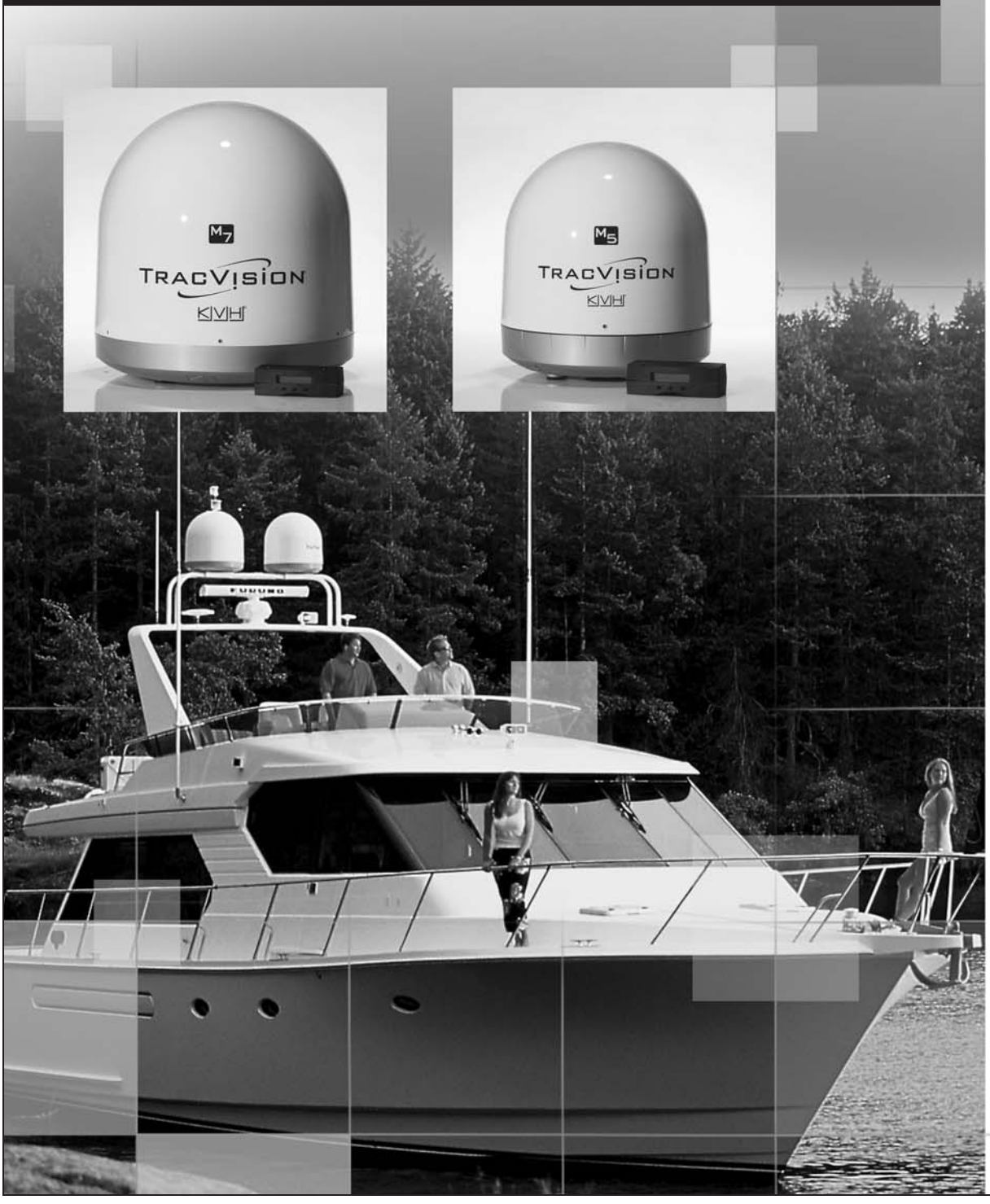
TracVision® BY KVH INDUSTRIES

TracVision M5/M7
Control Panel Configuration



TracVision M5/M7 User's Guide

MultiSat Control Panel Menu Quick Reference Guide

Main Display

Tracking <SAT NAME>
Menu

Main Menu

Install Satellite?
Yes Next Return

Set Sat Switch Type?
Yes Next Return

Restart Antenna?
Yes Next Return

Operations Mode?
Yes Next Return

Return to "Install Satellite"

Circular or Linear?
Cir Lin Cancel

- Service=DIRECTV?
  Yes Next Cancel
  - Select a DIRECTV mode
- Service=DISH?
  Yes Next Cancel
  - Select a DISH Network mode
- Service=ExpressVu?
  Yes Next Cancel
  - Select ExpressVu
- Service=Custom?
  Yes Next Cancel
  - Select 1 or 2 satellites from the library

Auto or Manual?
Auto Manual Cancel

- Automatic Satellite Switching
- Manual Satellite Switching

Trisat Mode?
Yes No Cancel

- Select 1 or 2 satellites from the library
- Install Europe WB?
  Yes Next Cancel
  - Select Hotbird WB, Astra1, Astra2S
- Install Europe?
  Yes Next Cancel
  - Select Hotbird, Astra1, Astra2S
- Install Scandinavia?
  Yes Next Cancel
  - Select Hotbird WB, Sirius, Thor

Antenna restarted

Get antenna status?
Yes Next Return

- Get system errors?
  Yes Next Return
  - Errors Detected *
- Get version?
  Yes Next Return
  - Antenna Software Versions *
- Get serial number?
  Yes Next Return
  - Antenna Serial Number *
- Get thres/sig level?
  Yes Next Return
  - Threshold and Signal Levels *
- Get skew angle?
  Yes Next Return
  - LNB Skew Angle *
- Get bit error rate?
  Yes Next Return
  - Bit Error Rate *
- Get state?
  Yes Next Return
  - Current State *

