------|
| Toolkit Rendition<br>U_REND argument              | U_START initialization |                  |         | Affected<br>platforms | Corresponding Windows Control<br>Panel items <sup>a</sup>                                |
|                                                   | Override<br>script?    | Attributes       | Palette |                       |                                                                                          |
| D-RND_LST_DSA<br>Disabled List                    | Yes                    | n/a              | 7       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i> Window<br><i>Windows 8:</i> Disabled text                    |
| D-RND_LST_FTR<br>Enabled List Footer <sup>f</sup> | Yes                    | Reverse          | 7       | All                   | n/a                                                                                      |
| D-RND_LST_SEL<br>Selected Item in List            | Yes                    | Bold,<br>reverse | 7       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i><br>Window, Selected Items<br><i>Windows 8:</i> Selected text |
| D-RND_SCR_IND<br>Scroll Bar Indicators            | Yes                    | Bold,<br>reverse | 8       | UNIX,<br>OpenVMS      | <i>Windows 7 and lower:</i> 3D Objects<br><i>Windows 8:</i> n/a                          |
| User Rendition 1<br>through User<br>Rendition 5   | Yes                    | None             | 1       | All                   | n/a                                                                                      |

- a. "Windows 8" in this column denotes high contrast theme Control Panel settings. Unless you use a high-contrast theme with Windows 8, Control Panel has only one setting for renditions: Windows color.
- b. On Windows, these renditions apply only if the header has multiple lines.
- c. For check boxes, these apply to the prompt only if Input Field Processing is not applied (see [E\\_STATE on page 7-45](#)) and no field-level renditions are set for the check boxes.
- d. On UNIX and OpenVMS, these can be changed only by U\_REND (not by U\_EDITREND or U\_MODREND). On Windows, these renditions cannot be changed by Toolkit.
- e. On Windows, only U\_REND can set these (they cannot be set by U\_EDITREND or U\_MODREND), and they are not used for lists (ActiveX Toolkit lists or standard Toolkit lists). Additionally, these renditions apply only if the E\_STATE code D\_INPPRCRND is set to on, and they override field-level settings only if the E\_STATE code D\_INPRNDOVER is set to on. See [E\\_STATE on page 7-45](#).
- f. These do not apply to ActiveX Toolkit lists.

## Renditions for specific UI elements

There are some renditions you can set for specific UI elements (rather than types of UI elements):

- ▶ To apply help window renditions to a window that isn't a help window, use `U_HELPREND`. (The help window renditions are Help Window Body, Help Window Title, and Help Window Border.)
- ▶ To set renditions for a specific input field, use the rendition qualifiers or arguments for `.FIELD`, `IB_FIELD`, or `I_FLDMOD`, or set them in a display method or an edit format method (see [%IDISPLAY\\_METHOD](#) on page 8-126 and [%IEDITFMT\\_METHOD](#) on page 8-132).
- ▶ To set renditions for an ActiveX Toolkit list, use the published properties for ActiveX lists. See [“Published Properties for ActiveX Toolkit Lists”](#) on page 9-17.
- ▶ To set renditions for other UI elements (i.e., UI elements that are not fields), use `.BORDER`, `.BOX`, `.FILL`, `.LINE`, `.TEXT`, `.TITLE`, `.WFIELD`, `T_SETUP`, and `%TS_TABSET`. Additionally, you can use `%U_SELPALETTE` to enable users to select a color palette for a specific UI element (among other things), and you can also change color and attribute settings with the Synergy windowing routines, such as `W_DISP`. (See the [“Synergy Windowing API”](#) chapter of the *Synergy DBL Language Reference Manual* for information.)

## Rendition schemes and Toolkit renditions for types of UI elements

In addition to the renditions for specific UI elements, you can set renditions for types of UI elements. For example, the Read-Only Input Field Display renditions control the look of read-only input fields (though there may be overrides for individual fields, and the Read-Only Input Field Processing renditions may be used for an active read-only input field).

On UNIX and OpenVMS, there are 47 Toolkit renditions for types of UI elements. On Windows, there are only 14. In both cases, five of these are user-assigned Toolkit renditions. (See the table [“Renditions”](#) on page 18-29.) There are more on UNIX and OpenVMS because on these platforms Toolkit controls the look of all UI elements. On Windows, however, the Windows Control Panel and Windows settings and defaults control the look of most UI elements, leaving only nine UI elements for Toolkit renditions (plus the five user-assigned Toolkit renditions).

A full set of renditions is a *rendition scheme*. You can create, change, and delete rendition schemes, and you can save them to and load them from rendition files as described in the following table.

For Windows, note the following:

- ▶ You can bring color for Toolkit renditions under the control of Windows settings by assigning Synergy *system colors* to renditions. For information on system colors and the default palette entries, see [“Colors and the color palette on Windows”](#) in the [“Synergy Windowing API”](#) chapter of the *Synergy DBL Language Reference Manual*.
- ▶ We recommend that you set the background colors for the Input Field Display renditions and the Input Window Background renditions to the same value. The default palette entries for these renditions are 3 and 1 respectively. (Incidentally, the default background settings for palette entries 3 and 1 on Windows are system colors.)

| <b>Working with Rendition Schemes</b>                                                   |                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>To...</b>                                                                            | <b>Do the following...</b>                                                                                                                                                                                                                                             | <b>For more information, see...</b>                                                                                                                                                                                                     |
| Create a rendition scheme                                                               | Start by modifying an existing rendition scheme. Then use U_SAVREND to save it to a new rendition file by passing the name of a non-existent file as the <i>filename</i> argument.                                                                                     | <a href="#">U_SAVREND on page 16-137</a>                                                                                                                                                                                                |
| Load a rendition scheme from your Toolkit application                                   | Use U_LDREND (if you want to specify a channel on which the file is open) or U_RSTREND (if you want to specify the filename or a rendition file rather than a channel).                                                                                                | <a href="#">U_LDREND on page 16-93</a> and <a href="#">U_RSTREND on page 16-129</a>                                                                                                                                                     |
| Modify a rendition scheme from your application                                         | Use U_REND.                                                                                                                                                                                                                                                            | <a href="#">U_REND on page 16-121</a>                                                                                                                                                                                                   |
| Save the current rendition scheme or a specified rendition scheme from your application | Use U_STOREND (if you want to specify a channel on which the rendition file is open) or U_SAVREND (if you want to specify the filename of the rendition file rather than a channel).                                                                                   | <a href="#">U_STOREND on page 16-145</a> and <a href="#">U_SAVREND on page 16-137</a>                                                                                                                                                   |
| Enable your users to modify, load, save, or delete rendition schemes                    | Call U_MODREND or U_EDITREND from your application or give your users access to Synergy UI Toolkit Control Panel or Proto, both of which call U_EDITREND when you select "Renditions" from their menu.<br>(See " <a href="#">U_MODREND versus U_EDITREND</a> " below.) | <a href="#">"Using the Renditions window (Windows)" on page 18-41</a> and <a href="#">"Using the U_EDITREND screens on UNIX and OpenVMS" on page 18-43</a>                                                                              |
| Manually modify, load, save, or delete rendition schemes                                | Open Synergy UI Toolkit Control Panel or Proto and select "Renditions" from the menu. This opens the Renditions screen, which enables you to do these things as well as modify color palette entries.                                                                  | <a href="#">"Using the Renditions window (Windows)" on page 18-41</a> , <a href="#">"Using the Palette Entry window (Windows)" on page 18-42</a> , and <a href="#">"Using the U_EDITREND screens on UNIX and OpenVMS" on page 18-43</a> |

#### U\_MODREND versus U\_EDITREND

Both U\_MODREND and U\_EDITREND open the Renditions window, which enables users to load, change, save, and delete rendition schemes (as well as color palette entries). The difference is that while U\_EDITREND automatically saves rendition changes to the loaded rendition (and can save them to a specified rendition scheme), U\_MODREND just modifies the rendition scheme loaded in memory. U\_MODREND doesn't save the rendition scheme unless the user clicks the Save button and supplies a rendition scheme name.

#### Files and environment variables used for rendition schemes

The following file and environment variables are used with rendition schemes:

|                   |                                                                                                                                                                                                                                                                                         |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>dtkrnd.ism</b> | A file that contains records defining various rendition schemes. The key for this file is the rendition scheme name. The maximum size of a rendition scheme name is 30 characters, and the scheme name is not case sensitive. A blank key is reserved for the working rendition scheme. |
| <b>DTKRNDFIL</b>  | An environment variable that is used to define an alternate location <i>and</i> name for the rendition file.                                                                                                                                                                            |
| <b>DTKRND</b>     | An environment variable that is used to define an alternate location for <b>dtkrnd.ism</b> .                                                                                                                                                                                            |

If you want to use a rendition file other than the default, **dtkrnd.ism**, set the DTKRNDFIL environment variable to the desired file. If you want to use the rendition file **dtkrnd.ism** from a directory other than the current one, set the DTKRND environment variable to the desired directory.

UI Toolkit looks for the rendition file as follows:

- ▶ If the DTKRNDFIL is defined, it determines the rendition file location and name.
- ▶ If DTKRNDFIL is not defined, UI Toolkit attempts to open the file as **DTKRND:dtkrnd.ism**.
- ▶ If Toolkit can't open **DTKRND:dtkrnd.ism**, it attempts to open the file **dtkrnd.ism** in the current directory.

#### Customizing user-assigned Toolkit renditions

U\_EDITREND, U\_MODREND, and U\_REND enable you to customize the five user-assigned Toolkit renditions, which are renditions that you and your users can assign to a type of element. (See [“Why use user-assigned Toolkit renditions?”](#) below.) If you call U\_EDITREND or U\_MODREND, you can specify the number of user-assigned renditions to be modified and, on UNIX and OpenVMS, their descriptions in the selection window and example windows in the Sample Windows screen section.



## UNIX, VMS

Note that by default

- ▶ user-assigned renditions are not displayed for editing by either `U_EDITREND` or `U_MODREND`. By passing the optional parameter for the number of user-assigned renditions, you can activate from 1 to 5 of these renditions.
- ▶ any active user-assigned rendition receives the description “User Rendition *n*” in the Select Screen Area selection window, where *n* is the user-assigned rendition number. By passing the optional array of user-assigned rendition descriptions, you can replace the default descriptions.
- ▶ any active user-assigned rendition is presented in the Sample Windows screen area as a single-line, unbordered window that contains only the description of the rendition. You can optionally create your own sample windows for user-assigned renditions and pass their IDs in the optional user renditions window IDs parameter. If you do this, you must also specify which areas of the window to affect when the user modifies the rendition. You can specify the window body, border, title, or any combination thereof, and you can specify a single field number to affect, or you can specify all fields. See [U\\_EDITREND on page 16-41](#) and [U\\_MODREND on page 16-102](#) for more information.

### Why use user-assigned Toolkit renditions?

User-assigned Toolkit renditions are renditions that you can assign to types of UI elements. For example, if you’ve written routines to create and maintain a checklist window of your own invention (like the one in [figure 18-2](#)), you can use user-assigned renditions to assign unique combinations of attributes and colors to the window background and text, to the border and title, and to the check mark character.

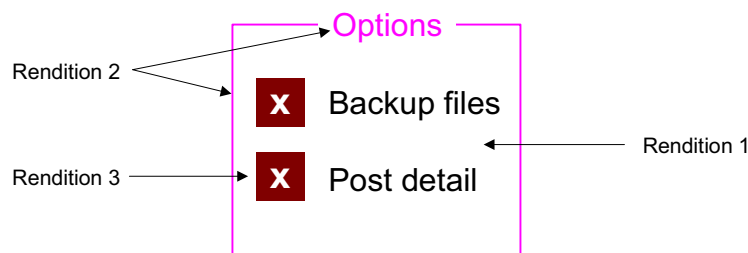


*Figure 18-2. Window with user-assigned renditions.*

For example, you could assign user rendition 1 as the rendition for the checklist body, user rendition 2 as the rendition for the border and title, and user rendition 3 as the rendition for the check mark character. The routines in your application that create and maintain these windows can call `U_REND` with the `D_COPY` argument to get the current settings for these renditions and then apply them to the windows.

Additionally, if you want to give your end users access to these renditions, you can tie a utility menu entry to a call to `U_EDITREND` within your application and tell `U_EDITREND` that three user renditions will be used. (A utility menu entry is one that begins with `U_` and is handled by an `EUTILS_METHOD` routine.)

---

#### UNIX, VMS

If your application runs on UNIX or OpenVMS, you can also pass a three-element array of the descriptions for these renditions—for example, “Checklist Body,” “Checklist Border,” and “Checklist Check Mark.” These descriptions will then appear in the Select Screen Area window when `U_EDITREND` or `U_MODREND` is called, enabling users to modify them as they would any other Toolkit rendition.

You can also customize the prototype for the window that will appear in the Sample Windows window when you call `U_EDITREND` or `U_MODREND`. To continue with the checklist window example, you could create a window that looks just like the checklist window that your routines create and modify. (Note that it doesn’t need to be a functioning model of the window, and note that the sample check mark characters should be window fields created with the `W_FLDS` subroutine.) You would place this window at the position in the screen where you want it to appear when the user selects one of these renditions from the Select Screen Area window. Then, when you call `U_EDITREND` or `U_MODREND`, pass the ID of this window in all three elements of the sample window ID’s array.

- ▶ In the *areas* array, you would pass `D_RND_AREA` for the first element (to affect the window’s processing area), `D_RND_BRDR+D_RND_TITLE` for the second (to affect the border and title), and 0 for the third (because this will affect fields instead of an area).
- ▶ In the *field\_numbers* array, you would pass 0 for the first two elements and `WFN_ALL` for the third element, so that all of your check marks will be affected by a change to this rendition. You have now integrated the renditions presentation for your new window class with the other classes of windows in UI Toolkit.

See [U\\_EDITREND on page 16-41](#) for additional information.

---

## Using the Renditions window (Windows)

When you call U\_EDITREND, or when you select Renditions from the General menu of Proto or the Preferences menu of the Synergy UI Toolkit Control Panel on Windows, UI Toolkit opens the Renditions window (figure 18-3), which enables you to manually restore, modify, delete, and save rendition schemes. The Sample windows area shows how the current renditions will look.

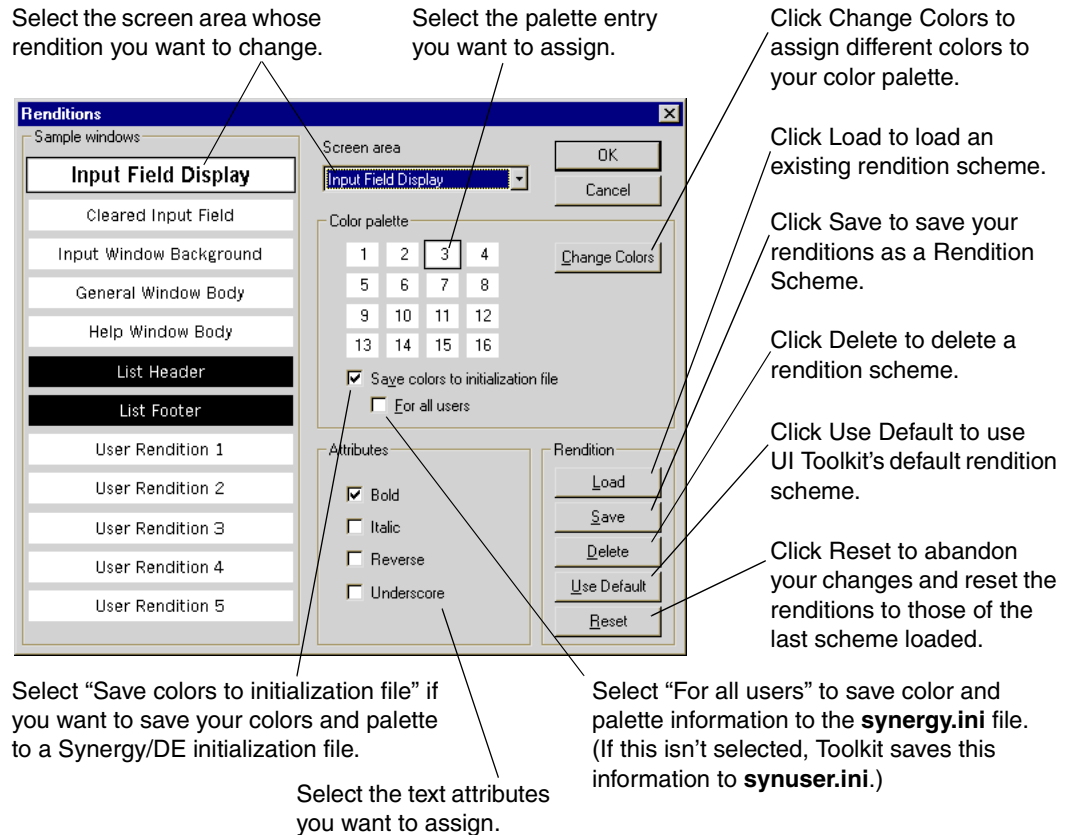


Figure 18-3. Modifying a rendition.

