HYDRA

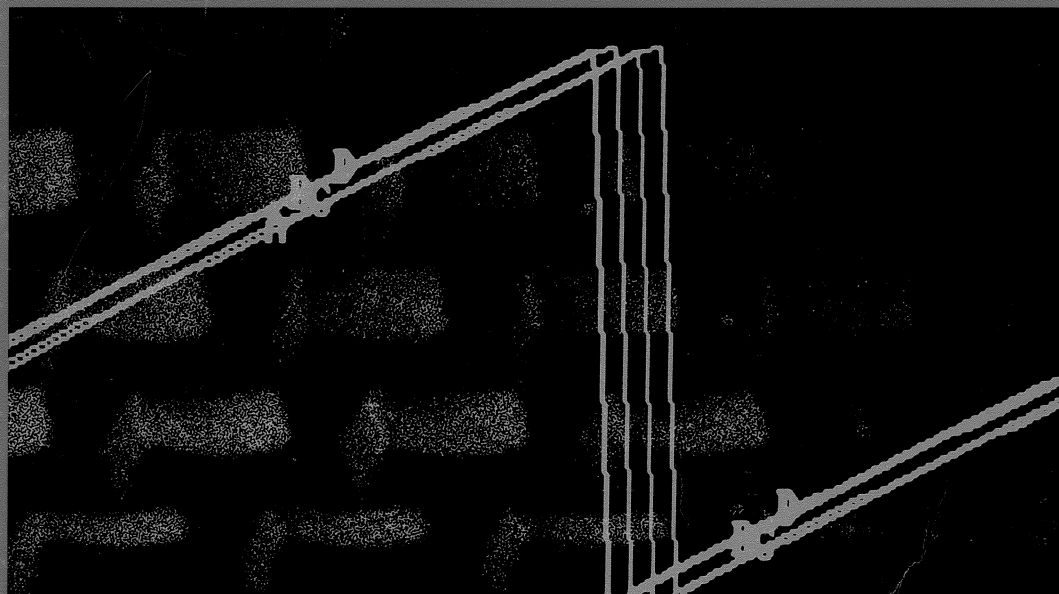*APPLICATION SOFTWARE*
HYDRA LOGGER PACKAGE


```
988 VDC   B:   8.1132 VDC    2:   8.1312 VDC    3:    8.1
820 VDC   6:  -8.1648 VDC    7:  -8.1468 VDC    8:   -8.1
956 VDC  11:  -8.8776 VDC   12:  -8.8596 VDC   13:   -8.8
992 VDC  16:   8.8888 VDC   17:   8.8232 VDC   18:    8.8
772 VDC                    Total:     143        DI:  HLLI

824 VDC   D:   8.1168 VDC    2:   8.1348 VDC    3:    8.1
784 VDC   6:  -8.1684 VDC    7:  -8.1424 VDC    8:   -8.1
```

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HYDRA
APPLICATION SOFTWARE
HYDRA LOGGER PACKAGE

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Section 1
Getting Started

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SUMMARY OF GETTING STARTED 1-1.

Hydra Logger Package™ (Logger) is a menu-driven, software package that is used to build a Hydra instrument and channels configuration database, transfer that data to the instrument, acquire data from the instrument, and manage the acquired data. Logger is sold as an accessory to Hydra and facilitates operating Hydra remotely from an IBM PC® (or compatible) over an RS-232 interface (all Hydra models) or IEEE-488 bus (Hydra Model 2620A Data Acquisition only).

For details on how to operate Hydra, refer to the following users manuals:

*   *Hydra 2620A Data Acquisition Unit/2625A Data Logger Users Manual* (PN 885988)
*   *Hydra 2635A Data Bucket Users Manual* (PN 931894)

Some major features of the Logger software are as follows:

*   Supports up to two Hydra instruments at a time using RS-232 (COM1 or COM2) or IEEE-488.1 (Model 2620A only) communication links.

*   Provides selectable RS-232 communication parameters (baud, parity, etc.), allowing easy setup of communications between the PC and Hydra.

*   Allows complete setup and operation with pull-down menus and text entries, eliminating the need to learn remote commands and syntax.

*   Provides a trend plot display during data acquisition with a graphics-capable display adapter. If a graphics-capable adapter is not installed, data is displayed in text mode only.

*   Allows Hydra to take measurements automatically at a user-defined interval. Measurements can be recorded automatically in a file.

*   Outputs a strip-chart printer plot on an Epson/IBM graphics compatible printer. Communication with the printer is via the PCs parallel interface (LPT1, LPT2, etc.).

*   Saves and reuses experiment setups (using files on the PC).

*   Uploads readings logged in the Model 2625A Data Logger internal data memory.

*   Manages Model 2635A Data Bucket memory card files.

SYSTEM REQUIREMENTS   1-2.

Logger is designed to run on the IBM PC®, PC-XT®, PC-AT®, 386, and 486, or true compatibles on the MS/PC-DOS operating system (version 3.3 or later).

The software consists of two executable "packed" program files: LOG.EXE and PG.EXE, plus a text file README.TXT. The LOG.EXE file unpacks the Logger application and the PG.EXE file unpacks the Pruning and Grafting Utility. For additional information about Logger, the README.TXT file can be read at the PC using word processing or a text editor. For additional information about the Pruning and Grafting Utility, the unpacked PANGD.DOC can be read at the PC, using word processing or a text editor. These files are distributed on both 5-1/4 inch (360K) and 3-1/2 inch (720K) diskettes to accommodate PCs with various disk drives.

Logger will work with the following standard IBM (or compatible) display boards:

*   Standard monochrome text display

*   Hercules Graphics Adapter

*   Color Graphics Adapter (CGA)

*   Enhanced Graphics Adapter (EGA)

*   Video Graphics Array (VGA)

*   Super VGA (SVGA)

USING THIS MANUAL   1-3.

Section 1 "Getting Started" provides an overview of Logger plus installation procedures and an introduction to the operation of Logger.

Section 2 "Menus and Windows" provides an extended description of the Logger menus and windows, and hints for operation.

Section 3 "Typical Operations" provides common sequences for operating Logger.

Section 4 "Pruning and Grafting Utility" provides the procedures for using the Logger Pruning and Grafting Utility.

Assumptions   1-4.

This manual assumes that Logger is configured as shipped from the factory. To ensure this, if a LOGGER.INI file (the Logger initialization file) is in the current working directory, delete it, rename it, or copy it to another directory.

Conventions 1-5.

The following conventions are used in this manual to help distinguish command line keystrokes from surrounding text.

ccc   Hydra and Logger command names are represented as all lowercase characters. However, these commands can be entered as any combination of uppercase and lowercase characters.

                Example: freq2

                means type the command "FREQ2" in any combination of uppercase and lowercase characters.

<ENTER>   Means press the carriage return or enter key on your PC.

<XXX>   Angle brackets enclosing all uppercase characters means press the "XXX" key.

                Example: <ESC>

                means press the "ESC" key.

LOADING AND RUNNING LOGGER 1-6.

The following information explains how to load and run Logger software, move around in the menu structure, and establish a communication link with Hydra. At each level of the menu structure, a help message for the currently highlighted menu item or active data entry window is displayed when you press the F1 key. The help text selected is dependent on the current selection in the menu. When you are done with the help screen, press any key on the keyboard (<SPACE> is convenient) to return to the menu.

What You Should Know 1-7.

Logger is easier to master if you are already familiar with the general operation of Hydra and the IBM Personal Computer.

You should be able to do the following:

- Locate and interconnect the serial ports (RS-232 interface connector) on the PC and Hydra.

- Plug in and turn on the PC and be sure the operating system (DOS) is loaded.

- Specify a path and file name (e.g., `C:\LOGGER\LOGGER.EXE`).

- Specify a pattern for matching (e.g., `DIR A:\*.TST`).

- Change the active drive.

You should also be able to use these DOS commands effectively:

*   `MD` (make directory, e.g., `MD C:\LOGGER`)

*   `DIR` (show directory listing)

*   `COPY` (copy a file, e.g., `COPY A:\*.* C:\LOGGER`)

*   `CD` (change working directory, e.g., `CD C:\LOGGER`)

If you do not know how to perform the actions and use the DOS commands indicated above, refer to the appropriate sections of your computer's operation or operating system (DOS) manual.

Setting Up   1-8.

First, make one backup copy of the Logger disk. Then store the original for safekeeping. Use the copy for day-to-day operations.

CAUTION

When Logger is being run, memory resident programs may cause a loss of serial data. Your AUTOEXEC.BAT file may be executing a program that stays active after returning to DOS (a terminate and stay resident program). It may be necessary to edit the AUTOEXEC.BAT file and reboot.

Connect the IBM PC serial port to Hydra using an appropriate cable (see the Users Manual for more information). If two Hydras are to be connected, connect each to a separate PC COM port, i.e., COM1 and COM2.

*   Use the Fluke RS40 terminal interface cable (DB-9 to DB-25 female connector) to connect a Hydra to a PC, PC/XT, or PS/2.

*   Use the Fluke RS41 modem cable (DB-9 to DB-25 male pins) if a Hydra is connected to a modem.

*   Use both the Fluke RS40 and RS41 cables to connect a Hydra to a PC/AT.

Installing Logger and the Pruning and Grafting Utility
On A Hard Disk   1-9.

Perform the following procedure to install Logger and the Pruning and Grafting Utility on a hard disk (assuming the use of a directory called `LOGGER`):

1. Change the default drive to the hard disk (`C:\>` prompt).

2. Make a directory on the hard disk by entering the DOS command line:

    `C:\> MD LOGGER <ENTER>`

3. Change to this directory using:

    `C:\> CD LOGGER <ENTER>`

4. Insert the Hydra Logger disk into a floppy disk drive (assumed to be the A drive).

5. With the `C:\LOGGER>` prompt displayed, copy the files from the A drive to the C drive by entering the following command:

   ```
   COPY A: *.* <ENTER>
   ```

   With the 3-1/2 inch floppy disk, three files are transferred:

   ```
   README.TXT
   LOG.EXE
   PG.EXE
   ```

   For 5 1/4-inch floppy disks, steps 4 and 5 are repeated for each of the two disks, copying the same three files. (Note that each of the 5 1/4-inch floppy disks have identical README.TXT files.)

6. Unpack Logger by typing:

   ```
   LOG <ENTER>
   ```

7. Unpack the Pruning and Grafting Utility by typing:

   ```
   PG <ENTER>
   ```

8. Start Logger by typing:

   ```
   LOGGER <ENTER>
   ```

   At the opening message, press any key to proceed to the Main Menu, which will appear as shown in Figure 1-1. Use the QUIT function to return to DOS.

9. Start the Pruning and Grafting Utility by typing:

   ```
   PANDG <ENTER>
   ```

   At the opening message, press any key to proceed to the Main Menu, which will appear as shown in Figure 1-2. Use the EXIT function in the FILES menu to return to DOS.

10. To execute the program from directories other than `C:\LOGGER>`, add the subdirectory `LOGGER` to the path statement in your `AUTOEXEC.BAT` file.

11. Use a text editor or word processing application to open and read the `README.TXT and PANDG.DOC` files for additional information about Logger and the Pruning and Grafting Utility.

Logger Command Line Switches   1-10.

Logger command line arguments are supported to allow start up from a batch file (such as AUTOEXEC.BAT) or to customize the operation of the program. These command line arguments are as follows:

/G   Startup data collection without Setup Menu.

/F<name>   Use <name> as the default configuration file.

/T<number>   Delay <number> of seconds before starting.

/M   Use monochrome mode.

/L   Inhibit display of the logo screen at startup.

/C   Inhibit configuration download when beginning data collection.

/D   Dial the modem at data collection startup.

/W   Run Logger under Microsoft® Windows™.

/Un   Start up memory upload without Setup Menu (Model 2625A Data Logger only). The n entry is either a 1 or 2 to indicate Hydra 1 or Hydra 2 as the source of the data.
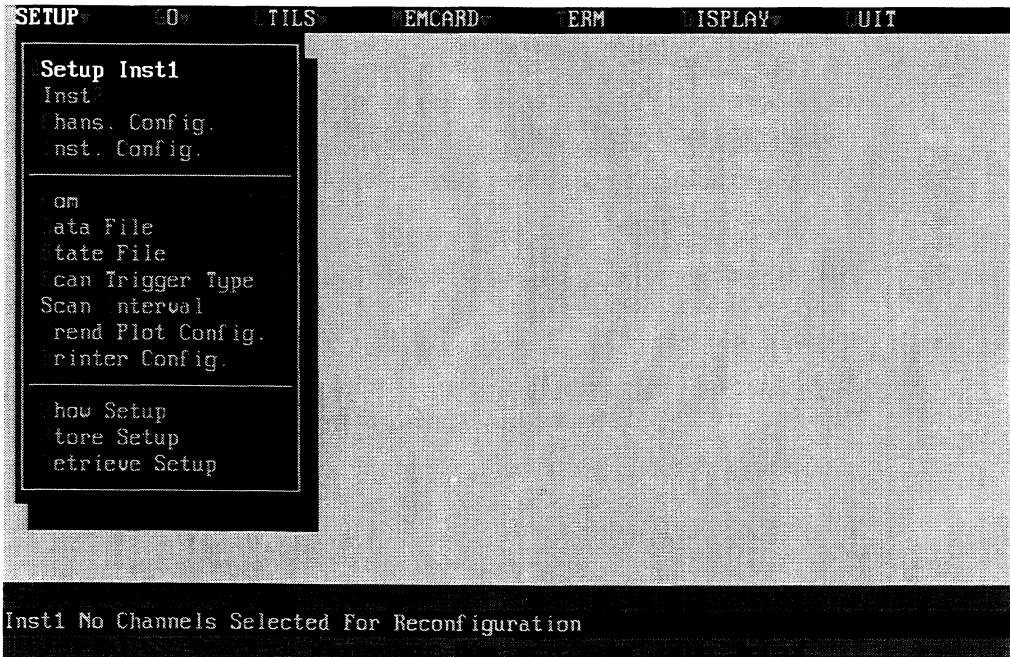
Figure 1-1. Main Menu for Logger

/UCn   Start up memory upload without Setup Menu, then clear memory
            (Model 2625A Data Logger only). The n entry is either a 1 or 2
            to indicate Hydra 1 or Hydra 2 as the source of the data.

When /G is included on the command line, data collection is entered without any
user interaction (the logo and Main Menu screens are not displayed).

When /F is included, the file specified in the /F<name> argument is used as
the Logger configuration default file.

The /T argument is used to delay data collection startup until equipment used in
the test setup is warmed up and ready.

The /M switch is used to force the use of monochrome display format on a color
display adapter. Logger automatically adapts to the graphic or text display adapter
installed in your PC; however, if you have color-capable adapter (EGA, VGA, or
SVGA) and are using it with a monochrome monitor, you may want to defeat color
display with the /M command line switch. The reason for this is that these adapters
attempt to use gray shading to simulate color on a black and white monitor, which
makes it difficult to read some of the menu items.
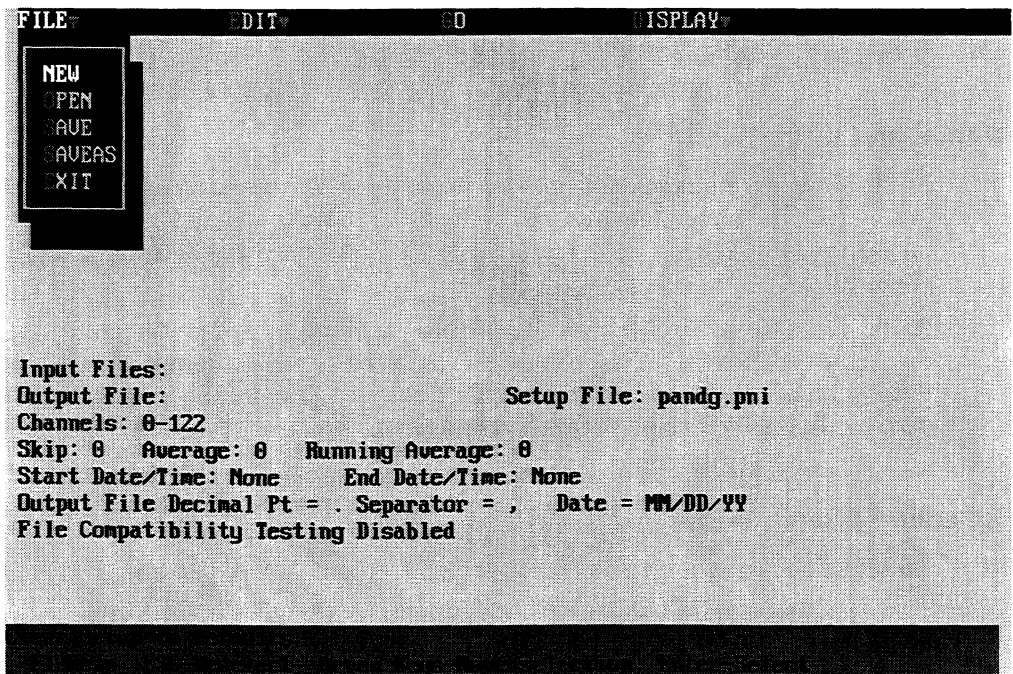
Figure 1-2. Main Menu for the Logger Pruning and Grafting Utility

The /L switch is used to inhibit the display of the startup logo screen.

The /C switch is used to inhibit a configuration download when beginning data collection.

The /D switch is used in conjunction with the /G switch to force the program to dial a preselected phone number on an attached modem.

The /W switch is used when Logger is run in the background mode under Windows version 3.0, inhibiting Logger from using a graphics display mode that is incompatible. This switch is not required for Windows version 3.1 or higher. The Trend Plot is disabled when this switch is used. See Appendix B for more information.

The /Un and /UCn switches are used to upload the contents of a Hydra Logging Memory (Model 2625A Data Logger only) without user interaction. Either the default setup file or the setup file specified in the /F argument is used. If /UCn is used, the logging memory is cleared after the upload is completed. The n entry is either a 1 or 2 to indicate Hydra 1 or Hydra 2 as the source of the data. (When using /Un with Hydra Main Firmware version 5.4 or before, the logging memory is always cleared after an upload.)

As an example of the command line switches, you could start data collection (without the Setup Menu) using STARTUP.INI as the default configuration file after a 100-second wait with the following command:

```
C:\LOGGER>LOGGER /G /FSTARTUP.INI /T100
```

Menus and Entry Windows   1-11.

The following paragraphs describe how to move around the menus and entry fields in Logger. The menus are arranged in the order that you will probably use to set up the program. When you first go to the Main Menu, the Setup Menu is displayed (Figure 1-1).

At the top of the screen is the Main Menu bar. At the bottom of the screen are three lines of text. The first line is a short description of the item currently highlighted; the second line is a short description of the allowed action; the last line displays the commands that you could perform at this point.

Similar operations apply to the Pruning and Grafting Utility (Figure 1-2).

Selecting From a Menu   1-12.

To select an item within a menu or submenu, do one of the following:

- Use the up/down arrow keys or a mouse to move the cursor to the desired selection, then press <ENTER>. If a mouse is used, the mouse and its associated driver must be properly installed before starting Logger or the Pruning and Grafting Utility.

- Press the key that corresponds to the highlighted letter in the selection, then press <ENTER>.

To exit from a menu, press <ESC>.

There are three types of menu items in Logger:

- Items with a small arrow displayed next to them. These will display a lower level menu when that item is selected.

- Items that toggle functions will display a check mark. This indicates the choice you have made.

- Items that open a data entry window when they are selected. These windows are described in more detail below.

Data Entry Windows   1-13.

Data entry windows allow you to enter values (such as a scan interval). To move among entry fields, use the up and down arrow keys or the <TAB> and <SHIFT> keys.

An entry field is a field in a submenu in which you can enter or edit information (i.e., file names) or numerical values. Entry fields are easily identified because they are highlighted and prompt you to enter a number, file name, or some other string of characters.

To change an entry, either type an entire new entry, or use the left and right arrow keys to move the cursor to the position of the characters to be changed, and overtype. The <INS> key may be used to toggle character insert mode. If you make a mistake, re-enter the value, or press the <ESC> key to cancel all the entries made during this time.

When you have finished making all entries in a data entry window, press <ENTER> to save the new information, or <ESC> to escape back to the previous menu (<ESC> cancels all new entries).

Functions Active During Data Collection   1-14.

If the display adapter supports graphics display, the Trend Plot function is enabled, and the /W switch was not used, a trend chart is displayed on the top half of the screen. An example of a Trend Plot is shown in Figure 1-3. The chart is a horizontal plot of value vs. time for readings on up to eight Hydra channels. The chart slides left when the traces reach the right margin. Function key F5 switches between graphics/table and table only. The most recent readings from plotted channels are displayed in numeric table form in the bottom half of the screen. If the display adapter does not support graphics display, the trend plot is disabled, or the /W switch is used, only the numeric table is displayed.

If printer plotting is not disabled (Figure 2-19) and a printer is attached to the PC, an output text or output plot mode may be selected (Figure 2-19). Figure 1-4 shows an example of the output text mode and Figure 2-20 an example of the output plot mode. The printer must have Epson/IBM graphics capability. There are no restrictions to the number of channels for printing (plot or text mode).

The Hydra keypad is locked during data collection mode and unlocked upon exit. This prevents accidental changes to channel configurations during data collection.

Active alarms are indicated by changing the color of the channel reading (or by displaying the reading in intense video on monochrome displays). Also, "ALARM" is displayed in the units field, or beside the reading, depending on the space available on the screen.

Logger allows for three scan triggering methods: interval scanning, externally triggered scanning, and triggering on monitor channel alarm. You may also enter the number of scans to skip between sets of scan data that are stored to the file (Figure 2-16).

When data collection is started, new data appended to an existing data file is checked for format consistency. If the format of the file is inconsistent with the format of the new data, the format of the established data file is used.
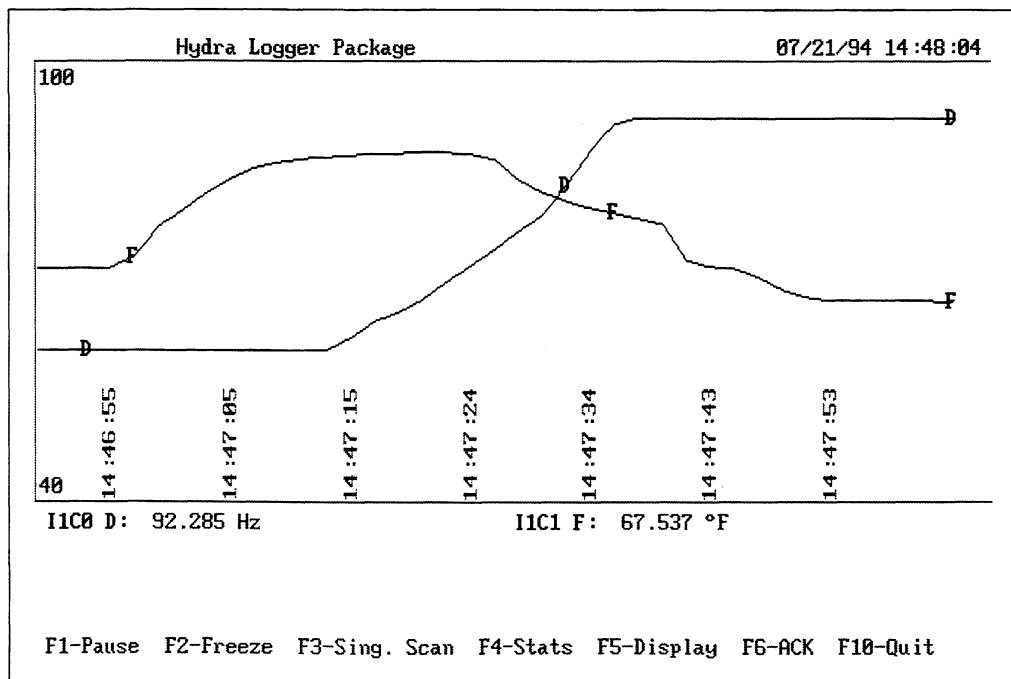
Figure 1-3. Typical Trend Plot Display

The data is appended to the data file after each scan. The file is also closed after each scan pass to prevent data loss due to power failure or computer malfunction.

Once data collection is started, the menu screen is replaced with the data collection screen. You must exit from data collection to return to the menus. Data collection is inactive during menu operations and menu operations cannot be performed during data collection.

If the alarm bell is enabled and an alarm becomes active (goes from off to on), the bell on the PC will ring until the user-specified time has elapsed or you press the F6 key on the PC keyboard.

Simulation Mode   1-15.

If there are no Hydras attached to the PC (or if communication has been disabled) at the time data collection is started, the program asks if you want to run in simulation mode. In this mode, the first four channels of each instrument are simulated, using a triangle, damped sine, random noise, and exponential decay for channels 0 to 3, respectively. The remainder of the channels represent a sawtooth-shaped waveform, with maximum and minimum values chosen to fit on the trend plot display.

```
Hydra Printer Output 07/21/94 12:41:28
Skipping 0 Scans Between Outputs

07/21/94 12:41:32

Inst. Number = 1
 0:  60.48169 Hz
 1:  110.15157 xF
ALMs: 0[HHHH}3
DI/O: 0{HHHHHHH}7
Total: 0

07/21/94 12:41:35

Inst. Number = 1
 0:  60.48848 Hz
 1:  110.41747 xF
ALMs: 0[HHHH}3
DI/O: 0{HHHHHHH}7
Total: 0
```

Figure 1-4. Printer Printout (Text Mode)

Problems Opening Logger or Pruning and Grafting Utility 1-16.

If Logger or the Pruning and Grafting Utility does not operate, make sure that you have done the following:

- Loaded DOS Version 3.3 or later.

- Placed the execution file in either your current working directory or in the PC's path list (LOGGER.EXE or PANDG.EXE).

- Used the correct command to start up Logger (e.g., C:\LOGGER>LOGGER <ENTER>) or the utility (C:\LOGGER>PANDG <ENTER>).

Until Logger or the Pruning and Grafting utility is running, error messages originate from the operating system.

Using On-Line Help 1-17.

On-line help is available for most of the menu items and data entry windows. Press <F1> to display an appropriate Help screen for the menu item or window. Press any key to remove the help message and return to the previous screen.

Linking the PC and Hydra 1-18.

Logger supports two Hydras. Be sure that the RS-232 (COM1 or COM2) ports on the PC are cabled to the RS-232 connector on the Hydra rear panels, then proceed as follows:

1. Turn Hydra ON.

2. Select Inst1 or Inst2 from the Logger Setup Menu.

3. Select COM from the Setup Menu by pressing <ENTER>.

4. Select COM1, COM2, or IEEE-488 (Model 2620A Data Acquisition Unit only) by highlighting the desired choice on the next menu and pressing <ENTER>.

5. When you enter your choice, the next menu appears; select the desired baud rate and parity (or AutoBaud) or IEEE-488 bus address (Model 2620A only). Any specific baud rate and parity (or address) that you select must match those selected on each Hydra.

6. If necessary, repeat steps 2 through 5 for the other Hydra.

Using a Modem to Link the PC and Hydra 1-19.

If you are using a modem pair to connect the PC and a Hydra, you will need to set up the modem parameters using the "Setup Modem" menu, immediately after selecting the COM port parameters. You can select the phone number to dial, the dialing mode, originate mode, and dialing times. Before using the connection, you must select the "Dial" menu entry to establish communication.

Section 2
Menus and Windows

CONTENTS

CONTENTS (Cont)

PAGE

SUMMARY OF MENUS AND WINDOWS 2-1.

Section 2 is a reference guide to Logger menus and windows. Each menu describes the keys used to make menu selections. Press the F1-Help key at any time to obtain On-line Help for specific information about an operation. Logger menus and windows are summarized in Table 2-1.

Section 3, "Typical Operations," provides examples of typical operations that use the menus and windows discussed in this section.

Table 2-1. Summary of Logger Menus and Windows

FUNCTION	DESCRIPTION	FIGURE
SETUP Menu	Sets up Hydra and Logger Configurations	2-1
Chans. Config. Menu - Channel Selection	Selects Hydra Channel(s) Configurations	2-2
Chans. Config. Menu - Function Selection	Selects Hydra Channel(s) Functions	2-3
Chans. Config. Menu - Mx+B Selection	Selects Hydra Channel(s) Scaling	2-4
Chans. Config. Menu - Alarm Selection	Selects Hydra Channel(s) Alarms	2-5
Inst. Config. Menu - General Selections	Selects Hydra Instrument General Functions	2-6
Inst. Config. Menu - Data Storage Configurations	Selects Hydra Data Storage Configurations	2-7
Inst. Config. Menu - Front Panel Lock	Selects Hydra Front Panel Lock Functions	2-8
Com Menu - Interface Selection	Selects PC Communications Interface	2-9
Com Menu - IEEE-488 Interface	Selects IEEE-488 Interface Parameters	2-10

Table 2-1. Summary of Menus and Windows (cont)

FUNCTION	DESCRIPTION	FIGURE
Com Menu - RS-232 (Direct Connection)	Selects RS-232 (Direct Connection) Communication Parameters	2-11
Com Menu - RS-232 (Modem Connection)	Selects RS-232 (Modem Connection) Communication Parameters	2-12
Data File Menu	Configures a DOS File for Measurement Data	2-13
State File Menu	Configures a DOS File for Current-State Data	2-14
Scan Trigger Type Menu	Selects Scan Triggering Configuration	2-15
Scan Interval Menu	Selects Scanning Interval	2-16
Trend Plot Config. Menu	Selects Trend Plot Parameters	2-17
Trend Plot Display	Shows Typical Trend Plot	2-18
Printer Config. Menu	Selects Printer Parameters	2-19
Printer Printout (Plot Mode)	Shows Typical Printer Printout (Plot Mode)	2-20
Show Setup Menu	Shows a Logger/Hydra(s) Configuration	2-21
Store Setup Menu	Stores a Logger/Hydra(s) Configuration	2-22
Retrieve Setup Menu	Retrieves a Logger/Hydra(s) Configuration	2-23
GO Menu	Enables Hydra Scanning	2-24
Measurement Display	Displays Measurements During Scanning	2-25
Measurement Statistics Display	Displays Data File Statistics During Scanning	2-26
UTILS Menu	DOS and File Translation Utilities	2-27
Translate Data File Menu	Converts Data Files to Other Formats	2-28
DOS Utilities Menu	DOS Functions while in Logger	2-29
Upload Memory Menu	Gets Scans Stored in Hydra Memory	2-30
Download Config. Menu	Hydra Config. Download from PC RAM	2-31
Upload Config. Menu.	Hydra Config. Upload into PC RAM	2-32
Save Config. Text Menu	Store Hydra/Logger Config. in Text File	2-33
Load Config. Text Menu	Load Text File into PC RAM	2-34

Table 2-1. Summary of Menus and Windows (cont)

FUNCTION	DESCRIPTION	FIGURE
List Setup Menu	List Hydra/Logger Configuration in Text File	2-35
Time Sync. Menu	Synchronize PC and Hydra Clocks	2-36
Trend Playback Menu	Playback a Data File as a Trend Plot	2-37
MEMCARD Menu	Selects Memory Card Operations	2-38
Card Location Menu	Selects Location of Memory Card Drive	2-39
Directory Menu	Queries the Memory Card For File Directory	2-40
Copy File Menu	Memory Card Drive and PC File Transfers	2-41
Convert File Menu	Copies and Converts Memory Card Files	2-42
Delete Memory Card File Menu	Deletes Selected Files from Memory Card	2-43
Format (In Hydra Only) Menu	Formats the Hydra Memory Card	2-44
Status (In Hydra Only) Menu	Returns Status of the Hydra Memory Card	2-45
Write Configuration File Menu	Configure Hydra with Logger Setup	2-46
Read Configuration File Menu	Configure Logger with Hydra Setup	2-47
TERM Menu	PC/Hydra(s) Terminal Emulator	2-48
DISPLAY Menu	Computer Background and Decimal Point	2-49
QUIT Menu	Quit Logger and Save Default Changes	2-50

SETUP MENU 2-2.