Control antenna?
Yes Next Return

- Man control antenna?
  Yes Next Return
  - Adjust Azimuth/Elevation
- Set sleep on/off?
  Yes Next Return
  - Sleep Mode On/Off
- Set instant on/off?
  Yes Next Return
  - Set Instant On Mode On/Off
- Set lat/long?
  Yes Next Return
  - Set Latitude/Longitude
- Sat frequency scan?
  Yes Next Return
  - Update Frequency Data ‡
- Configure satellite?
  Yes Next Return
  - Set Frequency, Symbol Rate, FEC Code, and Network ID ‡
- Reset to factory?
  Yes Next Return
  - Reset system to factory default satellites/brightness ‡

Upgrade software?
Yes Next Return

^RF Use Jack Main^
HALT Return

System halted

Use the latest version of the KVH Flash Update Wizard to upgrade the software

Set brightness?
Yes Next Return

Min Bright Max
****

- Set Display Brightness

Return to "Get Antenna Status"

* *Press any button to return*

‡ *TracVision M5/M7/M9 only*

TracVision M5/M7

MultiSat Control Panel Configuration User's Guide

This user's guide provides all of the basic information you need to operate, set up, and troubleshoot the TracVision M5/M7 satellite TV antenna system. For detailed installation information, please refer to the TracVision M5/M7 Installation Guide.

Please direct questions, comments, or suggestions to:

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Internet: www.kvh.com

If you have any comments regarding this manual, please e-mail them to manuals@kvh.com. Your input is greatly appreciated!

KVH Part # 54-0419-02 Rev. C

Table of Contents

D TracVision M7 Wiring Diagrams

1. Introduction

This chapter provides a basic overview of this manual and your TracVision system.

Contents

1

Using this Manual

This manual provides complete operation, setup, and troubleshooting information for your TracVision system, as well as wiring diagrams for various TracVision M5/M7 system configurations.

Who Should Use This Manual

The **user** should refer to the "Operation" chapter to learn how to operate the system.

The **user**, **installer**, or **servicing technician** should refer to the "Settings" chapter for information on configuring the system and the "Wiring Diagrams" appendices for information on connecting additional receivers.

The **user** and/or **servicing technician** should refer to the "Troubleshooting" chapter to help identify the cause of a system problem.

Notifications Used in this Manual

This manual uses the following notifications to call attention to important information:

CAUTION

This is a danger, warning, or caution notice. Be sure to read these carefully to avoid injury!

IMPORTANT!

This is an important notice. Be sure to read these carefully to ensure proper operation and configuration of your TracVision system.

NOTE: *Notes contain useful information about system settings.*

TIP: *Tips contain helpful information, allowing you to get the most out of your TracVision system.*

Typographical Conventions

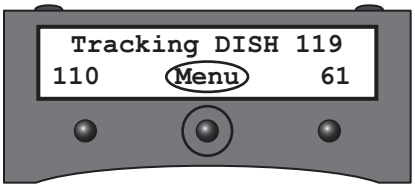
This manual uses the following typographical conventions:

Text Example	Description
<SAT NAME> ###	Text in brackets or the pound sign (#) indicates a variable portion of the MultiSat Control Panel (MCP) display

MultiSat Control Panel (MCP) Interface Conventions

When instructions indicate to select a specific MCP menu option, press the MCP button located directly beneath the menu option.

Figure 1-1 Example of MCP Menu Option and Corresponding Button



Related Documentation

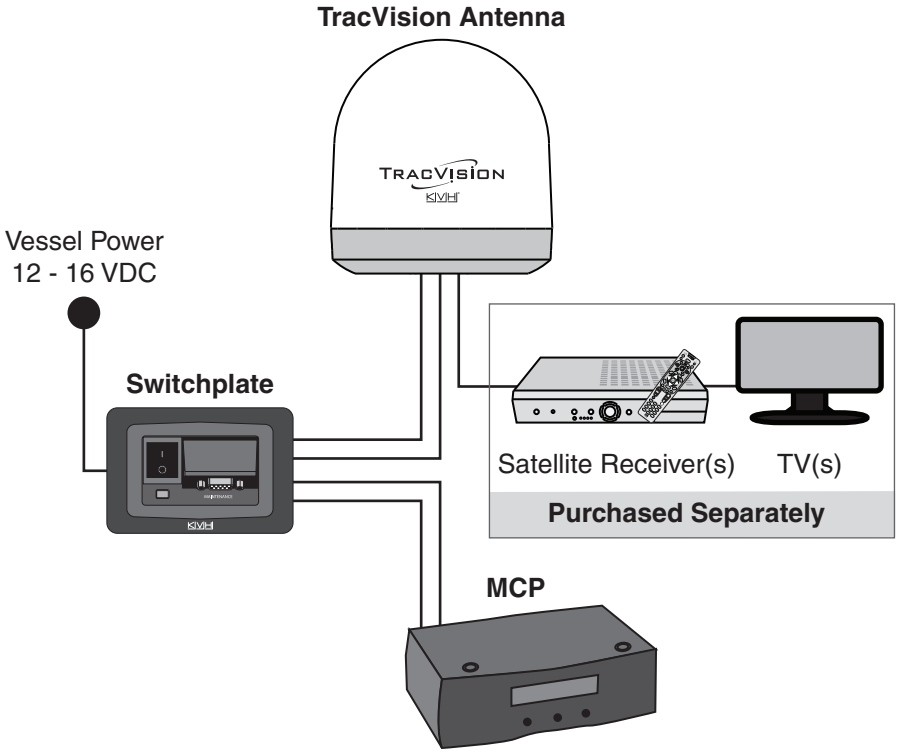
In addition to this User's Guide, the following documents are provided with your TracVision system:

Document	Description
Installation Guide	Complete product installation instructions
Product Registration Form	Details on registering the product
Warranty Statement	Warranty terms and conditions
Contents List	List of every part supplied in the kit

System Overview

Your TracVision M5/M7 system is a state-of-the-art, actively stabilized antenna system that delivers live satellite TV to your vessel's audio/video entertainment system. A basic system is illustrated below.