To load a different rendition scheme, save current settings, delete the loaded rendition scheme, or use the default renditions, click Load, Save, Delete, or Use Default. To modify one or more renditions, do the following:

1. To modify a rendition scheme other than the one that's loaded, click Load to load a rendition scheme by name, or click Use Default if you want to switch to the default rendition scheme.
2. Select a rendition by clicking one of the named squares under "Sample windows" or by selecting a rendition name from the "Screen area" list.
3. To assign a different color palette entry to the Toolkit rendition, click one of the numbered squares under "Color palette." For more information on modifying the color palette, see ["Using the Palette Entry window \(Windows\)"](#) below.
4. Select any attributes you want to assign to the rendition.
5. Repeat [step 2](#) through [step 4](#) for each Toolkit rendition whose screen area you want to modify.
6. To save the renditions as a rendition scheme that you can access later by name, click Save and enter a name for the rendition scheme.

To reset the renditions to the last loaded rendition scheme, click Reset.

7. When you're finished, click OK to exit the Renditions dialog box. The rendition scheme that is loaded when you click OK will be the new default.

## Using the Palette Entry window (Windows)

You can use the Palette Entry Window to change the foreground (text) and background colors of any palette entry. (For other methods, see ["Defining and modifying the color palette" on page 18-28.](#))

1. In the Renditions dialog box, select the number for the palette entry you want to modify, and click the Change Colors button.

The Palette Entry window is displayed for the palette entry. (See [figure 18-4.](#)) This dialog box displays colors you can apply to the foreground or background for the palette entry. System colors correspond to Windows system colors and can be changed only from Windows Control Panel. User colors are Synergy colors that you can change by clicking the Define color button or by using the `COLORn` setting in **synergy.ini** or **synuser.ini**. (See [COLORn](#) in the "Environment Variables" chapter of *Environment Variables & System Options* for more information.)

If you make a change in this dialog box, Toolkit updates the corresponding entry in the [colors] section of **synergy.ini** or **synuser.ini** if "Save colors to initialization file" is checked in the Renditions window. If there is no existing [colors] section, Toolkit will create one.

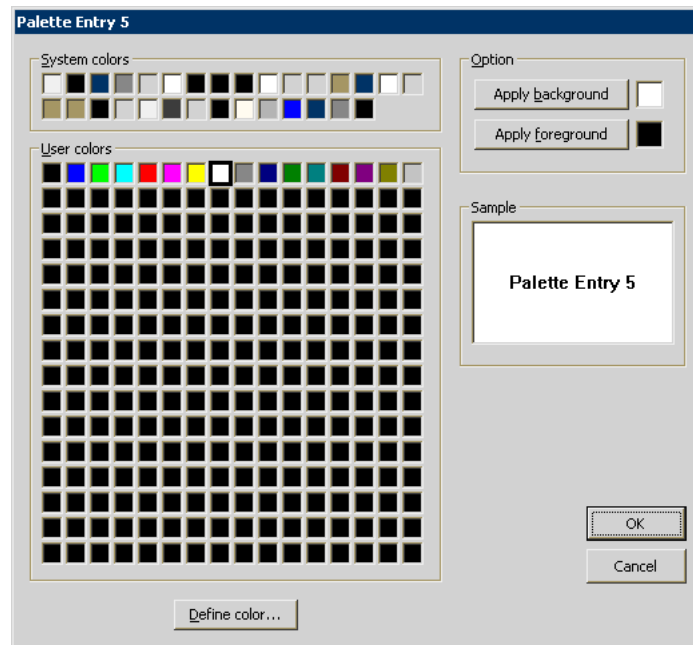


*Figure 18-4. Assigning a color to a palette entry.*

2. Click on a color in the “System colors” or “User colors” area.
3. Click “Apply background” if you want to assign the color as the background for the palette entry, or click “Apply foreground” to assign the color to the foreground (used for text). Then click OK.

## Using the U\_EDITREND screens on UNIX and OpenVMS

On UNIX or OpenVMS, if you call U\_EDITREND or select Renditions from the General menu of Proto or the Preferences menu of Synergy UI Toolkit Control Panel, UI Toolkit displays three windows:

- ▶ Select Screen Area
- ▶ Renditions
- ▶ Sample Windows

### **Modify a rendition scheme**

1. In the Select Screen Area screen, use the arrow keys to highlight the rendition name for the screen area you want to change. Then press ENTER.
2. In the Renditions window, use the arrow keys to move to the rendition you want to apply to (or remove from) the rendition and press ENTER.

3. When you're finished selecting renditions for the current screen area, press the Exit shortcut.
4. Repeat [step 1](#) through [step 3](#) for each screen area you want to modify.
5. To save the renditions as a rendition scheme that you can access later by name, select Save rendition scheme from the Renditions menu and enter a name for your rendition scheme.

#### Loading an existing rendition scheme

1. From the Renditions menu, select Load rendition scheme.
2. In the Select Scheme window, use the arrow keys to highlight the scheme you want to load, and press ENTER.

#### Assigning different colors to a palette entry

If you are using a color monitor and you have enabled color on your system, you can change colors when your cursor is on one of the color codes in the Renditions window. (For information on enabling color on your system, see [WNDC](#) in the “Environment Variables” chapter of *Environment Variables & System Options*.)

Each color palette entry has a background color code and a foreground color code, each of which can be from 0 to 255. These codes and the colors that they specify are system specific. For example, some systems use basic ANSI color codes, a few of which are listed in the table below:

| Color   | ANSI code |
|---------|-----------|
| Black   | 0         |
| Blue    | 1         |
| Green   | 2         |
| Cyan    | 3         |
| Red     | 4         |
| Magenta | 5         |
| Yellow  | 6         |
| White   | 7         |

To change the background or foreground color for a palette entry,

1. In the Renditions screen, use the arrow keys to move to the palette entry (under “Colors”) you want to modify.
2. From the Renditions menu, select Change colors.

The Color Codes screen is displayed.

3. Enter the numeric codes for the colors you want applied to the background and foreground for the color palette entry.

The new background and foreground colors for the palette entry immediately go into effect, changing all screen areas that use the palette entry.

4. When you are done modifying a color palette, you can continue to change renditions for the current screen area or press the Exit shortcut to return to the Select Screen Area window.

## Using Fonts on Windows

Because the fonts installed on each system may differ, we use the concept of a *font palette* to define the fonts that are actually used. A font palette consists of font palette entries, each of which associates a font name with a typeface, point size, and sizing character combination. (A sizing character determines cell width for an object using that font.) A font palette is created in memory when the Synergy runtime starts up, and it exists for the duration of that runtime (**dbr.exe**).

The runtime creates the initial font palette by reading font palette entries specified in the [fonts] section of the Synergy initialization file, **synergy.ini**, and then overrides or adds to the palette by reading **synuser.ini**. You can add new font palette entries and modify existing entries at runtime by calling the %U\_WNDFONT function.

The runtime identifies font palette entries by palette entry name or font handle. When assigning fonts to objects at runtime, you can specify either. When assigning fonts to objects at script time, or through Composer or Repository, you must use palette entry names.

The font (typeface) specified in a font palette entry is either *fixed* (every character has the same width, such as Courier) or *proportional* (different characters have different widths, such as Arial). See “Using fixed fonts” on page 18-55 and “Using proportional fonts” on page 18-55 for more information.

## Defining font palette entries

There are two ways to define the font palette entries used by the runtime to create the initial font palette: manually add a [fonts] section to a Synergy initialization file (**synergy.ini** or **synuser.ini**) or have Composer add a [fonts] section to **synuser.ini**. (Composer doesn’t add a [font] section or font entries to **synergy.ini**.) Additionally, you can define font palette entries at runtime by calling the %U\_WNDFONT function.

### Defining font palette entries in synergy.ini or synuser.ini

You can define font palette entries by manually adding them to the [fonts] section of a Synergy initialization file, **synergy.ini** or **synuser.ini**. (You can also add them at runtime by using the D\_SAVEFONT subfunction for %U\_WNDFONT. See [D\\_SAVEFONT on page 16-238](#) for information.)

Each font palette entry has the form

```
font_name=typeface;point_size[;sizing_char]
```

where *font\_name* is the case-insensitive name of the font you’re defining, *typeface* is a case-sensitive string that indicates the font’s typeface (for example, Times New Roman), *point\_size* is a numeric point size, and *sizing\_char* is an optional single character used to determine the cell size for purposes of positioning. If *sizing\_char* isn’t specified, it defaults to “A”.



Here are some example font palette entries:

```
Default=Fixedsys;9;A
Alternate=MS Sans Serif;10;W
My_input_font=Times New Roman;12
```

Four font names are reserved. If these names are not defined in **synergy.ini** or **synuser.ini**, they will be defined for you by the runtime:

- ▶ DEFAULT
- ▶ ALTERNATE
- ▶ DEBUGGER
- ▶ STATUS

For more information, see [“Setting the font for an application” on page 18-48](#).

## Defining font palette entries in Composer (synuser.ini)

When a window or input field is selected in Composer’s Application window, you can add or modify font palette entries in the [fonts] section of **synuser.ini**. To do so,

1. Select a window or input field in the Application window.
2. If you selected an input field, double-click the +Font selected attribute and change the property to Yes. (You can also do this from the +Font selected attribute below the +Prompt attribute.)
3. Click the drilldown button for the Font attribute.
4. The Font Palette dialog box is displayed.
5. Click the Add button.
6. The Add Font dialog box is displayed.
7. Enter a new font name in the Font name field.

The Font dialog box is displayed. See [figure 18-5](#).

8. Enter a typeface, point size, and sizing character in the appropriate input fields.
9. Click the OK button to exit the Font dialog box.

You are returned to the Font Palette dialog box.

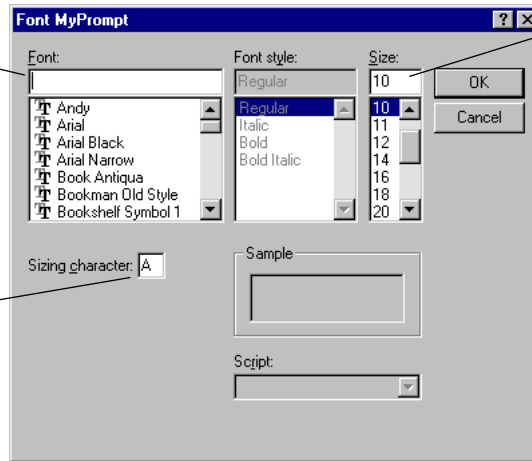
10. Click the OK button to exit the Font Palette dialog box.

You can also modify the typeface, point size, or sizing character for existing fonts by highlighting the font you want to change in the Font Palette dialog box and clicking the Modify button.

Composer updates the **synuser.ini** file to reflect your changes.

Select the typeface you want this font to have.

Enter the letter whose width will determine the cell size for any object using this font.



Select the point size for this font.

Figure 18-5. Defining a font.

## Defining font palette entries at runtime

You can define or modify font palette entries at runtime using the `%U_WNDFONT(D_SETFONT)` function. `D_SETFONT` enables you to define the characteristics of a font. Use the following syntax:

```
%U_WNDFONT (D_SETFONT, font_id, face_name, point_size[, sizing_char])
```

The *font\_id* argument specifies the font palette entry name or handle of the existing font you are defining. If successful, this call to `%U_WNDFONT` returns the font's handle. From this point on, you can refer to this palette entry by either palette entry name or font handle.

The `D_SETFONT` subfunction adds a font palette entry to memory or updates a font palette entry in memory. To save a font palette entry to **synergy.ini** or **synuser.ini**, use the `D_SAVEFONT` subfunction. See [D\\_SAVEFONT](#) on page 16-238 for information.

## Setting the font for an application

The Synergy runtime supports two global fonts. An application window defined as less than 132 columns uses the "global font." If automatic font switching is enabled, an application window of 132 columns or more uses the "alternate font". If you choose the alternate font carefully, it may enable the window to fit on the screen.

To determine the initial global font when an application starts up,

- ▶ The runtime looks at the FONT\_GLOBAL initialization setting, which specifies a font palette entry name. This allows the global font to be specified on a per application basis. See “[Setting application fonts in synergy.ini or synuser.ini](#)” below.
- ▶ If the above initialization setting is not found or if it references an undefined font palette entry name, the runtime looks at the font specified by the DEFAULT palette entry in the [fonts] section of **synergy.ini** and **synuser.ini**. If it’s defined in both of these files, the **synuser.ini** setting overrides the setting in **synergy.ini**.
- ▶ If the DEFAULT palette entry is not found, the runtime looks in the [fonts] section of **synergy.ini** and **synuser.ini** for the pre–version 6.3 initialization settings TYPE\_FACE, FONT\_HEIGHT, and FONT\_WIDTH. If any of these are defined in both of these files, the **synuser.ini** settings override the settings in **synergy.ini**.
- ▶ If the TYPE\_FACE, FONT\_HEIGHT, and FONT\_WIDTH settings are not found, the runtime uses Terminal font at the point size selected by the system as optimal (either the largest point size for which at least 80 columns of the font will fit on the screen or 10 point, whichever is smaller).

The logic described above is also used when determining the font palette entry name to use for the initial alternate font. The initialization settings involved are FONT\_ALTERNATE, ALTERNATE, ALT\_TYPE\_FACE, ALT\_FONT\_HEIGHT, and ALT\_FONT\_WIDTH.



We recommend using the DEFAULT and ALTERNATE initialization settings in the [fonts] section of **synergy.ini** or **synuser.ini** rather than the pre–version 6.3 TYPE\_FACE, FONT\_HEIGHT, FONT\_WIDTH, ALT\_TYPE\_FACE, ALT\_FONT\_HEIGHT, and ALT\_FONT\_WIDTH settings.

---

## Setting application fonts in synergy.ini or synuser.ini

Use the FONT\_GLOBAL and FONT\_ALTERNATE initialization settings to specify the initial global and alternate fonts that will be used in your application. FONT\_GLOBAL and FONT\_ALTERNATE should be specified in the [synergy], [dbr], or [*myprog*] section of **synergy.ini** or **synuser.ini**, where *myprog* is any **.dbr** file.

FONT\_GLOBAL and FONT\_ALTERNATE have the syntax

FONT\_GLOBAL=*palette\_name*

and

FONT\_ALTERNATE=*palette\_name*

Use the DEFAULT and ALTERNATE initialization settings to define the characteristics of the palette entry names that will be used if FONT\_GLOBAL and FONT\_ALTERNATE are undefined. See “[Defining font palette entries in synergy.ini or synuser.ini](#)” on page 18-46 for the syntax.

Refer to the “[Environment Variables](#)” chapter of *Environment Variables & System Options* for more information about all of these settings.

## Setting application fonts at runtime

To modify the global or alternate fonts used by your application after it has started up, use the %U\_WNDFONT(D\_SETFONT) function to modify the characteristics of the font IDs DF\_DEFAULT and DF\_ALTERNATE. Use the following syntax:

```
%U_WNDFONT (D_SETFONT, font_id, face_name, point_size[, sizing_char])
```

where *font\_id* specifies which font ID to modify.

See [chapter 16, “Utility Routines,”](#) for more information on using %U\_WNDFONT and its subfunctions, including D\_CHOOSEFONT, which displays the Font dialog box and enables your users to define font characteristics graphically.

## Setting fonts for the header, footer, and information line

The Synergy header, footer, and information line of the application window use their own fonts. The initial fonts are one of the following, in order of precedence.



For settings in **synergy.ini** and **synuser.ini**, definitions in the [*myprog*] section override definitions in [dbr], and definitions in [dbr] override definitions in [synergy]. In addition, a definition in **synuser.ini** overrides the same definition in the same section of **synergy.ini**.

---

- ▶ The font specified by the FONT\_HEADER, FONT\_FOOTER, and FONT\_INFO initialization settings in the [synergy], [dbr], or [*myprog*] section of **synergy.ini** or **synuser.ini**, where *myprog* is any **.dbr** file.
- ▶ The font specified by the reserved palette entry name STATUS in the [fonts] section of **synergy.ini** or **synuser.ini**. If a palette entry named STATUS is not defined, one will be defined using Arial font, point size 10, and sizing character “A”.

## Setting fonts for the Synergy debugger

The Synergy debugger window uses its own font. The initial “debugger font” is one of the following, in order of precedence.



For settings in **synergy.ini** and **synuser.ini**, definitions in the *[myprog]* section override definitions in *[dbr]*, and definitions in *[dbr]* override definitions in *[synergy]*. In addition, a definition in **synuser.ini** overrides the same definition in the same section of **synergy.ini**.

---

- ▶ The font specified by the FONT\_DEBUG initialization setting in the *[synergy]*, *[dbr]*, or *[myprog]* section of **synergy.ini** or **synuser.ini**
- ▶ The font specified by the reserved palette entry name DEBUGGER in the *[fonts]* section of **synergy.ini** or **synuser.ini**
- ▶ The font specified by the reserved palette entry name DEFAULT in the *[fonts]* section of **synergy.ini** or **synuser.ini**
- ▶ The font specified by the TYPE\_FACE, FONT\_HEIGHT, and FONT\_WIDTH initialization settings in the *[synergy]*, *[dbr]*, or *[myprog]* sections of **synergy.ini** or **synuser.ini**
- ▶ The terminal font

## Setting the font for an object

By default, the font used for an application is the font used for all objects within that application. You can override the default font for an object by

- ▶ specifying the font for that class of object in **synergy.ini** or **synuser.ini**. (If this is defined in both files, the **synuser.ini** setting overrides the setting in **synergy.ini**.)
- ▶ specifying the font in Repository.
- ▶ specifying the font in your script file (either manually or using Composer).
- ▶ using UI Toolkit routines I\_FLDMOD, IB\_FIELD, or %U\_WNDFONT.