The "SETUP" menu (Figure 2-1) provides selections to set up an instrument (Hydra 1 or Hydra 2), enter configurations, communication port parameters, scan triggering, scan interval, trend plot, printer, and data/file transfer functions. The selections for each instrument reside in PC RAM and are manipulated by other menus, including storing, downloading, etc. The "Show Setup" menu (Figure 2-21) summarizes the setup for the selected instrument. Each function in the SETUP menu is described in the following paragraphs.

Inst1 or Inst2 Selection 2-3.

Before proceeding to any SETUP menu selection, first select instrument 1 or instrument 2 as all subsequent setup selections will be reflected to that instrument. If only one instrument is used, usually "Inst1" is selected, although there are no restrictions to which instrument is assigned "1" or "2." When two instruments are used, usually "Inst1" is the instrument connected to the PC COM1 port, and "Inst2" is connected to the PC COM2 port. The SETUP menu has a check mark and appends "Setup" for the selected instrument.

The example in Figure 2-1 has selected instrument 2 for SETUP menu entries.
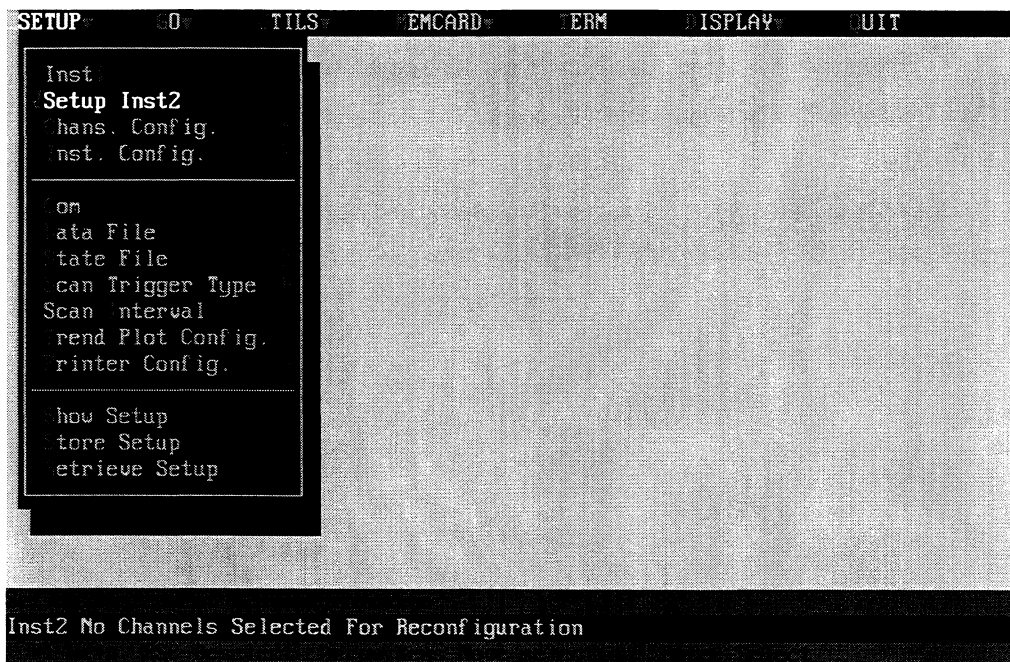
Figure 2-1. SETUP Menu

Chans. Config. Menu 2-4.

The "Chans. Config." menu (Figure 2-2) provides channel configuration selections, starting with the channels submenu and continuing with function, Mx+B scaling, and alarm settings. These are independent operations. For example, an existing channel configuration can be modified with just Mx+B scaling, or the channel can be completely configured with function, Mx+B scaling and alarms. The channel or channels selected for configuration are displayed on the middle status line at the bottom of the screen.

CHANNEL SELECTION

ALL is used to select all channels or toggle between selected and unselected channels; RESET is used to deselect all channels. When the channel(s) to be configured are selected, select DONE to move to the next submenu. Note that all channels selected will have the identical configuration applied to them. If different channels are to have different configurations, repeat this menu for each channel.

The example in Figure 2-2 has selected channel 5 for configuration. Note that the instrument and channels selected are displayed on the bottom of the screen.
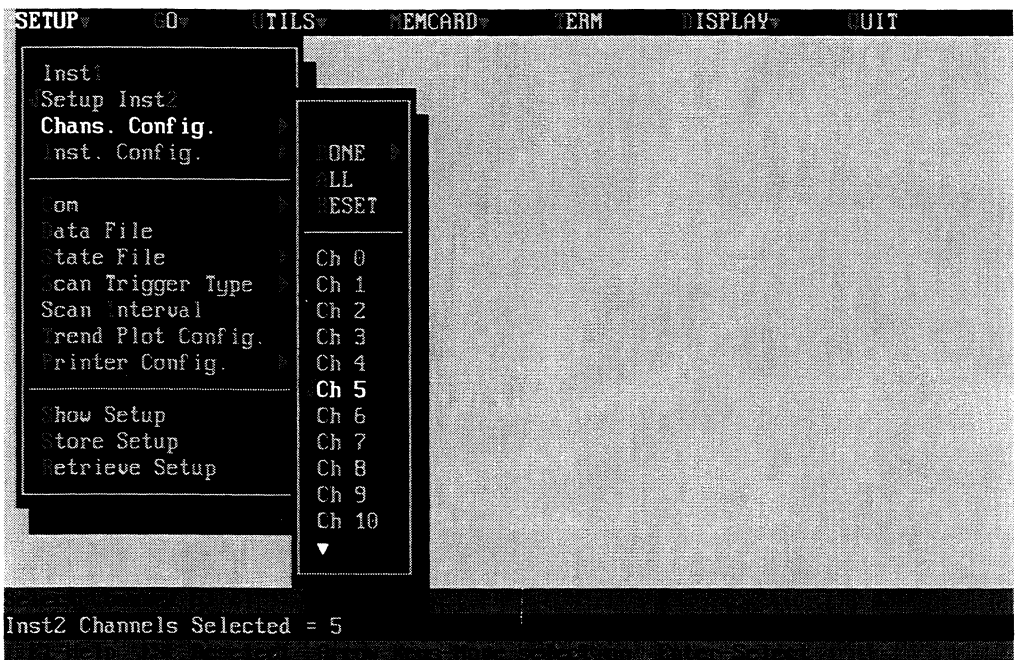
Figure 2-2. Chans. Config. Menu - Channel Selection

FUNCTION SELECTION

After selecting DONE, the selected channel(s) are assigned a Function, Mx+B scaling, or Alarms. To make function selections, open the Function menu (Figure 2-3). This allows the channel(s) to be configured OFF (clear configuration to OFF), VDC (Volts dc), VAC (Volts ac), OHMS-2T (Resistance/two-terminal), OHMS-4T (Resistance/four-terminal), TC (thermocouples), RTD-2W (Resistance Temperature Detector/two-wire), RTD-4W (Resistance Temperature Detectors/four-wire), and FREQ (Frequency). Each selected function opens a corresponding menu for range selection, except for OFF and RTD measurements.

The example in Figure 2-3 shows channel 5 being configured with "VDC" as the function and "900 mV" as the range (a scale not selectable at Hydra's front panel although it is reflected in Hydra range display as the 900.00 mV range).
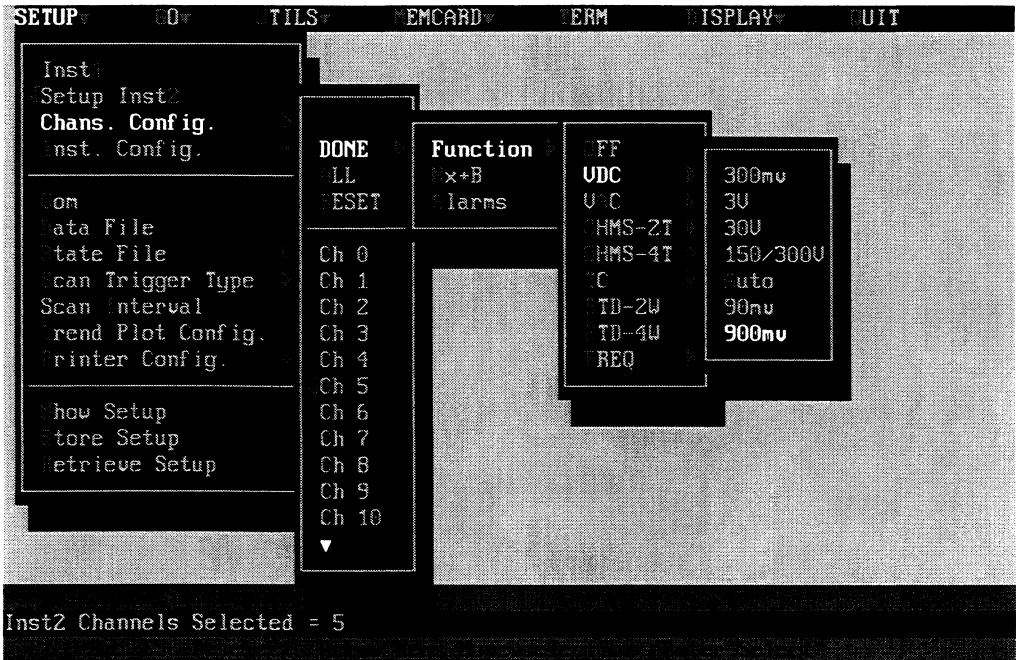
Figure 2-3. Chans. Config. Menu - Function Selection

Mx+B SCALING SELECTION

The Mx+B scaling menu (Figure 2-4) enables or disables scaling, selects a Scale Factor (M), an Offset (B), Range Code (1 through 16), and Units String (Mx+B is the default). Mx+B scaling removes the normal units label from the recorded measurements (VAC, VDC, etc.) and assigns "Mx+B" or any four-character string (maximum) by making an entry in the "Units String:" line. The "Range Code:" positions the scaled values based on the Offset (B). Press the F1 Help key to see the 16 ranges. For example, if the scaled values are expected to range from 3.5 to 7.5, they can be recorded as 3.5000 to 7.5000 (range 5), 03.500 to 07.500 (range 6), 003.50 to 007.50 (range 7), etc. If a range is exceeded, "OL" (Overload) is recorded. For the example above, an unexpectedly high reading of 16.25 for a range selection of 5 would result in OL, where a range section of 6 would have recorded 16.250.

The example in Figure 2-4 shows channel 5 being scaled with Enable scaling, Scale Factor 100, Offset: 0, Range Code: 6, and Units String: PSI.
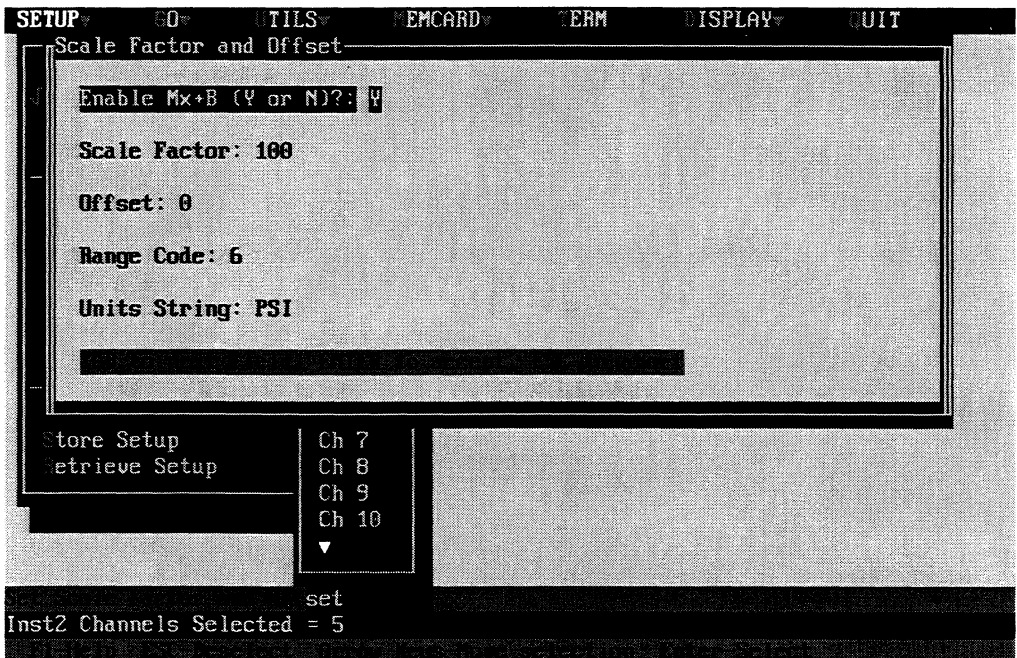
Figure 2-4. Chans. Config. Menu - Mx+B Selection

ALARM SELECTION

The Alarm menu (Figure 2-5) configures the two alarms that can be applied to any configured channel(s). If Mx+B scaling is also applied, the alarms are based on the scaled values. Any combination of High, Low, or Off can be applied. For example, only one alarm (high or low), or two alarms (high/low, both high, both low). The "Digital Output" selections allow an alarm condition for channels 4 to 20 to set a Hydra rear panel DIGITAL I/O connector line (0 to 7) to a logical zero when an alarm occurs. This output can be interfaced with other operations such as warning lights, audible alarms, etc. Channels 0 to 3 have nonconfigurable outputs and always appear on the ALARM OUTPUTS connector, lines 0 to 3, respectively.

The example in Figure 2-5 shows channel 5 Alarm #1 as High, with a value of 75.875, and Alarm #2 as Low, with a value of 25.225 (values that correspond with the range 6 format selected in the Mx+B scaling). Either an Alarm #1 or Alarm #2 condition will set the DIGITAL I/O connector line 5 to a logical zero.
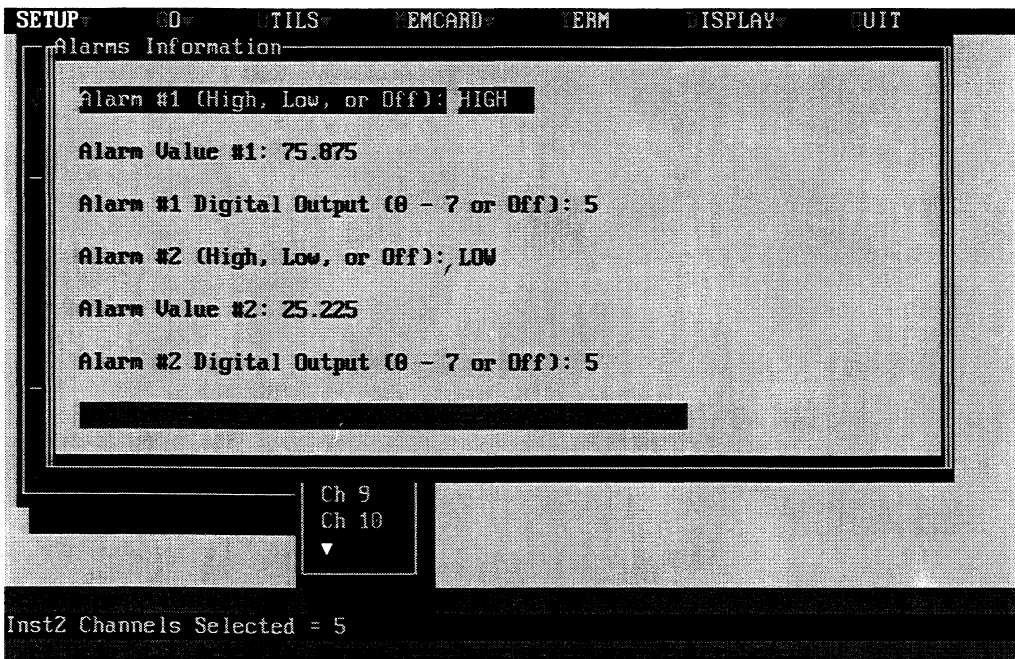
Figure 2-5. Chans. Config. Menu - Alarm Selection

Inst. Config. Menu   2-5.

The "Inst. Config." menu (Figure 2-6) provides global instrument configurations.

GENERAL

Measurement Rate   Check "Slow (High Res.) Rate" or "Fast Rate." The faster rate speeds up measurement time but with one less digit of resolution. .

Monitor Channel   Prompts for "OFF" or 0 to 20 channel entry.

Temperature Units   Check Celsius or Fahrenheit.

Open Thermocouple Detect Enable or Disable.

Totalizer Debounce   Enable or Disable.

Alarm Bell   Prompts for 0 to 32767 seconds of computer bell when a channel goes into alarm. "0" means no bell.

The example in Figure 2-6 shows Measurement Rate Slow, Temperature Units °F, Open Thermocouple Detect Enable, Totalizer Debounce Enable, Monitor Channel 16, and Alarm Bell 10 seconds.
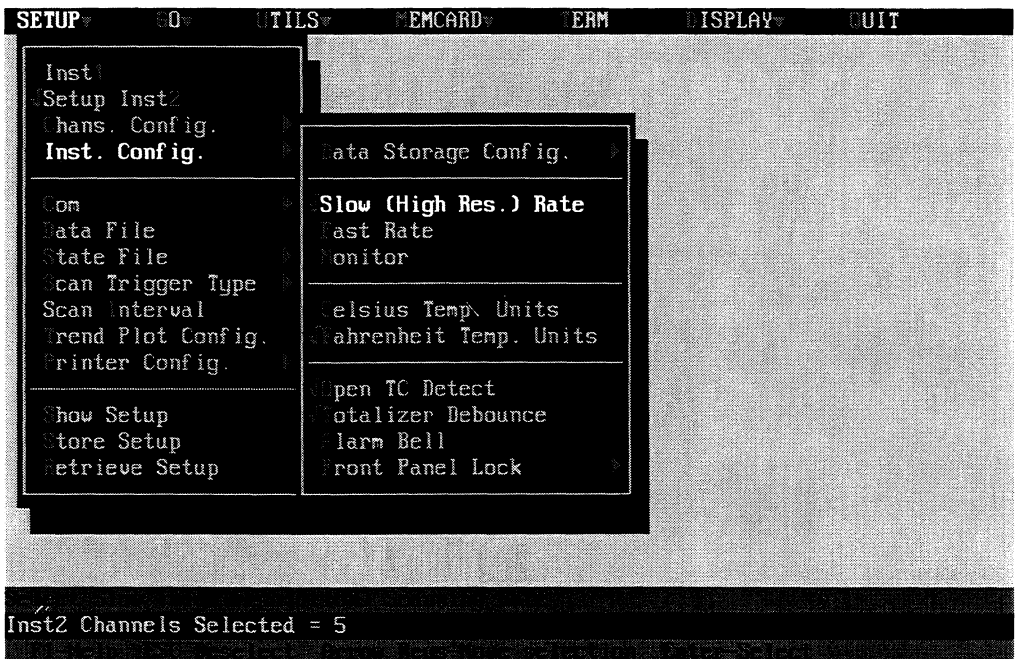
Figure 2-6. Inst. Config. Menu - General Selections

SETUP   O   TILS   EMCARD   ERM   ISPLAY   UIT

┌─Enter Monitor Channel (0 - 20 or Off)─────────────

Monitor Channel Number: 16

can Trigger Type
Scan nterval   elsius Temp. Units
rend Plot Config.   ahrenheit Temp. Units
rinter Config.
                       pen TC Detect
how Setup   otalizer Debounce
tore Setup   larm Bell
etrieve Setup   ront Panel Lock

Inst2 Channels Selected = 5

SETUP   O   TILS   EMCARD   ERM   ISPLAY   UIT

┌─Alarm Bell Time──────────────

Alarm Bell Sounding Time (sec, 0 = OFF): 10

can Trigger Type
Scan nterval   elsius Temp. Units
rend Plot Config.   ahrenheit Temp. Units
rinter Config.
                       pen TC Detect
how Setup   otalizer Debounce
tore Setup   **Alarm Bell**
etrieve Setup   ront Panel Lock

Inst2 Channels Selected = 5

Figure 2-6. Inst. Config. Menu - General Selections (cont)

DATA STORAGE CONFIGURATION

The "Data Storage Config." menu (Figure 2-7) determines the conditions under which Hydra scan data is to be stored (or printed). This is not a PC-related data storage, but an integral Hydra data storage media such as an internal logging memory (Model 2625A Data Logger) or memory card (Model 2635A Data Bucket). The Model 2620A Data Acquisition Unit can only print data.

The top portion of this menu determines the destination of the scan data: To Memory (Model 2625A), Print (all models), To Memory & Print (Model 2625A), To Card File (Model 2635A) or To Card & Print (Model 2635A). The middle portion of the menu set the conditions when data is stored or printed: Store All stores or prints all scan data; Store Alarms stores and prints scan data only when a scanned channel is in an alarm condition; Store Alarm Transition stores and prints scan data only during alarm transitions. The bottom portion of the menu applies to the Model 2625A Internal Memory (2047 scans) and defines the action taken when the internal memory is full. Wrap at End of Memory will save the most recent scans, overwriting the oldest scans. Stop at End of Memory will save the first 2047 scans and discard any subsequent scans.

The example in Figure 2-7 shows (for a Model 2635A Data Bucket) save scan data on the memory card and store all scans.
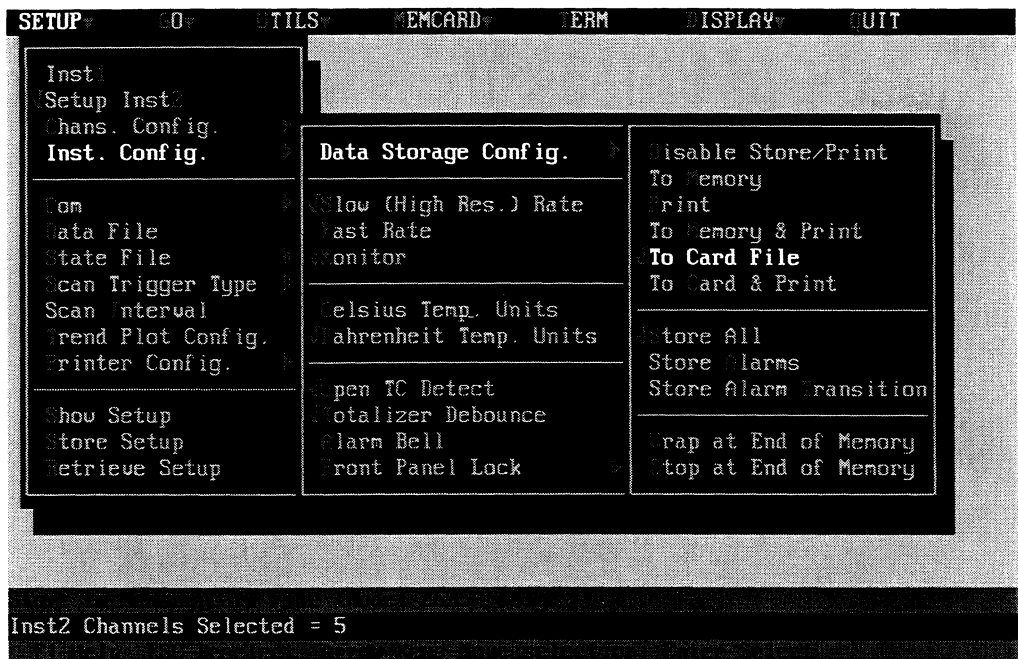
Figure 2-7. Inst. Config. Menu - Data Storage Configurations

FRONT PANEL LOCK

The "Front Panel Lock" menu (Figure 2-8) enables a configuration where the operation of the front panel keys on Hydra are locked out. With Review Lock, the Hydra becomes locked in the Review Mode. With Monitor Lock, the Hydra becomes locked in the Monitor Mode. With Config. Lock (Model 2635A Data Bucket only), all keys that could change a Hydra configuration from the front panel are locked. The Monitor and Review Lock can be cleared from the Hydra front panel, while the Configuration Lock requires that it be turned off in Logger and the configuration downloaded to the instrument or the instrument be powered down and powered up again using the Configuration-Reset sequence (holding the CANCL key down when applying power).

The example in Figure 2-8 shows the front panel lockout features have been disabled.
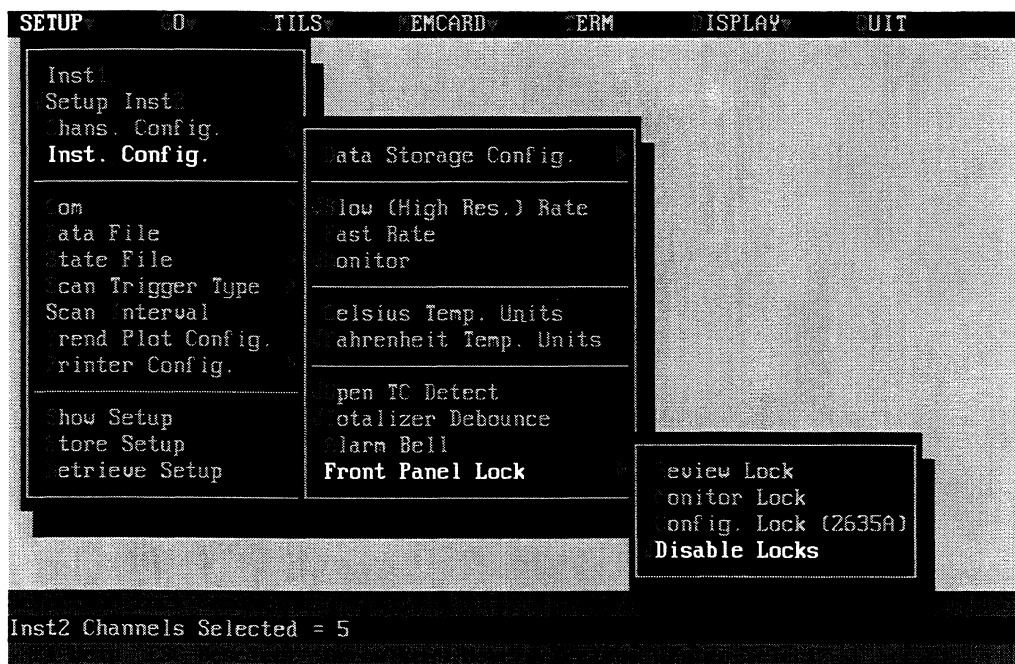
Figure 2-8. Inst. Config. Menu - Front Panel Lock

Com Menu   2-6.

The "Com" menu (Figure 2-9) begins by selecting a PC COM serial port or the IEEE-488 parallel port (Model 2620A Data Acquisition Unit only). After you make this selection, the menu advances to IEEE-488, RS-232 (Direct Connection), and RS-232 (Modem Connection) configurations.

The example in Figure 2-9 shows instrument 2 is connected to the RS-232 COM2 port.
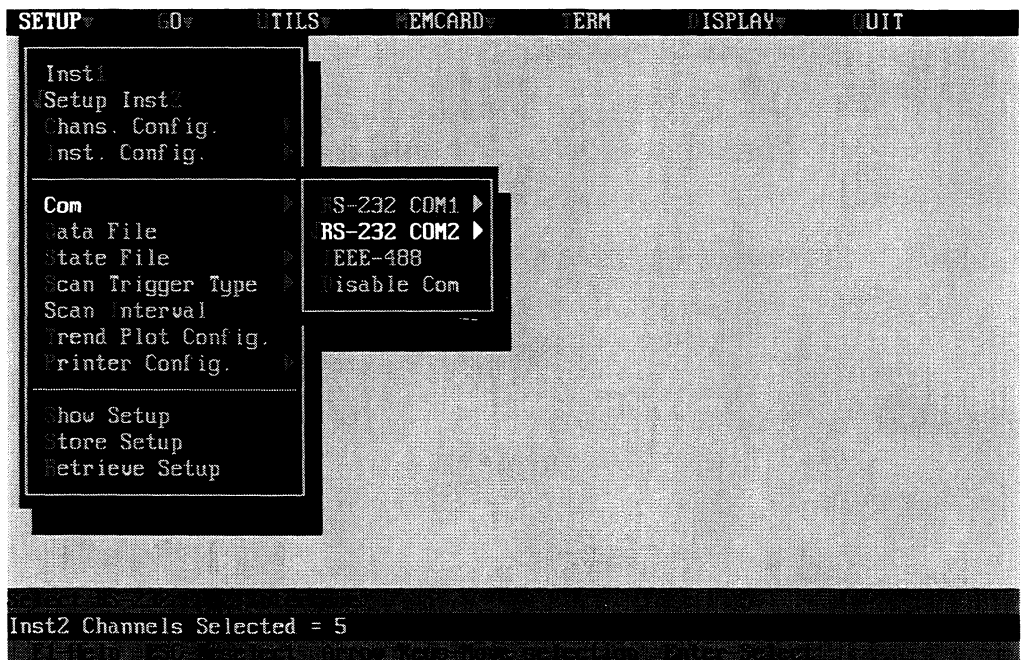
Figure 2-9. Com Menu - Interface Selection

IEEE-488

The "IEEE-488" menu (Figure 2-10) sets the IEEE-488 Bus Address, Bus Controller Device Name, and Bus Controller Device Address. The Bus Address is the address set in the selected Hydra, not the address for an IEEE-488 card in the PC. The Bus Controller Device Name is either GPIB0 or GPIB1, and the Bus Controller Device Address is the corresponding address associated with the GPIB0 or GPIB1 selection.