Figure 1-2 TracVision System Diagram (Typical Installation)

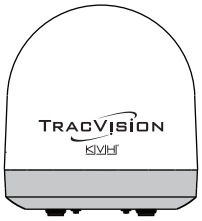


TIP: *TracVision M5 receiver wiring diagrams are provided in Appendix C on page 81. TracVision M7 receiver wiring diagrams are provided in Appendix D on page 85.*

System Components

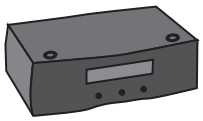
The TracVision M5/M7 system includes the following components:

Antenna Unit
The antenna unit houses the antenna positioning mechanism, LNB (low noise block), and control elements within a radome. Weathertight connectors join the power, signal, and control cabling from the belowdecks units.



Switchplate
The switchplate controls power to the antenna via the On/Off switch.

MCP (MultiSat Control Panel)
The MCP is the system's user interface, providing access to the system and its functions through an LCD with three buttons. The MCP serves as the system's junction box, and allows you to configure and operate the antenna.



System Features

Your TracVision M5/M7 system uses integrated DVB technology to quickly acquire and track the correct satellite, switch between your selected satellites, and send TV signals to the receiver.

In-motion Tracking

The TracVision system uses a state-of-the-art actively stabilized antenna. Once the satellite is acquired, the antenna's internal gyros and control system continuously measure the heading, pitch, and roll of your vessel, keeping the antenna pointed at the satellite at all times - even while you're on the move!

Tri-Sat Capability

Your system can track up to three satellites of your choice, as long as the antenna is located within the satellite's coverage area. During installation, your TracVision system should have been set up to track your desired satellites, allowing you to switch between them quickly and easily.

HD (High-Definition) Compatibility

The TracVision M5/M7 system's MCP enables Ku-band HDTV, including DISH Network HDTV, and the Ku-band portion of the overall DIRECTV HDTV programming available on the 101, 110, 119, and 72 satellites.

Satellite Library

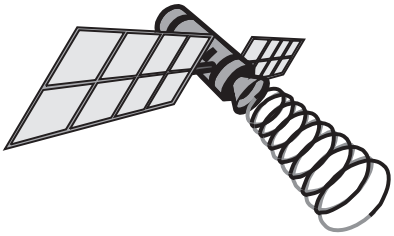
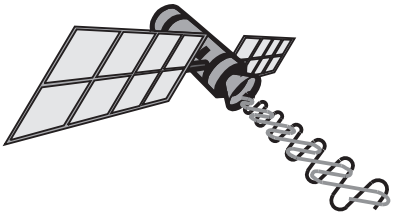
The TracVision M5/M7 system includes a pre-programmed satellite library of the most popular satellite services, offering a wide variety of satellite services to choose from. For complete information on the satellite library, see Chapter 3 "Settings" on page 29.

TIP: *You can add two more satellites of your choice to the satellite library. For complete information on adding satellites to the library, refer to the associated Application Note on the KVH Partner Portal (KVH-authorized technicians only).*

Circular and Linear Versions

Your TracVision system is configured to receive either circularly polarized satellite signals (e.g., North America) or linearly polarized satellite signals (e.g., Europe or Latin America). Figure 1-3 illustrates the difference between these two polarizations.

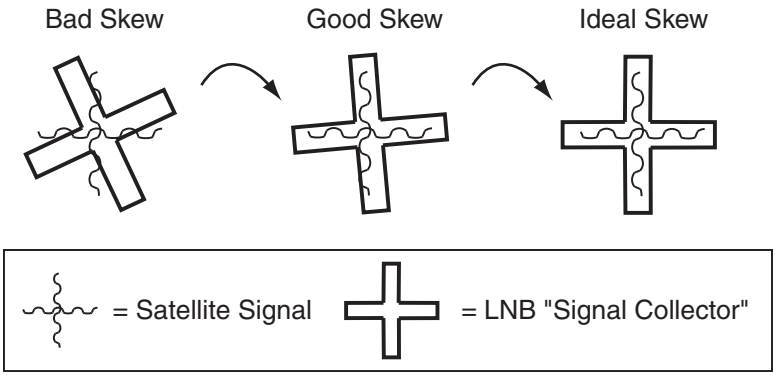
Figure 1-3 Polarizations of Satellite Signals

Circular	Linear
	
Signals transmitted in two "corkscrew" patterns, one running clockwise and one running counter-clockwise	Signals transmitted in vertical and horizontal "waves" offset exactly 90° from each other

LNB Skew Angle

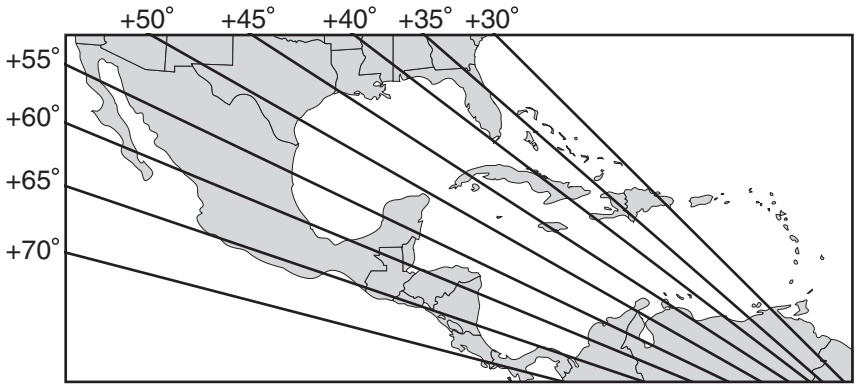
Since linear satellite signals are oriented in a precise cross pattern, the TracVision antenna's receiving element, called an LNB (low-noise block), must be oriented in the same way to optimize reception. This orientation adjustment is referred to as the LNB's "skew angle." Figure 1-4 illustrates how skew determines the amount of a linear signal that the LNB collects. The more signal, the better the reception.