In all of these cases, the font that you specify should already be defined in your font palette. See [page 18-54](#) for information about the defaulting hierarchy used if a referenced font is undefined.

If a font is specified for a window, it becomes the default for all objects in that window unless otherwise specified. The window is sized according to the metrics of that font, and objects are positioned according to rows and columns based upon the sizing character for that font. Likewise, if a font is specified for any other object or component, the object is sized according to the metrics for that font.



If a proportional font is specified for a window, objects in the window that do not support proportional fonts may not display as expected. See [page 18-55](#) for a list of objects that support proportional fonts.

---

## Setting fonts for a class of objects

You can define a font for a particular class of objects. This enables you to more easily migrate your application to proportional fonts.

Use one or more of the following initialization settings in the [synergy], [dbr], or [myprog] section of **synergy.ini** or **synuser.ini** to define the default font for the specified classes:

|               |                                                                                    |
|---------------|------------------------------------------------------------------------------------|
| FONT_NUMFLD   | Specifies the default font for numeric input fields (including dates and times).   |
| FONT_ALPHAFLD | Specifies the default font for alphanumeric input fields (including user-defined). |
| FONT_PROMPT   | Specifies the default font for input field prompts.                                |
| FONT_TEXT     | Specifies the default font for text in windows.                                    |
| FONT_LIST     | Specifies the default font for lists.                                              |

Refer to the “[Environment Variables](#)” chapter of *Environment Variables & System Options* for more information about these settings.

## Setting fonts for an object in Repository

Repository enables you to assign a font to a field or template. If you assign a font to a template, the font is used by all fields that use that template. You can also specify a font for a template or field prompt.

To specify fonts in Repository, enter a font palette entry name in the Font field and one in the Prompt font field on the Display tab of the Field Definition or Template Definition window. See “[Display information](#)” in the “Working with Fields” chapter of your *Repository User’s Guide* for more information.

You can also specify fonts using the Synergy Data Language. The FIELD, GROUP, and TEMPLATE statements all have FONT, NOFONT, PROMPTFONT, and NOPROMPTFONT keywords. Refer to the “[Synergy Data Language](#)” chapter of your *Repository User’s Guide* for more information about these keywords.

## Setting fonts for an object in a script file

You can set fonts in your script file using the .FONT command and certain qualifiers of the .FIELD command. You can also specify fonts in Composer by setting the Font and Font selected properties for an object. Composer will then generate the script file for you.

To set a window font in a script file, use the .FONT command, which has the following syntax:

```
.FONT palette_name
```

To set a field or prompt font in a script file, use the FONT and PROMPTFONT qualifiers of the .FIELD command. These qualifiers have the syntax

[, FONT (*palette\_name*) ]

and

[, PROMPTFONT (*palette\_name*) ]

To override a font specified for a repository field, use the NOFONT and NOPROMPTFONT qualifiers. If NOFONT or NOPROMPTFONT is specified, your application will use the input window's font for the affected field or prompt.

## Setting fonts for an object at runtime

You can set window fonts using the %U\_WNDFONT function and input field fonts using the I\_FLDMOD or IB\_FIELD subroutine.

To set a window font at runtime, use the following syntax:

%U\_WNDFONT (D\_SETWNDFONT, *window\_id*, *font\_id*)

To set the font for a field or prompt at runtime, use I\_FLDMOD or IB\_FIELD. For either routine, use the following argument qualifiers:

D\_FLD\_FONT, *font\_id*

and

D\_FLD\_PROMPTFONT, *font\_id*

To tell your application to use the input window's font for fields and prompts, turn D\_FLD\_FONT and D\_FLD\_PROMPTFONT off with the D\_OFF qualifier, as follows:

D\_OFF, D\_FLD\_FONT

and

D\_OFF, D\_FLD\_PROMPTFONT

### How fonts are applied

For the application window and the objects within it, Synergy/DE determines the font to use according to the following order of precedence (from highest to lowest).



For settings in **synergy.ini** and **synuser.ini**, definitions in the *[myprog]* section override definitions in *[dbr]*, and definitions in *[dbr]* override definitions in *[synergy]*. In addition, a definition in **synuser.ini** overrides the same definition in the same section of **synergy.ini**.

- ▶ Font specified for this field by I\_FLDMOD
- ▶ Font specified for this field in a script file or by IB\_FIELD
- ▶ Font specified in the repository for this field
- ▶ Font specified in the repository for the template that this field is derived from
- ▶ Font specified by %U\_WNDFONT(D\_SETWNDFONT)
- ▶ Font specified for the window in a script file
- ▶ Font specified for this class of object by FONT\_NUMFLD, FONT\_ALPHAFLD, FONT\_PROMPT, FONT\_TEXT, or FONT\_LIST in the *[synergy]*, *[dbr]*, or *[myprog]* section of **synergy.ini** or **synuser.ini**
- ▶ Font specified by FONT\_GLOBAL or FONT\_ALTERNATE in the *[synergy]*, *[dbr]*, or *[myprog]* section of **synergy.ini** or **synuser.ini**
- ▶ Font specified by the reserved palette entry name DEFAULT or ALTERNATE in the *[fonts]* section of **synergy.ini** or **synuser.ini**
- ▶ Font specified by TYPE\_FACE, FONT\_HEIGHT, and FONT\_WIDTH or ALT\_TYPE\_FACE, ALT\_HEIGHT, and ALT\_WIDTH in the *[synergy]*, *[dbr]*, or *[myprog]* section of **synergy.ini** or **synuser.ini**
- ▶ Terminal font, at the point size selected by the system as optimal (either the largest point size for which at least 80 columns of the font will fit on the screen or 10 point, whichever is smaller)

For the header, footer, and information line sections within the application window, Synergy/DE determines the font to use according to the following hierarchy:

- ▶ Font specified by FONT\_HEADER, FONT\_FOOTER, and FONT\_INFO in the *[synergy]*, *[dbr]*, or *[myprog]* section of **synergy.ini** or **synuser.ini**
- ▶ Font specified by the reserved palette entry name STATUS in the *[fonts]* section of **synergy.ini** or **synuser.ini**. If a palette entry named STATUS is not defined, one will be defined using Arial font, point size 10, and sizing character “A”



For the debugger window, Synergy/DE determines the font to use according to the following hierarchy:

- ▶ Font specified by FONT\_DEBUG in the [synergy], [dbr], or [myprog] section of **synergy.ini** or **synuser.ini**
- ▶ Font specified by the reserved palette entry name DEBUGGER in the [fonts] section of **synergy.ini** or **synuser.ini**
- ▶ Font specified by the reserved palette entry name DEFAULT in the [fonts] section of **synergy.ini** or **synuser.ini**
- ▶ Font specified by TYPE\_FACE, FONT\_HEIGHT, and FONT\_WIDTH in the [synergy], [dbr], or [myprog] section of **synergy.ini** or **synuser.ini**
- ▶ Terminal font, at the point size selected by the system as optimal (either the largest point size for which at least 80 columns of the font will fit on the screen or 10 point, whichever is smaller)

## Using fixed fonts

If you are using a fixed font on Windows, the foreground color (which is the text color) will change according to the following rules: If the foreground color for the palette is in the range 0-7 and the rendition for the object includes a bold attribute, 8 is added to the number for the foreground color. If reverse is applied, the background color and the foreground color are swapped and the above rules are applied to the new foreground color. For instance, the default rendition for fields that aren't in the current input set is palette 3 and includes the bold attribute. So, if you haven't changed this setting and the foreground color is in the range 0-7, it will be increased by 8 (3 will become 11, and so forth).

## Using proportional fonts

The following UI Toolkit objects support proportional fonts:

- ▶ Input windows
- ▶ Text windows
- ▶ Selection windows
- ▶ Lists
- ▶ List headers and footers
- ▶ Input window fields
- ▶ Prompts
- ▶ Application header, footer, and information line

Note the following restrictions and recommendations for using proportional fonts:

- ▶ Because Synergy/DE maintains support for UNIX and OpenVMS applications, although a proportional font may make an input prompt or input field take up less space within the input window, you cannot take advantage of that extra space by placing something there. If you do place something, it will most likely be truncated or covered by another object.
- ▶ Static text and text in a window are compressed to the left and cannot be justified.
- ▶ A sizing character that is too wide may cause prompts to be clipped. A sizing character that is too narrow may cause extra space to be displayed between the prompt and the field.
- ▶ You cannot align prompts with leading spaces. Prompts should be positioned at the location where their text will begin.
- ▶ Whenever renditions change, justification is used. For example, if this text is in your script  
`This is \hbold\~h text.`  
there may be extra space between the words “is” and “bold” and “text.”
- ▶ Horizontal scrolling will occur if text exceeds the width of the edit control. However, a multi-line text field will wrap without scrolling. A multi-line text field will scroll vertically only if exceeds its frame.
- ▶ We recommend that you use a fixed font for text in a window other than prompts or fields, because the text may wrap in strange places.
- ▶ When attributes are set or cleared, the text that follows begins on a cell boundary, so there may be extra space between an attribute change and the text that precedes or follows it.
- ▶ Text objects used for field headings or prompts will not be positioned correctly and should not be used. Instead, you can use input fields that are not in the set and display the text to these input fields.
- ▶ We recommend that you use a fixed font for the debugger window.
- ▶ We recommend that you use a fixed font when doing non-Toolkit processing.
- ▶ We recommend that you do not use proportional fonts in conjunction with the row and column arguments to `%UWNDEVENTS_METHOD`, because the column (x-direction) arguments are based on the sizing character for the window and not the actual text.
- ▶ Bold proportional fonts use an actual bold font rather than rendering bold as a color change the way fixed fonts do. Consequently, bold characters are more likely to be truncated, because Toolkit determines the width of the field or prompt using a nonbold (normal) font.
- ▶ For text fields (multi-line alpha fields), the number of characters displayed on each line is equal to the width of the arrayed field. For example, a **3a10** field will display 10 characters on each line, regardless of the font specified. This means there could be a gap between the last character of a line and the frame of the edit field.
- ▶ We recommend that you use a fixed font for UI Toolkit lists, because columns do not line up when a proportional font is used.

# Appendices

## **Appendix A: Maximums**

Lists all size and number maximums permitted by UI Toolkit.

## **Appendix B: Reserved Menu Entries**

Lists all reserved menu entries that are used by the various UI Toolkit subroutines that process input.

## **Appendix C: Keyboard Navigation for Lists on Windows**

Lists how on Windows you can navigate to and highlight items with the arrow keys and the PAGE UP, PAGE DOWN, HOME, END, and TAB keys, as well as combinations of these keys and the CTRL, ALT, and SHIFT keys.

## **Appendix D: Methods**

Discusses the difference between asynchronous and synchronous methods, issues you should keep in mind when using input methods, and what happens when context shifts and a method has been called as a menu entry with %M\_SIGNAL.

## **Appendix E: File-Stack Processing**

Discusses what file stacks are, how they work, and why you would want to use them.

## **Appendix F: Linked-List Processing**

Discusses how to use linked lists, as well as the advantages of using them.



# A

## Maximums

| Maximum Values Permitted by Toolkit                            |         |
|----------------------------------------------------------------|---------|
| Item                                                           | Maximum |
| Box name (size in bytes)                                       | 30      |
| Button name (size in bytes)                                    | 30      |
| Caption text on Windows (size in bytes)                        | 78      |
| Channels                                                       | 255     |
| Composite container window, children associated with           | 2047    |
| Environment levels (set by U_START, which has a default of 16) | 32      |
| Field name (size in bytes)                                     | 30      |
| File stack (set by FS_INIT, which has a default of 16,384)     | 114,688 |
| Footer lines                                                   | 4       |
| Format string (size in bytes)                                  | 80      |
| General window name (size in bytes)                            | 15      |
| Header lines                                                   | 4       |
| Input field display length (size in bytes)                     | 65,535  |
| Input field help identifier (size in bytes)                    | 80      |
| Input field information string (size in bytes)                 | 80      |
| Input field input length (size in bytes)                       | 65,535  |
| Input field name (size in bytes)                               | 30      |
| Input field prompt (size in bytes)                             | 80      |
| Input field user text string (size in bytes)                   | 80      |

## Maximums

| Maximum Values Permitted by Toolkit (Continued)                          |                                                                                                        |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Item                                                                     | Maximum                                                                                                |
| Input field view length (size in bytes)                                  | 9,999                                                                                                  |
| Input field, alpha and multi-dimensional (size in bytes)                 | 65,535                                                                                                 |
| Input field, decimal (size in bytes)                                     | 28 for decimal, including implied decimal (for implied decimal, up to 28 can follow the decimal point) |
| Input field, integer (size in bytes)                                     | 1, 2, 4, or 8                                                                                          |
| Input set name (size in bytes)                                           | 30                                                                                                     |
| Input set, fields in                                                     | 253                                                                                                    |
| Input structure name (size in bytes)                                     | 30                                                                                                     |
| Input structure, elements in                                             | 507                                                                                                    |
| Input window name (size in bytes)                                        | 15                                                                                                     |
| Input window, buttons in                                                 | 127                                                                                                    |
| Input window, Fields in                                                  | 253                                                                                                    |
| Input window, input sets in                                              | 25                                                                                                     |
| Input window, total characters (and associated data) for all field names | 2550                                                                                                   |
| Line name (size in bytes)                                                | 30                                                                                                     |
| List “find” window name (size in bytes)                                  | 15                                                                                                     |
| List class name (size in bytes)                                          | 15                                                                                                     |
| List, data argument associated with (size in bytes)                      | 3,999                                                                                                  |
| List, header/footer line length                                          | 32,767                                                                                                 |
| List, user data associated with (size in bytes)                          | 65,535                                                                                                 |
| Loaded windows and lists (note that each list includes multiple windows) | 1,024                                                                                                  |
| Menu column name (size in bytes)                                         | 15                                                                                                     |
| Menu columns, number placed (primary)                                    | 9                                                                                                      |

| <b>Maximum Values Permitted by Toolkit (Continued)</b>                |                |
|-----------------------------------------------------------------------|----------------|
| <b>Item</b>                                                           | <b>Maximum</b> |
| Menu columns, memory available for (in bytes)                         | 65,535         |
| Menu entries per menu column                                          | 20             |
| Menu entry name (size in bytes)                                       | 10             |
| Menu entry, user-defined text string associated with (size in bytes)  | 80             |
| Menu list name (size in bytes)                                        | 10             |
| Method name (size in bytes)                                           | 30             |
| Rendition scheme name (size in bytes)                                 | 30             |
| Repository structure alias name (size in bytes)                       | 30             |
| Scroll bar window name (size in bytes)                                | 15             |
| Selection list defined by S_SELBLD or .SELECT, entries in             | 32,767         |
| Selection list defined by the SELECT qualifier for .FIELD, entries in | 99             |
| Selection window name (size in bytes)                                 | 15             |
| Structure (size in bytes)                                             | 9,999          |
| Tab set window name (size in bytes)                                   | 15             |
| Tabs in a tab set                                                     | 24             |
| Text messages (size in bytes)                                         | 200            |
| Text object name (size in bytes)                                      | 30             |
| Toolbars                                                              | 256            |
| Toolbars placed                                                       | 4 (1 per side) |
| U_ABORT message line, characters in (UNIX, OpenVMS)                   | 70             |
| U_ABORT message, characters in (Windows)                              | 1,920          |
| U_ABOUT information line, characters in                               | 76             |
| U_DIALOG dialog box, lines in                                         | 12             |
| U_MESSAGE message line, characters in                                 | 76             |

| Maximum Values Permitted by Toolkit (Continued)                       |         |
|-----------------------------------------------------------------------|---------|
| Item                                                                  | Maximum |
| U_MESSAGE window, lines in (on UNIX and OpenVMS; no limit on Windows) | 5       |
| U_OPEN, filenames used with (number of characters)                    | 256     |
| Window, max height                                                    | 32,767  |
| Window, max width                                                     | 32,767  |
| Window library, text entry in (size in bytes)                         | 15      |
| Window script, physical line in (size in bytes)                       | 255     |



# B

## Reserved Menu Entries

The following reserved menu entries are used by the various Toolkit subroutines that process input. These include C\_PROCESS, I\_INPUT, I\_INPFLD, L\_SELECT, S\_SELECT, T\_EDIT, T\_VIEW, some of the utility subroutines, and others. (When applicable, the Discussion sections for the subroutines list the menu entries recognized by the subroutine.) Entries that begin with