The example in Figure 2-10 shows the Bus Address 2, Bus Controller Device Name GPIB0, and Bus Controller Device Address 0 (defaults).

```
SETUP       CO       TILS      EMCARD      ERM      ISPLAY      UIT
┌─Instrument IEEE-488 Address and Controller Device Name─────────────
│  ┌────────────────────────────────────────────────────────────────┐
│  │  IEEE-488 Bus Address(0 - 30):  2                               │
│  │                                                                 │
│  │  IEEE-488 Bus Controller Device Name: GPIB0                     │
│  │                                                                 │
│  │  IEEE-488 Bus Controller Device Address (0-30): 0               │
│  │                                                                 │
│  │                                                                 │
│  └────────────────────────────────────────────────────────────────┘
┌─────────────────────┐
│ rend Plot Config.   │
│ rinter Config.      │
│                     │
│ how Setup           │
│ tore Setup          │
│ etrieve Setup       │
└─────────────────────┘

Inst2 Channels Selected = 5
```
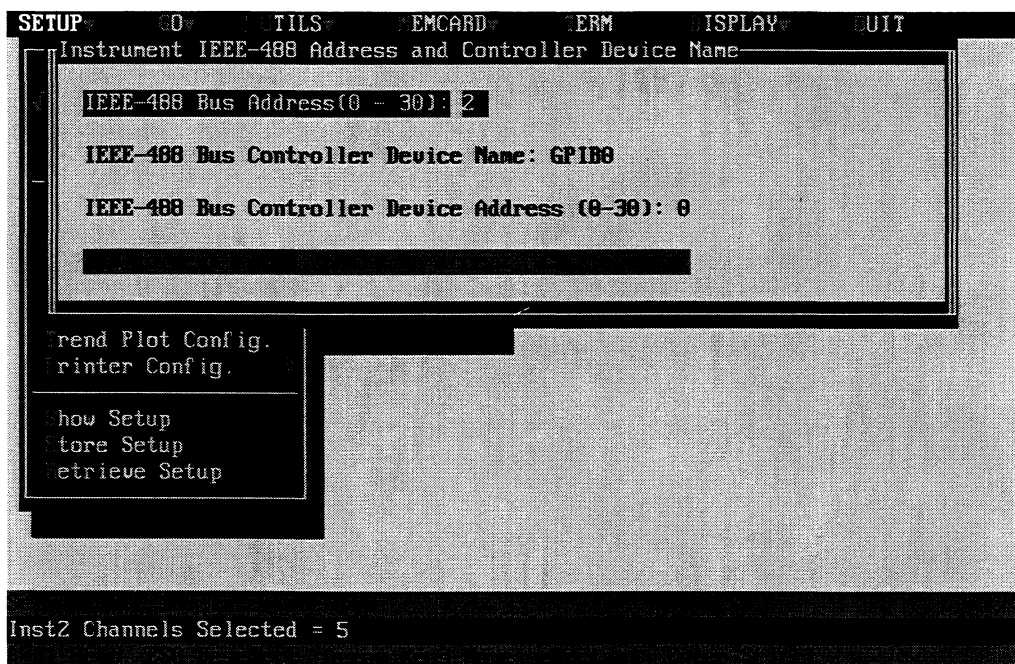
Figure 2-10. Com Menu - IEEE-488 Interface

RS-232 (DIRECT CONNECTION)

The RS-232 direct connection menu (Figure 2-11) selects the communication parameters that correspond to Hydra RS-232 parameters. For a direct RS-232 connection with Hydra (no modems), you may select AutoBaud to automatically track Hydra baud rate and parity.

If 38400 baud is selected, make sure CTS is "On" in the Hydra (Model 2635A Data Bucket only).

The example in Figure 2-11 shows selection of the RS-232 COM2 port and communication parameters 1200 baud and No Parity.
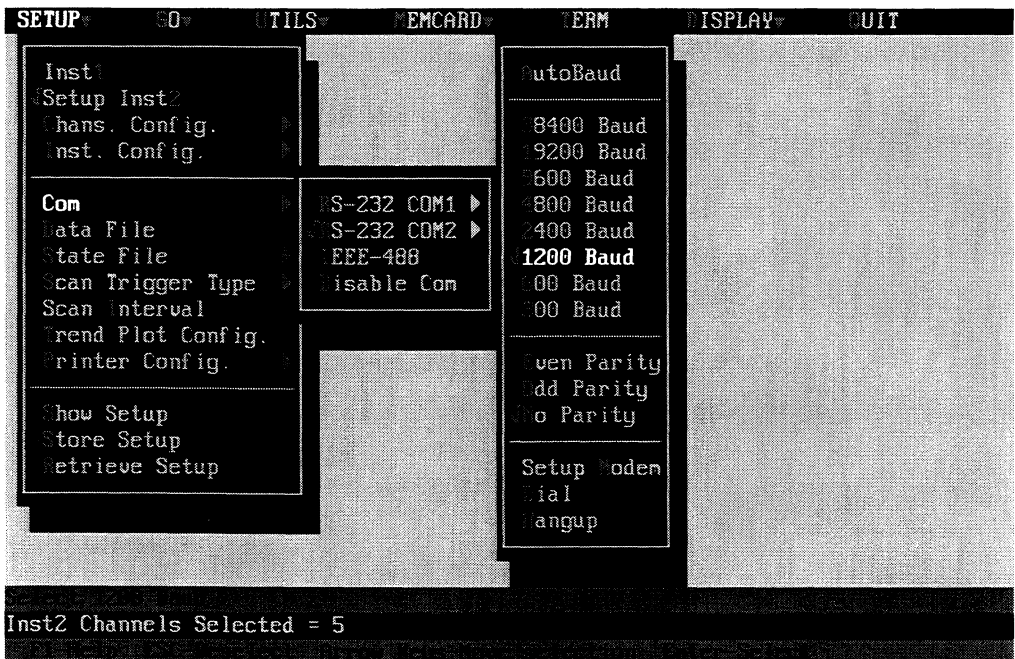
Figure 2-11. Com Menu - RS-232 (Direct Connection)

RS-232 (MODEM CONNECTION)

The RS-232 modem connection menu (Setup Modem) (Figure 2-12) configures modem parameters allowing Logger to originate or answer telephone calls. Most configurations have the PC call Hydra; therefore, Originate is usually selected.

The example in Figure 2-12 shows Enable Modem Communication, a remote (Hydra) telephone number starting with 9, then paused for 4 seconds (each "," character enters a 2-second pause) followed by the remaining numbers using "-" as a separator, Touchtone dialing, and call Originate. When you use Logger to make a telephone call using touchtone dialing, the duration and spacing of the dialing tones can be selected. The default for Dialing Tone Duration is 70 ms (shown). Answer Timeout sets the interval in which Hydra modem must answer, or the PC modem will hang up. The default is 30 seconds (shown).
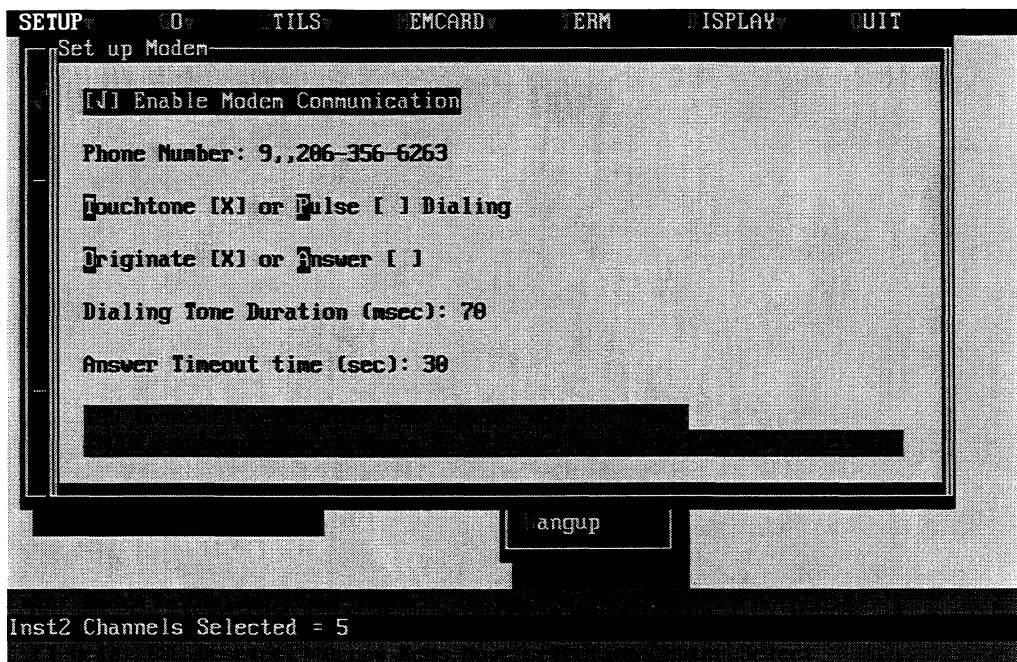
Figure 2-12. Com Menu - RS-232 (Modem Connection)

Data File Menu 2-7.

The "Data File" menu (Figure 2-13) enables and defines the DOS file used to record measurement data. When scanning starts and measurement data is sent to the PC, the data is recorded in this file. The data file is maintained in either binary or ASCII format. The binary format is more compact than the ASCII format, but the ASCII format is needed for compatibility with data analysis and management tools. Data stored in binary format can be converted to ASCII format using the "Translate Data File" menu (Figure 2-28).

The example in Figure 2-13 shows data recording to the file LOGDATA2.DAT, the comment Temperature Test, ASCII file formatting and Over-Write an existing file named LOGDATA2.DAT (if any). Also selected is Time/Date String appended to each measurement scan.
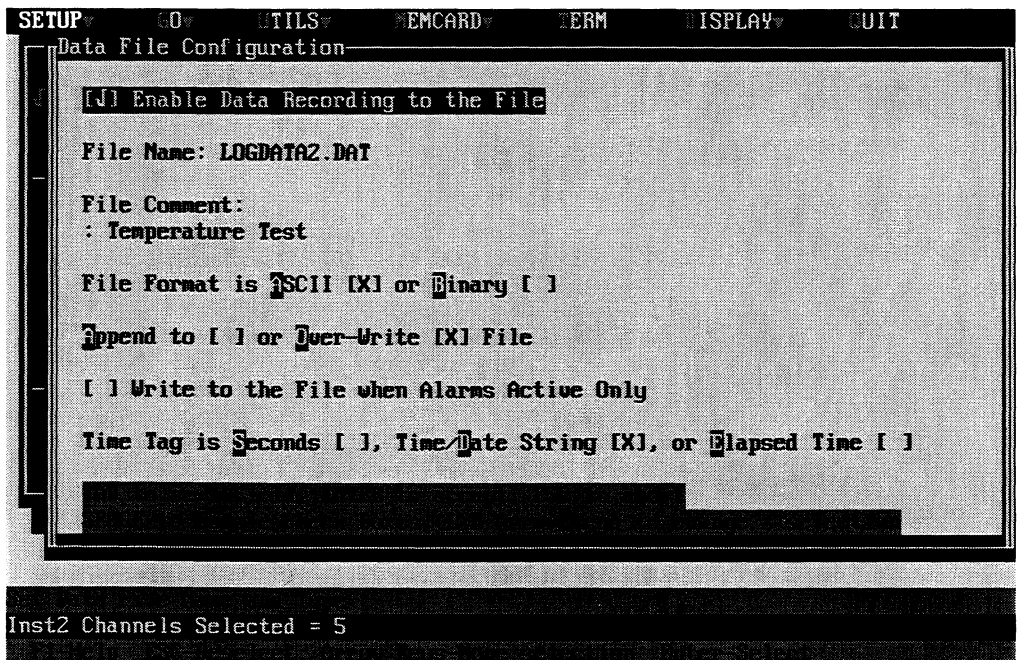
Figure 2-13. Data File Menu

State File Menu 2-8.

The "State File" menu (Figure 2-14) enables and defines the DOS file used to hold the current "state" of the channel readings, totalizer, and digital I/O of the Hydra instruments being logged. This file is written every time a scan takes place during data collection. This file is useful in transferring the latest logged values into programs running at the same time, e.g., Excel or Lotus 1,2,3.

The example in Figure 2-14 shows state data recording to the file LOGSTATE.DAT.
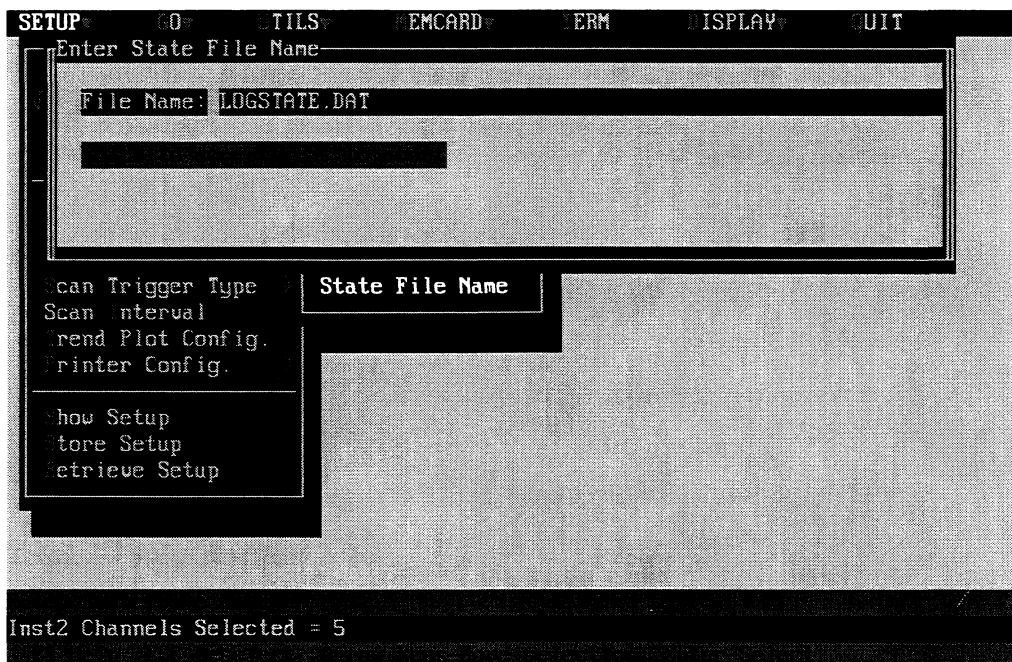
Figure 2-14. State File Menu

Scan Trigger Type Menu 2-9.

The "Scan Trigger Type" menu (Figure 2-15) sets the method used to trigger instrument scanning. Interval Scan Trigger is the normal triggering method. This normal triggering can be disabled or coupled with two triggering options: External Trigger and Monitor Alarm Trigger. External triggering is from an input at the rear of Hydra. Monitor Alarm Triggering is set by monitoring a channel and if the channel goes into alarm, scanning is triggered.

The example in Figure 2-15 shows Interval Scan Trigger and Monitor Alarm Trigger selections. If the scan interval is set for 60 minutes, then a measurement scan starts every 60 minutes, unless a Monitor Alarm Trigger occurs, which will enable continuous scanning for as long as the alarm condition exists.
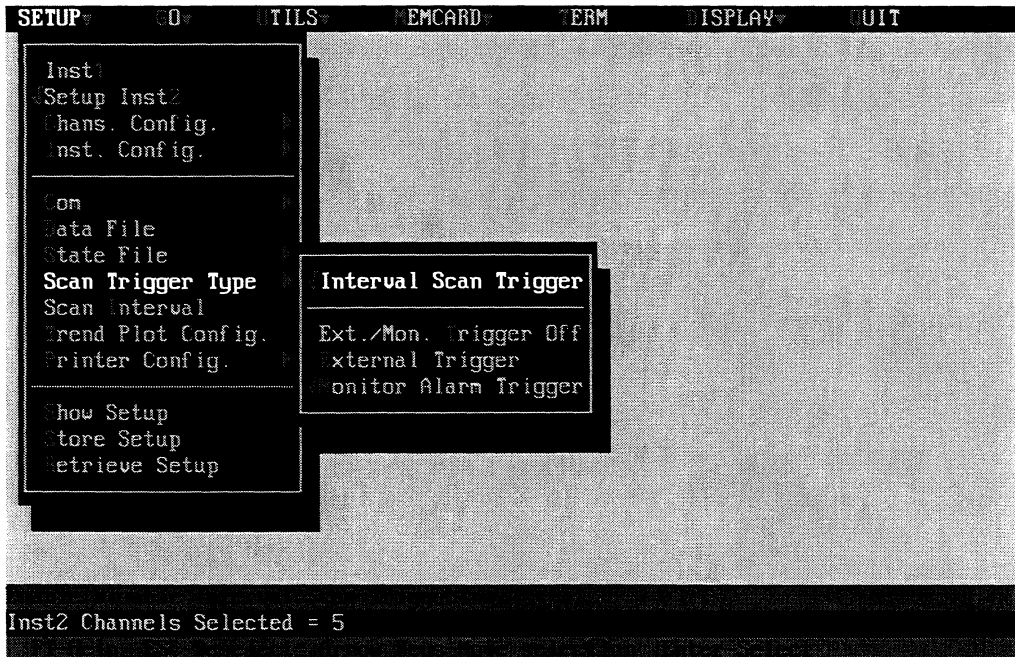
Figure 2-15. Scan Trigger Type Menu

Scan Interval Menu   2-10.

The "Scan Interval" menu (Figure 2-16) sets up the time in seconds between the starts of scans when normal interval scan trigger is enabled (Figure 2-15). A setting of 0 indicates continuous scanning.

This menu also allows an entry for skipping scans where all scans are displayed but only a fraction of the scans are recorded (alarms are active during all scans).

The example in Figure 2-16 has selected a scanning interval of 9015 seconds (2 hours, 30 minutes, and 15 seconds). Scans-to-skip is set at 4, which means all scans are displayed, but every fifth scan is recorded into the PC data file (Figure 2-13). The cycle for this example is scan/display/record, scan/display, scan/display, scan/display, scan/display, scan/display/record, scan/display, etc.
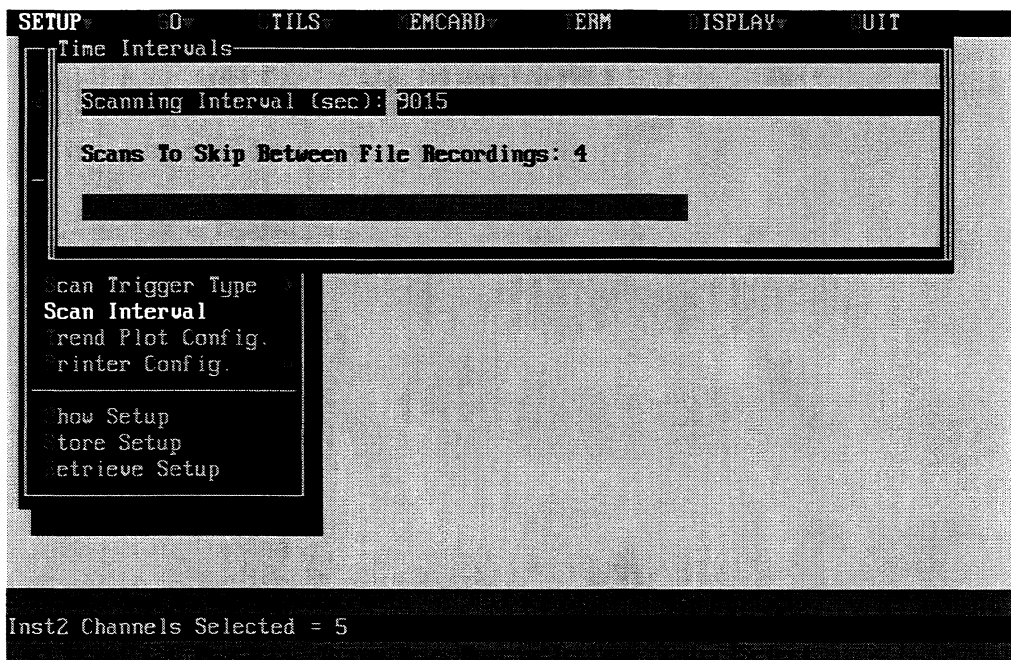
Figure 2-16. Scan Interval Menu

Trend Plot Config. Menu 2-11.

The "Trend Plot Config." menu (Figure 2-17) enables and selects the parameters for displaying measurement data graphically on the PC screen. Eight channels may be plotted simultaneously. If a hardcopy of the trend plot is desired, refer to the "Printer Config." menu (Figure 2-19). The Trend Plot requires a PC display adapter capable of graphics display and that the /W switch was not used when Logger was started (see Section 1). To use a Hercules Adapter in graphics mode, you must execute the program MSHERC.COM before starting Logger. The trend plot "Plot Minimum:" and "Plot Maximum:" settings determine the Y-axis excursions, while the" Plot Count:" determines the X-axis timebase by correlating the number of plots for a full-screen display vs. the measurement interval rate. For example, if Plot Count: is set to 60 and the scanning interval is 1-minute, a full-screen display encompasses 60 minutes. If enabled, the display includes a time tag. To play back a trend plot, refer to the "Trend Playback" menu (Figure 2-37).

The example in Figure 2-17 shows Enable Trend Plot, set a minimum scale reading of 40, a maximum scale reading of 100, a plot count of 50, and enable Time Tag Display. Only two of the eight plots were enabled: Plot D for instrument 1, channel 0, and Plot F for instrument 1, channel 1. Refer to Figure 2-18 for a corresponding plot with these settings.

```
SETUP      GO     UTILS    MEMCARD    TERM    DISPLAY    QUIT
  Trend Plot Configuration

    [√] Enable Trend Plot
    Plot Minimum: 40
    Plot Maximum: 100
    Plot Count: 50
    [√] Enable Time Tag Display

    Trend Plot Channels (Inst, Chan)

    Plot A: OFF
    Plot B: OFF
    Plot C: OFF
    Plot D: 1,0
    Plot E: OFF
    Plot F: 1,1
    Plot G: OFF
    Plot H: OFF




Inst2 Channels Selected = 5
```
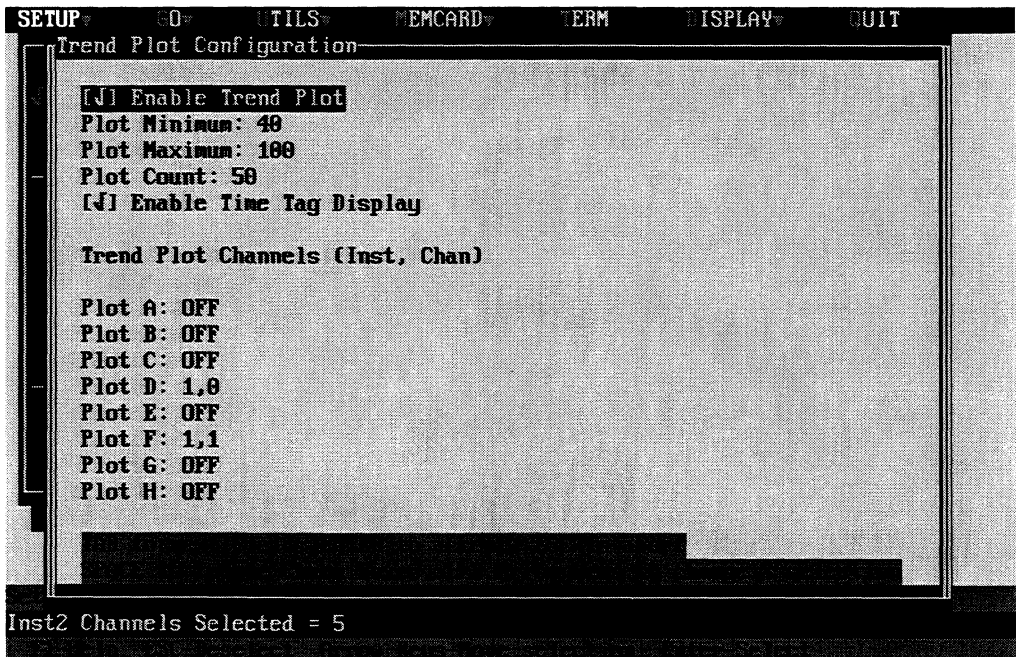
Figure 2-17. Trend Plot Config. Menu

Trend Plot Display 2-12.

A typical trend plot (Figure 2-18) (based on the parameters in Figure 2-17) shows the scale limits of 40 and 100, and two plots for I1C0 (instrument 1, channel 0) as letter "D" and I1C1 (instrument 1, channel 1) as letter "F." A trend plot is enabled with the GO Menu (Figure 2-24). The plot must fall within the scale limits or it will go offscale. In this example, the limits of 40 and 100 match the two measurements of 40 to 100 Hz (D:) and 40 to 100 °F (F:).
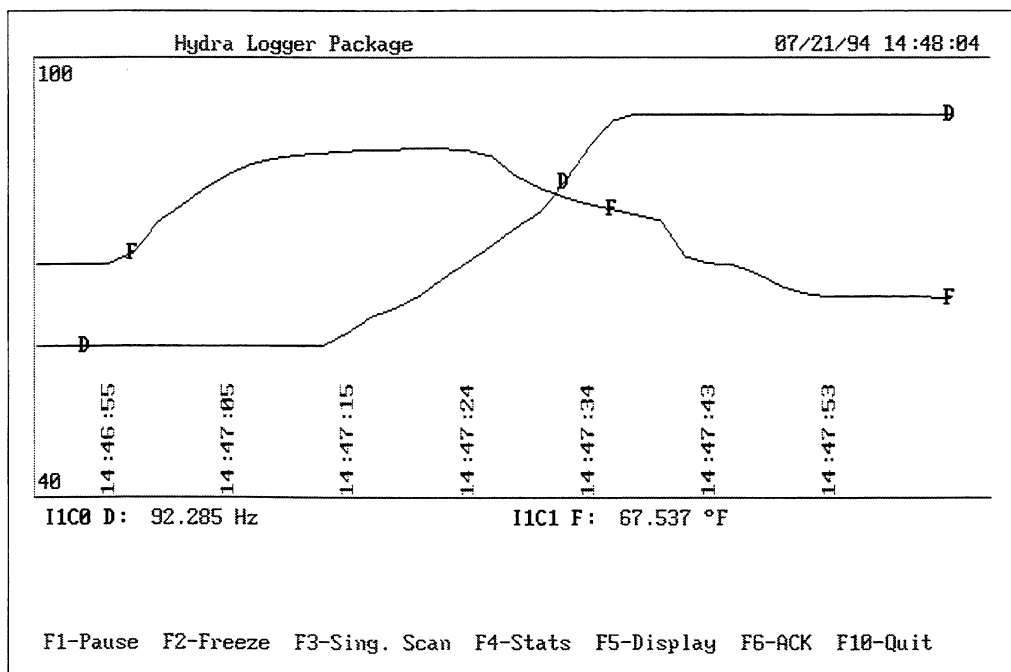
Figure 2-18. Trend Plot Display

Printer Config. Menu 2-13.

The "Printer Config." menu (Figure 2-19) enables and selects the parameters for displaying measurement data graphically on a printer. The printer must have Epson/IBM graphics capability or only the "Text" mode can be used. The configuration menu is opened after selecting the PC parallel port used for the connection to the printer (LPT1, LPT2 or LPT3). To disable this feature, select Disable.

The configuration includes a selection of the "Plot" or "Text" mode, the scale for the Plot Minimum and Plot Maximum, scans to skip between outputs to the printer, Text Page Width when operating in the "Text" mode, and the channels to be printed.

The example in Figure 2-19 shows selection of the Plot mode, with the scale limits of 40 and 100, plot all scans (Scans to Skip is 0), and plot instrument 1, channels 0 and 1. Refer to Figure 2-20 for a corresponding printout using these settings.

SETUP   ⁓O⁓   ⁓TILS⁓   ⁓EMCARD⁓   ⁓ERM   ⁓ISPLAY⁓   ⁓UIT

┌─Printer Output Configuration─

Output Plot [X] or **Text [ ]**

Plot Minimum: 40

Plot Maximum: 100

Scans To Skip Between Outputs: 0

Text Page Width (# of Char): 80

Inst 1 Chans: 0,1

Inst 2 Chans:

Inst2 Channels Selected = 5
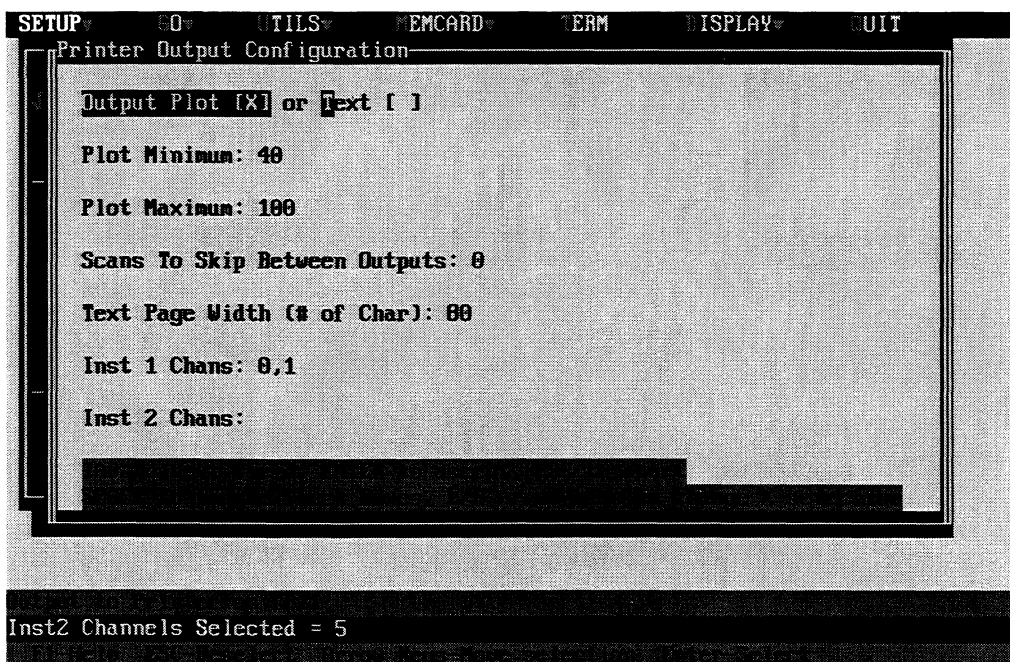
Figure 2-19. Printer Config. Menu

Printer Printout   2-14.