Figure 1-4 How Skew Works



The correct skew setting varies depending on your geographic location, since the orientation of your antenna to the satellite changes as you move. For example, if your antenna is tracking the PAS 9 satellite for Sky Mexico programming, the ideal skew setting ranges from +30 to +70, depending upon your location within the satellite's coverage area (see Figure 1-5).

Figure 1-5 Approximate Skew Settings for the PAS 9 Satellite



For complete details about adjusting the LNB's skew, see "Adjusting the Skew Angle (Linear Versions)" on page 33.

2. Operation

This chapter explains everything you need to know to operate the TracVision system.

Contents

2

Receiving Satellite TV Signals

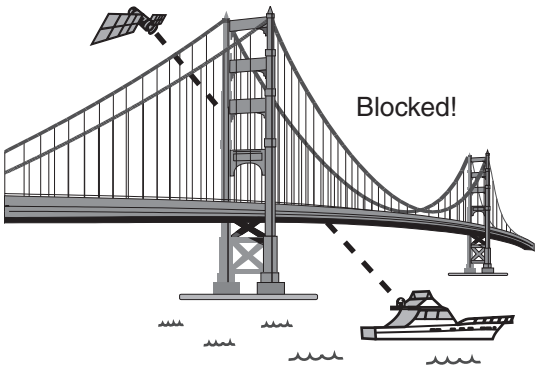
Television satellites are located in fixed positions above the Earth's equator and beam TV signals down to certain regions of the planet (not worldwide). To receive TV signals from a satellite, you must be located within that satellite's unique coverage area.

TIP: *For your convenience, KVH provides links to several websites that offer satellite coverage information. Simply visit our website at* ***www.kvh.com/footprint****.*

Figure 2-1 Location and Coverage Area of DIRECTV 101 Satellite

In addition, since TV satellites are located above the equator, the TracVision antenna must have a clear view of the sky to receive satellite TV signals. Anything that stands between the antenna and the satellite can block the signal, resulting in lost reception. Common causes of blockage include boat masts, trees, buildings, and bridges. Heavy rain, ice, or snow might also temporarily interrupt satellite signals.

Figure 2-2 Example of Satellite Blockage



Turning the System On/Off

You can turn the system on or off using the switchplate.

Turning On the System

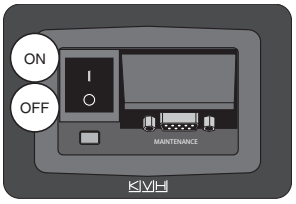
Follow the steps below to turn on your TracVision system.

IMPORTANT!

Avoid turning the vessel or changing channels for one minute after turning on the system.

1. Make sure the antenna has a clear view of the sky.
2. Turn on your satellite TV receiver and TV.
3. Set the switchplate's Power switch to the On (|) position.

Figure 2-3 Switchplate Power Switch



4. Wait one minute for system startup.

DIRECTV Subscribers Using the Tri-Sat AutoSwitch - Please Note

Once you turn on the TracVision system, the antenna automatically begins tracking the DIRECTV 101 satellite to download the program guide for the 101, 110, and 119 satellites. The receiver might take 30 minutes or more to fully load the program guide for all three of these satellites. Be sure to select only channels carried on the 101 satellite until the program guide is fully loaded.

Turning Off the System

Follow the steps below to turn off your TracVision system.

1. Set the switchplate's Power switch to the Off (O) position.
2. Turn off your satellite TV receiver and TV.

Changing Channels and Switching Between Satellites (Circular Versions)

During installation, your TracVision system should have been set up to track the satellite(s) of your choice and the channel guides for your selected satellite service should have been downloaded.

Since some channels might be located on another satellite, changing channels might require switching between satellites. With most TracVision configurations, satellite switching occurs automatically while you change channels using the primary receiver's remote control. Find your selected service and configuration in the following sections for complete details.

TIP: *The primary receiver is the receiver connected to the antenna's RF1 connector.*

DISH 1000

When the TracVision M5/M7 system is configured for DISH 1000, you can view the DISH HDTV programming for your geographic area. The system can be configured for either DISH 1000/61 or DISH 1000/129 use.

Figure 2-4 DISH 1000 Configurations

Configuration	Satellites Tracked
DISH 1000/61	DISH 110, 119, and 61
DISH 1000/129	DISH 110, 119, and 129

During installation, your TracVision system should have been set to the DISH 1000 configuration that best suits your geographic location (see Figure 2-5). If you change satellite coverage areas, refer to "DISH Network/ExpressVu Setup" on page 40 to change your DISH 1000 configuration.

Figure 2-5 Regional DISH 1000 Configuration Recommendations

DISH 1000 Automatic Mode - Preferred for One or Two Receivers

The antenna switches between satellites automatically as you change channels using the primary receiver's remote control. The primary receiver is the receiver connected to RF1 (see Figure 2-6 and Figure 2-7). If an optional secondary receiver is connected, you can use its remote control to switch between the channels on the currently selected satellite.