- ▶ “C\_” are for composite window processing
- ▶ “E\_” are for editing
- ▶ “I\_” are for input
- ▶ “O\_” are for key mapping and renditions
- ▶ “S\_” are for selection windows and lists
- ▶ “T\_” are for changing the view in text windows
- ▶ “TS\_” are for tab set processing
- ▶ “U\_” are for EUTILS\_METHOD processing

| Reserved Menu Entries |                                                                                  |
|-----------------------|----------------------------------------------------------------------------------|
| Menu entry            | Description                                                                      |
| C_FIRST               | Make the first child or button in a composite window active.                     |
| C_LAST                | Make the last child or button in a composite window active.                      |
| C_NEXT                | Make the next child or button in a composite window active.                      |
| C_PREV                | Make the previous child or button in a composite window active.                  |
| C_RESET               | Reset the context in a composite window to the currently active child or button. |
| C_SET <i>nnnn</i>     | Make the child window or list with a tabbing index of <i>nnnn</i> active.        |
| E_BMOV                | Move to beginning of line.                                                       |
| E_BOTTOM              | Move to bottom of window.                                                        |
| E_CDEL                | Delete current character.                                                        |

| Reserved Menu Entries (Continued) |                                                                        |
|-----------------------------------|------------------------------------------------------------------------|
| Menu entry                        | Description                                                            |
| E_CLEAR                           | Clear text.                                                            |
| E_COPY                            | Copy marked text.                                                      |
| E_CUT                             | Cut marked text.                                                       |
| E_DIR                             | Toggle direction.                                                      |
| E_DOWN                            | Move down.                                                             |
| E_EDEL                            | Delete to end of line.                                                 |
| E_EMOV                            | Move to end of line.                                                   |
| E_HARD                            | Toggle between inserting hard and soft returns when user presses ENTER |
| E_ILIN                            | Insert line.                                                           |
| E_JOIN                            | Join paragraph.                                                        |
| E_LCLR                            | Clear line.                                                            |
| E_LDEL                            | Delete line in the current direction.                                  |
| E_LEFT                            | Move one character left.                                               |
| E_LMOV                            | Move one line in the current direction.                                |
| E_MARK                            | Mark text.                                                             |
| E_MODE                            | Toggle between insert and overstrike mode.                             |
| E_PASTE                           | Paste text.                                                            |
| E_PDEL                            | Delete paragraph in the current direction.                             |
| E_PMOV                            | Move one paragraph in the current direction.                           |
| E_RIGHT                           | Move one character right.                                              |
| E_TOP                             | Move to top of window.                                                 |
| E_UP                              | Move up.                                                               |
| E_WDEL                            | Delete word in the current direction.                                  |
| E_WMOV                            | Move one word in the current direction.                                |

| Reserved Menu Entries (Continued) |                                                                                                                            |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Menu entry                        | Description                                                                                                                |
| E_XDOWN                           | Move down, exiting at field boundary.                                                                                      |
| E_XUP                             | Move up, exiting at field boundary.                                                                                        |
| I_CANCEL                          | Restore field to its initial state.                                                                                        |
| I_DFLT                            | Fill all fields that have a specified default with their default. (I_DFLT doesn't affect fields that don't have defaults.) |
| I_DONE                            | Fill all fields with defaults.                                                                                             |
| I_DRILL                           | Invoke drill method for field                                                                                              |
| I_EDIT                            | Go into edit mode.                                                                                                         |
| I_FRST                            | Move to first field.                                                                                                       |
| I_FRSTCLR                         | Move to first empty field.                                                                                                 |
| I_HYPER                           | Invoke hyperlink method for field                                                                                          |
| I_LAST                            | Move to last field.                                                                                                        |
| I_NEXT                            | Move to next field.                                                                                                        |
| I_NEXTCTL                         | Move to next field or button.                                                                                              |
| I_NXTCLR                          | Move to next empty field.                                                                                                  |
| I_OK                              | Fill with defaults and exit I_INPUT.                                                                                       |
| I_PREV                            | Move to previous field.                                                                                                    |
| I_PREVCTL                         | Move to previous field or button.                                                                                          |
| O_ACCEPT                          | Accept the shortcut sequence directly.                                                                                     |
| O_CANCEL                          | Cancel changes.                                                                                                            |
| O_CHGTERM                         | Change which terminal key map is being modified.                                                                           |
| O_COPYTERM                        | Copy a terminal key map definition.                                                                                        |
| O_DEFAULT                         | Set renditions to their default values.                                                                                    |
| O_DELTERM                         | Delete a terminal key map definition.                                                                                      |
| O_EXIT                            | Exit and save all changes.                                                                                                 |

| Reserved Menu Entries (Continued) |                                                                            |
|-----------------------------------|----------------------------------------------------------------------------|
| Menu entry                        | Description                                                                |
| O_HELP                            | Call EHELP_METHOD and pass <i>help_id</i> .                                |
| O_LDSCHEME                        | Load rendition schemes from the rendition file.                            |
| O_PALETTE                         | Modify a color palette.                                                    |
| O_RESET                           | Reset to the working rendition scheme that was saved on entry.             |
| O_RMSCHEME                        | Remove a rendition scheme from the rendition file.                         |
| O_STSCHEME                        | Store rendition schemes to the rendition file.                             |
| O_TIMEOUT                         | Signal that a time-out has occurred.                                       |
| S_BOTTOM                          | Move to bottom of a list.                                                  |
| S_DOWN                            | Move down in a selection window.                                           |
| S_FIND                            | Prompt for a prompt string and then find that string in a list.            |
| S_FINDDIR                         | Toggle the direction of the find in a list.                                |
| S_FINDNEXT                        | Find the next item in a list that has the same value as the previous find. |
| S_LEFT                            | Move left in a selection window.                                           |
| S_PGBOT                           | Move to the bottom of the current page of a list.                          |
| S_PGTOP                           | Move to top of the current page of a list.                                 |
| S_PGUP                            | Move to previous page of a list.                                           |
| S_RIGHT                           | Move right in a selection window.                                          |
| S_TOP                             | Move to top of a list.                                                     |
| S_UP                              | Move up in a selection window.                                             |
| T_BOTTOM                          | Move to bottom of window.                                                  |
| T_LINDWN                          | Scroll down one line.                                                      |
| T_LINUP                           | Scroll up one line.                                                        |
| T_LSIDE                           | Move to left side of window.                                               |
| T_PAGDWN                          | Scroll down one page.                                                      |

| Reserved Menu Entries (Continued) |                                                       |
|-----------------------------------|-------------------------------------------------------|
| Menu entry                        | Description                                           |
| T_PAGUP                           | Scroll up one page.                                   |
| T_RSIDE                           | Move to right side of window.                         |
| T_SCRDWN                          | Scroll down one half page.                            |
| T_SCRLFT                          | Scroll left 10 columns.                               |
| T_SCRRT                           | Scroll right 10 columns.                              |
| T_SCRUP                           | Scroll up one half page.                              |
| T_TOP                             | Move to top of window.                                |
| TS_TAB <i>n</i>                   | Switch to tab <i>n</i> .                              |
| TS_TABNEXT                        | Switch to next active tab, wrapping if necessary.     |
| TS_TABPREV                        | Switch to previous active tab, wrapping if necessary. |
| U_XXX                             | Call the EUTILS_METHOD subroutine.                    |



# C

## Keyboard Navigation for Lists on Windows

Along with using the mouse to navigate lists on Windows, users can highlight list items with the arrow keys and the PAGE UP, PAGE DOWN, HOME, END, and TAB keys, as well as combinations of these keys and the CTRL, ALT, and SHIFT keys. The table below documents what these keys and key combinations do by default. Note the following:

- ▶ In Windows environments, some keys and key combinations are *privatized*—that is, they are reserved for the list and can’t be assigned as menu shortcuts without calling `L_RETURNKEY` and setting their return states to true. (See [L\\_RETURNKEY](#) on page 9-126 for more information.) These are marked as “privatized” in the “Key or key combination” column of the table below.
- ▶ In Windows environments, some key combinations can never be assigned as shortcuts. These are marked as “list only” in the “Key or key combination” column of the table below.
- ▶ The `RowMode` published property determines whether a cell or a row is highlighted for ActiveX Toolkit lists. If `RowMode` is off, one cell is highlighted at a time. If it’s on, one row is highlighted. The table below includes columns for the two `RowMode` states.
- ▶ The `ArrowKeyAction` published property affects the way some keys and key combinations work for ActiveX Toolkit lists. With the default setting, which is 0, arrow keys move from one row to the next. If `ArrowKeyAction` is set to 1, arrow keys move from one list item (which can be more than one row) to the next. The table below includes columns for the two `ArrowKeyAction` states.
- ▶ Toolkit lists (non-ActiveX) page up by shifting the highlighted row to the bottom of the display (if there are enough items left in the list) and then highlighting the row at the top of the display. They page down by doing the converse, by moving the highlighted row to the top of the page, and so forth.

For more information on published properties for ActiveX Toolkit lists, see “[Published Properties for ActiveX Toolkit Lists](#)” on page 9-17.

| Key Behavior for Lists in Windows Environments |                                      |                                                         |                                            |                                                                                                           |                                                                                                             |
|------------------------------------------------|--------------------------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Key or key combination                         | Standard Toolkit lists (non-ActiveX) | ActiveX lists                                           |                                            |                                                                                                           |                                                                                                             |
|                                                |                                      | ArrowKeyAction=0                                        |                                            | ArrowKeyAction=1                                                                                          |                                                                                                             |
|                                                |                                      | RowMode off                                             | RowMode on                                 | RowMode off                                                                                               | RowMode on                                                                                                  |
| UP ARROW (privatized)                          | Moves up one row                     | Moves up one row (highlights same cell in previous row) | Moves up one row (highlights entire row)   | Moves up one list item (highlights same cell in the next list item <sup>a</sup> )                         | Moves up one list item (highlights same row in previous list item)                                          |
| DOWN ARROW (privatized)                        | Moves down one row                   | Moves down one row (highlights same cell in next row)   | Moves down one row (highlights entire row) | Moves down one list item (highlights same cell in the previous list item <sup>a</sup> )                   | Moves down one list item (highlights same row in next list item)                                            |
| LEFT ARROW (privatized)                        | Does nothing                         | Moves left one cell (no wrapping; stops at end of row)  | Does nothing                               | Moves left one cell (wraps up to previous row of list item; does not wrap beyond first cell of list item) | Moves up one row within the list item (highlights entire row; does not move beyond first row of list item)  |
| RIGHT ARROW (privatized)                       | Does nothing                         | Moves right one cell (no wrapping; stops at end of row) | Does nothing                               | Moves right one cell (wraps down to next row of list item; does not wrap beyond last cell of list item)   | Moves down one row within the list item (highlights entire row; does not move beyond last row of list item) |
| PAGE UP (privatized)                           | Pages up                             | Pages up                                                | Pages up                                   | Pages up                                                                                                  | Pages up                                                                                                    |
| PAGE DOWN (privatized)                         | Pages down                           | Pages down                                              | Pages down                                 | Pages down                                                                                                | Pages down                                                                                                  |



| Key Behavior for Lists in Windows Environments (Continued) |                                      |                                                                     |                                            |                                                                                                                                                |                                                         |
|------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Key or key combination                                     | Standard Toolkit lists (non-ActiveX) | ActiveX lists                                                       |                                            |                                                                                                                                                |                                                         |
|                                                            |                                      | ArrowKeyAction=0                                                    |                                            | ArrowKeyAction=1                                                                                                                               |                                                         |
|                                                            |                                      | RowMode off                                                         | RowMode on                                 | RowMode off                                                                                                                                    | RowMode on                                              |
| HOME (privatized)                                          | Moves to the first row in the list   | Moves to first cell in row                                          | Does nothing                               | Moves to first cell in first row of list item                                                                                                  | Moves to first row in list item (highlights entire row) |
| END (privatized)                                           | Moves to the last row in the list    | Moves to last cell in row                                           | Does nothing                               | Moves to last cell in last row of list item                                                                                                    | Moves to last row in list item (highlights entire row)  |
| TAB                                                        | Does nothing <sup>b</sup>            | Moves right one cell (wraps to first cell in same row) <sup>b</sup> | Does nothing <sup>b</sup>                  | Moves right one cell (wraps to first cell in next row of list item; wraps from last cell in list item to first cell in list item) <sup>b</sup> | Does nothing <sup>b</sup>                               |
| CTRL+UP ARROW                                              | Moves up one row                     | Moves up one row (highlights same cell in previous row)             | Moves up one row (highlights entire row)   | Moves up one row (highlights same cell in previous row)                                                                                        | Moves up one row (highlights entire row)                |
| CTRL+DOWN ARROW                                            | Moves down one row                   | Moves down one row (highlights same cell in next row)               | Moves down one row (highlights entire row) | Moves down one row (highlights same cell in next row)                                                                                          | Moves down one row (highlights entire row)              |
| CTRL+LEFT ARROW                                            | Does nothing                         | Moves left one cell (no wrapping; stops at end of row)              | Does nothing                               | Moves left one cell (no wrapping; stops at end of row)                                                                                         | Does nothing                                            |
| CTRL+RIGHT ARROW                                           | Does nothing                         | Moves right one cell (no wrapping; stops at end of row)             | Does nothing                               | Moves right one cell (no wrapping; stops at end of row)                                                                                        | Does nothing                                            |

| Key Behavior for Lists in Windows Environments (Continued) |                                      |                             |                                                            |                             |                                                            |
|------------------------------------------------------------|--------------------------------------|-----------------------------|------------------------------------------------------------|-----------------------------|------------------------------------------------------------|
| Key or key combination                                     | Standard Toolkit lists (non-ActiveX) | ActiveX lists               |                                                            |                             |                                                            |
|                                                            |                                      | ArrowKeyAction=0            |                                                            | ArrowKeyAction=1            |                                                            |
|                                                            |                                      | RowMode off                 | RowMode on                                                 | RowMode off                 | RowMode on                                                 |
| CTRL+PAGE UP                                               | Pages up                             | Moves to first cell in row  | Does nothing                                               | Moves to first cell in row  | Does nothing                                               |
| CTRL+PAGE DOWN                                             | Pages down                           | Moves to last cell in row   | Does nothing                                               | Moves to last cell in row   | Does nothing                                               |
| CTRL+HOME                                                  | Moves to the first row in the list   | Moves to first cell in list | Moves to the first row in the list (highlights entire row) | Moves to first cell in list | Moves to the first row in the list (highlights entire row) |
| CTRL+END                                                   | Moves to the last row in the list    | Moves to last cell in list  | Moves to the last row in the list (highlights entire row)  | Moves to last cell in list  | Moves to the last row in the list (highlights entire row)  |
| ALT+UP ARROW (list only)                                   | Does nothing                         | Does nothing                | Does nothing                                               | Does nothing                | Does nothing                                               |
| ALT+DOWN ARROW (list only)                                 | Does nothing                         | Does nothing                | Does nothing                                               | Does nothing                | Does nothing                                               |
| ALT+LEFT ARROW (list only)                                 | Does nothing                         | Does nothing                | Does nothing                                               | Does nothing                | Does nothing                                               |
| ALT+RIGHT ARROW (list only)                                | Does nothing                         | Does nothing                | Does nothing                                               | Does nothing                | Does nothing                                               |
| ALT+PAGE UP (list only)                                    | Does nothing                         | Moves to first cell in row  | Does nothing                                               | Moves to first cell in row  | Does nothing                                               |
| ALT+PAGE DOWN (list only)                                  | Does nothing                         | Moves to last cell in row   | Does nothing                                               | Moves to last cell in row   | Does nothing                                               |

| Key Behavior for Lists in Windows Environments (Continued) |                                      |                                                         |                                            |                                                         |                                            |
|------------------------------------------------------------|--------------------------------------|---------------------------------------------------------|--------------------------------------------|---------------------------------------------------------|--------------------------------------------|
| Key or key combination                                     | Standard Toolkit lists (non-ActiveX) | ActiveX lists                                           |                                            |                                                         |                                            |
|                                                            |                                      | ArrowKeyAction=0                                        |                                            | ArrowKeyAction=1                                        |                                            |
|                                                            |                                      | RowMode off                                             | RowMode on                                 | RowMode off                                             | RowMode on                                 |
| ALT+HOME<br>(list only)                                    | Does nothing                         | Does nothing                                            | Does nothing                               | Does nothing                                            | Does nothing                               |
| ALT+END<br>(list only)                                     | Does nothing                         | Does nothing                                            | Does nothing                               | Does nothing                                            | Does nothing                               |
| SHIFT+UP<br>ARROW                                          | Moves up one row                     | Moves up one row (highlights same cell in previous row) | Moves up one row (highlights entire row)   | Moves up one row (highlights same cell in previous row) | Moves up one row (highlights entire row)   |
| SHIFT+DOWN<br>ARROW                                        | Moves down one row                   | Moves down one row (highlights same cell in next row)   | Moves down one row (highlights entire row) | Moves down one row (highlights same cell in next row)   | Moves down one row (highlights entire row) |
| SHIFT+LEFT<br>ARROW                                        | Does nothing                         | Moves left one cell (no wrapping; stops at end of row)  | Does nothing                               | Moves left one cell (no wrapping; stops at end of row)  | Does nothing                               |
| SHIFT+RIGHT<br>ARROW                                       | Does nothing                         | Moves right one cell (no wrapping; stops at end of row) | Does nothing                               | Moves right one cell (no wrapping; stops at end of row) | Does nothing                               |
| SHIFT+PAGE<br>UP                                           | Pages up                             | Pages up                                                | Pages up                                   | Pages up                                                | Pages up                                   |
| SHIFT+PAGE<br>DOWN                                         | Pages down                           | Pages down                                              | Pages down                                 | Pages down                                              | Pages down                                 |
| SHIFT+HOME                                                 | Moves to the first row in the list   | Moves to first cell in row                              | Does nothing                               | Moves to first cell in row                              | Does nothing                               |
| SHIFT+END                                                  | Moves to the last row in the list    | Moves to last cell in row                               | Does nothing                               | Moves to last cell in row                               | Does nothing                               |