A typical printer plot (Figure 2-20) (based on the parameters in Figure 2-19) shows the plotting of instrument #1, channels #0 (using the "*" character on the plot) and #1 (using the "#" character on the plot), the scale limits of 40 and 100, and the corresponding plot (with a time tag). Since the print output is "sideways" on the paper, the only limitation to the length of the plot is the paper supply. The printed trend plot is enabled with the GO Menu (Figure 2-24). The plots must fall within the scale limits. In this example, the limits of 40 and 100 match the two measurements of 40 to 100 Hz (#0 display) and 40 to 100 °F (#1 display).
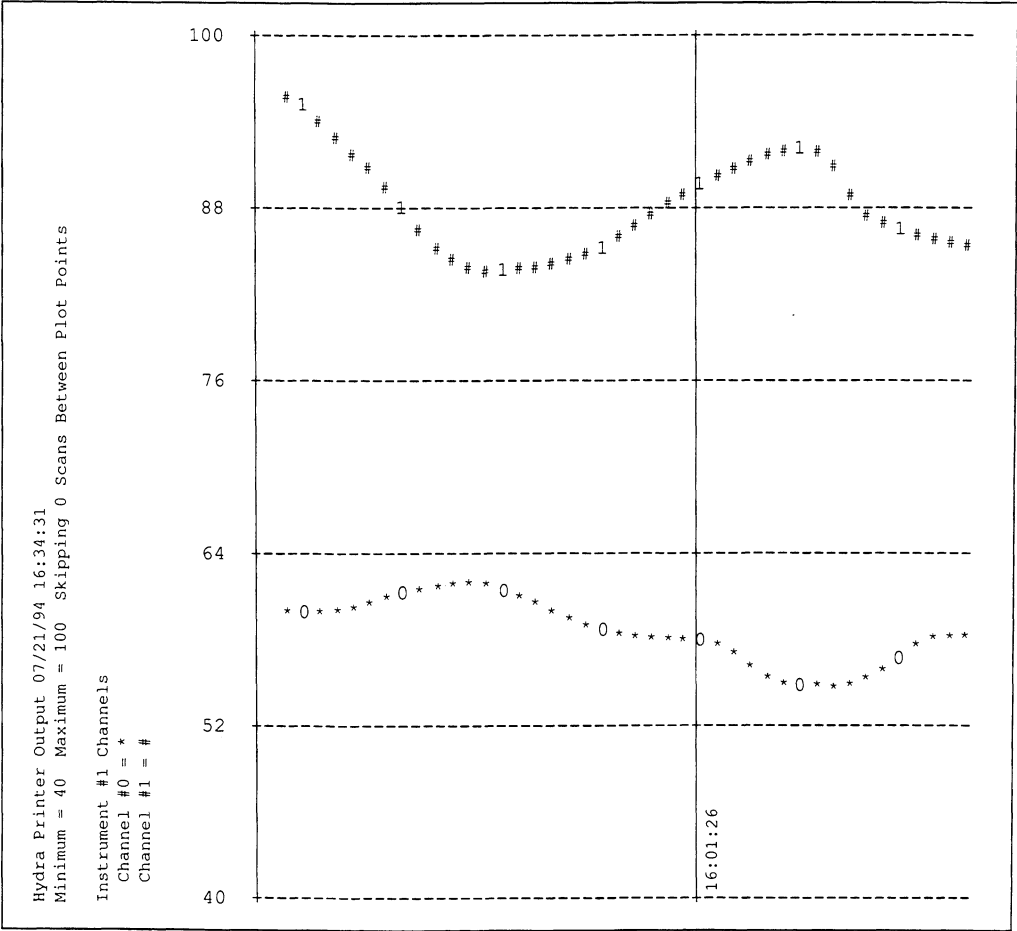
Figure 2-20. Printer Printout (Plot Mode)

Show Setup Menu
2-15.

The "Show Setup" menu (Figure 2-21) is a visual presentation of the complete Logger configuration. The Program Configuration portion reflects the settings made in Logger for PC operations, while the Instrument Configuration reflects the settings either created in Logger, using menus such as "Chans. Config." (Figures 2-2 to 2-5), or configurations from an initialization file (see the "Retrieve Setup" menu, Figure 2-23), source file (see the "UTILS" menu, Figure 2-27) or configurations uploaded into Logger from the instrument (see the "GO" menu, Figure 2-24). The Instrument Configuration menu reflects the actual Hydra configuration only if uploaded from the instrument or downloaded to the instrument (using the GO menu). Each menu parameter is described below.

PROGRAM CONFIGURATION

The sources of the Program Configuration selections are:

Data File Settings	Data File Menu (Figure 2-13)
Trend Plot Settings	Trend Plot Config. Menu (Figure 2-17)
Printer Plot Settings	Printer Config. Menu (Figure 2-19)

The example in Figure 2-21 reflects the examples in each figure reference above.

```
SPACE to exit; PgUp, PgDn, Up or Down Arrow keys to display more lines
   Program and Instrument Configuration  07/21/94 19:33:31

            Program Configuration

Data File Name = LOGDATA2.DAT
File Type = ASCII   File Operation = OVER-WRITE
Time Tag is Time and Date String
File Comment = Temperature Test
Trend Plot  Min=40  Max=100  Count=50
   (Inst 1 Chan 0)
   (Inst 1 Chan 1)
Printer Plot Port = 1 Min = 40 Max = 100 Skip = 0
   Inst 1 Channels = 0,1
   Inst 2 Channels =

            Instrument Configuration

Instrument Number = 2
Monitor Channel Alarm Scan Trigger
Interval Scan Enabled
Scan Interval = 9015 seconds    Scans to Skip Between File Records = 0
RS-232 Interface, COM2  Baud Rate = 1200  NO Parity
Modem Set to Dial  9,,206-356-6263
```

Figure 2-21. Show Setup Menu

INSTRUMENT CONFIGURATION

The sources of the Instrument Configurations (made entirely with Logger) are:

Instrument Number =	SETUP Menu (Figure 2-1)
Trigger	Scan Trigger Type Menu (Figure 2-15)
Interval Scan	"
Scan Interval =	Scan Interval Menu (Figure 2-16)
Scan to Skip	"
RS-232 Interface	Com Menu - RS-232 Interface (Figure 2-11)
IEEE-488 Interface	Com Menu - IEEE-488 Interface (Figure 2-10)
Modem Interface	COM Menu - RS-232 Interface (Figure 2-12)
Monitor Channel =	Inst. Config. Menu (Figure 2-6)
Temperature Units	"
Open Thermocouple	"
Scan Rate	"
Totalizer Debounce	"

```
─SPACE to exit: PgUp, PgDn, Up or Down Arrow keys to display more lines─

                  Instrument Configuration

Instrument Number = 2
Monitor Channel Alarm Scan Trigger
Interval Scan Enabled
Scan Interval = 9015 seconds     Scans to Skip Between File Records = 0
RS-232 Interface, COM2  Baud Rate = 1200  NO Parity
Modem Set to Dial  9,,206-356-6263
Monitor Channel = 16
Fahrenheit Temperature Units
Open Thermocouple Detect Enabled
Normal Scan Rate
Totalizer Debounce On
Logging All Scan Data to Memory
Wrap to start at end of memory
On alarm, bell sounds for 10 seconds
State File = LOGSTATE.DAT
Keyboard Unlocked

Channel 0     Function = Off

Channel 1     Function = Off
```

Figure 2-21. Show Setup Menu (cont)

Logging Scans   Inst. Config. Menu (Figure 2-7)
Wrap at end of Memory   "
Bell   Inst. Config. Menu (Figure 2-6)
State File   State File Menu (Figure 2-14)
Keyboard Lock   Inst. Config. Menu (Figure 2-8)
Channel Setups   Chans. Config Menus (Figures 2-2 to 2-5)

The example in Figure 2-21 reflects the examples in each figure reference above.

```
SPACE to exit; PgUp, PgDn, Up or Down Arrow keys to display more lines

Channel 0    Function = Off

Channel 1    Function = Off

Channel 2    Function = Off

Channel 3    Function = Off

Channel 4    Function = Off

Channel 5    Function = VDC 900 mv Range
    Scale Factor = 100  Offset = 0  Units =  PSI  Disp. Range = 6
    HIGH Alarm Value = 75.875   DI/O Assoc. with Alarm = 5
    LOW Alarm Value = 25.225   DI/O Assoc. with Alarm = 5

Channel 6    Function = Off

Channel 7    Function = Off

Channel 8    Function = Off

Channel 9    Function = Off
```

Figure 2-21. Show Setup Menu (cont)

Store Setup Menu   2-16.

The "Store Setup" menu (Figure 2-22) stores the Logger Program Configuration and Instrument Configuration in a PC DOS binary file. To view the setup that will be stored, use the "Show Setup" menu (Figure 2-12). The stored setup can be retrieved using the "Retrieve Setup" menu (Figure 2-23) or by using the /F switch when starting Logger (see Section 1). When this menu is selected, a window opens and prompts for the name of the file for storing the setup. The file extension defaults to *.INI.

The example in Figure 2-22 shows the present Logger configuration is being saved in a PC DOS file called LOGGER6.INI.

NOTE

If an existing file name is selected, it is overwritten without warning.
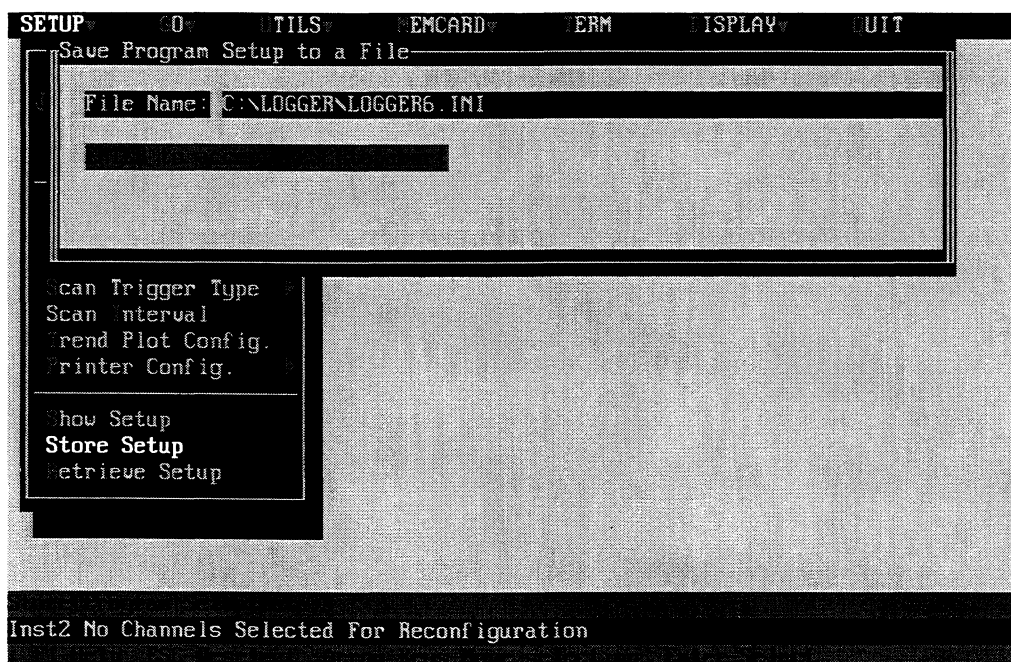
Figure 2-22. Store Setup Menu

Retrieve Setup Menu   2-17.

The "Retrieve Setup" menu (Figure 2-23) initializes Logger with different Program Configuration and Instrument Configuration parameters. The stored setup can also be retrieved using the /F switch when starting Logger (see Section 1). For example, starting Logger with the command LOGGER /FLOGGER6.INI , will initialize Logger with the setup file LOGGER6.INI . Setup files are created with the "Store Setup" menu (Figure 2-22) and viewed with the "Show Setup" menu (Figure 2-21).

The example in Figure 2-23 shows Logger being initialized using the configuration defaults in a PC DOS file called LOGGER6.INI.
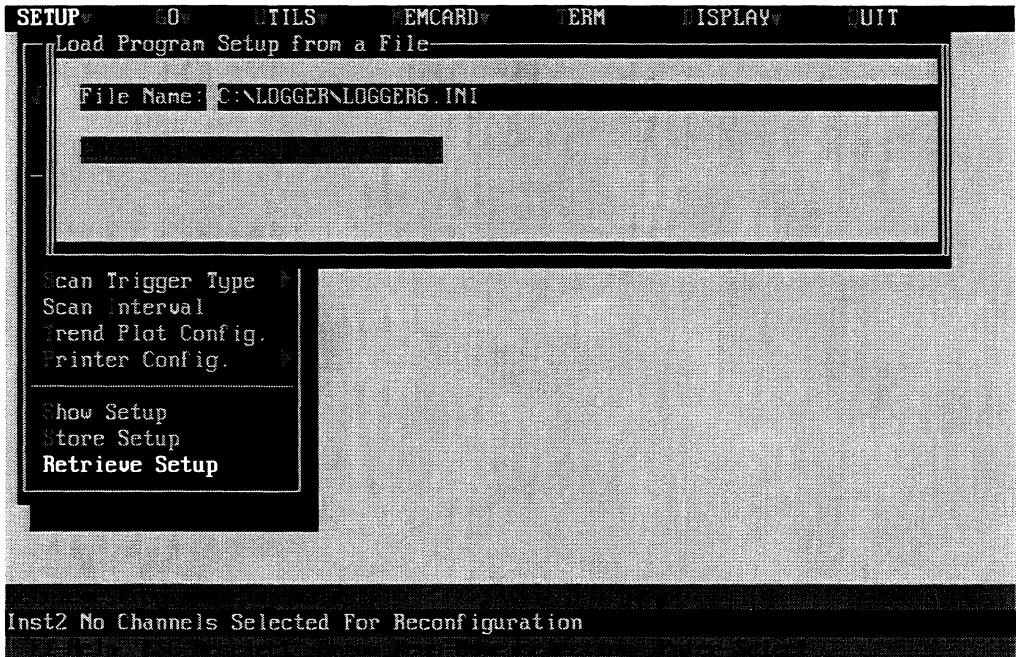
Figure 2-23. Retrieve Setup Menu

GO MENU   2-18.

The "GO" menu (Figure 2-24) controls instrument scanning, simulates data collection, and verifies the Logger Instrument Configuration compatibility.

"Start Scanning with Configuration Upload" uses the present instrument configuration for scanning, and uploads this configuration into PC RAM. The uploaded configuration can be viewed using the "Show Setup" menu (Figure 2-21) and saved as a setup file using the "Store Setup" menu (Figure 2-22), or as a text file using the "Save Config. Text" menu (Figure 2-33). To upload the configuration without scanning, see the "Upload Config." menu (Figure 2-32).

"Start Scanning with Configuration Download" uses the Hydra configuration stored in PC RAM, which is downloaded into Hydra. The configuration in PC RAM can originate from settings in an initialization file when Logger was started, from a "Retrieve Setup" menu (Figure 2-23), from a text file loaded with the "Load Config. Text" menu (Figure 2-34), from an "Upload Config." menu (Figure 2-32), or from the configuration menus in Logger. Use the "Show Setup" menu (Figure 2-21) to view the configuration in PC RAM.

"Simulated Data Collection" provides a display of pseudo measurement activity; "Verify Configuration" indicates Hydra/Logger setup compatibility.
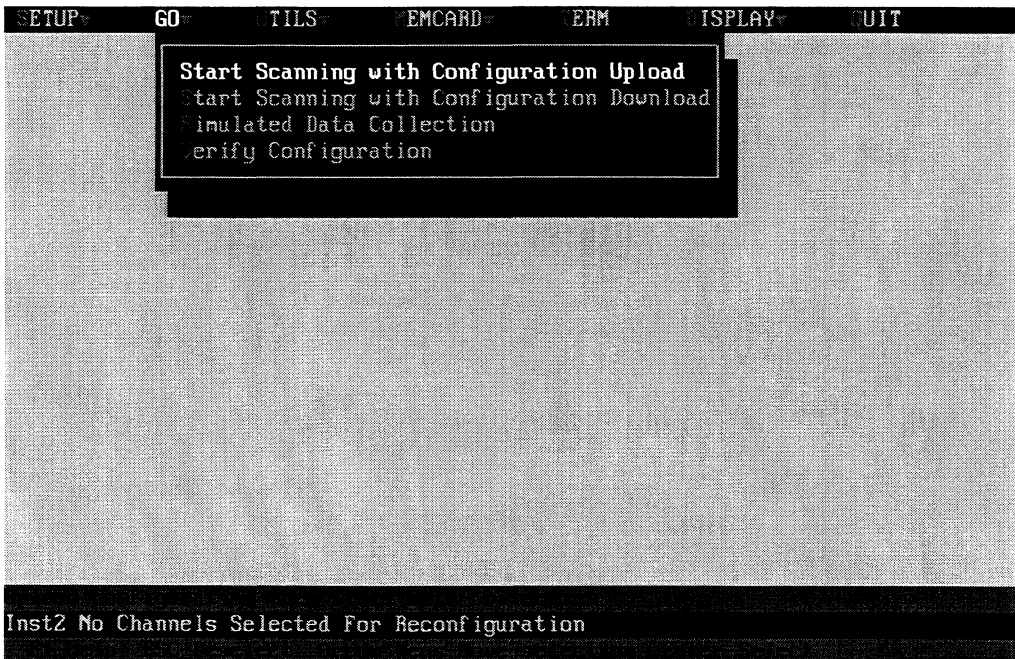
Figure 2-24. GO Menu

Measurement Display 2-19.

The measurement display portion of the "GO" menu (Figure 2-25) appears when scanning has started. Seven switches may be operated: F1-Pause (message: "Data Collection Paused - Press any key to continue"), F2-Freeze (message: "Screen Display Frozen - Press any key to continue), F3-Single Scan (no effect if a measurement is taking place, otherwise, triggers an immediate single scan), F4-Stats [Statistics] (Figure 2-26), F5-Display (toggles between trend plot display and tabular display), A6-ACK (acknowledges and silences an Alarm Bell), and F10-Quit (ends scanning).

For an example of a trend plot display and an example of how to set up for a trend plot display, see Figures 2-17 and 2-18. The example in Figure 2-25 shows a tabular display of a typical measurement. In this example, only instrument 1 is scanning, using channel 0 to measure frequency and channel 1 to measure temperature. If a channel had been in Alarm, ALM would appear after the reading and the PC bell would sound (if selected-see Figure 2-6). The totalizer count is shown at 0, and all alarms are H (high). When an alarm is set, L (low) will appear instead of H.

```
         Hydra Logger Package                              07/21/94 20:30:40


 I1C0  :  75.240 Hz        I1C1  :  110.26 °F       I1C2  :  OFF
 I1C3  :  OFF              I1C4  :  OFF             I1C5  :  OFF
 I1C6  :  OFF              I1C7  :  OFF             I1C8  :  OFF
 I1C9  :  OFF              I1C10 :  OFF             I1C11 :  OFF
 I1C12 :  OFF              I1C13 :  OFF             I1C14 :  OFF
 I1C15 :  OFF              I1C16 :  OFF             I1C17 :  OFF
 I1C18 :  OFF              I1C19 :  OFF             I1C20 :  OFF
 Total: 0  ALMs: 0(HHHH)3  DI/O: 0(HHHHHHHH)7



 F1-Pause  F2-Freeze  F3-Sing. Scan  F4-Stats  F5-Display  F6-ACK  F10-Quit
```
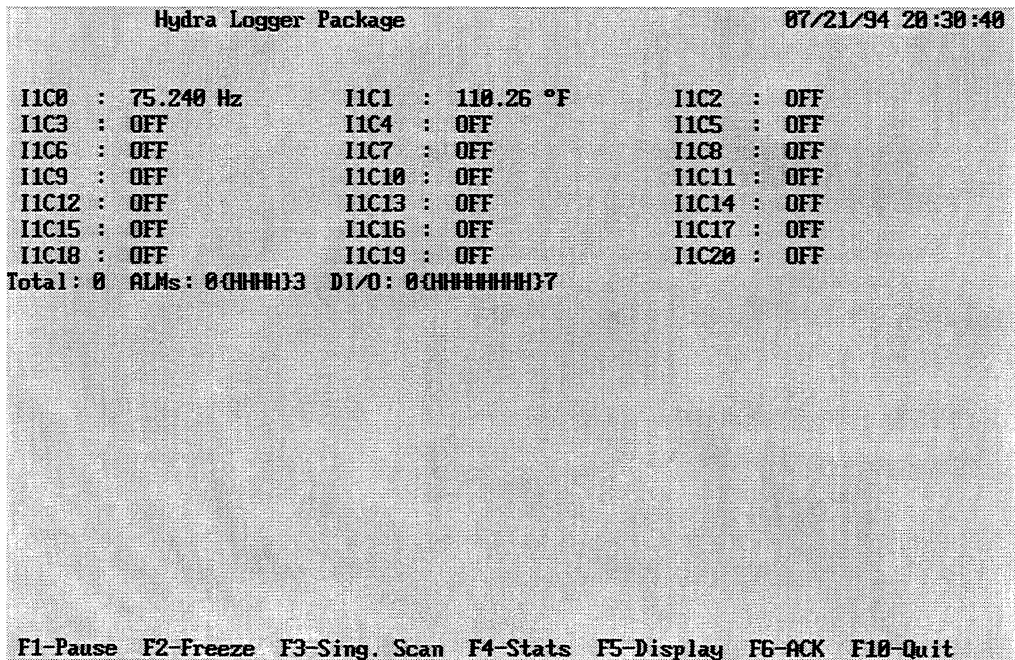
Figure 2-25. Measurement Display

Measurement Statistics Display   2-20.

The statistics (Stats) display (Figure 2-26) is enabled by pressing the F4-Stats key in the "GO" menu measurement display (Figure 2-25). The display parameters include the file name where the data is being recorded (as selected by the "Data File" menu in Figure 2-13), dates and times, and the number of completed scans. The F4 key changes to F4-Readings, which you press to return to the measurement display menu. The other F-keys have the indicated functions as previously discussed (Figure 2-25).

The example in Figure 2-26 shows 54 scans have been recorded, and the data file is LOGDATA2.DAT. The comment "Temperature Test" was entered in the Data File menu (Figure 2-13). I/O error count refers to detected communication errors, either RS-232 parity, overrun, or operational errors, or IEEE-488 operational errors. These errors will not cause bad data to be logged, but may affect data collection timing. If large numbers of errors are occurring, check cables or reduce the baud rate (Figure 2-11).

```
       Hydra Logger Package                              07/21/94 20:48:53


Data Acquisition Run Information 07/21/94 20:48:52

Scanned Channels = 54 times  Logged to file 54 times

106 Seconds since start of run

Run Started on 07/21/94 20:47:06

Last scan on 07/21/94 20:48:51

Logged to file last on 07/21/94 20:48:51

Scan Interval = 0 sec.  Skipping 0 Scans Between File Logging

Logging to file LOGDATA2.DAT

Comment: Temperature Test



     I/O error count, Inst1 = 0     Inst2 = 0
F1-Pause  F2-Freeze  F3-Sing. Scan  F4-Readings  F6-ACK  F10-Quit
```

Figure 2-26. Measurement Statistics Display

UTILS MENU   2-21.

The "UTILS" (Utilities) menu (Figure 2-27) contains file translation commands, DOS commands, configuration commands, and related functions for convenient file and configuration handling operations.


```
SETUP     GO     UTILS    EMCARD     TERM    DISPLAY    QUIT

          Translate Data File
          IR
          ename
          elete
          opy
          D
          OS
          pload Memory
          ownload Config.
          pload Config.
          ave Config. Text
          oad Config. Text
          ist Setup
          ime Sync.
          Trend Playback



Inst1 No Channels Selected For Reconfiguration
```
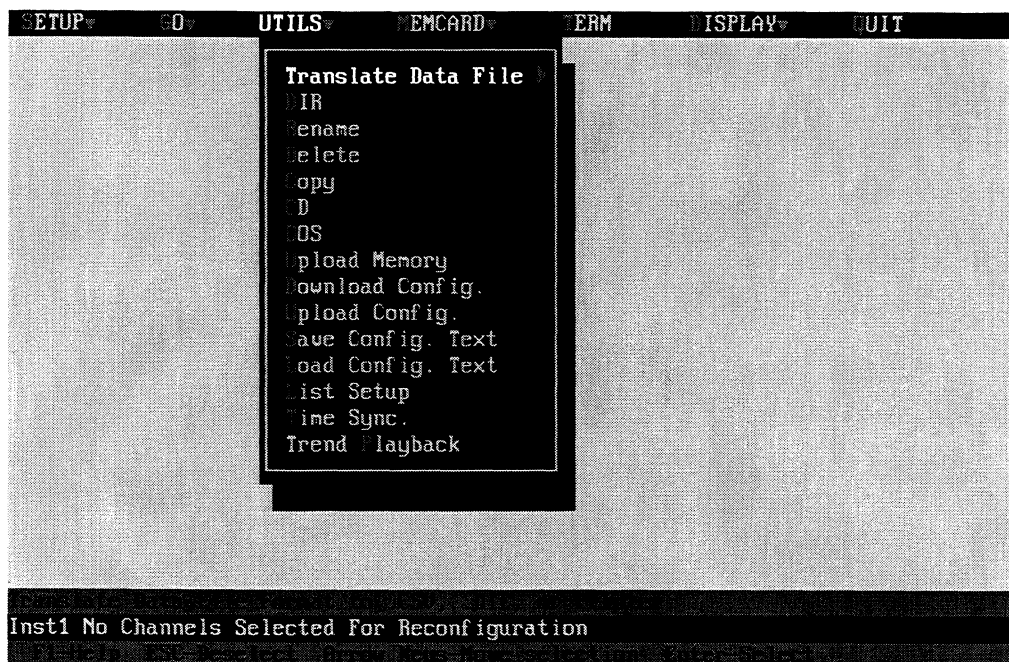
Figure 2-27. UTILS Menu

Translate Data File Menu   2-22.

The "Translate Data File" menu (Figure 2-28) allows raw data files to be translated into other formats. The three translation choices are *.CSV (Comma Separated Variable), *.DIF (Data Interchange Format), and Print. *.CSV and *.DIF files are used by spreadsheet and data analysis programs for data importation. The print translation converts the data file into an ASCII (text) format for printing, word processing, or text editing operations. File translations create a new file, or overwrite an existing file with the name name, but do not alter the original file.

Data files must be in the formats created by Logger (binary or ASCII) or in memory card binary format (Model 2635A Data Bucket only).

The example in Figure 2-28 shows the file DATFIL08.DAT will be translated into DATFIL08.CSV (default). After you press <ENTER>, a prompt appears for entering the name of the new file if the default file name is not desired.

```
 ETUP        GO      UTILS       EMCARD       ERM      ISPLAY       UIT

           Translate Data File   Convert File To .CSV
            IR                    Convert File To  IF
           ename                  Convert File To  rint
           elete
           opy                               Convert From File
            D                         ▲   DATFIL01.DAT
            OS                            DATFIL02.DAT
           pload Memory                   DATFIL03.DAT
           ownload Config.               DATFIL04.DAT
           pload Config.                 DATFIL05.DAT
           ave Config. Text              DATFIL06.DAT
           oad Config. Text              DATFIL07.DAT
           ist Setup                     DATFIL08.DAT
           ime Sync.                     DATFIL09.DAT
           Trend  layback                DATFIL10.DAT
                                         DATFIL11.DAT
                                         DATFIL12.DAT
                                         DATFIL13.DAT
                                         DATFIL14.DAT
                                         DATFIL15.DAT

 Instl No Channels Selected For Reconfiguration
```

Figure 2-28. Translate Data File Menu

DOS Utilities Menu   2-23.

The DOS portion of the utilities menu (Figure 2-29) allows normal DOS file and directory operations while in Logger including Rename, Delete, Copy, CD (Change Directory), and DOS prompt (allowing any DOS-related activity).

The example in Figure 2-29 shows that file DATFIL15.DAT will be copied. After you press <ENTER>, a prompt appears for entering the name of the new file.

```
SETUP▼      CO▼    UTILS▼    MEMCARD▼     TERM     DISPLAY▼     QUIT

            ┌─────────────────────────┐
            │ ranslate Data File ▶     │
            │  IR                      │
            │ ename                    │
            │ elete                    │
            │ Copy                     │            ┌Copy From File──────┐
            │  D                       │            │▲  DATFIL03.DAT      │
            │  OS                      │            │   DATFIL04.DAT      │
            │ pload Memory             │            │   DATFIL05.DAT      │
            │ ownload Config.          │            │   DATFIL06.DAT      │
            │ pload Config.            │            │   DATFIL07.DAT      │
            │ ave Config. Text         │            │   DATFIL08.DAT      │
            │ oad Config. Text         │            │   DATFIL09.DAT      │
            │ ist Setup                │            │   DATFIL10.DAT      │
            │ ime Sync.                │            │   DATFIL11.DAT      │
            │ Trend Playback           │            │   DATFIL12.DAT      │
            └─────────────────────────┘            │   DATFIL13.DAT      │
                                                    │   DATFIL14.DAT      │
                                                    │   DATFIL15.DAT      │
                                                    │   DATFIL16.DAT      │
                                                    │   DATFIL17.DAT      │
                                                    └────────────────────┘

Inst1 No Channels Selected For Reconfiguration
```

Figure 2-29. DOS Utilities Menu

Upload Memory Menu   2-24.

The "Upload Memory" menu (Figure 2-30) is used to extract scan measurement data held in a Model 2625A Data Logger logging memory. Up to 2,047 scans may be uploaded. Sending scan data to the logging memory is a selectable feature at Hydra using MODE (front panel SHIFT-PRINT keys).

The example in Figure 2-30 shows the normal sequence of steps for uploading readings, where a total of 60 scans are recorded, but only the scans 7 through 21 are being uploaded. At the end of the procedure, you are given a choice to clear the logging memory. If you select Y (Yes) is selected, the logging memory is erased. If you attempt this procedure when the logging memory is empty, the message "Empty logging memory" will appear and the procedure will terminate. See the appropriate Hydra Users Manual for methods of clearing memory using front panel controls.

Figure 2-30. Upload Memory Menu

SETUP   O   **UTILS**   EMCARD   ERM   ISPLAY   UIT
┌─60 Scans Available, Enter Scans to Upload─────────────────
│
│ Enter First-Last (Enter for All): 7-21
│
│
└

    ownload Config.
    pload Config.
    ave Config. Text
    oad Config. Text
    ist Setup
    ime Sync.
    Trend layback

Inst1 No Channels Selected For Reconfiguration

Opens a Data File (Figure 2-13)

SETUP   O   **UTILS**   EMCARD   ERM   ISPLAY   UIT

    ranslate Data File
    IR
    ename
    elete
    opy
    D
    OS

  Doing Memory Upload
  Upload Successful, Clear Logging Memory? (Y or N):

        Press ESC To Stop Upload

Inst1 No Channels Selected For Reconfiguration

Figure 2-30. Upload Memory Menu (cont)

Download Config. Menu   2-25.

The "Download Config." menu (Figure 2-31) loads a Hydra configuration from PC RAM to Hydra. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. The configuration data in PC RAM originates from settings in an initialization file when Logger was started, from a "Retrieve Setup" menu (Figure 2-23), from a text file loaded with the "Load Config. Text" menu (Figure 2-24), from an "Upload Config." menu (Figure 2-32), or from the configuration menus in Logger (see SETUP menus). Use the "Show Setup" menu (Figure 2-21) to view the configuration in PC RAM.