Figure 2-6 DISH 1000 Automatic Mode - Receiver Controls

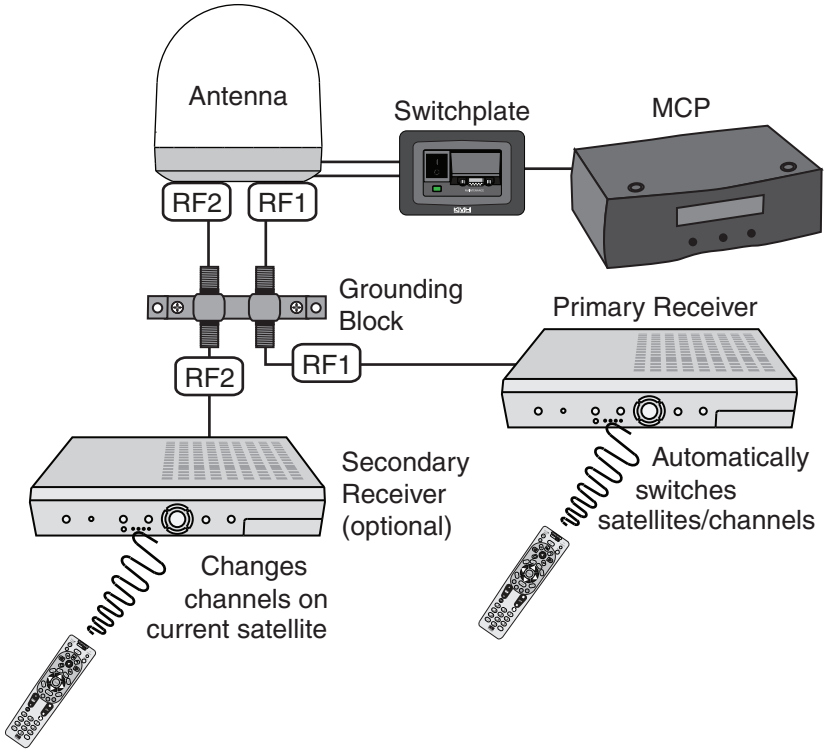
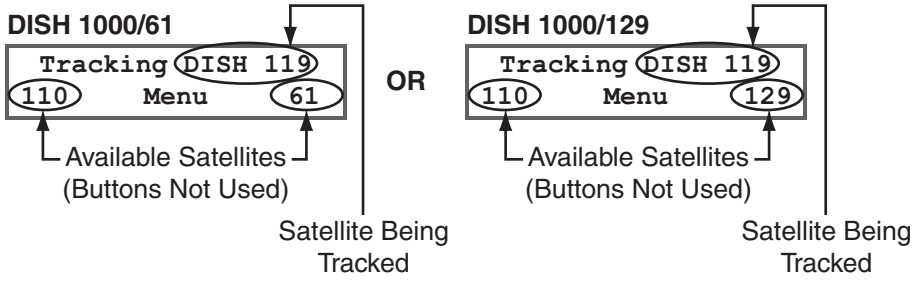


Figure 2-7 DISH 1000 Automatic Mode - MCP Displays



DISH 1000 Manual Mode - Required for Three or More Receivers

Since multiswitches interfere with communications between the receivers and the antenna, the system must be set up in Manual mode when three or more receivers are installed. When Manual mode is enabled, you can switch between your selected satellites using the buttons on the front of the MCP (see Figure 2-8 and Figure 2-9). You can use the receivers' remote controls to switch between the channels on the currently selected satellite.

Figure 2-8 DISH 1000 Manual Mode - Receiver/MCP Controls

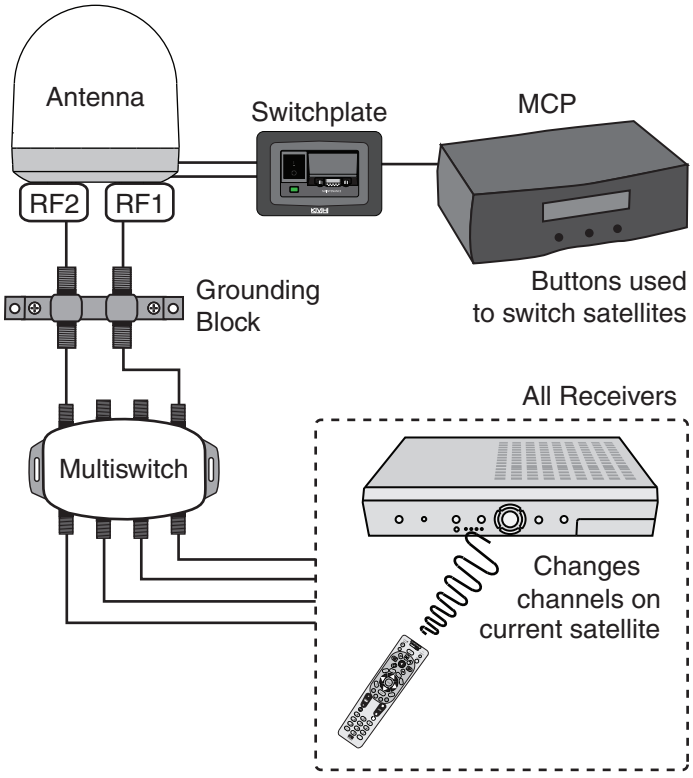
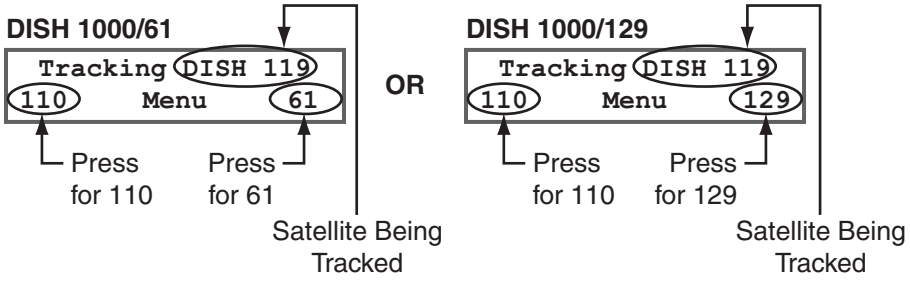


Figure 2-9 DISH 1000 Manual Mode - MCP Displays



DIRECTV Tri-Sat Automatic Mode - Tri-Sat AutoSwitch Kit Users Only

When the KVH Tri-Sat AutoSwitch Kit (KVH Part #72-0301-07, purchased separately) is installed, you can switch automatically among the Ku-band portion of the overall programming on the DIRECTV 101, 110, and 119 satellites when using a DIRECTV H21-200 or H20-600 receiver. Simply use the receiver's remote control to switch channels and satellites. Refer to the instructions provided in the Tri-Sat AutoSwitch Kit for more information.