| Key Behavior for Lists in Windows Environments (Continued) |                                      |                                                                   |                                            |                                                                                                                                                  |                                            |
|------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Key or key combination                                     | Standard Toolkit lists (non-ActiveX) | ActiveX lists                                                     |                                            |                                                                                                                                                  |                                            |
|                                                            |                                      | ArrowKeyAction=0                                                  |                                            | ArrowKeyAction=1                                                                                                                                 |                                            |
|                                                            |                                      | RowMode off                                                       | RowMode on                                 | RowMode off                                                                                                                                      | RowMode on                                 |
| SHIFT+TAB                                                  | Does nothing <sup>b</sup>            | Moves left one cell (wraps to last cell in same row) <sup>b</sup> | Does nothing <sup>b</sup>                  | Moves left one cell (wraps to last cell in previous row of list item; wraps from first cell in list item to last cell in list item) <sup>b</sup> | Does nothing <sup>b</sup>                  |
| CTRL+SHIFT+UP ARROW (list only)                            | Moves up one row                     | Moves up one row (highlights same cell in previous row)           | Moves up one row (highlights entire row)   | Moves up one row (highlights same cell in previous row)                                                                                          | Moves up one row (highlights entire row)   |
| CTRL+SHIFT+DOWN ARROW (list only)                          | Moves down one row                   | Moves down one row (highlights same cell in next row)             | Moves down one row (highlights entire row) | Moves down one row (highlights same cell in next row)                                                                                            | Moves down one row (highlights entire row) |
| CTRL+SHIFT+LEFT ARROW (list only)                          | Does nothing                         | Moves left one cell (no wrapping; stops at end of row)            | Does nothing                               | Moves left one cell (no wrapping; stops at end of row)                                                                                           | Does nothing                               |
| CTRL+SHIFT+RIGHT ARROW (list only)                         | Does nothing                         | Moves right one cell (no wrapping; stops at end of row)           | Does nothing                               | Moves right one cell (no wrapping; stops at end of row)                                                                                          | Does nothing                               |
| CTRL+SHIFT+PAGE UP (list only)                             | Pages up                             | Moves to first cell in row                                        | Does nothing                               | Moves to first cell in row                                                                                                                       | Does nothing                               |
| CTRL+SHIFT+PAGE DOWN (list only)                           | Pages down                           | Moves to last cell in row                                         | Does nothing                               | Moves to last cell in row                                                                                                                        | Does nothing                               |

| Key Behavior for Lists in Windows Environments (Continued) |                                      |                             |                                                                |                             |                                                                |
|------------------------------------------------------------|--------------------------------------|-----------------------------|----------------------------------------------------------------|-----------------------------|----------------------------------------------------------------|
| Key or key combination                                     | Standard Toolkit lists (non-ActiveX) | ActiveX lists               |                                                                |                             |                                                                |
|                                                            |                                      | ArrowKeyAction=0            |                                                                | ArrowKeyAction=1            |                                                                |
|                                                            |                                      | RowMode off                 | RowMode on                                                     | RowMode off                 | RowMode on                                                     |
| CTRL+SHIFT+HOME<br>(list only)                             | Moves to the first row in the list   | Moves to first cell in list | Moves to the first row in the list (Highlights the entire row) | Moves to first cell in list | Moves to the first row in the list (Highlights the entire row) |
| CTRL+SHIFT+END<br>(list only)                              | Moves to the last row in the list    | Moves to last cell in list  | Moves to the last row in the list (Highlights the entire row)  | Moves to last cell in list  | Moves to the last row in the list (Highlights the entire row)  |

- a. The same column is activated in the previous or next row or list item. For example, if a list item has eight columns in two rows (four columns each), and the fifth column in the list item is active (i.e., the first cell in the second row), pressing down arrow activates the fifth column in the next item in the list.
- b. If the list is part of a composite window, TAB and SHIFT + TAB move focus to the next or previous child window or enabled button on the composite container window.



# D

## Methods

### **Methods: Asynchronous vs. Synchronous D-2**

Lists and describes the two kinds of methods: methods that are called as soon as the triggering event takes place and methods that are deferred until Toolkit is ready.

### **Notes on Input Methods D-3**

Discusses issues you should keep in mind when using input methods (arrive, leave, change, edit format, and display).

### **Signaling a Menu Entry from a Method D-11**

Discusses what happens when context shifts and a method has been called as a menu entry with %M\_SIGNAL.

## Methods: Asynchronous vs. Synchronous

Methods are subroutines you write, but they aren't something you call from your program.

UI Toolkit calls methods automatically when certain events take place. Some methods are called immediately when a given event takes place. Others aren't called until Toolkit is ready. Methods are documented throughout this manual (for example, [hyperlink](#) and [drill](#) methods are documented in [chapter 8](#), “[Input Routines](#)”), but this appendix discusses issues common to types of methods.

*Asynchronous* methods are called as soon as their events take place. For example, if you've written an arrive method for a field, the arrive method is called immediately when the user arrives on the field. Asynchronous methods include the following:

- ▶ Arrive, leave, change, edit format, and display input methods
- ▶ Arrive, leave, double-click, and load list methods
- ▶ Toolbar button methods
- ▶ %UWNDEVENTS\_METHOD methods (including AX\_ methods)
- ▶ The following E\_METHOD environment methods: D\_METH\_APPCLOSE, D\_METH\_CHKFLD, D\_METH\_DSPFLD, D\_METH\_EDTDSP, D\_METH\_ENTRST, D\_METH\_APPMOVE, D\_METH\_APPSIZ, and D\_METH\_APPSTATE

Within asynchronous methods on Windows, it's best to avoid doing any user-interactive processing (with the possible exception of a highly conditional message box). Asynchronous methods need to be self contained and they need to execute quickly because they are triggered by Windows events, so it is difficult to determine exactly when the method might be used in relation to your code and Toolkit code. See “[Notes on Input Methods](#)” on [page D-3](#) for more restrictions.

*Synchronous* methods are *not* called when their events take place, but are deferred until Toolkit is ready to call them. For example, if you write a drill method for an input field, the method will not be called immediately when the user clicks the drilldown button or selects the drilldown menu entry. Instead, if the input field is in focus, the leave method for the field is first invoked, then the drill method is called. Synchronous methods include the following:

- ▶ Hyperlink and drilldown input methods
- ▶ The following E\_METHOD environment methods: D\_METH\_UTILS, D\_METH\_HELP, D\_METH\_FKEY, D\_METH\_CENTURY, and D\_METH\_SCRIPTERR
- ▶ Methods invoked as a result of %M\_SIGNAL
- ▶ Tab set methods
- ▶ Composite window methods



# Notes on Input Methods

## WIN

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- ▶ Avoid calling anything that forces reconstruction of the input field frameset on the window being processed. This includes `I_SETDEL`, `I_SNAPSHOT (D_LOAD)`, `I_DSPAREA`, `I_FRAMES`, `T_SETUP`, `S_SELLD` (on an associated selection window). If you do, it will result in a `U_ABORT` message.
  - ▶ Any shift of input focus is allowed and supported within `%IDISPLAY_METHOD`, `%IEDITFMT_METHOD`, and `%ICHANGE_METHOD`, including calling `I_NEXT` on the current input set.
- 

- ▶ Changing the read-only state for a field from an input method for the field (by using `I_READONLY` or `I_FLDMOD`) won't affect input processing. For example, if a change method for a field sets the field to read-only, Toolkit will complete the rest of the method sequence (change method, display method, and leave method). Setting a field to read-only in an input method simply prevents the user from modifying the field any further.

Additionally, note the following for edit format methods:

- ▶ If a field is read-only when it receives focus, you can't turn off the read-only state from an edit format method. No edit format method will be invoked.
- ▶ If an edit format method sets a field to read-only, the user won't be able to modify the field. The field will contain whatever the edit format method returns.

For all asynchronous input methods, note the following:

- ▶ The contents of `g_fldnam` are undefined.
- ▶ `I_INPUT` may not exit until after processing the arrive method for another field. Therefore, you cannot use `g_fldnam` to get the field's name. Instead, use `%I_GETSTRING(inp_wndid, inp_fldnam)`.
- ▶ Except for `E_CUT`, `E_COPY`, `E_PASTE`, `E_CLEAR`, and `E_MARK`, "E\_" menu entries will be ignored if signaled. All other menu entries (including "I\_") will be dispatched as if signaled while performing input to the field.
- ▶ `I_ENABLE` and `I_DISABLE` can be used to change the enabled state of this or other fields.

**UNIX, VMS**

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- ▶ Using `I_ENABLE` or `I_DISABLE` to enable or disable the next field that would be accessed changes the course of input.
  - ▶ You can use `I_SETDEL` and `I_SNAPSHOT` to modify input set context and/or contents. The behavior is exactly as if the action were performed after a break. Thus, using `I_SETDEL` to delete the next field to be accessed alters the context, and using `I_SNAPSHOT` with `D_LOAD` restores the context for the next input. Using `I_SNAPSHOT` with `D_COPY` saves the context that points to the next field to be accessed (if `I_NEXT` was not also called) because the change in context that causes the leave has not yet occurred.
- 

- ▶ Using `I_DISPLAY` or `I_DSPFLD` marks fields as “not empty.” The behavior is exactly as if the action were performed after a break. Subsequent input set processing depends upon the previous context.
- ▶ Using `I_INIT` for a field marks the field as “empty.” Using `I_INIT` for a set resets the context to the first field in the set, as well as marks all fields in the set as “empty.”
- ▶ Performing input to the current set using `I_INPUT` or fields within the current set using `I_INPFLD` is possible but not recommended because it may cause confusion: input to the current set will alter the input context for subsequent input. Input to fields in the current set will alter their “empty” state.

For leave methods, note the following:

- ▶ Accessing (performing input to or displaying) other windows, sets, or fields, within the leave method will not affect the current input process. Accessing the current window, set, or field will affect the input process as noted above.
- ▶ If you modify the information line using `E_SECT` in your leave method, this will occur after restoring any information line superseded by the `INFORMATION` field qualifier. That is, your new information line will persist within the current environment. This is symmetrical with the arrive method, which occurs prior to overloading the information line for the field.
- ▶ The *a\_inpinfo* record contains the following information:

```
inp_entered   ,i4   ;TRUE if data was modified in this field
inp_return    ,i4   ;TRUE if the RETURN key was pressed on this field
```

Either of these fields may be true or false, as shown in the following table.

| inp_entered | inp_return | Meaning                                                                                                       |
|-------------|------------|---------------------------------------------------------------------------------------------------------------|
| False       | False      | User has neither modified the field nor pressed RETURN (ENTER).                                               |
| True        | False      | User has modified field but has not pressed RETURN (ENTER).                                                   |
| False       | True       | Field was not previously empty, and user only pressed RETURN (ENTER).                                         |
| True        | True       | The user pressed RETURN (ENTER) and either the field was previously empty and/or the user modified the field. |

Method sequences

Depending on the user’s action, Toolkit calls methods in one the sequences listed below. These sequences start when the user moves to a new field. Note that these are the basic sequences; additional method calls from these methods will complicate the sequences.

| Method Sequences                                                                                                                                                                                                                                                 |                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| User activity                                                                                                                                                                                                                                                    | Method sequence                                                                                     |
| Enter or edit data in a field and then move to another field.                                                                                                                                                                                                    | change<br>display<br>leave<br>break<br>arrive<br>edit format                                        |
| Signal I_OK.<br>▶ The first four methods (the first change through the first break) are for the current field if that field has been modified or is empty—even if it has a default value.<br>▶ The last six methods are called for every subsequent empty field. | change<br>display<br>leave<br>break<br>arrive<br>edit format<br>change<br>display<br>leave<br>break |

| Method Sequences (Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| User activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Method sequence                                                                                                                                          |
| Click a drilldown button or hyperlink prompt for the current field (a drilldown button or hyperlink prompt whose method uses I_FORCE to modify the field's data).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | leave<br>drill<br>arrive<br>change<br>display<br>break<br>arrive<br>edit format                                                                          |
| Enter or edit data in a field and then click a drilldown button or hyperlink prompt for a different field (a drilldown button or hyperlink prompt whose method uses I_FORCE to modify the second field's data). <ul style="list-style-type: none"><li>▶ The first five methods (the first "change" through the first "arrive") are for the field the user edited.</li><li>▶ The next eight methods (the first "edit format" through the last "break") are for the field whose drilldown button or hyperlink prompt was clicked.</li><li>▶ The final two methods are for the next field in the input sequence, the field that receives focus after the field with the drilldown button or hyperlink prompt.</li></ul> | change<br>display<br>leave<br>break<br>arrive<br>edit format<br>leave<br>drill<br>arrive<br>change<br>display<br>leave<br>break<br>arrive<br>edit format |

To be consistent with Toolkit's handling of other internally supported menu entries (I\_NEXT, I\_PREV, and so on), place drill and hyperlink events after the leave event. This enables you to validate the field (or to avoid validation by testing `g_select/g_entnam`) in the leave method without having to duplicate it in the drill or hyperlink method. Furthermore, it provides the same sequence of events for both non-Windows and Windows platforms.

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## WIN

If the user clicks on the hyperlink prompt or drilldown button for a field other than the one currently in focus, several things could happen:

- ▶ If any input in the currently focused field has not yet been validated, it will be. This could cause a validation message to pop up and focus to be forced back to the current field.
  - ▶ If the current field is a break field and the field has been modified or the field is a “break always” field, when the user attempts to click the hyperlink prompt or drilldown button of another field, a break occurs. This effectively cancels the click, although focus naturally transfers to the new field, unless your break logic alters the input set context. Thus, in some cases with break fields, two clicks may be required to access the hyperlink for a field other than the one currently being processed.
  - ▶ If the new field has an arrive method, this method is invoked before the hyperlink or drill method. If the arrive method signals a menu entry or alters the input set context, this may effectively cancel the hyperlink or drilldown click.
- 

## Using hyperlink and drill methods

Both hyperlink and drill methods can be used for a number of things. Primarily, they are used for some form of lookup or presentation of additional information. Your subroutine can use `I_FORCE` or `I_DSPFLD` to return data back into the field being processed. If the default type for the field is `COPY` and the field is empty, any change you make to the data area will affect the default value for the field. You can also alter other fields or other windows. You can perform input to another window, a list, or a selection window. You can alter the input set context on the current window using `I_NEXT`. You can signal a menu entry by calling `%M_SIGNAL`. If you signal a menu entry in your drill or hyperlink method, it will be dispatched appropriately. Menu entries beginning with “`I_`” are handled by the input processor. “`U_`” menu entries invoke any `EUTILS_METHOD`. “`O_HELP`” invokes any `EHELP_METHOD`. Other menu entries are returned to the calling routine outside `I_INPUT`.

See “[Method sequences](#)” above for information on the sequence of events that occur when a user clicks a hyperlink prompt or a drilldown button.

## Changing focus in an input method on Windows

Although you can call `I_NEXT` to change the current field within the current input set, if you have a change method and `%ICHANGE_METHOD` returns a validation error, the context for the current input set will be forced back to the current field, even if `I_NEXT` has been called.

Note that if a change method signals a menu entry and the response to that menu entry causes the field to be modified (for instance, with `I_FORCE`), an infinite loop may occur.

In leave methods, the problems can be similar though more complex. When the leave method is called, focus has already been established on the new field. If the leave method steals focus (with `U_MESSAGE`, for example), focus is restored to the new field. This works well, unless the leave method also calls `I_NEXT` to force the input context to a different field. In this case, the original new field loses focus and invokes its leave method before arriving at the field specified by `I_NEXT`. Additionally, the field referenced by `*NEXT*` and `*PREV*` will be different depending on whether or not the leave method stole focus.

To work around these problems, we recommend that you avoid stealing focus or calling `I_NEXT` in either arrive or leave methods. You can also use `%M_SIGNAL` in the method to signal a menu entry (which does not have to be on a menu) that tells your program which action to take. This forces `I_INPUT` to exit with `g_select` set to true and `g_entnam` set to the entry name you signaled. You can then take the desired action in the calling routine and loop back into `I_INPUT` to continue.