The example in Figure 2-31 shows the message window displayed during the download process. If the RS-232 link between Hydra and PC isn't working, or Hydra is not powered, the window changes to "Configuration Download Failed."
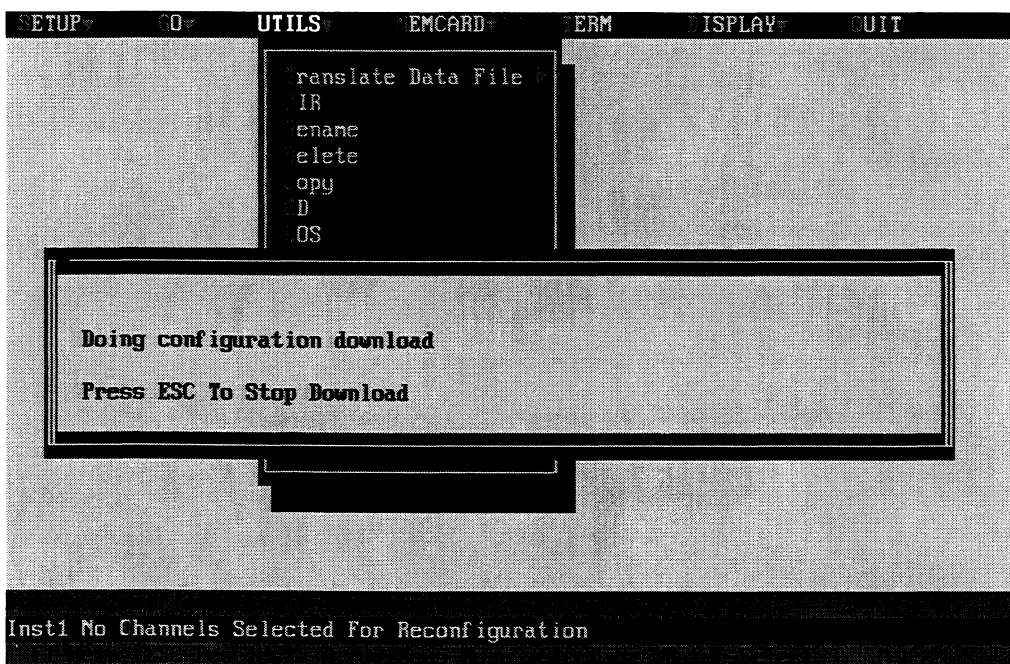
Figure 2-31. Download Config. Menu

Upload Config. Menu. 2-26.

The "Upload Config." menu (Figure 2-32) loads a Hydra configuration from Hydra into PC RAM. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. To view the configuration after completing this menu, refer to the "Show Setup" menu (Figure 2-13). The configuration can be saved in a binary file using the "Store Setup" menu (Figure 2-22) or text file using the "Save Config. Text" menu (Figure 2-33).

The example in Figure 2-32 shows the message window displayed during the upload process. If the RS-232 link between Hydra and PC isn't working or Hydra is not powered, the window changes to "Configuration Upload Failed."
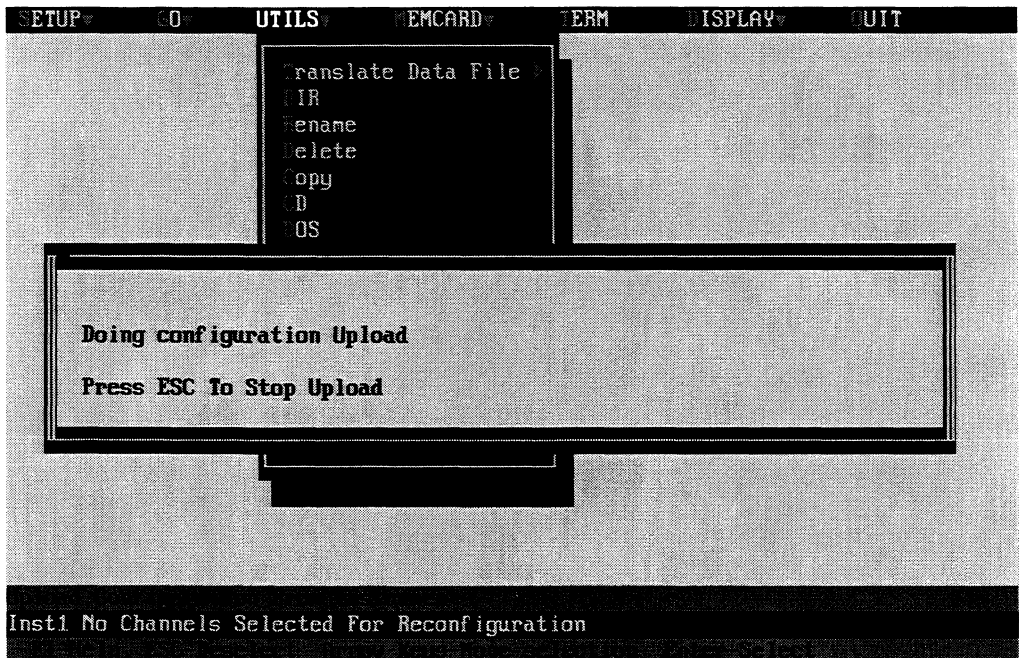
Figure 2-32. Upload Config. Menu

Save Config. Text Menu   2-27.

The "Save Config. Text" menu (Figure 2-33) transfers a complete Hydra configuration from PC RAM into a PC DOS text file. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. Since the source of this data is the configuration stored in PC RAM and not Hydra, use the "Upload Config." menu (Figure 2-32) first to save the present Hydra configuration. To view this configuration, use the "Show Setup" menu (Figure 2-21). The file extension defaults to *.CFG.

The example in Figure 2-33 shows the message window displayed during the process and the file name CONFIG12.CFG.

NOTE

If an existing file name is selected, it is overwritten without warning.
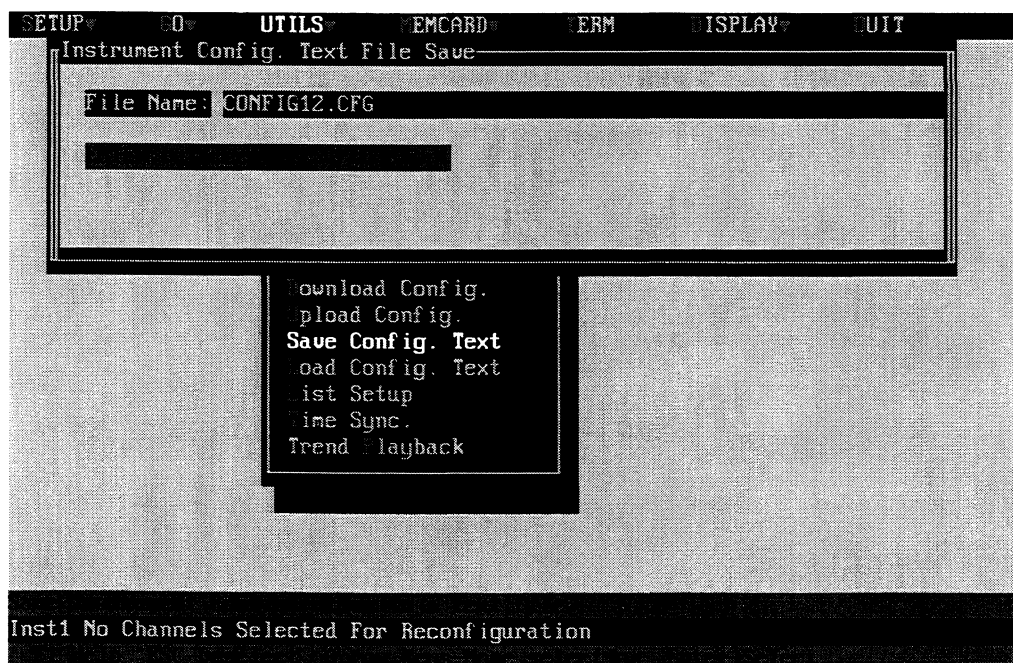
Figure 2-33. Save Config. Text Menu

Load Config. Text Menu 2-28.

The "Load Config. Text" menu (Figure 2-34) loads a complete Hydra configuration from a PC DOS text file into PC RAM. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. To view the configuration after completing this menu, use the "Show Setup" menu (Figure 2-21). To download this configuration to Hydra, use the "Download Config." menu (Figure 2-31).

The example in Figure 2-34 shows the message window containing the configuration files and the selection of the configuration file CONFIG12.CFG.
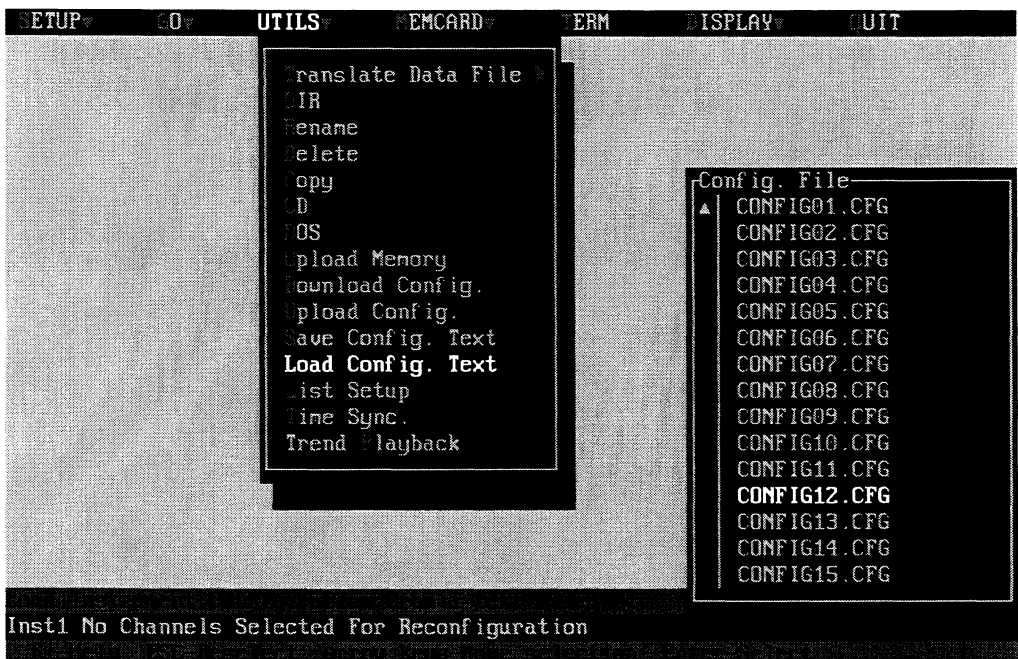
Figure 2-34. Load Config. Text Menu

List Setup Menu   2-29.

The "List Setup" menu (Figure 2-35) saves the Logger configuration and Hydra configuration (as stored in PC RAM) as a PC DOS file. "List Setup" files are created for external word processing and printing, allowing a hardcopy output of Logger/Hydra configurations. The file extension defaults to *.LST.

The example in Figure 2-35 shows Logger/Hydra configuration data will be saved in the text file CONFIG12.LST. The List Setup information can be viewed using the "Show Setup" menu (Figure 2-21). To print out a copy of a listing file, use a print utility to call up the file in any text editing/word processing application.

NOTE

If an existing file name is selected, it is overwritten without warning.
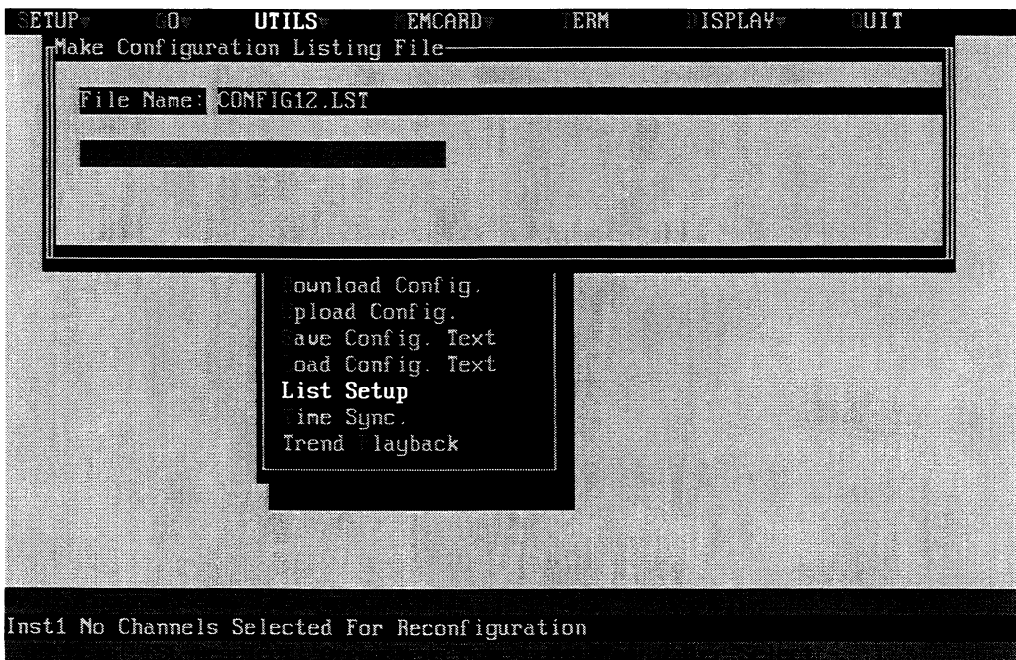
Figure 2-35. List Setup Menu

Time Sync. Menu 2-30.

The "Time Sync." menu (Figure 2-36) sets the Hydra clock in all attached instruments to match the clock in the PC, synchronizing the units. Be sure the PC has the correct time before completing this menu. The time is set to the minute for Model 2620A Data Acquisition Unit and Model 2625A Data Logger, and to the second for the Model 2635A Data Bucket. If the communication link between Hydra and the PC is not operating, an error message "Could not Sync Clocks" is generated.

The example in Figure 2-36 shows the message during the synchronization procedure.
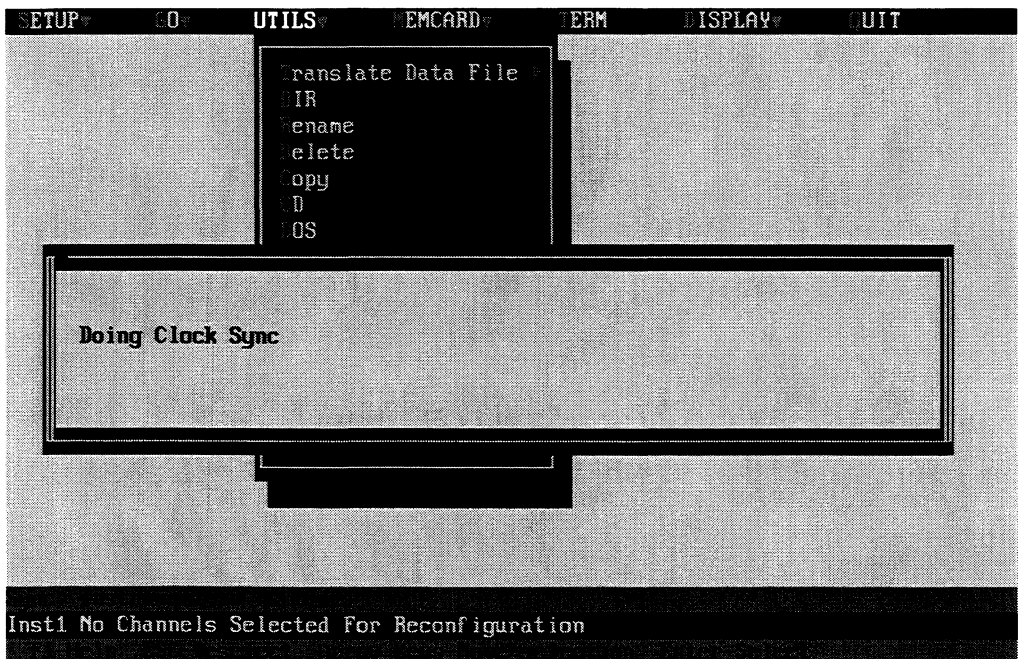
Figure 2-36. Time Sync. Menu

Trend Playback Menu 2-31.`

The "Trend Playback" menu (Figure 2-37) recreates a trend plot based on a previously recorded "Data File" (Figure 2-13). The regenerated trend plot is viewed at a constant time rate, rather than in the time base when the data was collected. For example, a data file collected over two hours could be played back within a few minutes. See the "Trend Plot Config." menu (Figure 2-17) for more information about trend plots.

The example in Figure 2-37 shows the selection of the data file DATFIL15.DAT for the trend plot playback, followed by the menu of parameters used when the trend plot was recorded (which can be changed to suit), and then the trend plot. The playback is controlled with the switches F1-Continuous (toggles playback at a steady rate), F2-Next Screen (playback screen-by-screen), F3-Next Scan (playback scan-by-scan), F4-Pause (freeze playback at any point), and F10-Quit (exit trend playback).
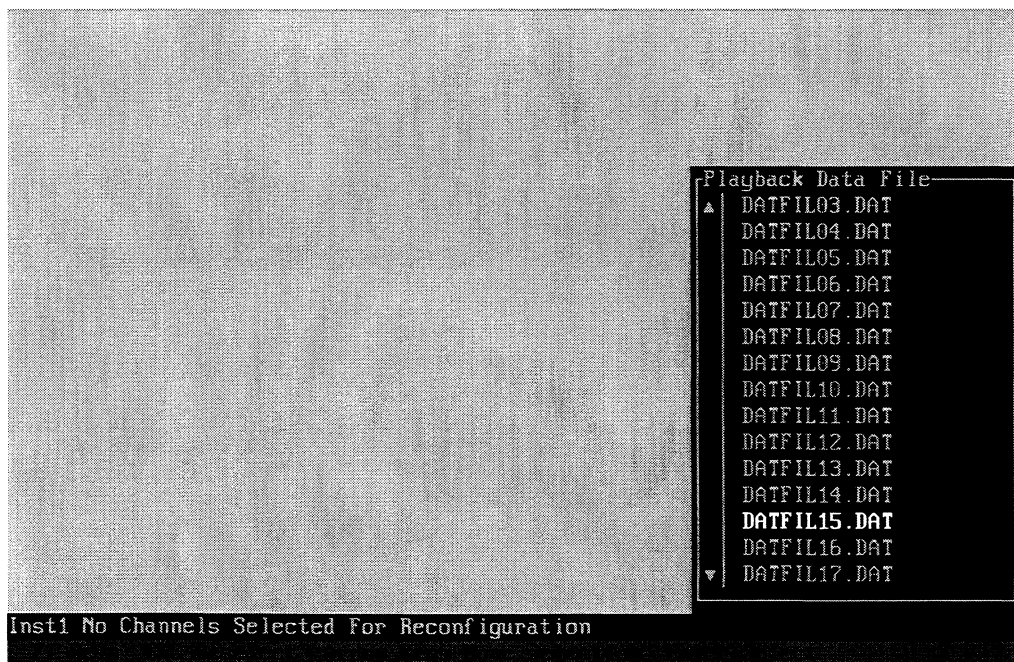
Figure 2-37. Trend Playback Menu
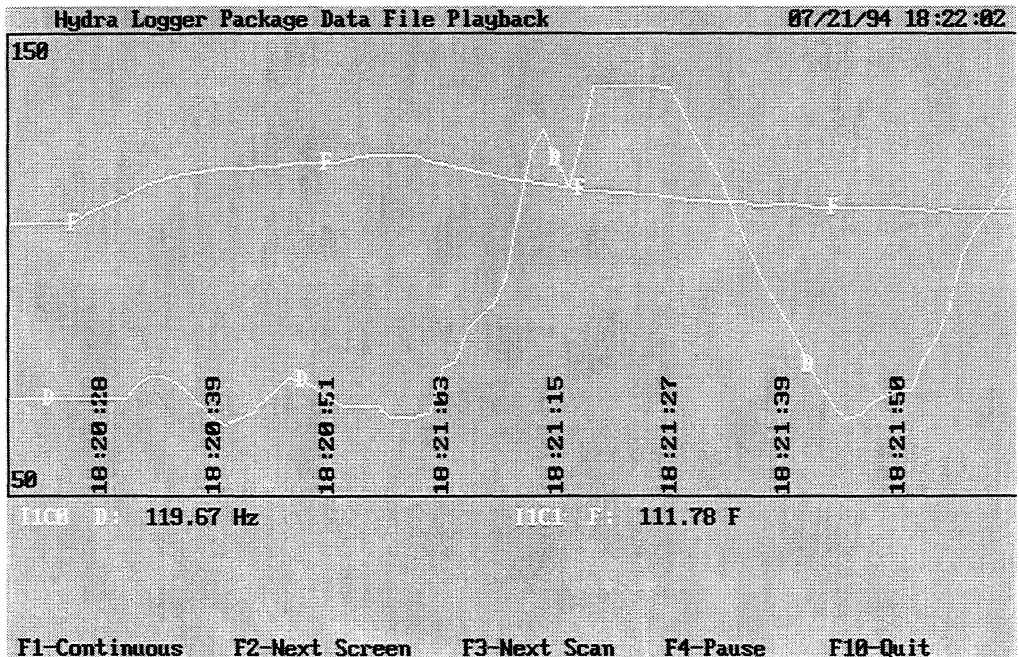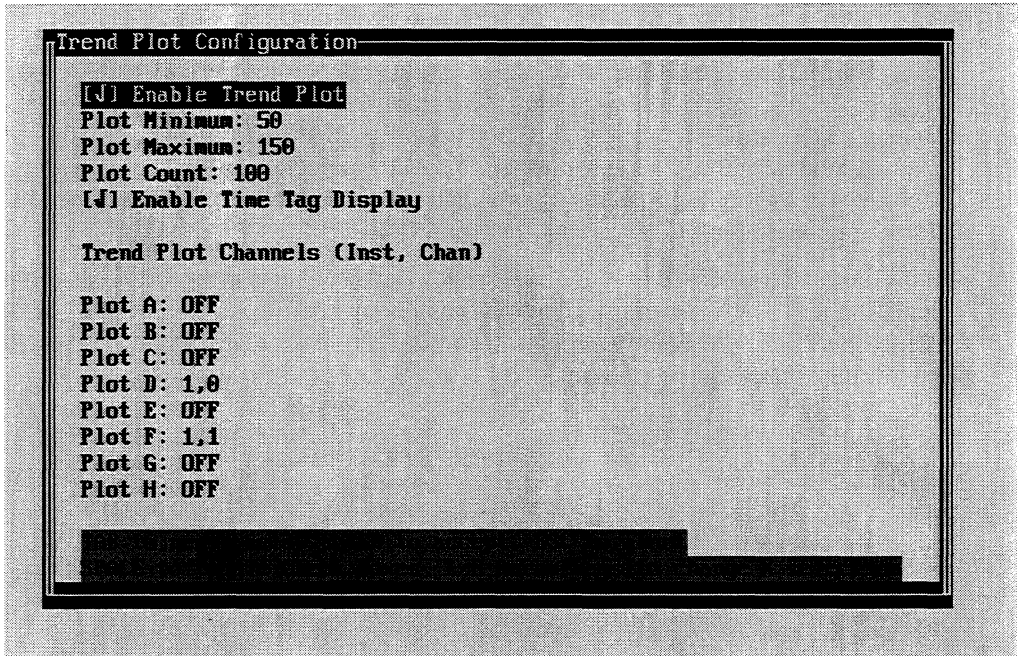
Figure 2-37. Trend Playback Menu (cont)

MEMCARD MENU 2-32.

The "MEMCARD" menu (Figure 2-38) controls the interface between a memory card drive and Logger. Items in this menu apply only to the Model 2635A Data Bucket. The memory card drive is mounted in Hydra as Instrument 1, Instrument 2, or as an external unit attached to the PC. Menu selections allow file transfers, memory card formatting, status reports, and related functions. The memory card drive appears to the PC as just another disk drive.

If the card to be accessed is in a Model 2635A Data Bucket instrument, be sure that scanning and channel monitor functions are inactive before starting MEMCARD menu operations. If scanning or monitoring are active in the instrument, they will be turned off before file transfer starts.


```
SETUP        GO       UTILS       MEMCARD       TERM       DISPLAY       QUIT

              Card in PC Drive
              Card in Instrument
              Card in Instrument

              Directory
              Copy File to PC
              Copy File to Card
              Convert File to .CSV
              Convert File to .DIF
              Convert File to Print
              Delete Memory Card File
              Format (In Hydra Only)
              Status (In Hydra Only)

              Write Configuration File
              Read Configuration File

Inst1 No Channels Selected For Reconfiguration
```

Figure 2-38. MEMCARD Menu

Card Location Menu 2-33.

The card location menu selects the location of the memory card drive for "MEMCARD" menu operations. For a memory card drive in the instrument, select "Card in Instrument 1" or "Card in Instrument 2" from the menu. For a memory drive installed at the PC, select "Card in PC drive" (see Figure 2-38) and a window opens for the drive letter that was determined when the memory card drive was installed.

The example in Figure 2-39 shows that the memory card drive in the PC is called the D drive.
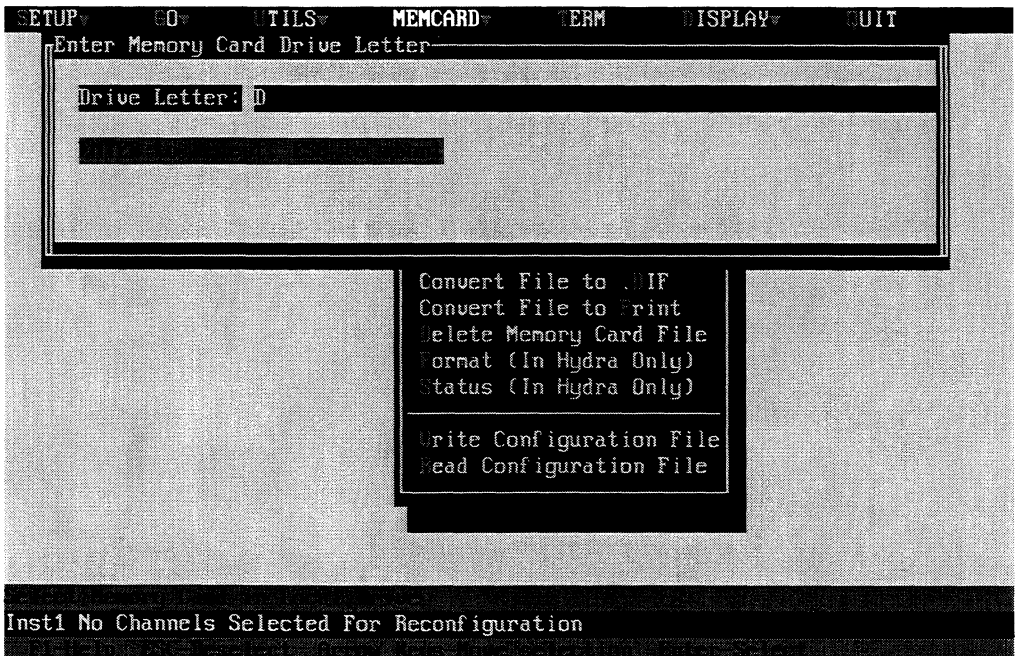
Figure 2-39. Card Location Menu

Directory Menu   2-34.

The "Directory" menu (Figure 2-40) queries the memory card installed in the selected drive for all files on the card. Typically, the file names have the extension *.HYD, where DATxx.HYD are data files and SETxx.HYD are setup (Hydra configuration) files. Since any DOS file can be written to card, other file names such as READ.ME or TESTFILE.SAV could appear in a directory. Normally, the card is reserved for *.HYD files because other files take up memory space.

The example in Figure 2-40 shows 12 files are on the memory card, using a total of 9288 bytes, leaving 240640 bytes for other files. The card size is identified as a 256K-byte card. The date format is Month-Day-Year, and the time format is Hours:Minutes:Seconds (am or pm). If a "Decimal pt = ," selection is made on the "Display" menu (Figure 2-49), the date format is Day-Month-Year and the time is formatted as a 24-hour clock.

```
SPACE to exit; PgUp, PgDn, Up or Down Arrow keys to display more lines
DAT00.HYD          850          07-21-1994  02:18:30p
DAT01.HYD          778          07-21-1994  02:26:16p
DAT02.HYD          814          07-21-1994  03:19:12p
DAT03.HYD          826          07-21-1994  04:09:10p
DAT04.HYD          766          07-21-1994  04:39:02p
DAT05.HYD          874          07-21-1994  05:10:02p
SET00.HYD          730          07-21-1994  12:10:08a
SET01.HYD          730          07-21-1994  02:40:00p
SET02.HYD          730          07-21-1994  03:21:00p
SET03.HYD          730          07-21-1994  05:14:06p
SET04.HYD          730          07-21-1994  06:05:06p
SET05.HYD          730          07-21-1994  07:37:06p
12 files used 9288 bytes
   240640 bytes available on 256 Kbyte card
Card Write Enabled   Card Battery OK
```

Figure 2-40. Directory Menu

Copy File Menu 2-35.

The "Copy File" menu (Figure 2-41) transfers a file from the memory card to the PC (Copy File to PC) or a file from the PC to the memory card (Copy File to Card). When a copy menu is selected, a window opens displaying the files that can be copied. After a file is selected, a window opens to allow the file to be renamed (if desired), and then another window opens that indicates the results of the copy. If the memory card drive is in Hydra, the RS-232 computer interface is established first. If this interface cannot be established, an error message appears. Check the RS-232 parameters set at Logger with the "Com" menu (Figures 2-9, 2-11, and 2-12), check the RS-232 cabling, and verify that Hydra is powered and the memory card is valid.

The example in Figure 2-41 shows the file DAT05.HYD is being copied from the memory card to the PC. The example also shows a READ.ME file that has been copied to the memory card. (This file was created in word processing, in DOS, or from a text editor and could describe the specific memory card function.)

NOTE

If an existing file name is selected, it is overwritten without warning.

Figure 2-41. Copy File Menu

SETUP   GO   TILS   MEMCARD   ERM   ISPLAY   QUIT
Copy File from card to PC

To File Name: C:\LOGGER\DAT05.HYD

Convert File to .IF
Convert File to rint
elete Memory Card File
ormat (In Hydra Only)
tatus (In Hydra Only)

rite Configuration File
ead Configuration File

Inst1 No Channels Selected For Reconfiguration

SETUP   GO   TILS   MEMCARD   ERM   ISPLAY   UIT
Copy File from card to PC

Copying file

Transfered 8 blocks, 896 bytes
Block Retry Count = 0
End of file, cleaning up
Copy Complete - Press any key to continue

Convert File to .IF
Convert File to rint
elete Memory Card File
ormat (In Hydra Only)
tatus (In Hydra Only)

rite Configuration File
ead Configuration File

Inst1 No Channels Selected For Reconfiguration

Figure 2-41. Copy File Menu (cont)

Convert File Menu 2-36.

The "Convert File" menu (Figure 2-42) allows memory card data files to be copied and converted into *.CSV (Comma Separated Variable), *.DIF (Data Interchange Format), or Print files. *.CSV and *.DIF files are used by spreadsheet and data analysis programs for data importation. The print conversion reformats the raw data into an ASCII print file for printing, word processing, or text editing operations.