Figure 2-10 DIRECTV Tri-Sat Automatic Mode - Receiver Controls

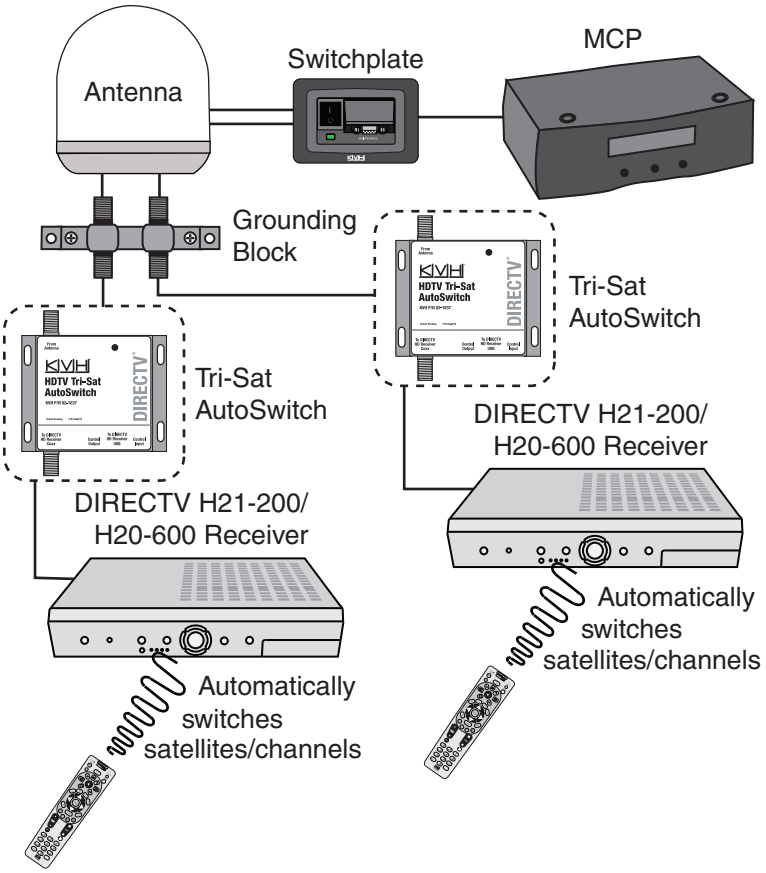
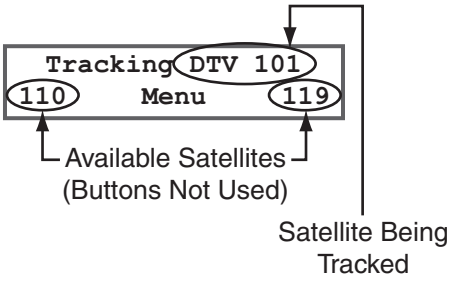


Figure 2-11 DIRECTV Tri-Sat Automatic Mode - MCP Display



Dual-Sat Mode - Required for all DISH 500, ExpressVu, DIRECTV, and Custom Dual-Sat Setups

Dual-Sat Mode is used with several service configurations. Figure 2-12 lists each Dual-Sat service configuration, the satellites tracked for each service, and available satellite switching modes.

Figure 2-12 Dual-Sat Modes

Service	Satellites Tracked	Available Switching Mode(s)
DIRECTV	DIRECTV 101 and 119	Auto or Manual
DISH 500	DISH 119 and 110	Auto or Manual
ExpressVu	ExpressVu 91 and 82	Auto or Manual
Custom	Selected by user	Manual

Dual-Sat Automatic Mode - Preferred Mode for One or Two Receivers*

The antenna switches between satellites automatically while you change channels using the primary receiver's remote control. The primary receiver is the receiver connected to the antenna's RF1 cable (see Figure 2-13 and Figure 2-14). If an optional secondary receiver is connected, you can use its remote control to switch between the channels on the currently selected satellite.

***NOTE:** Custom Dual-Sat configurations must use Manual mode.*

Figure 2-13 Dual-Sat Automatic Mode - Receiver Controls

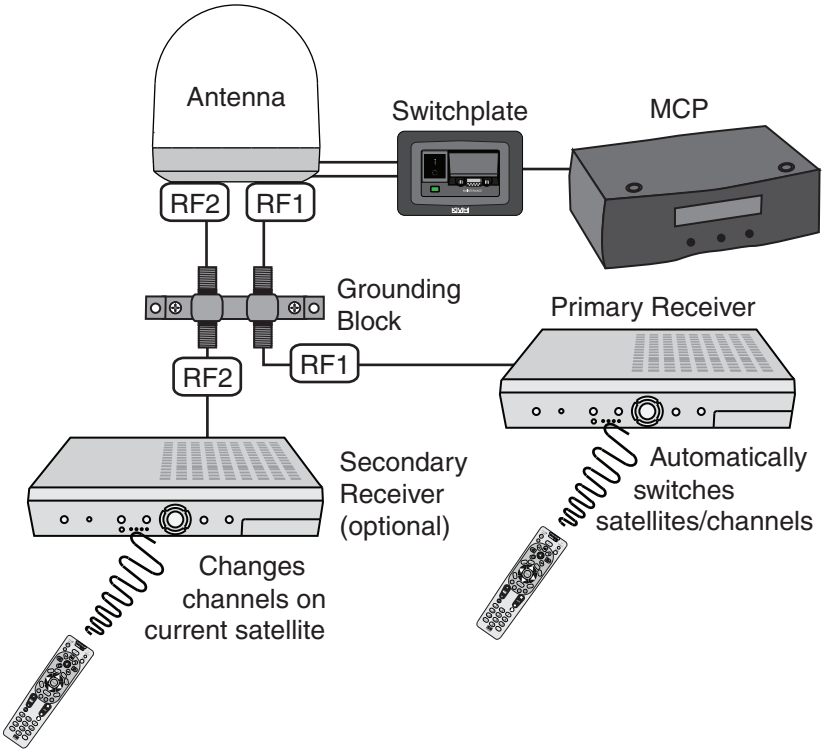
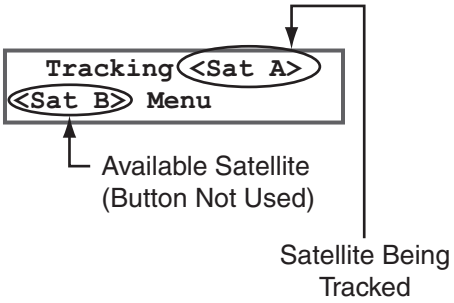