To do this efficiently, we recommend creating a “wrapper” for `I_INPUT` that handles the problem—assuming you can sufficiently abstract the problem to create a generalized solution. For instance, let’s say you want to display a message box and/or advance to a specific field from either an arrive or leave input method. To do this, you would create the following fields in either a common or global data section. For the following example, assume these fields are defined in an include file that’s named **myinput.def**.

```
g_break_msg    ,a256
g_break_next   ,a30
```

Next, you would create a wrapper for `I_INPUT`. For example:

```
subroutine my_input, reentrant
;
; Description: Wrapper for I_INPUT
;
; Arguments:
;
;         a_inpid      ,n      ;Input window ID
;         a_inpset     ,a      ;(Optional) set name
;         a_record     ,a      ;Data record area
;
;         . (etc., all the rest of I_INPUT's arguments)
;
.include "myinput.def"      ;References the global fields we need
```

```

proc
    repeat
        begin
            xcall i_input(a_inpid, a_inpset, a_record, ...)
            if (%m_signal(entnam, D_REMOVE)) then
                using entnam select
                ("MY_BREAK "), begin
                    if (g_break_msg)
                        begin
                            xcall u_message(%atrim(g_break_msg))
                            clear g_break_msg
                        end
                    if (g_break_next)
                        begin
                            xcall i_next(a_inpid, a_inpset, g_break_next)
                            clear g_break_next
                        end
                    end
                end
            end
            (,), begin
                xcall m_signal(entnam, D_SIGNAL) ;Unrecognized--resignal
                exitloop
            end
        endusing
    else
        exitloop
    end
    xreturn
endsubroutine

```

With the above example, you can generate a message and/or call `I_NEXT` from an arrive or leave input method. In the method, you can display **`g_break_msg`** as the message and/or set **`g_break_next`** to access the next field. You would then call `%M_SIGNAL` with the `MY_BREAK` argument to force a break out of `I_INPUT` and into the above logic. The following makes this step even simpler:

```

subroutine my_break, reentrant
;
; Description: Display message and/or call I_NEXT for a method
;
; Arguments:
;
;     a_msg      ,a      ;(Optional) Message to be displayed
;     a_next     ,a      ;(Optional) Next field to access
.include "myinput.def"

```

## Methods

### Notes on Input Methods

```
proc
    if (^passed(a_msg)) then
        g_break_msg = a_msg
    else
        clear g_break_msg
    if (^passed(a_next)) then
        g_break_next = a_next
    else
        clear g_break_next
    xcall m_signal("MY_BREAK")
    xreturn
endsubroutine
```



## Signaling a Menu Entry from a Method

In method routines, a twilight zone exists from the moment you use `%M_SIGNAL` to signal a menu entry to the moment control returns from the method routine. An `%M_SIGNAL (D_SIGNAL)` call in a method routine simultaneously sets `g_select` and `g_entnam` and instructs the Synergy runtime to signal the menu entry when control returns from the method routine. So if you clear `g_select` or `g_entnam` or set them to something different during this time, your changes will be ignored. As soon as control returns from the method routine, they will be reset to the values set by the `%M_SIGNAL` call because the Synergy runtime has already received its instructions. We recommend, however, that you return immediately after the `%M_SIGNAL` call, and we recommend that you avoid modifying `g_select` or `g_entnam` after the `%M_SIGNAL` call. (`%M_SIGNAL` can also be used to cancel a signaled menu entry. See [%M\\_SIGNAL on page 10-56](#) for information.)

Note the following:

- ▶ If you signal a menu entry (using `%M_SIGNAL`) twice without dispatching the entry between the calls, the first call is discarded. There is no event queue.
- ▶ If you use `%M_SIGNAL` to signal a menu entry when not in a method routine and then call a Toolkit input routine, such as `I_INPUT`, the event is forgotten. Again, this is because `%M_SIGNAL` signals the menu entry by setting `g_select` and `g_entnam`. `I_INPUT` resets these upon entry, as do the other Toolkit input routines. Note, however, that if the `%M_SIGNAL` call causes an input field leave method to be invoked, and if the method modifies `g_select` or `g_entnam`, they remain modified. This causes the `%M_SIGNAL` call to behave just like a menu entry selected by the user. It also means that a leave method can effectively cancel a signaled menu entry or signal a different menu entry.
- ▶ On Windows, by the time an input field change or leave method signals a menu entry (by using `%M_SIGNAL`), the input context has already begun to shift to the field the user is trying to access. On UNIX and OpenVMS systems, however, the context does not shift to the next input field until menu entries are processed (`I_NEXT`, `I_PREV`, etc.). So signaling a menu entry from a change or leave method will typically cancel the movement to the next field because the new menu entry overwrites the menu entry the user selected. Even if the user left the field by pressing `RETURN`, signaling a menu entry on UNIX or OpenVMS implies that focus should not change unless the program explicitly moves the focus. The same thing occurs on Windows if the user uses a menu entry (`I_NEXT`, `I_PREV`, and so forth) for movement, but does not occur if the user used `TAB/SHIFT+TAB`, `ENTER` or the mouse to leave the field.
- ▶ If a change method signals a menu entry and the response to that menu entry causes the field to be modified (for instance, with `I_FORCE`), an infinite loop may occur.

Combinations of these subtleties can create order-of-magnitude subtleties. For instance, if a method routine signals a menu entry with `%M_SIGNAL` and then calls a Toolkit input routine such as `I_INPUT`, `I_INPUT` clears `g_select` and `g_entnam` and may signal another menu entry. But unless `%M_SIGNAL` is called again before returning from the method, the lost menu entry will be resurrected when the method returns. In general, it is a good idea to avoid these situations, and it's best to avoid nesting methods. You can do this by signaling the menu entry and then returning and

letting the outer-level routine dispatch the signaled menu entry. This approach results in a somewhat flatter application design, which more closely matches Toolkit's event paradigm, where there is no event stack or queue.

There is one subtle effect of `%M_SIGNAL` that makes things easier: `%M_SIGNAL` helps you to synchronize events. On Windows platforms, there are two different types of event processing: the UI Toolkit processing of the menu entry and Windows messaging. Because Windows messages occur quickly—you can get hundreds of them by simply moving the mouse across a window—the Synergy runtime dispatches these messages between lines of Synergy code. And because asynchronous methods are invoked immediately by their associated Windows events, a toolbar method, for example, can be called between statements of another Synergy routine. If the toolbar method and the routine it interrupts access shared data, the result can be extremely confusing. If, however, you limit the toolbar routine to calling `%M_SIGNAL` with an event that will be dispatched later, you have ensured that the associated code will not be executed asynchronously.

# E

## File-Stack Processing

### Introduction to File-Stack Processing E-2

Discusses what file stacks are, how they work, and why you would want to use them.

### The File-Stack Subroutines E-4

|                                                               |      |
|---------------------------------------------------------------|------|
| FS_APPEND – Append a record to the current logical file ..... | E-5  |
| FS_CLOSE – Close one or more logical files .....              | E-6  |
| FS_INIT – Initialize a file-stack system.....                 | E-7  |
| FS_OPEN – Add a logical file to the top of the stack .....    | E-9  |
| FS_PARAM – Get a logical file’s parameters .....              | E-10 |
| FS_QUIT – Terminate a file-stack system .....                 | E-12 |
| FS_READ – Read an existing record from a logical file .....   | E-13 |
| FS_WRITE – Write a record to a logical file .....             | E-15 |

# Introduction to File-Stack Processing

## What is a file stack?

A *file stack* is multiple sets of fixed-length, logical records, stored in a single, physical scratch file. These logical record sets are organized in the file in a last-in, first-out (LIFO) stack manner.

## Why use file stacks?

Let's say that your application does some processing that requires the use of a temporary file. For instance, it presents the user with a list of choices, and records each one selected into the temporary file. However, the user might use a hot entry to pop up a different function, also using a temporary file. Traditionally, even though the first process is suspended, you had to open a separate temporary file for the second process.

Instead, you would like to extend your already-opened temporary file for use by the hot-entry process, and then cut back to your original use of the file when the hot-entry process returns.

When you use the file stack, you have several advantages over creating and maintaining your own temporary files. The main advantages are the following:

- ▶ You do not have to come up with unique names or manage the channels for separate files.
- ▶ You minimize the number of open channels.
- ▶ You localize the mechanism for managing temporary file space to common routines.
- ▶ You tune your file-stack system for high-speed access of temporary work space.

## How file stacks work

The file stack enables you to “stack” temporary files in one file. Each of these temporary files, also called logical files, may have a different record length. As the logical files are stacked, the one most recently stacked becomes the “current” file. When that one is closed, the file that was stacked immediately prior to it becomes the current file.

Typically, processing occurs on the current file, which is also the current level, though you may read from and write to records on any level.

Only the current file can be extended. If you need to extend more than one logical file at a time, you can initiate multiple file stacks. For instance, in the distributed version of the list-processing routines, each list has its own private file stack.

## How much memory do the file stacks allocate?

The amount of memory allocated by the file stack will be the largest specification among the following:

- ▶ The default size 16,384.
- ▶ The size specified by environment variable DTKFSWINSIZ.
- ▶ The size specified by FS\_INIT.
- ▶ The size needed by the file stack routines.

Any value specified is rounded up to the nearest multiple of 16,384 but not more than 114,688.

Note, however, that file stack processing caches data so that data is saved to disk only if the size of the cache (which is just over 100K is exceeded).

# The File-Stack Subroutines

UI Toolkit file-stack subroutines can maintain one or more file stacks. These routines are used by the UI Toolkit's list processor, and can be used from your applications as well.

Multiple file stacks are supported by passing an optional channel number, which is synchronized with the current file stack number. If the channel number is not passed, the default file stack will be used. The default file stack is separate from any file stack accessed by a channel number.

The file-stack subroutines allocate a private memory cache to minimize disk I/O. The scratch file is, therefore, not opened until the cache overflows for the first time. Thus, the channel number passed to these routines is not a true Synergy I/O channel, but rather a handle (virtual channel).

The following pages contain the specifications for the UI Toolkit file-stack subroutines.

## FS\_APPEND – Append a record to the current logical file



```
xcall FS_APPEND (record, [channel][, error])
```

### Arguments

*record*

The record to write. (**a**)

*channel*

(optional) The file-stack channel. (**n**)

*error*

(optional) Returned with one of the following error flags: (**n**)

**0**        No error occurred.

**1**        Not a file-stack channel.

### Discussion

The FS\_APPEND subroutine appends a record to the current logical file.

If *channel* is not passed, the default file-stack channel is used.

It is assumed that the size of the data transfer is the size of the accessed logical file's record length, as specified in FS\_OPEN.

This subroutine only accesses the current (highest) level of the file stack. The record number of the appended *record* will be one greater than the highest record number written to this level. A new EOF point will be set for the level.

If *error* is not passed, and an error occurs, a fatal program error is generated.

### Examples

The following example appends the data in **page** to the end of the current (highest) level in the default file stack.

```
xcall fs_append(page,, sts)
```

## FS\_CLOSE – Close one or more logical files



```
xcall FS_CLOSE([level][, channel])
```

### Arguments

*level*

(optional) The level through which to close. (**n**)

*channel*

(optional) The file-stack channel. (**n**)

### Discussion

The FS\_CLOSE subroutine will close one or more file stack levels, always starting with the current one, and ending with the *level* specified. The highest level number is always the current one.

If *channel* is not passed, the default file-stack system will be used.

### Examples

The following example will close file stack levels 3 and higher (through the current level).

```
xcall fs_close(3)
```

The second example will close the current file-stack level in the file stack whose channel is stored in **filchn2**.

```
xcall fs_close(, filchn2)
```



## FS\_INIT – Initialize a file-stack system



```
xcall FS_INIT([filename], [channel][, size])
```

### Arguments

*filename*

(optional) The name of the physical scratch file to be created and used for the file stack. **(a)**

*channel*

(optional) Returned with the file-stack channel. **(n)**

*size*

(optional) The size (in bytes) of the memory to be allocated for the file-stack cache. If not specified, the default is 16,384. **(n)**

### Discussion

The FS\_INIT subroutine initializes a file-stack system.

If *filename* is not passed, a filename in the form **DTKTMP:XFSnnn.SCR** will be used, where *nnn* is the value returned from the %JBNO routine.

The scratch file will be opened in output mode and the resulting Toolkit channel will be promoted to global status.

If *channel* is not passed, the default file stack will be initialized. If the default file stack has already been initialized, a fatal error occurs.

The scratch file will be opened with the TEMPFILE OPEN qualifier to ensure a unique scratch file for each call to the FS\_INIT subroutine. The DTKTMP environment variable can be assigned to indicate where the file should be created. The file will be only created when the internal memory cache overflows.

The default file-stack cache size can be specified with the environment variable DTKFSWINSIZ. This size specifies the amount of memory allocated by the file-stack if no larger size is specified to FS\_INIT, nor is subsequently needed by the file-stack routines. Any value specified will be rounded up to the nearest multiple of 16,384 but not more than 114,688. Increasing the size may result in improved performance for applications that traverse a large number of records on the file stack (for example, large lists).

## Examples

The following example will initialize a file-stack system by creating a scratch file named **pages.scr**, and will return the virtual channel number in **pgchn**.

```
xcall fs_init("pages.scr", pgchn)
```

## FS\_OPEN – Add a logical file to the top of the stack



```
xcall FS_OPEN(record_size[, channel])
```

### Arguments

*record\_size*

The size of the fixed-length records to be stored in the new logical file. **(n)**

*channel*

(optional) The file-stack channel. **(n)**

### Discussion

The FS\_OPEN subroutine pushes the current logical file on the file stack and opens a new one.

If *channel* is not passed, the default file-stack system will be used.

When a new logical file is opened on the stack, all I/O at that stack level will use data of the size specified in the FS\_OPEN call, regardless of the size of the field that is passed. If a shorter field is used, subsequent data will be accessed.

If *channel* is not passed and there is no default file stack, or if *channel* is zero, Toolkit will automatically call FS\_INIT to activate a new file stack.

### Examples

The following example will add a new logical file to the file stack whose channel is stored in **pgchn**. The size of the records for this new logical file will be 512 bytes.

```
xcall fs_open(512, pgchn)
```

## FS\_PARAM – Get a logical file’s parameters



```
xcall FS_PARAM([rtrn_level], [record_size], [last_rec], [rtrn_channel], [which_level],
&               [which_channel][, error])
```

### Arguments

*rtrn\_level*

(optional) Returned with the file-stack level. **(n)**

*record\_size*

(optional) Returned with the record size of the logical file. **(n)**

*last\_rec*

(optional) Returned with the last record written to the logical file. **(n)**

*rtrn\_channel*

(optional) Returned with the file-stack channel. **(n)**

*which\_level*

(optional) The file-stack level to access. **(n)**

*which\_channel*

(optional) The file-stack channel to use. **(n)**

*error*

(optional) Returned with one of the following error flags: **(n)**

- 0**      No error occurred.
- 1**      Not a file-stack channel.
- 2**      File stack not active.
- 4**      No logical file stacked.
- 6**      Invalid file-stack level.

### Discussion

The FS\_PARAM subroutine returns information about a given logical file for a given file-stack system.

If *which\_level* is not passed or is passed and zero, the current (highest) logical file (level) will be used. If *which\_level* is not specified and no logical file is currently active, *rtrn\_level* will be set to zero and *record\_size* and *last\_rec* will be undefined. If *which\_channel* is not passed, the default file stack will be used.

## Examples

This example returns the current (highest) file-stack level in **level**, the record size of the current logical file in **resize**, the last record written in **lastrec**, and any error in **sts**.

```
xcall fs_param(level, resize, lastrec,,, sts)
```

## FS\_QUIT – Terminate a file-stack system



```
xcall FS_QUIT([channel])
```

### Arguments

*channel*

(optional) The file-stack channel. (**n**)

### Discussion

The FS\_QUIT subroutine terminates the given file-stack system.

If *channel* is not passed, the default file-stack channel is used.

### Examples

The following example terminates the file-stack system whose channel is stored in **pgchn**.

```
xcall fs_quit(pgchn)
```

## FS\_READ – Read an existing record from a logical file



```
xcall FS_READ (record, number, [level], [channel][, error])
```

### Arguments

*record*

Returned with the record read. **(a)**

*number*

The number of the record to read. **(n)**

*level*

(optional) The file-stack level from which to read. **(n)**

*channel*

(optional) The file-stack channel. **(n)**

*error*

(optional) Returned with one of the following error flags: **(n)**

- 0**        No error occurred.
- 1**        Not a file-stack channel.
- 2**        File stack not active.
- 4**        No logical file stacked.
- 5**        Illegal record number.
- 6**        Invalid file-stack level.

### Discussion

The FS\_READ subroutine reads a record that exists in a logical file.

If *channel* is not passed, the default file-stack channel is used.

It is assumed that the size of the data transfer is the size of the accessed logical file's record length, as specified in FS\_OPEN.

If *error* is not passed and an error occurs, a fatal program error is generated.

## Examples

This example reads the data stored in record 3 of the current level of the default file-stack into **page**. Any error will be returned in **sts**.

```
xcall fs_read(page, 3,, sts)
```



## FS\_WRITE – Write a record to a logical file



```
xcall FS_WRITE (record, number, [level], [channel][, error])
```

### Arguments

*record*

The record to write. (**a**)

*number*

The number of the record to write. (**n**)

*level*

(optional) The file-stack level to which to write. (**n**)

*channel*

(optional) The file-stack channel. (**n**)

*error*

(optional) Returned with one of the following error flags: (**n**)

- 0**        No error occurred.
- 1**        Not a file-stack channel.
- 2**        File stack not active.
- 4**        No logical file stacked.
- 5**        Illegal record number.
- 6**        Invalid file-stack level.

### Discussion

The FS\_WRITE subroutine writes a record to a logical file.

If *channel* is not passed, the default file-stack channel is used.

It is assumed that the size of the data transfer is the size of the accessed logical file's record length, as specified in FS\_OPEN.

If the current (highest) level is being accessed, and number is greater than the highest record number written to this level, a new EOF point will be set for the level.