The example in Figure 2-42 shows the instrument 1 memory card file DAT03.HYD will be copied to the PC and converted to a *.CSV file. Similar to copy operations (Figure 2-41), the file can be renamed, and a successful operation is noted. The file tag, entered when the active configuration file was written to the memory card, is written to the reader section of the *.CSV, *.DIF, and Print files.

NOTE

If an existing file name is selected, it is overwritten without warning.
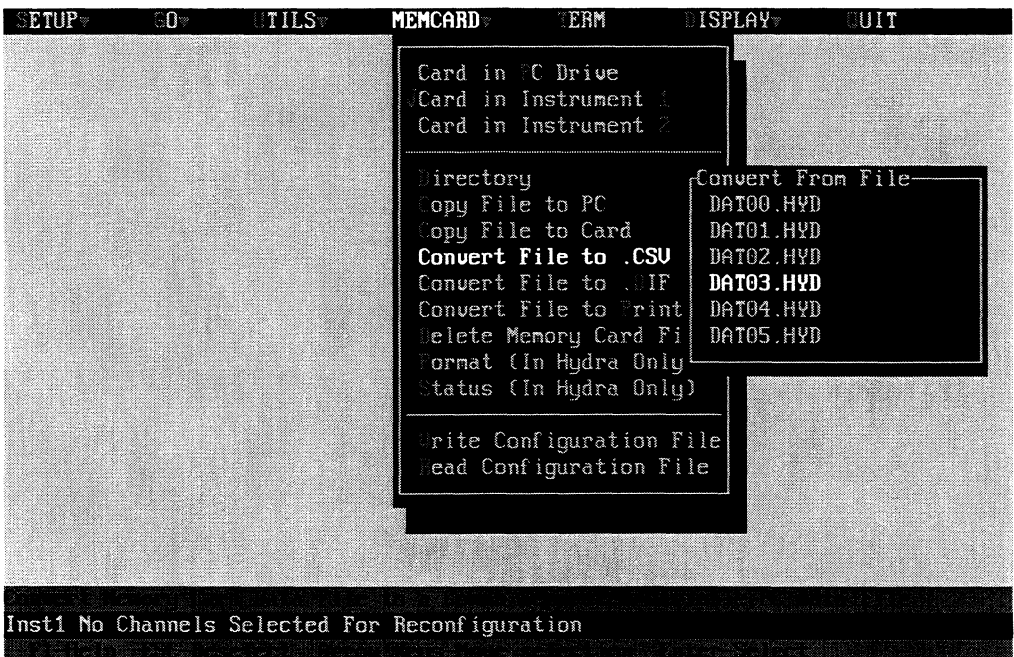
Figure 2-42. Convert File Menu

Delete Memory Card File Menu   2-37.

The "Delete Memory Card File" menu (Figure 2-43) calls up the directory on the memory card and allows a file to be selected for deletion.

The example in Figure 2-43 shows the file SET04.HYD will be deleted when the <ENTER> key is pressed.

NOTE

No warning message will be given. Be sure you want to delete the selected file before completing this operation.
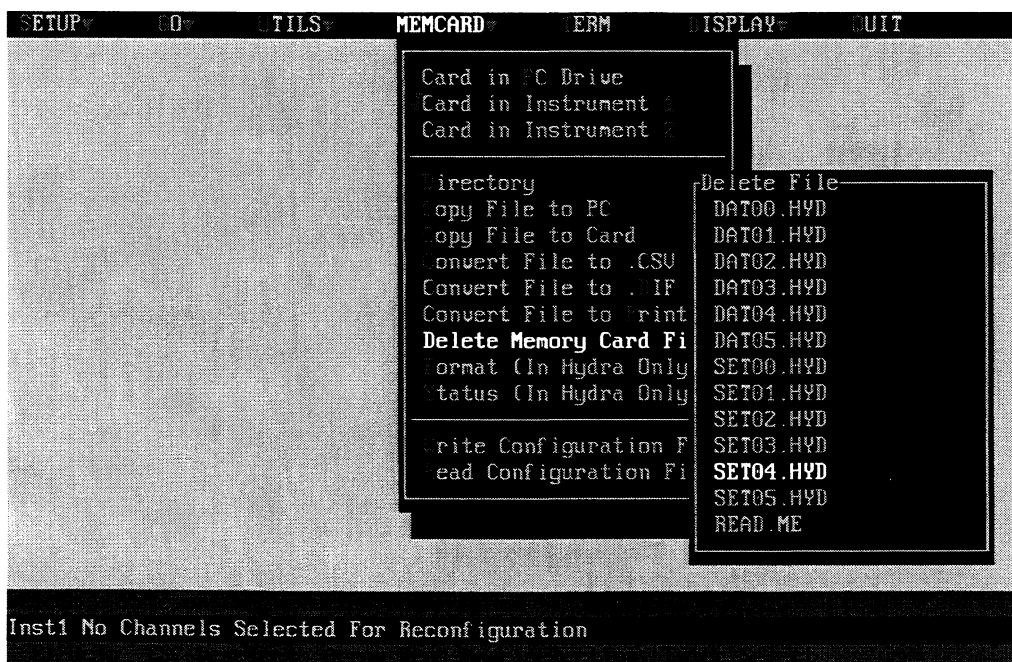
Figure 2-43. Delete Memory Card File Menu

Format (In Hydra Only) Menu   2-38.

The "Format (In Hydra Only)" menu (Figure 2-44) is used to totally erase the memory card in Hydra and format it in preparation for memory card operations. To format a memory card in a PC memory card drive, use the utility program supplied with the memory card drive. A warning window appears when this menu is selected to verify that the memory card should really be erased and reformatted. Enter Y (Yes) or N (No).

The example in Figure 2-44 shows a Y (Yes) response to the "Really Format the Card (Y or N):" warning.
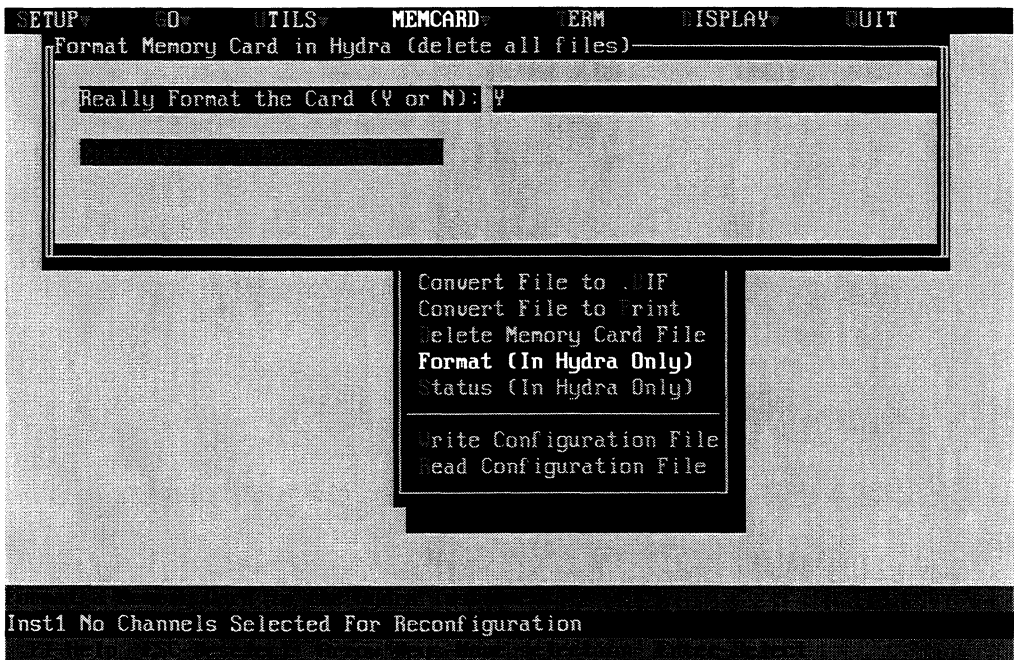
Figure 2-44. Format (In Hydra Only) Menu

Status (In Hydra Only) Menu   2-39.

The "Status (In Hydra Only)" menu (Figure 2-45) is used to check how many bytes are available on the card for memory card operations, to verify that the card is "Card Write Enabled," and that the memory card battery is O.K.

To determine the status of a memory card in a PC memory card drive, use the utility supplied with the memory card drive.

The example in Figure 2-45 shows 239616 bytes are available for memory card operations, the size of the card is 256K bytes, the card is write enabled, and the battery is O.K.
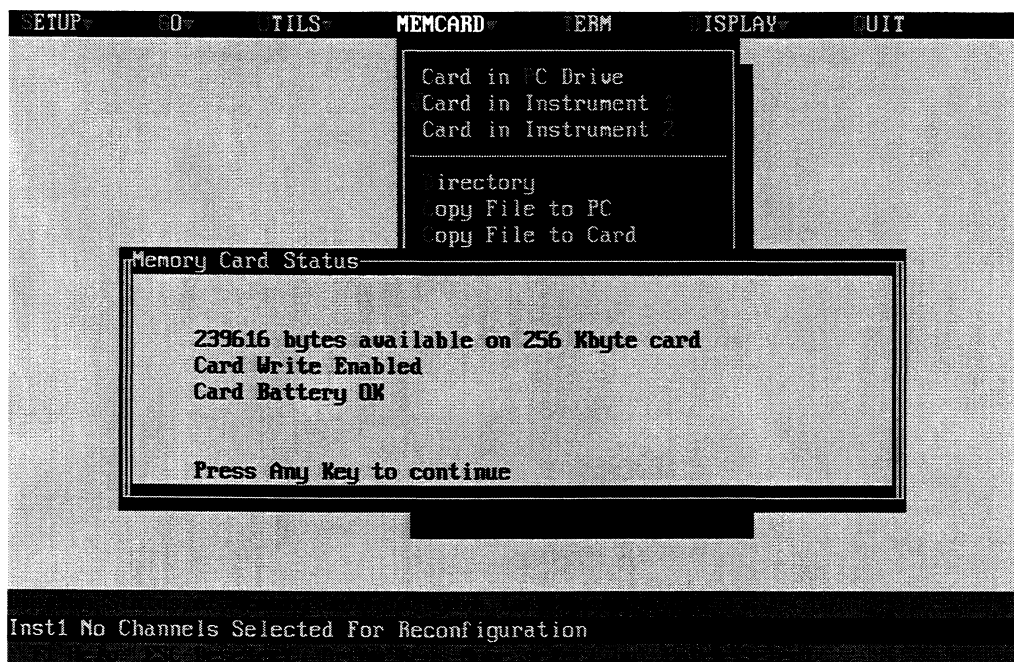
Figure 2-45. Status (In Hydra Only) Menu

Write Configuration File Menu   2-40.

The "Write Configuration File" menu (Figure 2-46) is used to save a Hydra configuration stored in PC RAM to the memory card. On Hydra, the FILES front panel control is used to load this configuration into Hydra from the memory card. The configuration file name must be in the form SETxx.HYD, where xx is a number from 00 to 99. If the file already exists on the card, that file is overwritten without warning. The configuration data in PC RAM originates from an "Upload Config." menu (Figure 2-32), a "Load Config. Text" menu (Figure 2-34), or from a default configuration when Logger was initialized or reinitialized with a "Retrieve Setup" menu (Figure 2-23). To view the configuration before completing this menu, refer to the "Show Setup" menu (Figure 2-21).

The file tag is saved with the configuration file and is used as a comment on any data files recorded to the memory card after the configuration is loaded from this file.

The example in Figure 2-46 shows that the configuration in PC RAM will be copied to the memory card with the name SET26.HYD, and the tag is "Power Supply Test."
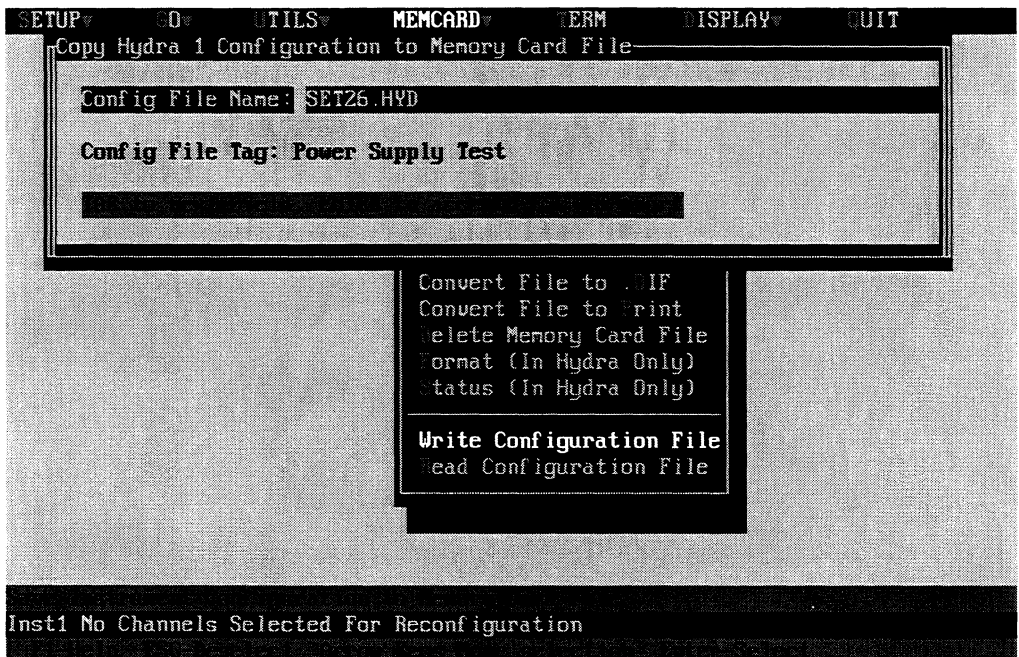
Figure 2-46. Write Configuration File Menu

Read Configuration File Menu   2-41.

The "Read Configuration File" menu (Figure 2-47) is used to load a SETxx.HYD file on the memory card into PC RAM. This includes channel configurations, alarms, scaling, measurement rate, and all other Hydra parameters. To view this configuration after completing this menu, refer to the "Show Setup" menu (Figure 2-21). The configuration can be saved from PC RAM by using the "Save Config. Text" menu (Figure 2-33) or "Store Setup" menu (Figure 2-22).

The example in Figure 2-47 shows the memory card file SET03.HYD will be loaded in PC RAM.
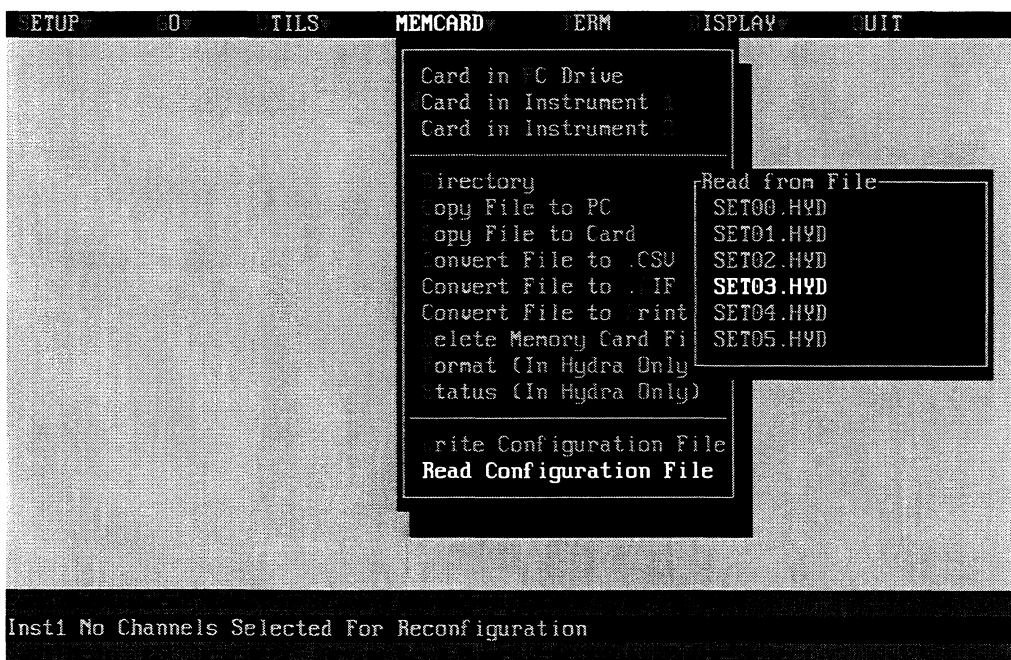
Figure 2-47. Read Configuration File Menu

TERM MENU 2-42.

The "TERM" (Terminal) menu (Figure 2-48) starts a terminal emulator mode to communicate directly with Hydra via the RS-232 or IEEE-488 computer interfaces. The Hydra computer command set can be used (see the Users Manual) to diagnose problems with the computer/Hydra interface, display Hydra model and software versions, and exercise the command set.

The example in Figure 2-48 shows the entry of several commands. The *IDN? command returns a string that identifies the instrument model and software versions. A successful command execution returns the "=>" prompt. The FUNC 0, VDC, 4 command configured channel 0 for volts dc and range 4 (150 volt scale); the TEMP_CONFIG 3 command enabled "Open Thermocouple Detect," and set the temperature scale to °F; the TOTAL_DBNC 1 command enabled the totalizer contact debounce feature; and the LOCK 0 command unlocked all Hydra front panels keys. Refer to the Users Manual for more information about these and other interface commands.

```
Terminal Emulator (ESC to quit)
Establishing RS-232 interface with Instrument on COM2
Have interface with Model 2635A  Version M6.5 A4.7 D1.0 L0.0
Baud rate = 9600 bps
Parity = NONE

 Press ESC to exit from terminal emulator
=>
*IDN?
FLUKE,2635A,9110930,M6.5 A4.7 D1.0 L0.0
=>
FUNC 0, VDC, 4
=>
TEMP_CONFIG 3
=>
TOTAL_DBNC 1
=>
LOCK 0
=>
```

Figure 2-48. TERM Menu

DISPLAY MENU   2-43.

The "DISPLAY" menu (Figure 2-49) gives a choice of a light background or dark background. The Decimal Pt (Point) allows you to specify numbers with periods or commas as decimal points. The Separator refers to the character used to separate the fields in data files as follows:

Separator = ,	12.345,23.456,34.567
Separator = ;	12,345;23,456;34,567
Separator = TAB	12,345 23,456 34,567

These selections also set the date-reporting format Month/Day/Year (decimal point ".") or Day/Month/Year (decimal point ",").

"PC Memory Remaining" reports the conventional DOS memory available after Logger is loaded. If the PC is overloaded with software programs, the Memory Left could fall below 32000 bytes, which is the minimum number for Logger to perform properly. If this happens, functions like the "Show Setup" menu (Figure 2-21) may cause "Not Enough Memory" error messages.
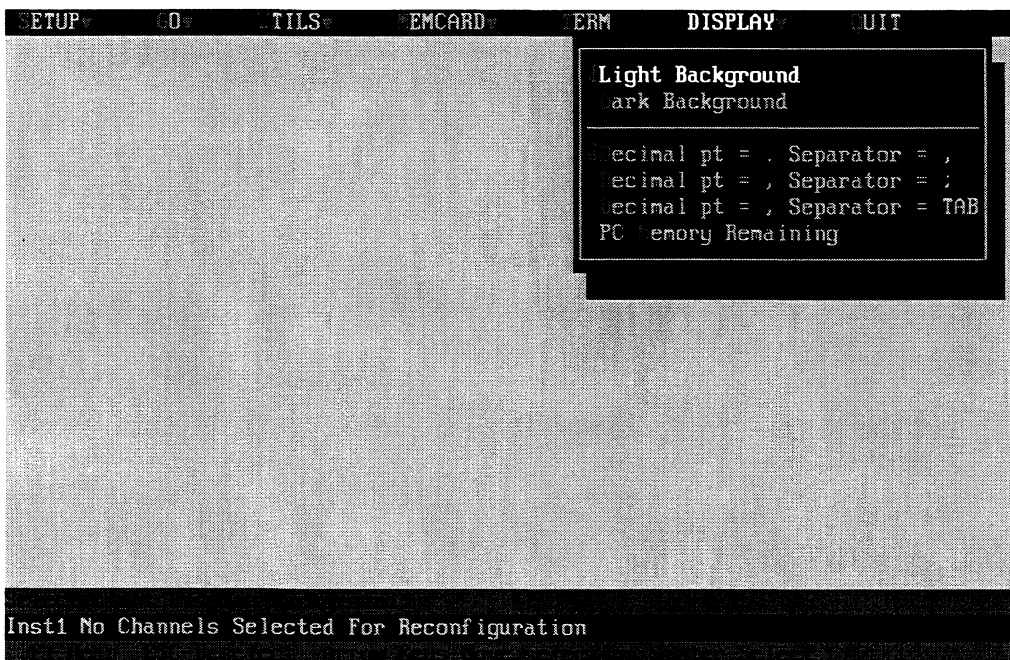
Figure 2-49. DISPLAY Menu

QUIT MENU 2-44.

The "QUIT" menu (Figure 2-50) is used to exit the Logger program. When Logger is initialized, the file LOGGER.INI provides program and instrument defaults, as does any subsequent "Retrieve Setup" menu selection (Figure 2-23). If any default was changed during operations, the program asks if the changes should become the new defaults (changes saved) before quitting. If you select Y (Yes), a window requests the name of the initialization file in which to store the changes. This can be the current initialization file, a different file, or a new file to be created. If you select N (No), the changes to the defaults are not changed, and the next window verifies the Quit operation, where Y will exit the program, and N will return to the main menu.

Figure 2-50. QUIT Menu

```
┌─Save Program Setup to a File───────────────────────────────────
│
│   File Name: C:\LOGGER\LOGGER6.INI
│
│
```

Inst1 No Channels Selected For Reconfiguration

```
┌─Quit Verify───────────────────────────────────────────────────
│
│   Do you really want to QUIT? (Y or N): Y
│
│
```

Inst1 No Channels Selected For Reconfiguration
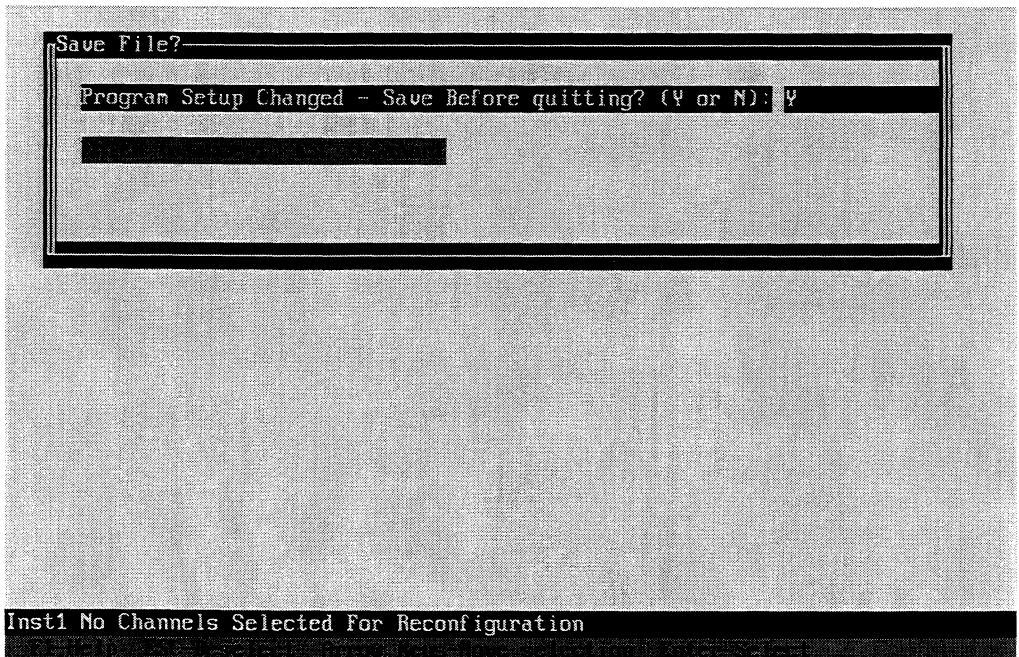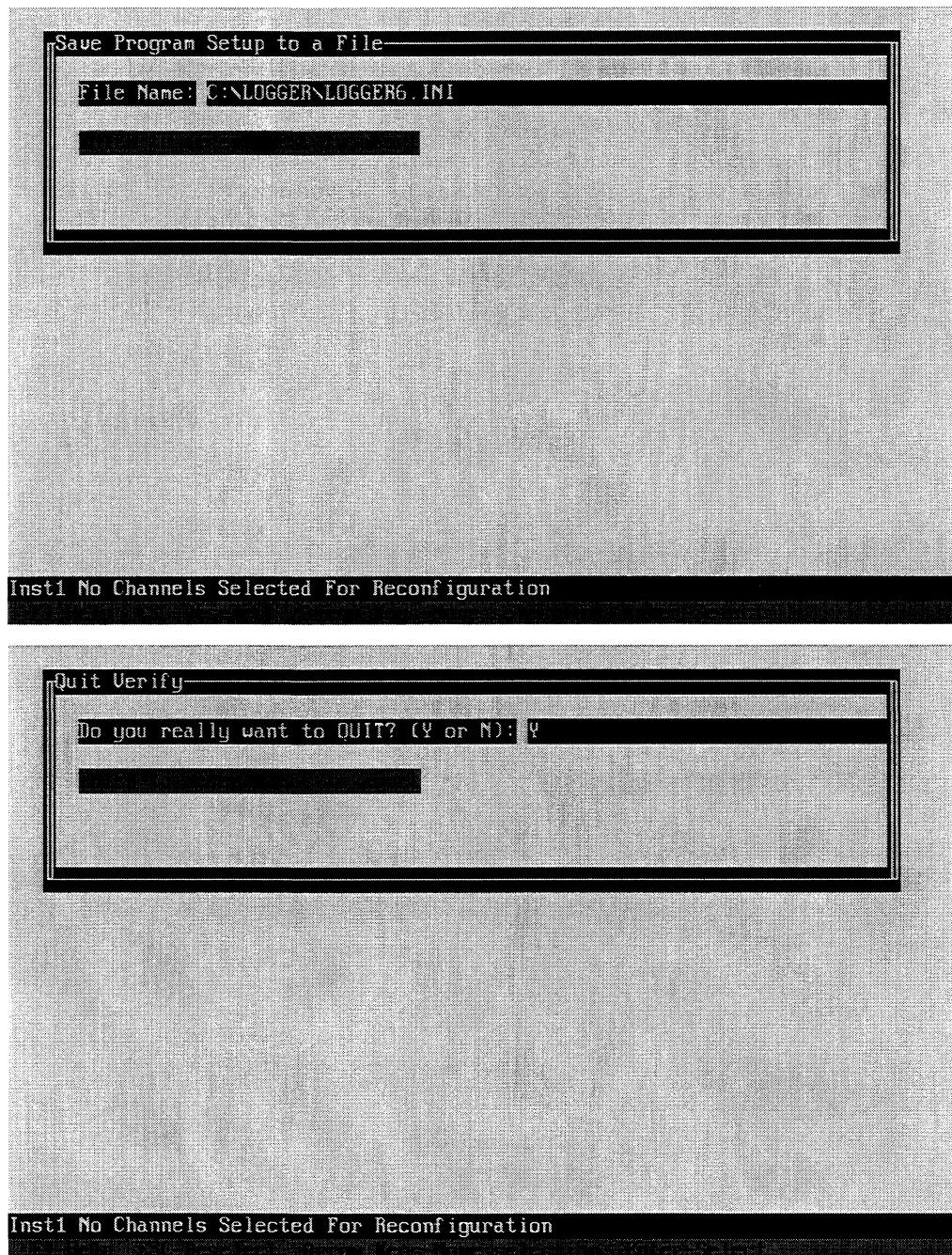
Figure 2-50. QUIT Menu (cont)

Section 3

Typical Operations

CONTENTS

SUMMARY OF TYPICAL OPERATIONS 3-1.

This section provides a collection of typical operations that use the menus and windows described in Section 2. It is assumed that Logger has been installed and started as described in Section 1, "Getting Started."

SELECTING THE DISPLAY MODE 3-2.

You can select the PC display options and numbers decimal point ("." or ",") by opening the "DISPLAY" menu (Figure 2-49). While in this menu, check the "PC Memory Remaining" display to verify that the PC has at least 32000 bytes available to operate Logger. The shading of the background screen can also be selected providing a light or dark background.

CONFIGURING AND TESTING THE COMPUTER INTERFACE 3-3.

Complete the following procedure to use the terminal emulation (TERM) feature to test the operation of the computer interface with Hydra. The interface can be either an RS-232 link (all Hydra models) or IEEE-488 link (Hydra Model 2620A Data Acquisition Unit only). It is assumed that the Hydra(s) have been cabled together as described in the appropriate Hydra Users Manual.

1.   At the PC, open the "Com" menus (Figures 2-9, 10, 11) and select the RS-232 baud rate and parity that matches the setting in Hydra, or select the IEEE-488 interface and associated parameters.

2.   If a modem is being used, continue by opening the "Setup Modem" menu (Figure 2-12), and establish modem communications. (Note that the modem unit should be prepared for operation before Logger is initialized.)

3.   Open the "TERM" menu (Figure 2-48) and wait for the "=>" prompt, which indicates connection with Hydra. With an RS-232 interface using AutoBaud, up to 60 seconds may be required to establish the link, depending on the baud rate of Hydra. If the error message, "Couldn't Establish Interface" is returned, then Hydra is not powered, there is a cabling problem, or parameters in Hydra and the PC don't match.

4.   When communications are established, press the <ENTER> key a few times and observe the => returns. See the appropriate Hydra Users Manual for a description of the command set that can be used over the computer interface.

CONFIGURATION FILES 3-4.

A configuration file is a PC DOS file that completely defines a Hydra configuration, including channel functions, alarms, Mx+B scaling, scan interval, triggering, and measurement rate. Typical operations for saving, loading, and printing Hydra configuration files are described in the following paragraphs. Configuration files are created from an actual instrument configuration or a Logger-created instrument configuration.

Creating a Configuration in Hydra   3-5

A Hydra configuration can be created at the instrument using the front panel keys and, using Logger functions, this configuration can be stored and manipulated as described in the following paragraphs. See the appropriate Hydra Users Manual for information on how to configure Hydra. The following parameters cannot be set at the Hydra front panel, but they can be added to the configuration using Logger functions by making the following selections:

- Open Thermocouple Detect (Figure 2-7)
- Totalizer Debounce (Figure 2-7)
- Front Panel Configuration Lock (Figure 2-8)
- Modem Communications (Figure 2-12)
- Volts DC 900mV Scale (Figure 2-3)

Creating a Configuration in Logger   3-6.

Complete the following procedure to create a Hydra configuration in Logger. This configuration is placed in PC RAM and can be stored and manipulated as described in the following paragraphs. Complete only those steps that apply. For example, to assign only Mx+B scaling to a channel, use step 4.