Figure 2-14 Dual-Sat Automatic Mode - MCP Display



Dual-Sat Manual Mode - Required for Three or More Receivers and All Custom Dual-Sat Setups

Circular TracVision M5/M7 systems with three or more receivers require the use of a multiswitch. Since multiswitches interfere with communications between the receivers and the antenna, the system must be set up in Manual mode. When manual mode is enabled, you can use the receiver's remote control to change channels on the currently selected satellite. If you need to switch satellites, simply use the buttons on the front of the MCP (see Figure 2-15 and Figure 2-16). You can use the receivers' remote controls to switch between the channels on the currently selected satellite.

Figure 2-15 Dual-Sat Manual Mode - Receiver/MCP Controls

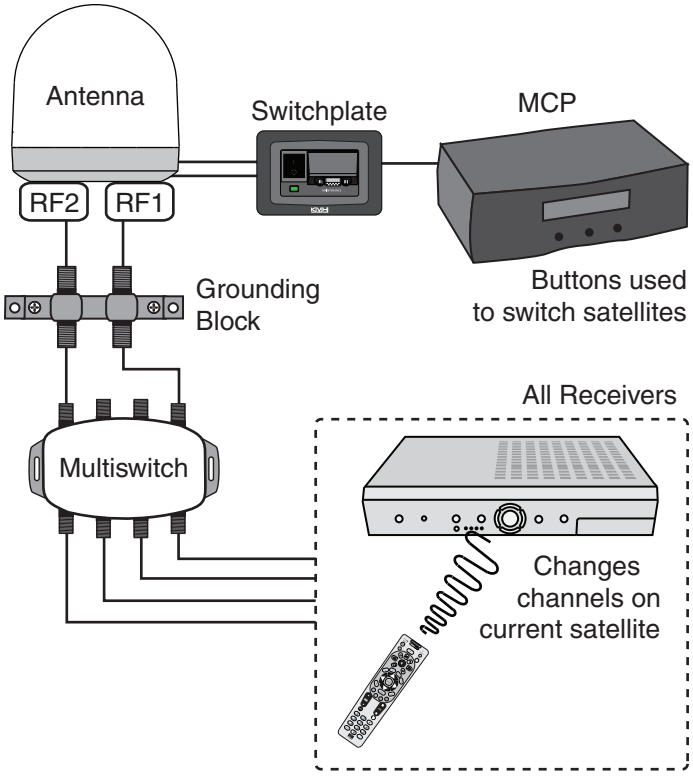
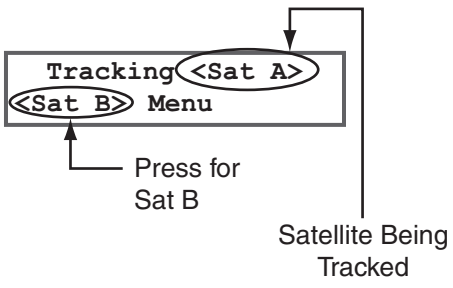


Figure 2-16 Dual-Sat Manual Mode - MCP Display



Changing Channels and Switching Between Satellites (Linear Versions)

During installation, your TracVision system should have been set up to track the satellite(s) of your choice and the channel guides for your selected satellite service should have been downloaded.

Since some channels might be located on another satellite, changing channels might require switching between satellites. Switching satellites occurs automatically with most TracVision system configurations. However, if the TracVision system includes a multiswitch, manual satellite switching is required.

NOTE: *To enable automatic switching, the receiver must be properly configured (see "Linear Receiver Configuration" on page 26 for more information).*

Automatic Satellite Switching

Most TracVision system configurations switch between satellites automatically while you change channels using the primary receiver's remote control. The primary receiver is the receiver connected to the antenna's RF1 cable (see Figure 2-17 and Figure 2-18 on page 23). If an optional secondary receiver is connected, you can use its remote control to switch between the channels on the currently selected satellite

Figure 2-17 Primary/Secondary Receiver Control (Dual-output version shown)