Only the current (highest) level can extend the logical file length. Lower levels (logical files) can only update existing records.

If *error* is not passed, and an error occurs, a fatal program error is generated.

## Examples

The following example writes the data in **page** to record number 5 in file-stack level **page\_level**. If **page\_level** is not the current (highest) level, record number 5 must be an existing record, since you can only extend the logical file length of the highest file-stack level.

```
xcall fs_write(page, 5, page_level,, sts)
```

# F

## Linked-List Processing

### Using Linked Lists F-2

Discusses how to use linked lists, the advantages of using them, and gives the specifications for the linked list subroutines.

|                                                                       |     |
|-----------------------------------------------------------------------|-----|
| LL_CLOSE – Close a linked list on the file stack.....                 | F-3 |
| LL_OPEN – Open a linked list on the file stack .....                  | F-4 |
| %LL_PROCESS – Process a linked list.....                              | F-5 |
| LL_SYNCH – Synchronize duplicate linked-list control structures ..... | F-8 |

## Using Linked Lists

The linked list subroutines enable you to maintain a linked list on the file stack. Because they use the file stack routines (which have a built-in cache), these routines are ideal if you need a mechanism for managing an ordered linked list of items of the same size without a restriction on the number of items, and with automatic paging to disk as needed. (See “[Appendix E: File-Stack Processing](#)” for information on the file stack routines.) With the linked list subroutines you can insert or delete records anywhere in the list, and you can retrieve the first, last, previous, next or previously marked record. You can also update the current record and swap the position of adjacent records.

You pass these routines a control structure, defined in **lnklst.def**, to indicate which linked list on which file stack you are accessing, as well as the current state of that list. The data in the control structure is read-only to calling routines.

## LL\_CLOSE – Close a linked list on the file stack



```
xcall LL_CLOSE(control)
```

### Arguments

*control*

The linked list control structure. **(a)**

### Discussion

The LL\_CLOSE subroutine closes a linked list on the file stack.

This subroutine will close the specified linked list, but the file-stack level (logical file) will only be closed if there are no higher levels active.

### Examples

The following example closes the linked list identified by **lnkctl**.

```
xcall ll_close(lnkctl)
```

### LL\_OPEN – Open a linked list on the file stack



```
xcall LL_OPEN(control, record_size[, channel])
```

#### Arguments

*control*

Returned with the linked-list control structure. **(a)**

*record\_size*

The size of the linked-list records. **(n)**

*channel*

(optional) The file-stack channel to use. **(n)**

#### Discussion

The LL\_OPEN subroutine opens a new linked list on a new file-stack level.

If *channel* is not passed, the default file stack will be used. If *channel* is not passed and there is no default file stack, or if *channel* is zero, a new file stack will be activated.

D\_LL\_CTLSIZE (defined in **tools.def**) should be used in declaring a control structure for the linked-list subroutine. Alternatively, use the structure defined in **lnklst.def**.

#### Examples

The following example will create a linked list on a new level of the default file stack. The size of the linked-list records will be 50, and the control structure will be returned in **lnkctl**.

```
xcall ll_open(lnkctl, 50)
```

## %LL\_PROCESS – Process a linked list



```
rec = %LL_PROCESS (control, operation, data, [error][, mark])
```

or

```
xcall LL_PROCESS (control, operation, data, [error][, mark])
```

### Return value

*rec*

For operations other than D\_LL\_DELETE, this function returns the internal record number of the current record if the operation is successful. For D\_LL\_DELETE, this function returns –1 if successful. If unsuccessful, %LL\_PROCESS returns 0. (^VAL)

### Arguments

*control*

The linked list control structure. (a)

*operation*

The operation to perform: (n)

|                      |                                    |
|----------------------|------------------------------------|
| <b>D_LL_FIRST</b>    | Retrieve first record.             |
| <b>D_LL_LAST</b>     | Retrieve last record.              |
| <b>D_LL_PREV</b>     | Retrieve previous record.          |
| <b>D_LL_NEXT</b>     | Retrieve next record.              |
| <b>D_LL_CURR</b>     | Read current record.               |
| <b>D_LL_WRITE</b>    | Rewrite current record.            |
| <b>D_LL_INSERT</b>   | Insert before current record.      |
| <b>D_LL_APPEND</b>   | Insert after current record.       |
| <b>D_LL_DELETE</b>   | Delete current record.             |
| <b>D_LL_SWAPPREV</b> | Swap current and previous record.  |
| <b>D_LL_SWAPNEXT</b> | Swap current and next record.      |
| <b>D_LL_MARK</b>     | Mark the current record.           |
| <b>D_LL_JUMP</b>     | Retrieve previously marked record. |

*data*

The data for the operation. (**a**)

*error*

(optional) Returned with the error status: (**n**)

**D\_LL\_NOCURR**     No current record.

**D\_LL\_NOTFND**     Requested record not found.

**D\_LL\_FSERR**       File-stack error.

**D\_LL\_NOTTOP**     Not at top level of file stack.

*mark*

(optional) The internal record number of the record you want to retrieve (for **D\_LL\_JUMP** only). (**n**)

## Discussion

The **%LL\_PROCESS** function processes a linked list on the file stack.

The *data* argument is returned with the data for the current record when using **D\_LL\_JUMP** and the **D\_LL\_FIRST** through **D\_LL\_CURR** operations. For **D\_LL\_WRITE** through **D\_LL\_SWAPNEXT** (except **D\_LL\_DELETE**), the data passed as *data* is written to the record. The *data* argument is ignored when using the **D\_LL\_MARK** operation.

If *error* is not passed, all errors are fatal.

The *mark* argument is recognized only by **D\_LL\_JUMP**. All other operations ignore it.

After a **D\_LL\_DELETE** operation, the content of *data* is undefined and there is no current record (*rec* returns -1), but the next and previous pointers remain unchanged.

After a **D\_LL\_SWAPPREV** or **D\_LL\_SWAPNEXT** operation, the next and previous pointers are changed, but the current record pointer remains unchanged.

If there is no previous record for a **D\_LL\_SWAPPREV** operation, or no next record for a **D\_LL\_SWAPNEXT** operation, an error (**D\_LL\_NOTFND**) occurs.

**D\_LL\_MARK** marks the current record for a subsequent **D\_LL\_JUMP** operation. If there is no current record, this operation will cause an error (**D\_LL\_NOCURR**).



D\_LL\_JUMP retrieves either the record specified by *mark* or the last record marked by D\_LL\_MARK. The last record specified by D\_LL\_MARK is retrieved only if *mark* is not passed or is passed as 0. Note the following:

- ▶ If D\_LL\_JUMP is successful, the retrieved record becomes the new current record. *Rec* is returned with the internal record number for that record, *data* is returned with the data for the record, and *error*, if passed, is returned with 0.
- ▶ If no record has been marked by a previous call to D\_LL\_MARK, and *mark* is not passed or is passed as 0, D\_LL\_JUMP fails, and *error* (if passed) is returned with D\_LL\_NOTFND.
- ▶ If *mark* is passed with a non-zero value (including -1, the return value for D\_LL\_DELETE) and the specified record does not exist, D\_LL\_JUMP fails, and *error* (if passed) is returned with D\_LL\_NOTFND.

## Examples

The following example inserts a new record into the linked list. If the operation is successful, the record is inserted before the current record, the new record contains the data passed in **new\_rec**, and the internal number for the record is returned in **rec\_num**. If an error occurs, the error status is returned in **sts**.

```
rec_num = %ll_process(lnkctl, D_LL_INSERT, new_rec, sts)
```

The next example reads the first record in the linked list identified by **lnkctl** and returns the data for the first record in **list\_rec**. If the operation is successful, **rec\_num** is returned with the internal record number of the first record in the linked list. If an error occurs, the error status is returned in **sts**.

```
rec_num = %ll_process(lnkctl, D_LL_FIRST, list_rec, sts)
```

The next example retrieves the record specified by **rec\_num**. If the operation is successful, the data for the record is returned in **list\_rec**.

```
xcall ll_process(lnkctl, D_LL_JUMP, list_rec, sts, rec_num)
```

# LL\_SYNC – Synchronize duplicate linked-list control structures



```
xcall LL_SYNC (mentor, protege[, deleted])
```

## Arguments

*mentor*

The linked-list control structure that contains the most up-to-date information. **(a)**

*protege*

Another linked-list control structure for the same linked list. **(a)**

*deleted*

(optional) Returned true if the *protege*'s current record has been deleted. **(n)**

## Discussion

The LL\_SYNC subroutine synchronizes two control structures for the same linked list.

It is possible to maintain more than one context in a linked list simply by copying the control structure and using one or the other copy in calls to %LL\_PROCESS. The only time this can cause a problem is if records are inserted, appended, deleted, or moved in the list. In any of these cases, the secondary control structure will become outdated and will need to be updated.

This subroutine updates one control structure from another. The *mentor* control structure is assumed to possess the most up-to-date information about the linked list, and the *protege* control structure will learn from it, while maintaining its own current context in the linked list.

If the control structures do not refer to the same linked list, no action will be taken.

If *protege*'s current item has been deleted, *deleted* may optionally be returned true. In this case, the previous and next records will also be checked for deletion, and if they are deleted their pointers will be erased. It is therefore recommended that you re-sync control structures after each such operation, or else discard the *protege* control structure altogether.

Any "marked" record (through D\_LL\_MARK passed to %LL\_PROCESS) will also be checked for deletion. If it has been deleted, there will be no marked record for the *protege* control structure.

## Examples

The example below updates the information in **lnkctl2** from the information in **lnkctl1**, and returns **delflg** set to true if the current item in **lnkctl2** has been deleted.

```
xcall ll_sync(lnkctl1, lnkctl2, delflg)
```

# Glossary

## A

### **arrive method**

For an input field, the method (subroutine) that Toolkit calls before processing the field. For a list, a method (subroutine) that Toolkit calls when highlighting an item.

### **application container**

The outermost window for a Toolkit application. Along with the application title bar (header), frame, menu bar, and footer, the application window owns all windows created for the application, including the application window, the information line, and any toolbars for the application. When the application container is moved or resized, the application window is automatically moved or resized.

### **application window**

The window that owns all Synergy windows and lists created for the application. It is the area below the title bar and menu bar, above the information line, and inside of the outermost window border for the application and any toolbars for the application.

## B

### **body**

The portion of the display screen between the menu bar and the information line. The screen body will contain all of the application's placed windows.

## C

### **callback routine**

An external routine that, when called, appropriates all processing control, including error processing. The calling program regains control only when the callback routine explicitly abdicates it. Note that callback routines are called asynchronously, which means that they can be called between statements in another routine.

### **caption**

A window's caption is synonymous with its title. In a Windows environment, the application as a whole also has a caption, which can be modified with E\_SECT.

### **cascading menu**

Another name for a submenu. "Cascading" describes the effect that submenus create on your screen.

|                                   |                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>change method</b>              | The method (subroutine) that Toolkit calls after validating an input field.                                                                                                                                                                                                                                                                                                |
| <b>child list</b>                 | A list in a composite window. Child lists can be either ActiveX Toolkit lists or standard Toolkit lists.                                                                                                                                                                                                                                                                   |
| <b>child window</b>               | A window within a composite window. Child windows can be any type of Toolkit window: an input window, an ActiveX container, another composite window, and so forth.                                                                                                                                                                                                        |
| <b>client area</b>                | The visible area within a window. This area does not include scroll bars, the information line, the footer, the title bar (header), or menu bars.                                                                                                                                                                                                                          |
| <b>color palette</b>              | There are up to 16 combinations of foreground/background color that can be assigned to any Toolkit rendition. The entire set is called a palette, and an individual combination is called a palette code. You can change the colors assigned to a given palette code by setting the WND environment variable, or through the U_REND, U_MODREND, or U_EDITREND subroutines. |
| <b>container</b>                  | A window that contains another window or control. For example, a container for a button is the window (e.g., a tab set) that contains the button.                                                                                                                                                                                                                          |
| <b>Composer</b>                   | An interactive tool (on Windows) for creating and modifying window scripts.                                                                                                                                                                                                                                                                                                |
| <b>composite container window</b> | The parent window for a composite window.                                                                                                                                                                                                                                                                                                                                  |
| <b>composite window</b>           | A window that consists of a parent window (a composite container window) and child windows and lists, but functions and appears to the user as a single window.                                                                                                                                                                                                            |
| <b>configuration field</b>        | A field you can modify within your program to change operational characteristics of UI Toolkit.                                                                                                                                                                                                                                                                            |
| <b>context</b>                    | The next field that will be processed in an input set. You can change the context with the I_NEXT subroutine.                                                                                                                                                                                                                                                              |

**D**

|                              |                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>data control commands</b> | The commands that affect the position and display of text within text (general) windows and input windows.                                                                                                                                                                                                                                          |
| <b>debugger</b>              | A UI Toolkit utility that enables you to look into the windowing environment and evaluate the state of the Toolkit system.                                                                                                                                                                                                                          |
| <b>demand-loading</b>        | A method used by the list routines to load list data. List items are loaded as needed for display purposes, rather than all at once at the beginning. This can significantly improve the initial performance of processing a large list.                                                                                                            |
| <b>disabled</b>              | Refers to a menu column or entry that the user cannot currently select. See also <a href="#">enabled</a> .                                                                                                                                                                                                                                          |
| <b>dispatch</b>              | To send an event to the routine that is appropriate for handling it. Typically, this involves calling a method (subroutine), or returning the event to the parent routine.                                                                                                                                                                          |
| <b>display</b>               | The display of a program consists of the menu bar and screen body. It also owns menu column and window placement (although the menu columns and windows themselves belong to the environment).                                                                                                                                                      |
| <b>display area</b>          | The part of a window that shows on the screen. It is a subset of the total window area (and can be equal to the total window area). See also <a href="#">view</a> .                                                                                                                                                                                 |
| <b>display attributes</b>    | The attributes of each display cell on the screen can be any combination of reverse video, blinking, highlighted (bold), and underlined.                                                                                                                                                                                                            |
| <b>display length</b>        | The maximum number of characters that can be displayed in a field. This includes any formatting characters and the negative sign if negative numbers are allowed for the field.                                                                                                                                                                     |
| <b>display rendition</b>     | A combination of the display attributes and color of the screen. Each screen cell has its own display rendition.                                                                                                                                                                                                                                    |
| <b>display screen</b>        | The screen layout used by Toolkit. The screen is divided into five sections: header, menu bar, body, information line, and footer.                                                                                                                                                                                                                  |
| <b>drag bar</b>              | In a Windows environment, if DRAGBAR is specified as ON (using the .BORDER command), the window's title bar functions also as a drag bar. The user can move such a window by clicking on the window's title (or caption) bar and, while continuing to press down on the mouse button, dragging the window to a new location within the application. |

**dtkmap.ism**

See [dtkmap.ism](#).

**dtkrnd.ism**

A library that contains the renditions for each defined rendition scheme. Each rendition scheme is stored as a record in **dtkrnd.ism**. See also [rendition scheme](#).

## E

**EHELP\_METHOD**

A programmer-defined subroutine that Toolkit calls when the user selects a menu entry whose internal name is “O\_HELP;” if the method was registered with E\_METHOD.

**empty field**

A field that contains absolutely no data (not even blanks for alpha fields or zeros for decimal or implied-decimal fields). An empty field is also a field that has been neither displayed nor entered since it was last initialized. See also [full field](#).

**enabled**

Refers to a menu column or entry that the user is able to select. See also [disabled](#).

**encapsulation**

A program design philosophy in which a routine is called to perform a specified function, but how it performs that function need not be known to the caller. Private data and methods for the encapsulated routine are not accessible to other routines. Also referred to as “black-box processing”. See also [privatized](#).

**endpoints**

Special optional characters displayed at either end of a scroll bar on a UNIX or OpenVMS system, which may optionally indicate whether or not further progress in that direction is possible.

**entry**

A possible selection in a menu.

**environment**

A program state that consists of the current definition of the screen, any terminal settings and processing options, and open channels. When you create (enter) a new environment, UI Toolkit saves the old environment and copies its attributes to the current one. Any change to an environment item supersedes the previous contents.

**environment level**

Each creation of a new environment. Environments are nested as you go from one to another. A program can have up to 32 environment levels with 16 being the default. An application moves from one environment to another with the E\_ENTER subroutine, and leaves an environment level using the E\_EXIT subroutine. Upon exit, the current environment is deleted, including all of its local items, and the previous environment is restored. See also [shared display](#).

**EUTILS\_METHOD**

A programmer-defined subroutine that Toolkit calls when the user selects a menu entry whose internal name begins with “U\_” if the method was registered with E\_METHOD. It must dispatch the menu entry to the appropriate method. See also [dispatch](#).

**event**

An occurrence to which a routine must respond. Events can be user-generated (for example, by selecting a menu entry) or program-driven (for example, a list needs to load a new item). Events can be dispatched by Toolkit in two ways: (1) They can be returned to the caller for dispatching (for example, menu selections); or (2) They can be dispatched automatically to a specified method.

**event-driven programming**

A programming style that allows Toolkit to control your application after you have called a Toolkit subroutine. After the UI Toolkit subroutine has finished its task, it returns control to your program, potentially signaling that an event has occurred that your program must now dispatch. Also known as “event-style programming”. See also [dispatch](#) and [encapsulation](#).