1. Select the instrument for configuration, i.e., Instrument 1 or Instrument 2 (Figure 2-1).

2. Select the instrument channel(s) for configuration (Figure 2-2).

3. Assign the desired function for the channel(s) selected in step 2 (Figure 2-3).

4. Assign Mx+B scaling for the channel or channels selected in step 2 (Figure 2-4).

5. Assign Alarms for the channel(s) selected in step 2 (Figure 2-5).

6. Select the instrument measurement rate, monitor channel temperature unit, open thermocouple detect option, totalizer debounce option, and alarm bell (Figure 2-6).

7. Select the instrument data storage configuration (Figure 2-7).

8. Select an instrument front panel lock option (Figure 2-8).

9. Select the method of instrument triggering (Figure 2-15).

10. Select the scanning interval and measurements to skip between file recordings (Figure 2-16).

11. Observe the completed configuration by opening the Show Setup Menu (Figure 2-21).

Saving a Hydra Configuration as the Logger Default File   3-7.

Complete the following procedure to save a Hydra configuration as the default settings for Logger.

1. At Hydra, configure all channels and parameters for their default settings.
2. At the PC, upload the configuration into PC RAM using the "Upload Config." menu (Figure 2-32).
3. Open the "Show Setup" menu (Figure 2-21) to verify Hydra configuration.
4. Open the "Store Setup" menu (Figure 2-22) to save the configuration as a setup file. For example, LOGGER6.INI.

Loading a Logger Default Configuration File into Hydra   3-8.

Complete the following procedure to load a Logger default configuration file into Hydra.

1. At the PC, initialize Logger with the desired default setup file using the /F switch (see Section 1), e.g., LOGGER /FNAME.INI, where NAME.INI is the configuration file, or after Logger is running, use the "Retrieve Setup" menu (Figure 2-23) to select and initialize with a setup file.
2. Open the "Show Setup" menu (Figure 2-21) to verify Hydra configuration. The "Trigger", "Interval Scan" and "Scan Interval" parameters can be changed in Logger by using the "Scan Trigger Type" menu (Figure 2-15) and "Scan Interval" menu (Figure 2-16).
3. Download the configuration to Hydra using the "Download Config." menu (Figure 2-31).
4. At Hydra, verify the configuration change was successful.

Saving a Hydra Configuration as a PC Configuration File   3-9.

Complete the following procedure to save the present Hydra setup as a PC configuration file (saved in ASCII text).

1. At Hydra, configure all channels and parameters for the desired settings.
2. At the PC, upload the configuration into PC RAM using the "Upload Config." menu (Figure 2-32).
3. Open the "Show Setup" menu (Figure 2-21) to verify Hydra configuration.
4. Open the "Save Config. Text" menu (Figure 2-33) to save the configuration as a configuration file. For example, CONFIG12.CFG.

Saving a Logger Configuration as a PC Configuration File   3-10.

Complete the following procedure to save the present Logger setup as a PC configuration file (saved in ASCII text).

1. View the current Logger configuration using the "Show Setup" menu (Figure 2-21). To create or change the Logger configuration, refer to "Creating a Configuration in Logger" above.

2.   Open the "Save Config. Text" menu (Figure 2-33) to save the configuration as a configuration file. For example, CONFIG12.CFG.

Loading a PC Configuration File into Hydra   3-11.

Complete the following procedure to load a previously saved configuration file (saved in ASCII text) into Hydra.

1.   At the PC, open the "Load Config. Text" menu (Figure 2-34) and select the desired *.CFG (configuration) file.
2.   Open the "Show Setup" menu (Figure 2-21 to verify Hydra configuration. The "Trigger," "Interval Scan," and "Scan Interval" parameters can be selected in Logger by using the "Scan Trigger Type" menu (Figure 2-15) and "Scan Interval" menu (Figure 2-16).
3.   Download the configuration to Hydra using the "Download Config." menu (Figure 2-31).
4.   At Hydra, verify the configuration change was successful.

Printing a PC Configuration File   3-12.

Complete the following procedure to print a previously saved configuration file. Configuration files can be printed out directly because they are in ASCII text; however, they are formatted for Logger and are difficult to interpret. Converting them with "List Setup" makes them easy to read and interpret.

1.   At the PC, open the "Load Config. Text" menu (Figure 2-34) and select the desired *.CFG (configuration) file.
2.   Open the "Show Setup" menu (Figure 2-21) to verify Hydra configuration.
3.   Open the "List Setup"menu (Figure 2-35) to save the "Show Setup" menu as an ASCII text file (*.LST), for example, CONFIG10.LST.
4.   Quit Logger (Figure 2-50) and use DOS commands, a text editor, or word processing application to print out the *.LST file.

DATA FILES   3-13.

Data files contain measurement data that was transferred over the computer interface from Hydra to Logger or saved on the Model 2635A Data Bucket memory card. The raw data files can be printed out only if recorded in ASCII, or they can be translated for spreadsheet and other data management applications. For the Model 2625A Data Logger, data can be stored in the logging memory (up to 2,000 scans) and extracted into a data file. The Model 2620A Data Acquisition Unit and Model 2635A Data Bucket do not have a logging memory.

For the Model 2635A Data Bucket, measurement data may be transferred to Logger via the RS-232 interface, or it can be stored on the memory card. Memory card data files are in binary format and must be translated by Logger before use.

Opening Data Files 3-14.

To open a data file for the collection of measurement data, refer to the "Data File" menu (Figure 2-13). The selections made can be viewed in the "Show Setup" menu (Figure 2-21.

Opening State Files 3-15.

To open a state file, usually used to communicate the latest readings to other programs, refer to the "State File" menu (Figure 2-14).

Printing Data Files 3-16.

To print a data file, open the "File Translation" menu (Figure 2-28) and select the "Convert File to Print" option. After the conversion is complete, Quit Logger (Figure 2-50) and use your word processing or text editing applications or DOS commands to print out the measurement data file in a readable format.

Translating Data Files 3-17.

Data files can be translated to comma-separated variable format (*.CSV), data interchange format (*.DIF), and print format. To translate a file, refer to the "File Translation" menu (Figure 2-28).

Data Files and the Logging Memory 3-18.

The Model 2620A Data Acquisition Unit has no internal logging memory. For this instrument, opening the "Show Setup" menu (Figure 2-21) will always report "Logging Memory Disabled."

The Model 2625A Data Logger has an internal logging memory that you can select at Hydra front panel by using MODE. Up to 2000 scans are saved in this memory. For the Model 2625A, opening the Show Setup menu will report (when Logging Memory for data destination and All is selected for data mode) "Logging all Scan Data to Memory."

When data is recorded in the logging memory, it is uploaded from Hydra to the PC and into a data file by opening the "Upload Memory" menu (Figure 2-30). Once the data is in a data file, it can be handled like any other data file.

SCANNING 3-19.

Logger can record measurement data only when scanning is initiated at the PC. Scanning initiated at Hydra by pressing the SCAN key will not result in measurement data being saved in Logger. Open the "GO" menu (Figure 2-24 to enable scanning.

USING DOS UTILITIES 3-20.

Logger uses the following file types with the following default file extensions: initialization files (*.INI), configuration text files (*.CFG), list setup files (*.LST), memory card files (*.HYD) (Model 2635A Data Bucket only), and data measurement files in raw format, comma-separated variable format (*.CSV), data interchange format (*.DIF), and print format. These, and any related files created by the user, can be manipulated with the Logger DOS utilities. To use the DOS utilities, including Directory, Rename, Delete, Copy Change Directory, and DOS prompt (for other DOS functions), open the "DOS Utilities" menu (Figure 2-27).

MEMORY CARD 3-21.

Memory card operations (Model 2635A Data Bucket only) are described in the "MEMCARD" menu (Figure 2-38). Memory card files (*.HYD) are in two types: DATxx.HYD and SETxx.HYD, where xx represents a two-digit number from 00 to 99. The DATxx. HYD files contain measurement data and are treated like Logger data files, including translation and file handling. The SETxx.HYD files are setup (configuration) files and are transferred to and from Hydra in the same manner as Configuration files (discussed above).

SIMULATION MODE 3-22.

The simulation mode puts a "Measurement Display" menu on the screen (Figure 2-25) and sequences numbers to give the appearance of measurement scanning. The simulation mode is entered by opening the "GO" menu (Figure 2-24) and selecting "Simulated Data Collection."

TREND PLOTS 3-23.

Trend Plots are generated when the "GO" menu (Figure 2-24) starts Hydra scanning. To select the channels for display and the scale values for the display, see the "Trend Plot Config." menu (Figure 2-17). A trend plot example is shown in Figure 2-18. Trend plots can be played back from an existing data file. To play back a trend plot, see the "Trend Playback" menu (Figure 2-37).

TIME SYNCHRONIZATION 3-24.

To synchronize the PC and Hydra clocks, refer to the "Time Sync." menu (Figure 2-36).

PLOT OR TEXT PRINTING 3-25.

Measurement results can be printed at the PC in either a Plot or Text format. To select the channels for printing and the scale values for the print, see the "Printer Config." menu (Figure 2-19). A text printout example is shown in Figure 1-4), and a plot printout example is shown in Figure 2-20.

QUIT MODE 3-26.

The "Quit" menu (Figure 2-50) prompts for possible changes to the current initialization file and verifies that the quit function is desired.

PRUNING AND GRAFTING DATA FILES 3-27.

Using the Pruning and Grafting Utility (Section 4), data files can be filtered using criteria as channel numbers, scan skipping, averaging, running average, data/time range, and greater-than and less-than values and AND/OR value limits. For example, a data file can be pruned to measurements for a single channel or a single channel within value limits, recording the output in an output file. The grafting portion combines separate data files into a single output file. These operations can be combined both filtering and combining data files. This is a single utility and it is described in Section 4, "Pruning and Grafting Utility."

Section 4
Pruning and Grafting Utility

CONTENTS

SUMMARY OF PRUNING AND GRAFTING UTILITY   4-1.

Section 4 is a guide to operation of the Hydra Logger Pruning and Grafting Utility. The utility allows data files of potentially thousands of scan records to be reduced to only the records of interest by passing the data through a "filter." The output of the filter is saved in a separate ASCII file. Filter parameters include channels, measurement skipping, averaging, date/time range, greater-than, less-than, and AND/OR value limits.

The utility can merge separate data files into a single data file. The source files may be in the binary data file format and ASCII data file format produced by Logger and Starter application software, or memory card binary format (Model 2635A Data Bucket only). Both utility functions can be applied, filtering and combining files simultaneously into a single output file.

The main menu for the utility consists of four menus, FILE, EDIT, GO, and DISPLAY, plus a program setup screen summarizing the parameters of the files and filters. As parameters are selected, they appear on the program setup screen.

Table 4-1. Summary of Pruning and Grafting Utility Menus and Windows

FUNCTION	DESCRIPTION	FIGURE
FILE Menu	Manage setup files	4-1
NEW Menu	Resets setup to defaults	4-1
SAVE Menu	Saves the setup	4-1
OPEN Menu	Reads an initialization file	4-2
SAVEAS Menu	Saves setup to an initialization file	4-3
EXIT Menu	Used to exit the utility	4-4
EDIT Menu	Selects files and filters	4-5
Input Files Menu	Selects the input files for merging and filtering	4-6
Output File Menu	Selects the output file for the merged/filtered data	4-7
Channels List Menu	Selects the channels to be filtered and merged	4-8
Filters Menu	Selects the filter parameters for the selected files	4-9
Decimal Point Menu	Selects the data file separator and date format	4-10
File Compatibility Menu	Enables/disables data file compatibility checking	4-10
GO Menu	Used to initiate the utility to perform its function	4-11
DISPLAY Menu	Selects background format and memory remaining	4-12

FILE Menu   4-2.

The "FILE" menu (Figure 4-1) is used to set the initial conditions of the program. Program setups can be created, recalled, and saved. When the utility is started, a default initialization file `PANDG.PNI` loads the initial program setup.

NEW Menu   4-3.

When "NEW" is selected, press the <ENTER> key to reset the program to the default values stored in the current initialization file. Use the entries in the "EDIT" menu (Figure 4-5) to configure the program setup for the desired operations.

SAVE Menu   4-4.

When "SAVE" is selected, press the <ENTER> to save the program setup in the current initialization file. For example, if the default initialization file PANDG.PNI is active, Save will update this file with the configuration shown in the program setup screen.

```
FILE          DIT          O          ISPLAY

 NEW
  PEN
  AVE
  AVEAS
  XIT



 Input Files:
 Output File:                    Setup File: pandg.pni
 Channels: 0-122
 Skip: 0    Average: 0    Running Average: 0
 Start Date/Time: None    End Date/Time: None
 Output File Decimal Pt = .  Separator = ,   Date = MM/DD/YY
 File Compatibility Testing Disabled
```
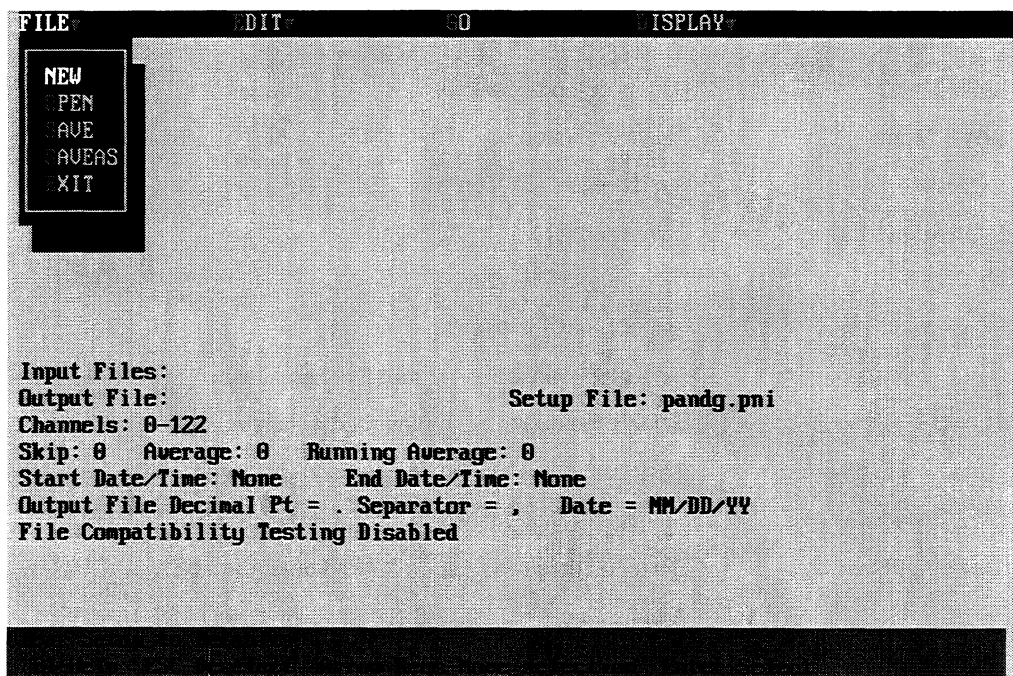
Figure 4-1. FILE Menu

OPEN Menu   4-5.

The "OPEN" Menu (Figure 4-2) lists all the available program initialization files (default extension *.PNI). Program initialization files are created using the "SAVEAS" menu (Figure 4-3). To load the initialization defaults into the program setup, select a file then press the <ENTER> key .

The example in Figure 4-2 shows selection of the file PANDG04.PNI . When the <ENTER> key is pressed, the program setup screen will change to the parameters saved in this file.
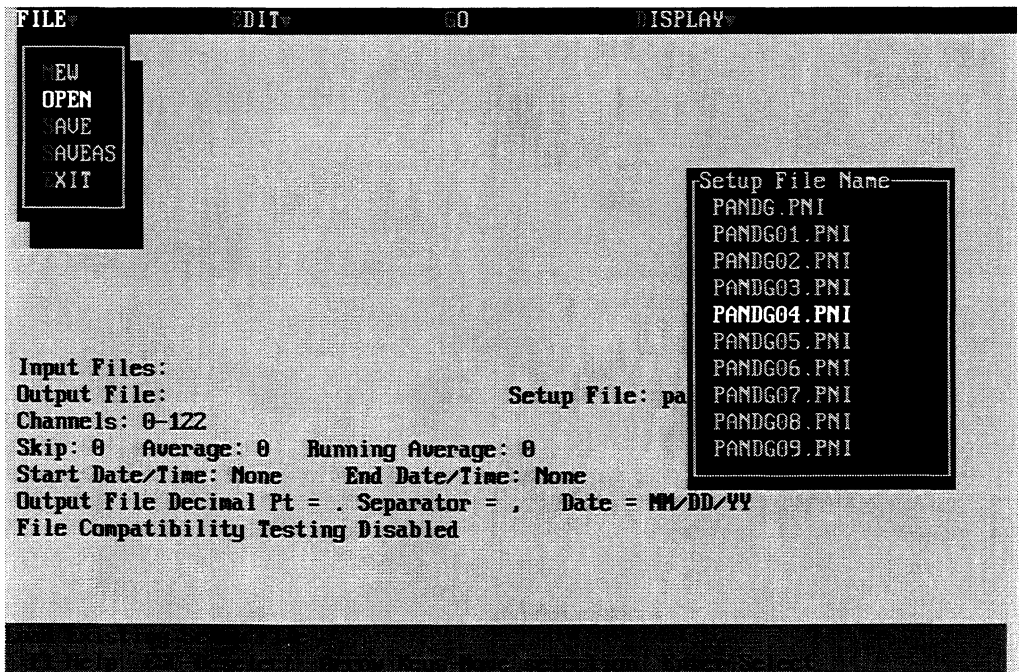
Figure 4-2. OPEN Menu

SAVEAS Menu   4-6.

The "SAVEAS" menu (Figure 4-3) creates an initialization file. When the program setup is configured as desired (using the "EDIT" menu (Figure 4-5) functions), select SAVEAS and press the <ENTER> key. A window opens that prompts for the name of the initialization file.

NOTE

If the file name already exists, it will be overwritten without warning.

The example in Figure 4-3 shows the program setup will be saved in the file PANDG09.PNI.
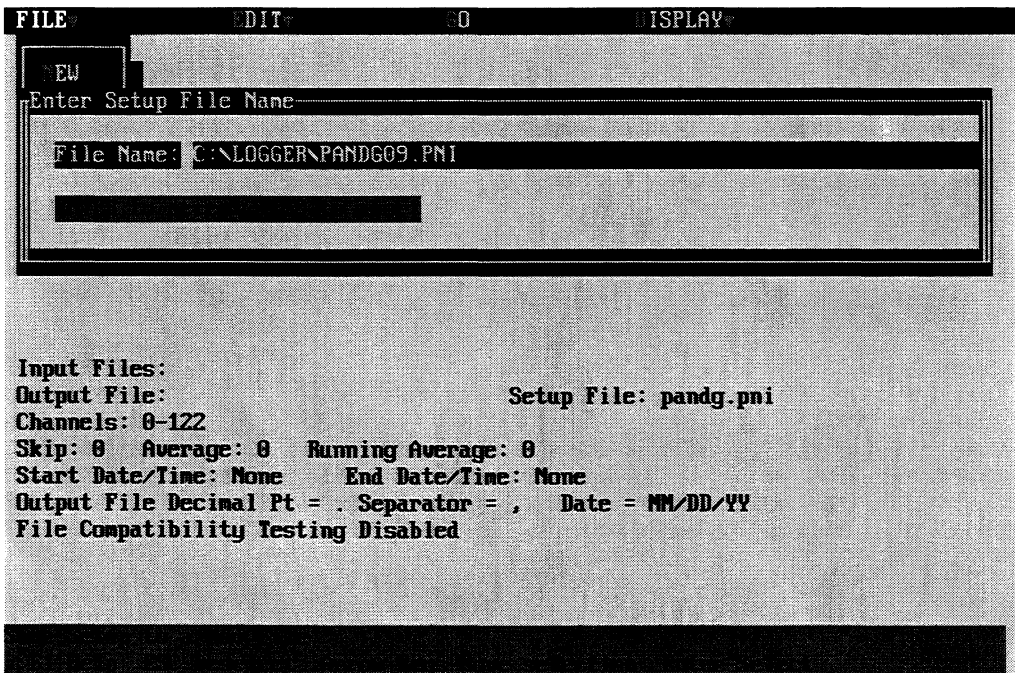
Figure 4-3. SAVEAS Menu

EXIT Menu 4-7.

The "EXIT" menu (Figure 4-4) is used to exit the Pruning and Grafting Utility. When the utility is initialized, the file PANDG.PNI provides the setup defaults, as does any subsequent "OPEN" menu selection (Figure 4-2). If any parameter was changed during operations, the program asks if the changes should be saved before quitting. If you select Y (Yes), a window requests the name of the initialization file in which to store the changes. This can be the current initialization file, a different file, or a new file to be created. If you select N (No), the changes to the defaults are not changed, and the next window verifies the Exit operation, where Y will exit the program, and N will return to the main menu.

```
┌Program Setup Changed─────────────────────────────────
│
│ Do you want to save before Exiting (Y or N): Y
│
│
```

```
Input Files:
Output File:                              Setup File: pandg.pni
Channels: 0-122
Skip: 0    Average: 0    Running Average: 0
Start Date/Time: None     End Date/Time: None
Output File Decimal Pt = .  Separator = ,   Date = MM/DD/YY
File Compatibility Testing Disabled
```
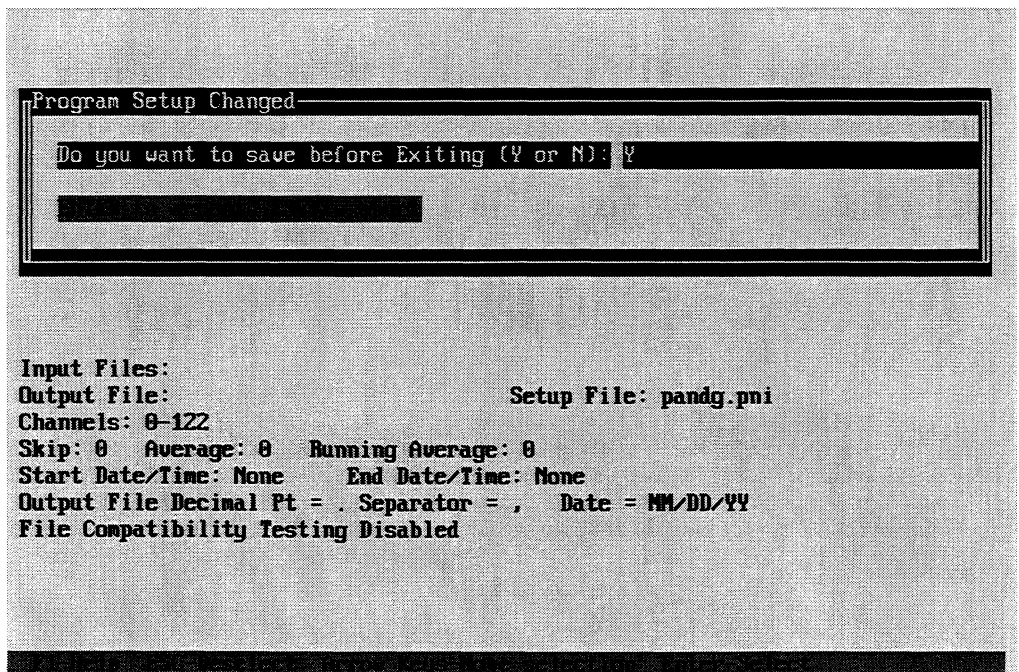
Figure 4-4. EXIT Menu

```
┌Enter Setup File Name─────────────────────────────────────┐
│                                                          │
│  File Name: C:\LOGGER\PANDGO9.PNI                         │
│                                                          │
│                                                          │
│                                                          │
└──────────────────────────────────────────────────────────┘


Input Files:
Output File:                          Setup File: pandg.pni
Channels: 0-122
Skip: 0   Average: 0   Running Average: 0
Start Date/Time: None      End Date/Time: None
Output File Decimal Pt = . Separator = ,   Date = MM/DD/YY
File Compatibility Testing Disabled
```

```
┌Exit Verify───────────────────────────────────────────────┐
│                                                          │
│  Do you really want to EXIT? (Y or N): Y                 │
│                                                          │
│                                                          │
│                                                          │
└──────────────────────────────────────────────────────────┘


Input Files:
Output File:                          Setup File: PANDGO9.PNI
Channels: 0-122
Skip: 0   Average: 0   Running Average: 0
Start Date/Time: None      End Date/Time: None
Output File Decimal Pt = . Separator = ,   Date = MM/DD/YY
File Compatibility Testing Disabled
```

Figure 4-4. EXIT Menu (cont)

EDIT Menu   4-8.

The "EDIT" menu (Figure 4-5) selects the files and filters, plus the decimal point and file compatibility testing. It is the selections in this menu that configure the program setup screen, except for the entries for the "Output File Decimal Pt =," "Separator =," and "Date =" entries, which are part of the "DISPLAY" menu (Figure 4-12).
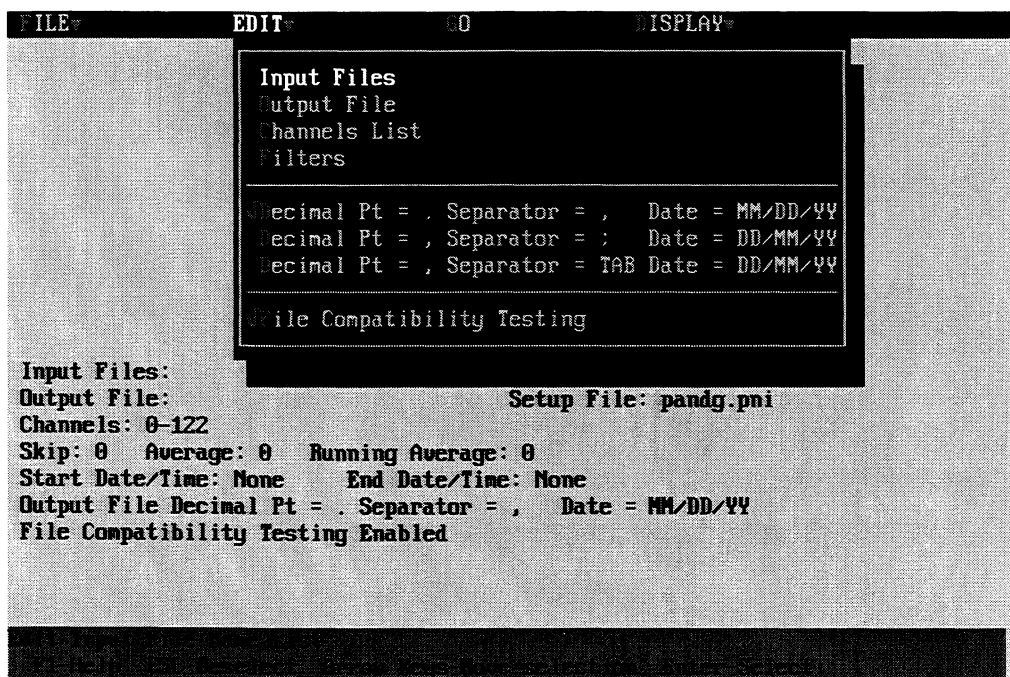
Figure 4-5. EDIT Menu

Input Files Menu   4-9.

The "Input Files" menu (Figure 4-6) is used to enter the file names for the files that will be filtered or combined, or both filtered and combined as a simultaneous operation. If no filters are specified (Figure 4-9), the files simply combine into an ASCII output file (Figure 4-7). If only a single file is entered, it can be filtered (Figure 4-9), with the results sent to an output file (Figure 4-7). Up to 10 files can be entered. A full path name may be used if the file is not in the current directory.

The example in Figure 4-6 shows five files LOGDATA1.DAT through LOGDATA5.DAT will be filtered and combined.


```
 ILE          EDIT           GO           ISPLAY

              Input Files
              utput File
 Input File Names Entry & Edit

  File #1:  C:\LOGGER\LOGDATA1.DAT
  File #2:  C:\LOGGER\LOGDATA2.DAT
  File #3:  C:\LOGGER\LOGDATA3.DAT
  File #4:  C:\LOGGER\LOGDATA4.DAT
  File #5:  C:\LOGGER\LOGDATA5.DAT
  File #6:
  File #7:
  File #8:
  File #9:
  File #10:
```
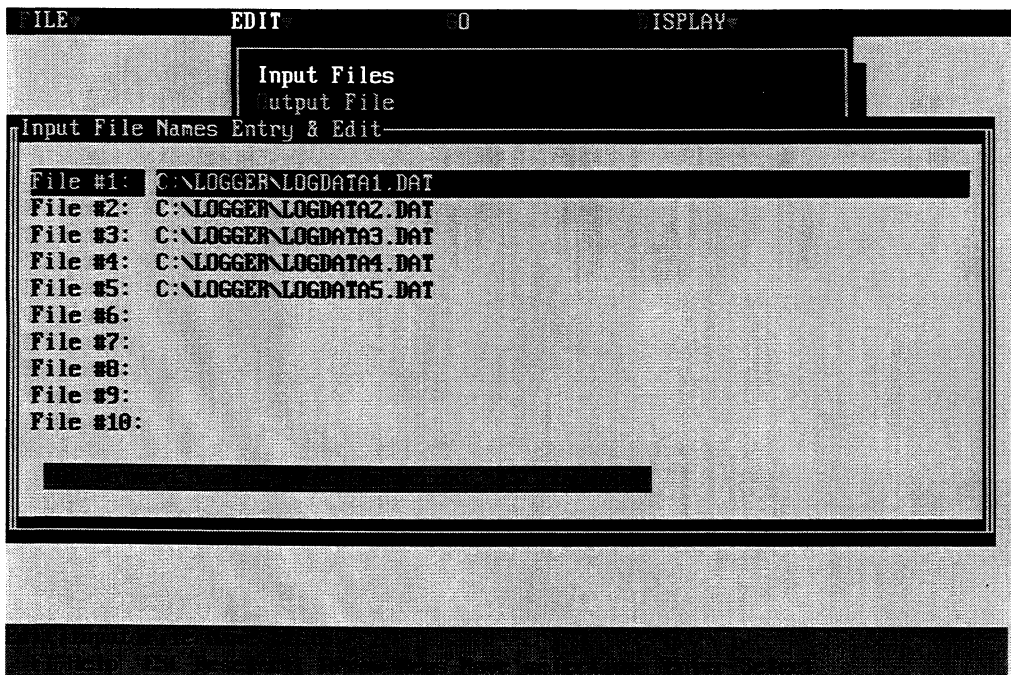
Figure 4-6. Input Files Menu

Output File Menu 4-10.

The "Output File" menu (Figure 4-7) is used to specify the output file for the filtered and combined data. Output files are always in ASCII format.

NOTE

If an existing file name is selected, it is overwritten without warning.

The example in Figure 4-7 shows the output file name SUMMDATA.DAT. After pressing the <ENTER> key, the program setup screen will change the Output File: entry from blank (as shown in Figure 4-7) to SUMMDATA.DAT.

```
 FILE              EDIT              GO            DISPLAY

                     nput Files
 Enter Output File Name
     File Name: C:\LOGGER\SUMMDATA.DAT



                     File Compatibility Testing

 Input Files:  LOGDATA1.DAT LOGDATA2.DAT LOGDATA3.DAT LOGDATA4.DAT ...
 Output File:                      Setup File: pandg.pni
 Channels: 0-122
 Skip: 0   Average: 0   Running Average: 0
 Start Date/Time: None    End Date/Time: None
 Output File Decimal Pt = . Separator = ,  Date = MM/DD/YY
 File Compatibility Testing Enabled
```

Figure 4-7. Output File Menu

Channels List Menu 4-11.

The "Channels List" menu (Figure 4-8) selects the channel or groups of channels to be included in the output file. Channels for instrument 1 are in the range 0 to 22 (including two pseudo channels – see below), and for instrument 2, in the range 100 to 122. For example, to filter the measurement data for instrument 1, channel 16, the number 16 would be entered; to filter the measurement data for instrument 2, channel 6, the number 106 would be entered.

To specify groups of channels, the "-" and "," characters are used. For example, 0,5,9,10 selects instrument 1, channels 0, 5, 9, and 10. The entry 105-115 specifies instrument 2, channels 5 to 15.

To filter Totalizer and Alarm data, pseudo channels are assigned with channel 21 representing the Totalizer data and channel 22 representing the Alarm data. For example, an entry of 22 filters the alarm data for instrument 1; an entry of 121 filters the totalizer data for instrument 2.

The example in Figure 4-8 shows the entry 100-122, selecting instrument 2, channels 0 to 20, plus the two pseudo channels 21 (Totalizer) and 22 (Alarms). After pressing the <ENTER> key, the program setup screen will change the Channels: entry from 0-122 (as shown in Figure 4-8) to 100-122.
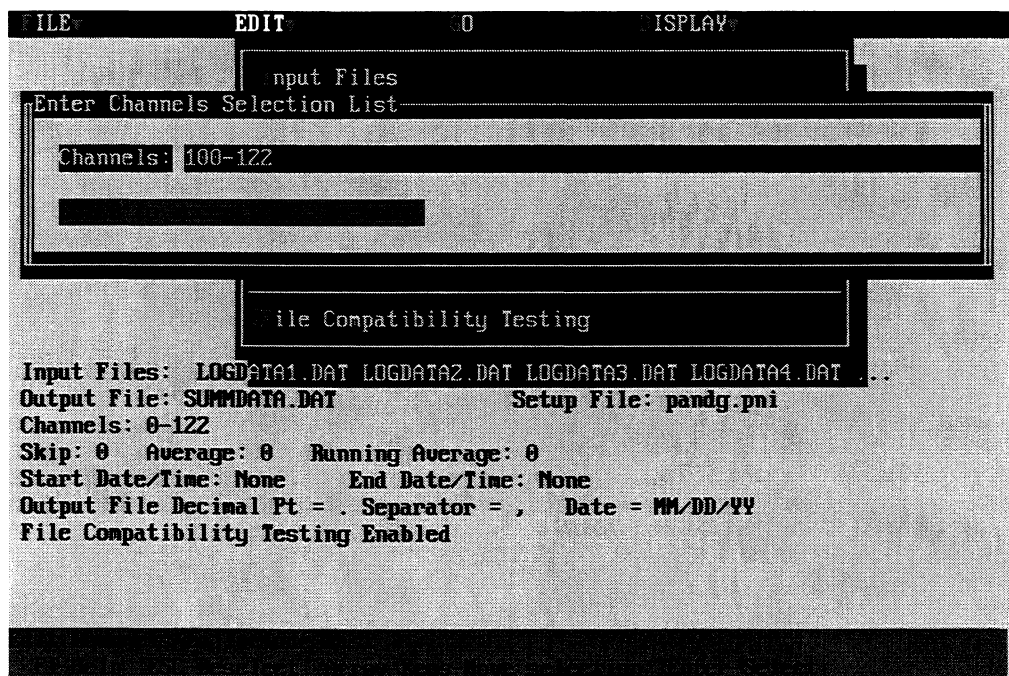

Figure 4-8. Channels List Menu

Filters Menu 4-12.

The "Filter" menu (Figure 4-9) is used to filter the scan records for the selected channels (Figure 4-8). Each scan record is compared to the parameters specified in this menu. If the scan record meets the specified requirements, it is recorded into the output file (Figure 4-7). Each filter parameter is described below.

SKIP COUNT

The Skip Count simply skips over n scan records. For example, if a file has 5,000 scan records this can be reduced to 1,000 scan records by entering the number 4 (read, skip, skip, skip, skip, read, skip, skip, skip, skip, read, etc.)

AVERAGE COUNT

The Average Count entry averages readings into a single reading. For example, if a file has 5,000 scan records, this can be reduced to 1,000 averaged scan records by entering the number 5 (read, read, read, read, read, average, read, etc.).

RUNNING AVERAGE COUNT

The Running Average Count smooths the averaging output. The higher the entry, the more intense the smoothing. This is a smoothing function only and the number of input scan records equals the number of the output scan records. The smoothing is based on the following algorithm:

$Xout = (Xlast \times (n-1) + Xcurrent)/n$, where:

$Xout$ = Value of the output scan record (the smoothed value)
$Xlast$ = The value of the previous Xout
$Xcurrent$ = The value of the current recorded scan record
n = The number entered in this menu (shown as 3 in Figure 4-9)

A special case is $Xout = Xfirst$, where Xfirst is the very first scan record.

An example for n=3 and ten measurements would be:

Input scan record values: 110, 113, 117, 110, 118, 114, 111, 116, 117, 112
Output scan record values: 110, 111, 113, 112, 114, 114, 113, 114, 115, 114

The first Xout value is equal to the Xfirst, which is 110
then in sequence: $Xout = (110 \times (3-1) + 113)/3 = 111$
$Xout = (111 \times (3-1) + 117)/3 = 113$
$Xout = (113 \times (3-1) + 110)/3 = 112$
$Xout = (112 \times (3-1) + 118)/3 = 114$
$Xout = (114 \times (3-1) + 114)/3 = 114$
$Xout = (114 \times (3-1) + 111)/3 = 113$
$Xout = (113 \times (3-1) + 116)/3 = 114$
$Xout = (114 \times (3-1) + 117)/3 = 115$
$Xout = (115 \times (3-1) + 112)/3 = 114$

START DATE/END DATE

Scan records can be filtered by date and time. The format is MM/DD/YY (Month/
Day/Year [or Day/Month/Year - See Figure 4-5]) and HH:MM:SS (Hours/
Minutes/Seconds). For example, 07/21/94 15:00:00 as a Start Date and 07/22/94
22:00:00 as an End Data specifies that only the scan records within these date/time
limits are recorded.

RECORD ONLY WHEN GREATER THAN/LESS THAN

Further filtering is provided by channel readings above or below a specified value.
When this filtering is desired, a check mark is placed in the box, a channel is
specified, and then the "Greater Than" and/or "Less Than" value is entered. The
operating mode of these filters is in either an OR configuration, where scan records
are recorded when either the Greater Than OR Less Than conditions are met, or
in an AND configuration where both the Greater Than AND Less Than conditions
are met.

The example in Figure 4-9 shows scan values will be recorded only when channel
5 measurements are greater than 120 AND channel 8 measurements are less than
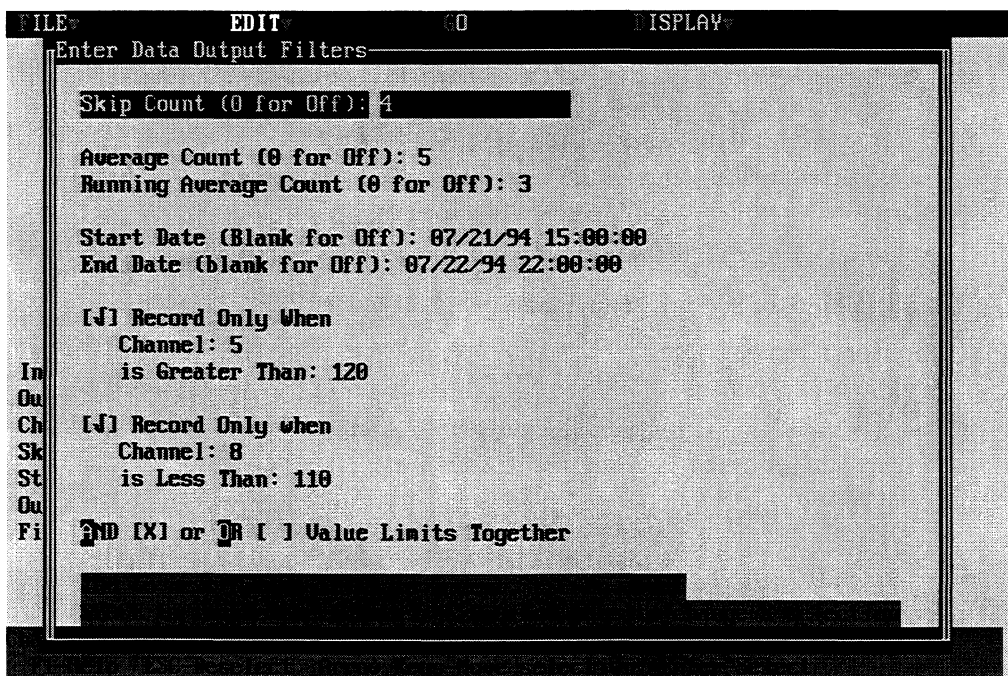110.

Figure 4-9. Filters Menu

Decimal Point Menu   4-13.

The "Decimal Pt" menu (Figure 4-10) allows you to specify how numbers will be saved in the output ASCII file as follows:

Separator = ,	12.345,23.456,34.567
Separator = ;	12,345;23,456;34,567
Separator = <TAB>	12,345 23,456 34,567

These selections also set the date-reporting format Month/Day/Year (decimal point ".") or Day/Month/Year (decimal point "," or "<TAB>").

File Compatibility Testing Menu   4-14.

The File Compatibility Testing menu (Figure 4-10) enables/disables input file compatibility testing. For example, combining two files where Channel 1 measures ohms in one file and volts dc in the other may result in meaningless data for channel 1 in the output file. The files are checked during "GO" (Figure 4-11).


```
 FILE            EDIT              GO              DISPLAY

            Input Files
            Output File
            Channels List
            Filters

            Decimal Pt = . Separator = ,   Date = MM/DD/YY
            Decimal Pt = , Separator = ;   Date = DD/MM/YY
            Decimal Pt = , Separator = TAB Date = DD/MM/YY

            File Compatibility Testing

Input Files:
Output File:                          Setup File: pandg.pni
Channels: 0-122
Skip: 0   Average: 0   Running Average: 0
Start Date/Time: None     End Date/Time: None
Output File Decimal Pt = . Separator = ,   Date = MM/DD/YY
File Compatibility Testing Enabled
```

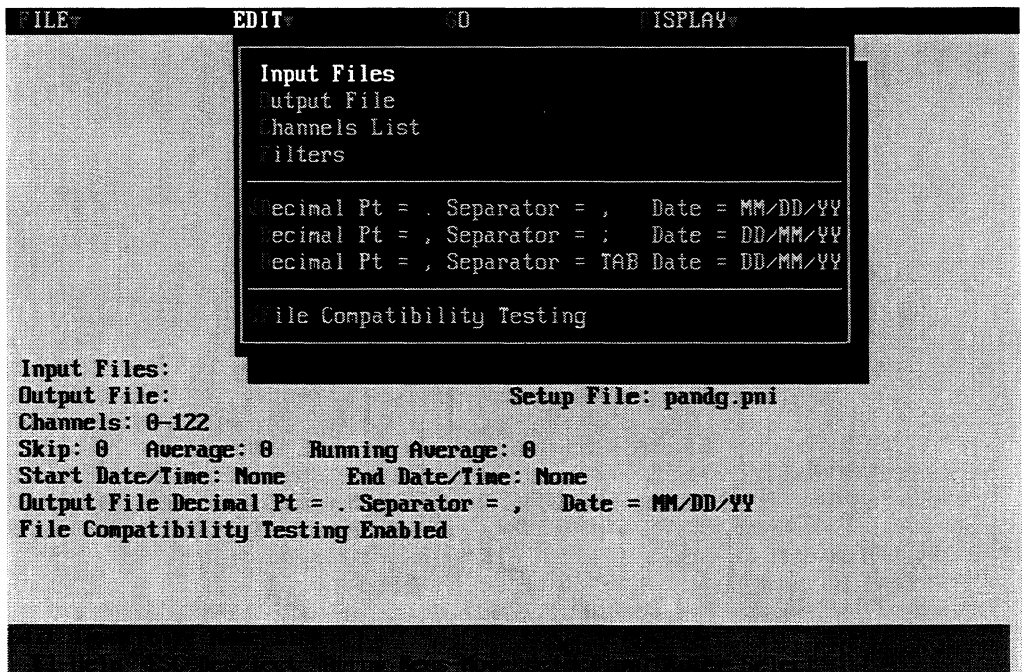**Figure 4-10. Decimal Point and File Compatibility Testing Menu**

GO Menu   4-15.

The "GO" menu (Figure 4-11) is selected to initiate a Pruning and Grafting run with the configuration shown in the program setup screen. If File Compatibility Testing was enabled (Figure 4-5), the input files will be checked before pruning and grafting. An error message appears if file compatibility testing fails, halting the Pruning and Grafting run.

```
 ILE            DIT              GO             ISPLAY




Input Files:  LOGDATA1.DAT LOGDATA2.DAT LOGDATA3.DAT LOGDATA4.DAT ...
Output File: SUMMDATA.DAT                   Setup File: pandg.pni
Channels: 100-122
Skip: 4   Average: 5   Running Average: 3
Start Date/Time: 07/21/94 15:00:00      End Date/Time: 07/22/94 22:00:00
Record Only When Chan: 5  Value Greater Than: 120.000000
Record Only When Chan: 8  Value Less Than: 110.000000
AND Limits Filters
Output File Decimal Pt = .  Separator = ,   Date = MM/DD/YY
File Compatibility Testing Enabled
```
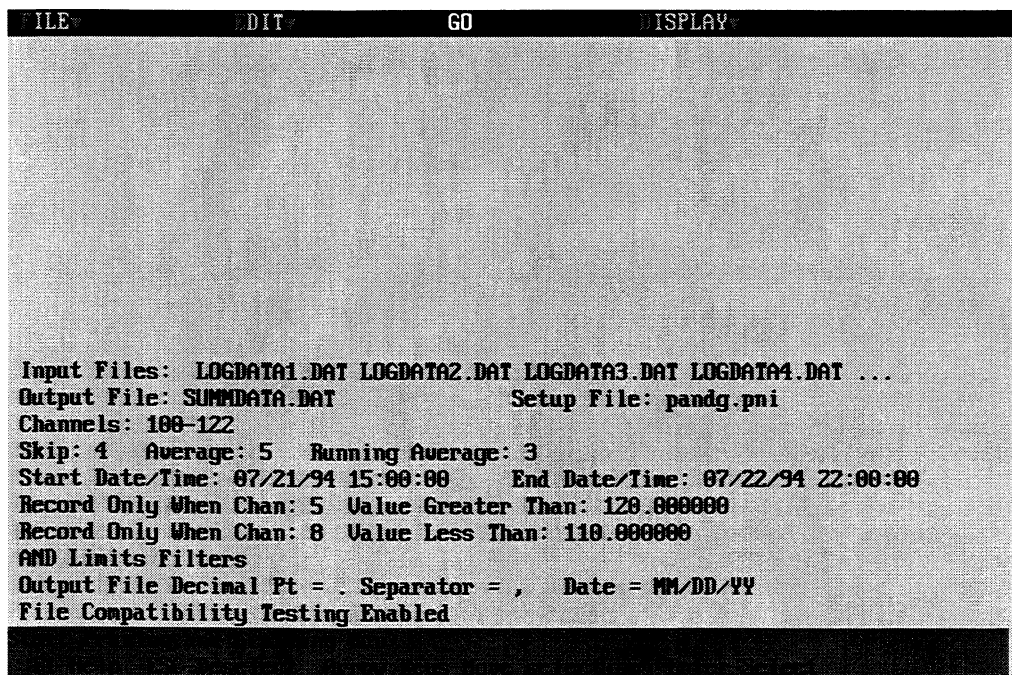
Figure 4-11. GO Menu

DISPLAY Menu   4-16.

The "Display" menu (Figure 4-12) gives a choice of a light screen background or dark screen background. "PC Memory Remaining" reports the conventional DOS memory available after the utility is loaded. If the PC is overloaded with software programs, the Memory Left could fall below 32000 bytes, which is the minimum number for the utility to perform properly.
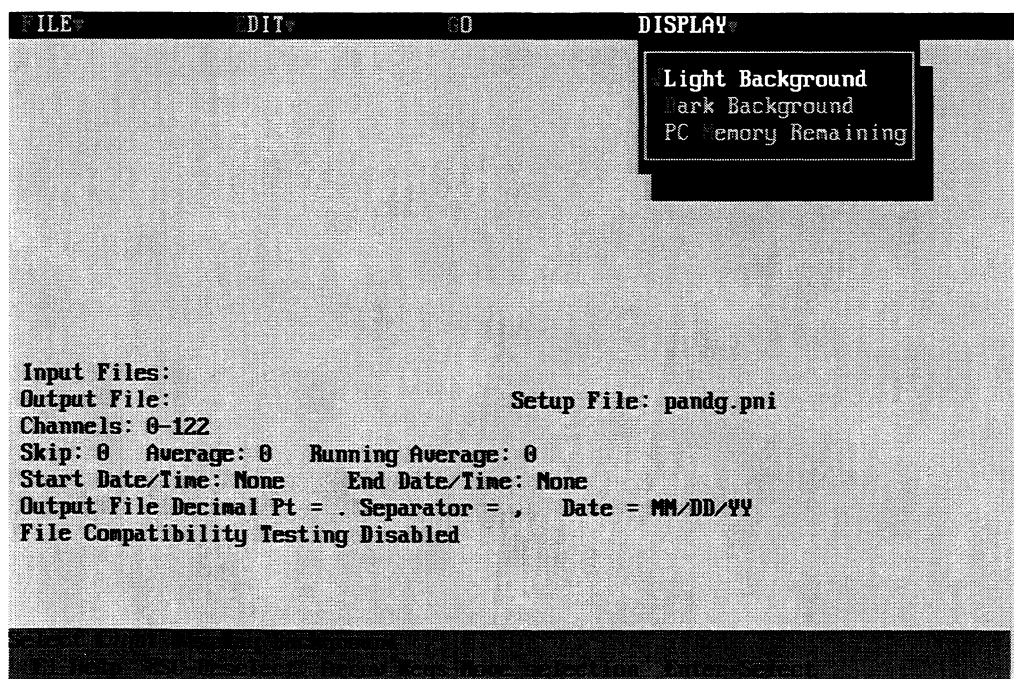

Figure 4-12. DISPLAY Menu

Appendices

Appendix A

File Formats

THE DATA FILE A-1.

The data file is maintained in either binary or comma-separated ASCII format, as selected during setup. The binary format is much more compact than the ASCII format, but ASCII format is compatible with many data analysis and management tools running simultaneously in other computers on a network.

Data files are opened in SHARED mode with write blocked. This enables network reads but no writes of the data file while scan data is being recorded. Between scans, the file is closed, allowing full network access to the file (including delete if allowed by the security level enabled on the file server). If the file disappears between one scan and the next, a new file (including header and with the previous file name) is created before the new scan data is recorded.

Binary File Format A-2.

The binary file format is as follows:

FILE HEADER:

TAB	1 byte (contents = FF hex)
File Name	81-character string
Time Count	4 bytes (long integer - seconds past midnight 1/1/70)
Comment	80-byte string)
Hydra Count	1 byte (1 or 2)
Spare	1 byte (to get word alignment)
Units	23 (for 2 Hydra) or 46 (for 2 Hydras), 9 byte strings

DATA RECORDS (one for each scan recorded):

Time Count	4 bytes (long integer - seconds past midnight 1/1/70)

Channel Readings   84 or 168 bytes (21 or 42, single precision (4 byte), IEEE format, floating point numbers)

Totalizer   4 bytes (long integer - the extended totalizer maintained by the Logger software)

Digital and Alarms I/O   2 bytes (a 16-bit integer with bits 0-7 representing the digital I/O state and bits 8-11 representing the alarm I/O state)

The channel readings, totalizer and digital/alarms I/O fields are repeated for the second Hydra if two are being logged (Hydra count is 2).

Each scan record consists of the current time (a 32-bit integer) plus 21 or 42 floating-point numbers (84 bytes or 168 bytes) reflecting the readings from all channels. The readings section for the Hydra instrument is followed by a long integer (32 bit) number for the totalizer, followed by a 16-bit integer for the Digital Input/Output. If a measurement channel is off, 0.0 is recorded for the reading.

In this format, slightly less than 100 bytes are consumed for each scan recorded (for a single Hydra), so 10,000 scans can be recorded in a 1-Meg file.

Comma Separated ASCII File Format   A-3.

The comma-separated ASCII file format is as follows (<EOL> means "end of line", a <CR> <LF> sequence):

- File name string (< 64-character string) <EOL>
- Date and time file was created<EOL>
- File comment (<80-character string) <EOL>
- Number of Hydras being logged (1 character) <EOL>
- Channel Units string (21 or 42, comma-separated strings) <EOL>
- Scan Record 1<EOL>
- Scan Record n<EOL>

Each scan record consists of the time (in seconds past midnight, 1/1/70, or as a time and date character string) and a comma-separated list of channel readings (including the totalizer and digital input/output). The strings are surrounded by quotes so they can be directly imported to Lotus 1-2-3 and other data analysis and presentation packages.

In this format, each scan consumes about 250 bytes. A 1 Meg file can hold about 4,000 scans.

CHANNELS AND INSTRUMENT CONFIGURATION
TEXT FORMAT   A-4.

This file is an image of the Hydra commands necessary to configure all 21 channels in Hydra. It is an ASCII text format and is human readable (or editable).

PROGRAM SETUP FILE FORMAT   A-5.

This file is used to save the user-entered data collection setup parameters. The file is in binary format and is read during program startup and to set the default values for the session.

You may over-write this file with the current setups via functions in the Setup Menu. You may also restore the setups to what is in the file by the same means.

Until a setup file is retrieved from a file on the disk, Logger uses the following setup defaults:

Setup File Name:	'logger.ini'
Data File Name:	'logdata.dat'
Conf. Text File:	'config.cfg'
Format:	ASCII
Function:	append
Comment:	blank
Alarm Filter:	Off
Trigger Type:	Internal (external and mon alarm disabled)
Scan Interval:	10 seconds
File skip count:	10
Trend Plot:	Disabled
Trend min:	-0.2
Trend max:	0.2
Trend Count:	100
Plot Chans:	1,1, 1,2 1,3 1,4
Printer Plot:	Disabled
Interface;	RS-232 (inst1=COM1, inst2=COM2)
Baud Rate:	9600
Parity:	None
IEEE-488:	Disabled
Channels:	All set to OFF
Mx+B:	Disabled

Alarms: Disabled

Monitor: Off

Total Debounce: On

Temp Units: C

Open TC Detect: On

Appendix B

Using Logger With Microsoft Windows

Logger may be run as a full-screen, exclusive application under Windows Standard or Real modes, or it may be run as a Windowed/Background application in 386 Enhanced mode. Included in the Logger distribution is a Windows application called LogLink that provides Dynamic Data Exchange (DDE) services between Logger and other Windows applications (see Appendix C).

Logger is written as a DOS application program. However, there is provision within Microsoft Windows 3.0 and beyond, in the 386 Enhanced mode, to run DOS applications in Windowed/Background mode. To do this with Windows 3.0, the DOS application may use the display in text mode only. There is no such restriction with Windows 3.1 and beyond. Logger uses graphics display modes only in the intro screen (to display the FLUKE logo) and to display the Trend Plot. If you start Logger with the /w switch, these features are inhibited, and Logger can be run as a Windowed/Background task.

When Logger is run as a Windowed/Background task, other programs may be run at the same time. For example, you may run Logger and a spreadsheet program (like Microsoft EXCEL®) to do data collection and analysis at the same time. You may even use the DDE standard to allow data sharing between Logger and other applications by using the LogLink Utility program provided with Logger (see Appendix C for more information on LogLink).

Like any other DOS application run in Windowed mode under Windows 3.0, Logger will lose the mouse function (mouse support goes to Windows).

The log30.pif (Windows 3.0), log31.pif (Windows 3.1), and logger.ico files, distributed with the Logger package, are the Windows Program Information and Icon graphic files for use with Windows 386 Enhanced mode. To add Logger as a program item within Windows:

EXCEL is a registered trademark of the Microsoft Corporation.

1. Open the group window for desired group (e.g. "Windows Applications").

2. Choose "New" from the Program Manager File Menu.

3. Select "Program Item" in the New Program Object Dialog Box, then chose "OK". Windows will display the Program Item Properties.

4. Type the full path name to the log30.pif or log31.pif file on the command line. For example, if the log31.pif file were in the Hydra directory on the C drive, type "C:\hydra\log31.pif" on the command line.

5. Select "Change Icon."

6. Type the full path name to the logger.ico file on the command line and chose "OK."

7. Chose "OK" on the New Program Object Dialog Box.

For more detailed information on adding a program item, see "Changing the Contents of Groups" in the Program Manager chapter of your Microsoft Windows User's Guide.

Once you have an Icon for Logger in a Group Window, you may start Logger by double clicking on the Logger Icon, just like any other Windows Icon.

The log30.pif and log31.pif files are structured to bring up Logger in a window, as a full screen Background task. If you want to change this, or if you want to change the background priority (to give Logger more or less of the total time available), use the PIF editor (usually found in the Accessories Group).

To share information between Logger and other running windows tasks, use the clipboard to cut from logger and paste to the other application, use one of the files created and maintained by logger, or use DDE with the LogLink utility program (see Appendix C).

The state file is the most convenient file to use for interprogram communication. It is updated at each scan time with the values of the readings, digital I/O, alarms outputs, and totalizer if enabled. It also contains the date and time of the last scan. This file can be periodically read by another application to keep up to date on what the instruments are measuring. The state file format is as follows:

Line 1 = Number of Hydra instruments being logged (1 or 2).
Line 2 = Time of the last readings (seconds past midnight 1/1/70).
Lines 3-23 = Readings from the first instrument channels 0-20.
Line 24 = Totalizer reading from first instrument.
Line 25 = Alarms and Digital I/O state from first instrument.

If there is a second instrument being logged,

Lines 26-46 = Readings from the Second instrument channels 0-20.
Line 47 = Totalizer reading from second instrument.
Line 48 = Alarms and Digital I/O state from second instrument.

The Alarms and Digital I/O state should be interpreted as a 16-bit integer, with the low order 8 bits (bits 0-7) representing the Digital I/O lines and bits 8-11 representing the Alarm Output lines.

Channel reading values will be in the file even if the channel is set OFF in the instrument. Readings for OFF channels will be the value 0.0.

Appendix C
DDE Via The LogLink Utility

LogLink is a Windows application program provided with Hydra Logger. It acts as a DDE (Dynamic Data Exchange) server to allow DDE linkages between Logger and other applications running under Windows.

Since LogLink is a Windows application, you install it by adding it to one of your program groups as follows:

1. Within the Program Manager, select the group to which you want to add LogLink.

2. Select the File menu, then the New entry.

3. Select "Program Item" in the New Program Object Dialog Box, then "OK."

4. Windows will display the Program Item Properties dialog box to enter the Description and Command Line. Enter "LogLink" on the description line and the path to the loglink.exe file on the Command Line.

5. Select "OK."

For more detailed information on adding a program item, see "Changing the Contents of Groups" in the Program Manager chapter of your Microsoft Windows User's Guide.

To start up a data logging session with DDE to another application:

1. Select the LogLink Icon to start the LogLink DDE server. LogLink will come up as an ICON only.

2. Select the LogLink Icon and select "Select File" on the menu displayed. Enter the file name (including the path) of the state file that Logger will write.

3. Start the Hydra Logger program by selecting the Logger Icon.

4. Start the other application that will request data (via DDE) from Logger (DDE Client).

5. Select the Hydra Logger window, set up the logging run, (you must enable the

state file and enter the name that matches what you used when setting up LogLink) and select GO to start logging. Remember, the Mouse does not work within Windowed DOS applications under Windows 3.0, so, in this case, you will have to use the arrow keys during setup.

6. Select the DDE client window and perform any setup necessary to access external data via DDE. Data from a DDE server is accessed by specifying the DDE Server Name, the Data Topic, and the Item Name. For example, in Excel, external information is specified by:

```
=Server_Name|Topic!Item
```

The LogLink Server Application Name is LOGLINK, the only Topic supported by LogLink is HYDRA_READINGS, and the Item Names are as follows:

RDATETIME	Count of seconds past midnight 1/1/70
HYDRACOUNT	Number of Hydra's being Logged (1 or 2)
ELDATETIME	Date and time in EXCEL/LOTUS® serial number format.

Instrument 1 Readings	Instrument 2 Readings
I1C0 - Channel 0	I2C0 - Channel 0
I1C1 - Channel 1	I2C1 - Channel 1
I1C2 - Channel 2	I2C2 - Channel 2
I1C3 - Channel 3	I2C3 - Channel 3
I1C4 - Channel 4	I2C4 - Channel 4
I1C5 - Channel 5	I2C5 - Channel 5
I1C6 - Channel 6	I2C6 - Channel 6
I1C7 - Channel 7	I2C7 - Channel 7
I1C8 - Channel 8	I2C8 - Channel 8
I1C9 - Channel 9	I2C9 - Channel 9
I1C10 - Channel 10	I2C10 - Channel 10
I1C11 - Channel 11	I2C11 - Channel 11
I1C12 - Channel 12	I2C12 - Channel 12
I1C13 - Channel 13	I2C13 - Channel 13
I1C14 - Channel 14	I2C14 - Channel 14
I1C15 - Channel 15	I2C15 - Channel 15

I1C16 - Channel 16   I2C16 - Channel 16

I1C17 - Channel 17   I2C17 - Channel 17

I1C18 - Channel 18   I2C18 - Channel 18

I1C19 - Channel 19   I2C19 - Channel 19

I1C20 - Channel 20   I2C20 - Channel 20

I1TOTAL - Totalizer   I2TOTAL - Totalizer

I1DIO - Digital I/O   I2DIO - Digital I/O

For example, to access the reading from channel 10 of instrument number 1 within an Excel spreadsheet cell, use:

```
=LOGLINK|HYDRA_READINGS!I1C10
```

to get the number of Hydras being logged:

```
=LOGLINK|HYDRA_READINGS!HYDRACOUNT
```