**F****fatal utility errors**

A problem that results in immediate, unconditional termination of your program, unless trapped by the FATAL subroutine.

**file stack**

A single physical file that contains multiple logical scratch files accessed in a stack manner. Only the most recently opened logical file can be extended, though prior files can be accessed. Logical files contain only fixed-length records. The file stack is managed by the file-stack routines (FS\_xxx).

**file-stack level**

Identifies a logical file within a file stack.

**fixed font**

A font in which every character has the same width. Also known as a monospaced font. See also [proportional font](#).

**font**

A design for a set of characters, comprised of typeface, point size, width, and spacing. For example, within the Helvetica typeface there are many different fonts: 10-point italic, 12-point bold, and so forth.

**font handle**

An identifier associated with a font. Be aware that this identifier is not a memory handle, and, therefore, the font handle’s value can coincidentally be the same as an existing memory handle.

**font palette** A group of font entries, each associating a font name with a typeface, point size, and sizing character combination. You can change a font palette entry by explicitly modifying it in a Synergy initialization file, modifying it with Composer, or by calling the %U\_WNDFONT function.

**footer** An optional trailer for the UI Toolkit screen layout. The footer can be up to four lines long. You can place information into the footer with the E\_SECT subroutine.

**force buffer** The location to which pending input is copied if the user selects a menu entry (for example, a search function) before pressing RETURN to enter the data. You must use the I\_FORCE subroutine to get that data from the force buffer into your program.

**full field** A field that contains data. Note that a field can be full of blanks and still be considered full. A full field has been either displayed or entered since its last initialization. See also [empty field](#).

## G

**general window** A basic window that is not an input window, selection window, list, or menu column. General windows are usually used to convey information, such as error or information messages. Text windows and Message windows are general windows. See also [text window](#).

**global** Refers to an element that is owned by the entire environment system rather than by a specific environment level. Global elements can be defined or deleted at any environment level, but they are not automatically deleted when exiting an environment. Global elements include Synergy channels, columns, windows, and lists. See also [local](#).

## H

**header** An optional banner for the UI Toolkit screen layout. The header can be up to four lines long. You can place information into the header with the E\_SECT subroutine.

**hot entry** A routine that is not tied to any particular program and is accessible from anywhere in your application. Hot-entry processing is performed by the EHELP\_METHOD and EUTILS\_METHOD subroutines, which you write yourself but which are called by one of the UI Toolkit general input routines (such as I\_INPUT, I\_INPFLD, T\_EDIT, or T\_VIEW).



**I**

|                         |                                                                                                                                                                                                                                                                            |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>include file</b>     | A file containing data definitions that is included by a routine using the <code>.INCLUDE</code> compiler directive. Also called a definition file.                                                                                                                        |
| <b>information line</b> | A single line at the bottom of the screen body (above the footer) that is used by Toolkit to display messages and general information.                                                                                                                                     |
| <b>inheritance</b>      | When one class of object is derived from another, it may retain characteristics (properties) of its parent class. This is termed inheritance. In Toolkit, fields derived from the Repository inherit all of the properties defined therein, but may overload some of them. |
| <b>input field</b>      | A window field associated with a set of characteristics that define how terminal input and display are to occur.                                                                                                                                                           |
| <b>input length</b>     | The maximum number of characters that can be entered into an input field.                                                                                                                                                                                                  |
| <b>input set</b>        | A list of one or more fields in an input window. An input set defines the default order for processing fields.                                                                                                                                                             |
| <b>input window</b>     | A window that can contain text, input fields, and buttons.                                                                                                                                                                                                                 |

**K**

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>key map</b>                 | A record in the key map file that defines the correspondence between the function keys and other special keys on the user's keyboard and the functions they perform. A user's terminal type is stored in the logical DTKTERM (or TERM), which UI Toolkit uses as the key to locate the appropriate record in the key map file. When the window environment is initialized, Toolkit loads the key map defined in DTKTERM (or TERM). |
| <b>key map file</b>            | A file ( <b>dtkmap.ism</b> by default) that associates keys (escape sequences) with internal function codes to create shortcuts.                                                                                                                                                                                                                                                                                                   |
| <b>key mapping script file</b> | A file ( <b>keymap.ctl</b> by default) that contains function codes for shortcuts for a given environment or terminal type. When you generate a window library, shortcuts defined in the key mapping script file are combined with shortcuts specified with <code>.ENTRY</code> .                                                                                                                                                  |
| <b>keymap.ctl</b>              | See <a href="#">key mapping script file</a> .                                                                                                                                                                                                                                                                                                                                                                                      |

### L

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>leading</b>      | The spacing between lines of text.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>leave method</b> | For an input field, the method (subroutine) that Toolkit calls after processing the field. For a list, the method (subroutine) that Toolkit calls when it is preparing to change which item is highlighted.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>linked list</b>  | A list of records in a logical file within a file stack. Linked lists are maintained with the linked-list routines (LL_xxx). Records can be inserted or deleted at any point, and the ordering of logically adjacent records can be interchanged. First, last, previous, next, and previously marked records can be retrieved.                                                                                                                                                                                                                                                                                                                                |
| <b>list</b>         | A set of data and windows managed by the list-processing routines (L_xxx) to maintain a visible list of items. List items are loaded on demand. New items can be inserted at any point, and existing items can be deleted. Adjacent items can be interchanged. The list pointer can be positioned up or down one item, one page of items, to the top or bottom of the list or of the current page. The horizontal display area can be modified, and is automatically tied to the display area of the list's input window. Searching for a specific alphanumeric string is also supported. See also <a href="#">list class</a> and <a href="#">null list</a> . |
| <b>list class</b>   | A set of specifications for creation of a list. These include default placement, number of visible items, headers, footers, whether or not the list may be null, and other options. You can define list classes in scripts and store them in window libraries (with the .LISTCLASS command) or you can create them at runtime (with the L_CREATE subroutine).                                                                                                                                                                                                                                                                                                 |
| <b>load method</b>  | The method (subroutine) that the UI Toolkit's list-processing routine calls when it needs to load items in a list.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>local</b>        | Refers to an element owned by the defining environment level. Only the defining environment level can delete a local element. Local items include channels, columns, and windows. All local columns and windows are deleted and all local channels are purged when an environment level is exited. See also <a href="#">global</a> .                                                                                                                                                                                                                                                                                                                          |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>logging</b>      | A way to associate Synergy channels and window IDs with the internal control structures of Toolkit. All channels and windows are automatically logged if they are opened or loaded with a Toolkit subroutine. If a program creates, loads or restores a window without using the U_LDWND, M_LDCOL, or I_LDINP subroutine, the window ID must be logged into the utility system by the U_LOGWND subroutine. When the window is logged, it is marked as global or local. If it is local, the current environment is the defining environment level.                                            |
| <b>logical file</b> | A set of fixed-length records grouped together and maintained in a file stack. A logical file is associated with a single level.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>M</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>margin</b>       | The number of spaces from the left and right edge of the window that will not be occupied by text.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>menu</b>         | A menu consists of menu columns associated with the menu bar.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>menu bar</b>     | A one-line bar across the screen that lists the menu columns available to the current environment level. The menu bar follows the optional header and is part of the display screen. See also <a href="#">process-menu key</a> .                                                                                                                                                                                                                                                                                                                                                             |
| <b>menu column</b>  | A window that contains entries which a user can select. There are two kinds of menu columns: primary and submenu. A primary menu column is a drop-down list of selections from the menu bar. A submenu column is a drop-down list of selections adjacent to a primary menu entry or another submenu entry. Both types of menu columns are defined in a script file and are generated either by the Script or Proto programs, or at runtime. The terms “menu column” and “column” are used interchangeably. See also <a href="#">entry</a> , <a href="#">Script</a> , <a href="#">Proto</a> . |
| <b>method</b>       | A subroutine or function that you can write, but that is called by Toolkit. There are event methods (arrive methods, leave methods, etc.), composite window processing methods, environment methods, and so forth.                                                                                                                                                                                                                                                                                                                                                                           |
| <b>modal</b>        | A term used in Windows environments to describe functions, routines, or applications that suspend all other processing until that function (routine or application) is done processing. Application-modal means that other processes <i>within</i> that application are unavailable until the modal process is complete; however, the user can use ALT+TAB or click on another application to move and do processing within other applications.                                                                                                                                              |

### N

#### **non-window data**

In list processing, the data buffer containing additional information that you don't want to display in the list. Non-window data can be supplemental data that needs to be stored and retrieved for each list item. Although this data may duplicate input window data, it will be stored and retrieved in the format passed to the list processor, whereas the input window data is stored and retrieved as displayed.

#### **null list**

A list with no items loaded into it, or a list that has had its last item deleted. You can prohibit null lists in a list class. See also [list class](#).

#### **numeric fields**

A **d** (decimal) or **i** (integer) input field.

### O

#### **occluded window**

A window that is covered, in whole or in part, by another window. No terminal input can be performed within the covered area of the window. All other processing of the windows remains unaffected by the occlusion.

#### **overloading**

Redefining the properties or methods for an object. In Toolkit, the properties of fields derived from the Repository can be redefined, or overloaded, in the script file (or by `IB_FIELD` or `I_FLDMOD`). The general help method supplied by UI Toolkit (`TKP_HELP`) can be overloaded by registering your own version with `E_METHOD`.

### P

#### **point size**

The height of characters in a font. A point equals 1/72 of an inch.

#### **pristine state**

The initial state of the input window display data and the associated data field upon creation of a list (in other words, as passed to `L_CREATE`). This state is re-created each time the list processor requests load of an item, and is useful for loading initial values (prompts, static data).

#### **privatized**

Reserved for the private use of a graphic control and unavailable for public use by the calling routines.

#### **process-menu key**

The key or key sequence that the user presses to activate a menu. This key is a toggle that also deactivates the menu. As Toolkit is distributed, the process-menu key is `ALT` on Windows and `CTRL+P` on all other systems.

|                                    |                                                                                                                                                                                                                                                                                                                  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>proportional font</b>           | A font in which different characters have different widths. See also <a href="#">fixed font</a> .                                                                                                                                                                                                                |
| <b>Proto</b>                       | A menu-driven program that creates windows from a script file, displays them on the screen, and stores them in a window library.                                                                                                                                                                                 |
| <b>pseudo array</b>                | A single-dimension array of type <b>a</b> , <b>d</b> , <b>d.</b> , <b>i1</b> , <b>i2</b> , <b>i4</b> , <b>i8</b> , <b>p</b> , or <b>p.</b> (for example, <b>10a5</b> ).                                                                                                                                          |
| <b>Q</b>                           |                                                                                                                                                                                                                                                                                                                  |
| <b>quick-select character</b>      | A single character that accesses a menu, column entry, or selection window item. The default quick-select character is the first non-blank character of each entry. Quick-select characters are not case sensitive and can be defined in the menu column or selection window script file.                        |
| <b>R</b>                           |                                                                                                                                                                                                                                                                                                                  |
| <b>ratio of current to maximum</b> | The relationship between what is currently displayed in a window and the total possible.                                                                                                                                                                                                                         |
| <b>redraw key</b>                  | The key or key sequence that the user presses to redraw the screen. As Toolkit is distributed, the redraw key sequence is CTRL+R.                                                                                                                                                                                |
| <b>rendition file</b>              | See <a href="#">dtkrnd.ism</a> .                                                                                                                                                                                                                                                                                 |
| <b>rendition scheme</b>            | A record in <b>dtkrnd.ism</b> that defines the display attributes and colors for your screen. Each rendition scheme has a unique name that UI Toolkit uses as the key to locate the appropriate record in <b>dtkrnd.ism</b> . See also <a href="#">dtkrnd.ism</a> and <a href="#">working rendition scheme</a> . |
| <b>repository</b>                  | Where data definitions are stored.                                                                                                                                                                                                                                                                               |
| <b>Repository</b>                  | The application that orders and defines your data structures, files, and attributes.                                                                                                                                                                                                                             |
| <b>routine</b>                     | A main routine, subroutine, or function.                                                                                                                                                                                                                                                                         |
| <b>S</b>                           |                                                                                                                                                                                                                                                                                                                  |
| <b>scriidl</b>                     | A utility that converts and moves field information from existing script files into the Repository.                                                                                                                                                                                                              |
| <b>Script</b>                      | A program that creates windows or columns from a script file and saves them in a window library. See also <a href="#">window libraries</a> .                                                                                                                                                                     |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>script file</b>                | A standard text file that contains special commands for building windows.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>scroll bar</b>                 | A one-dimensional window that is used to represent progress or regress by moving an indicator from one end of the window to the other. Scroll bars can optionally contain endpoints, which may indicate whether or not further progress in the given direction is possible. See also <a href="#">endpoints</a> .                                                                                                                                                                                                                                                                                                                             |
| <b>selection entry/field/item</b> | The item selected from a list or menu. The terms “selection entry,” “selection field,” and “selection item” are all synonymous.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>selection window</b>           | A window with a choice of one or more items that can be selected (usually with arrow keys).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>shared display</b>             | A display that is accessible by more than one environment level. Any changes made to the display in one environment level are reflected in all other environment levels that share that display. See also <a href="#">environment level</a> .                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>shortcut</b>                   | <p>A key or key sequence that is associated with a specific menu entry. It provides a quick way to access a menu item, bypassing the standard menu entry selection method.</p> <p>Shortcuts, except for arrow keys, can be processed at any time when the program is requesting input. During menu processing, the arrow keys are disabled as shortcuts and are used to move between menu and column entries.</p> <p>On Windows, some keys are privatized by certain controls (input fields, lists, and so forth), and are thus not available as shortcuts when those controls are being processed. See also <a href="#">privatized</a>.</p> |
| <b>sizing character</b>           | A single character that determines the cell size within a visual object for the purposes of positioning. For example, when you specify the sizing character to be “W”, the cell size is significantly wider than with a sizing character of “i”. Additionally, the sizing character is case sensitive, so a lowercase “w” sizing character produces a smaller cell size than an uppercase “W” sizing character.                                                                                                                                                                                                                              |
| <b>state flags</b>                | Flags marking the state of the environment. These flags can be set using the E_STATE subroutine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>storage size</b>               | The size of the data area for a field (in bytes).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

|                                         |                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>structure</b>                        | Defines the relative positions of fields within a data area (for example, a record). Structures for input fields can be drawn from the Repository or defined in a window script or with the IB_STRUCTURE subroutine.                                                                                                                                      |
| <b>submenu column</b>                   | See <a href="#">menu column</a> .                                                                                                                                                                                                                                                                                                                         |
| <b>Synergy UI Toolkit Control Panel</b> | A program ( <b>synctl.dbr</b> ) that enables you to customize many aspects of Toolkit, including message text, renditions, and keymapping.                                                                                                                                                                                                                |
| <b>T</b>                                |                                                                                                                                                                                                                                                                                                                                                           |
| <b>tab set</b>                          | A group of related windows, rendered in the metaphor of tabbed file folders. The tab set processing functions in UI Toolkit enable you to associate input windows or lists with the “tabs” of a tabbed dialog. Specific input window or list processing is handled using a method that you register with Toolkit.                                         |
| <b>text entry</b>                       | An entry in a window library that contains only compressed text.                                                                                                                                                                                                                                                                                          |
| <b>text field</b>                       | A multi-element alpha field that contains editable text.                                                                                                                                                                                                                                                                                                  |
| <b>text window</b>                      | A special window that contains variable-length, editable text. The user can change the “view” of a text window by scrolling through it with a view-control menu column. See also <a href="#">general window</a> .                                                                                                                                         |
| <b>tkctl.def</b>                        | A file that contains runtime modifiable fields that affect the operational characteristics of Toolkit.                                                                                                                                                                                                                                                    |
| <b>toolbar</b>                          | A variable-size rectangle containing buttons, which are selected by clicking the mouse on the button face. The toolbar functions enable you to create and manipulate an application window toolbar. Toolbars provide an alternative method for invoking functions within an application; they are used as extensions to or replacements for the menu bar. |
| <b>tools.def</b>                        | A file used by Toolkit and your routines. It contains general definitions and is a required include file for programs that use the UI Toolkit subroutines. Do not modify <b>tools.def</b> .                                                                                                                                                               |
| <b>true/false flags</b>                 | A numeric value passed or returned to the routine. If the flag is zero (0), it is false. If the flag is any value other than zero, it is true.                                                                                                                                                                                                            |
| <b>typeface</b>                         | A design for a set of characters which defines the shape of each character. For example, Helvetica and Times Roman are typefaces. The two general categories of typeface are serif and sans serif.                                                                                                                                                        |

### U

**user data set** A one-dimensional alpha array that is associated with a window (rather than your program) and is maintained within the window data area by the window system. Its parameters and contents are completely defined by you. The data is not displayed.

### V

**view** The portion of a text or input window that is visible to the user. See also [display area](#).

**view length** A setting that determines the width of a field.

### W

**window field** A portion of a window defined by row, column, length, and contents; and whose contents are visible.

**window libraries** A Synergy ISAM file with a specific format. Windows are saved to and restored from window libraries by Toolkit.

**working rendition scheme** The scheme stored with a blank key in a rendition file. It is used as the default scheme when a scheme is not specified in one of the rendition subroutine calls. See also [rendition scheme](#).



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