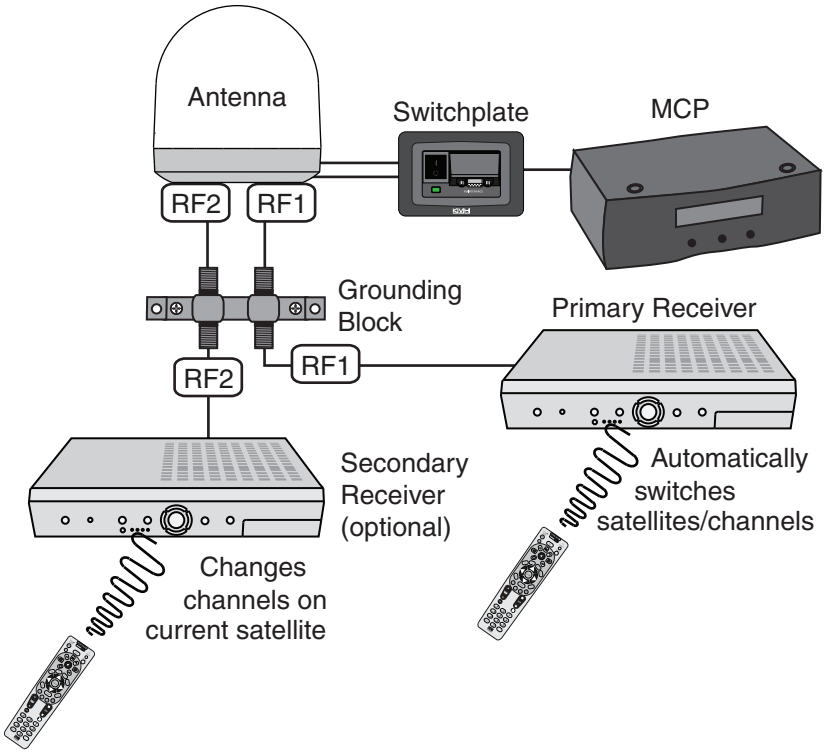
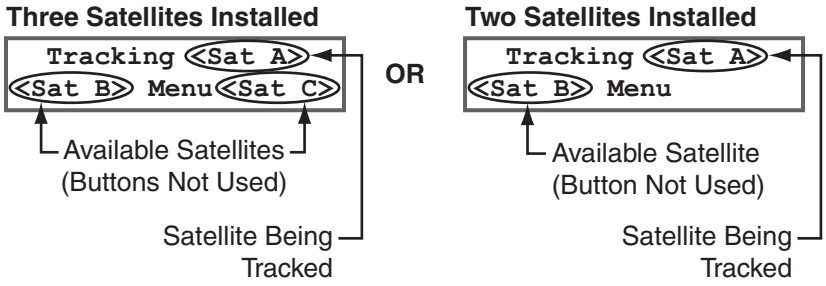


Figure 2-18 Automatically Switching Between Satellites - MCP Displays



Manual Satellite Switching

If the TracVision system includes a multiswitch, you can use the receivers' remote controls to change channels on the currently selected satellite. If you need to switch satellites, simply use the buttons on the front of the MCP (see Figure 2-19 and Figure 2-20).

Figure 2-19 Manual Satellite Switching - Receiver/MCP Controls (M7 Quad-output version shown)

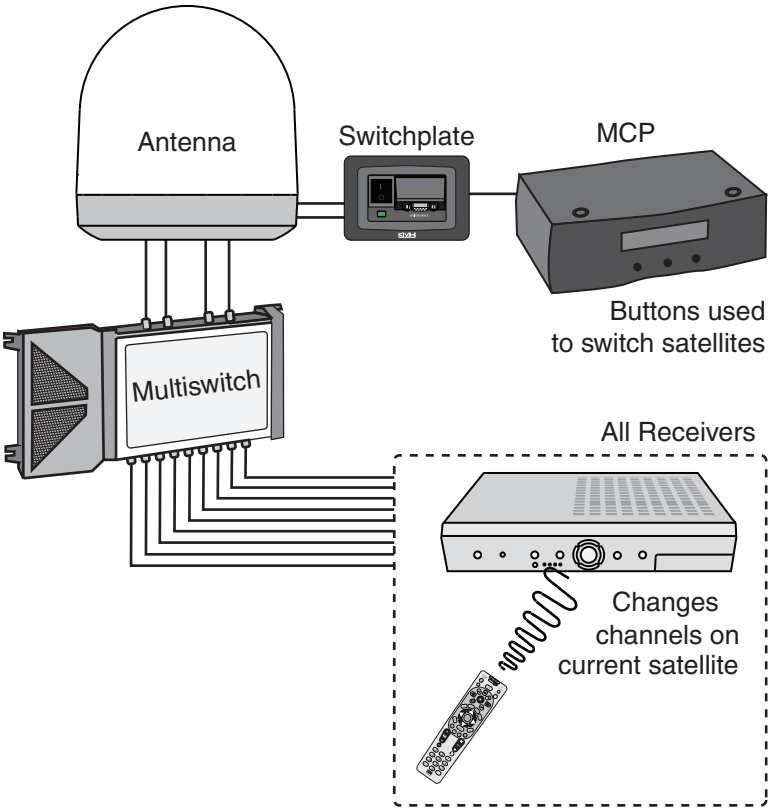
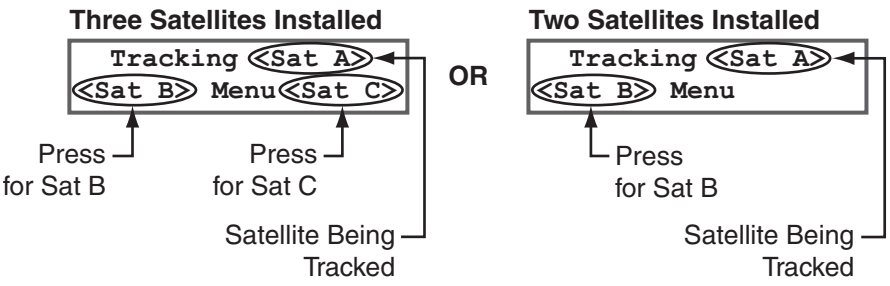


Figure 2-20 Manually Switching Between Satellites - MCP Displays



Receiver Requirements

This section lists U.S. and Canadian circular receiver models that are compatible with the TracVision M5/M7 system and explains linear and circular receiver setup requirements.

Circular Receiver Compatibility

To ensure compatibility with your TracVision M5/M7 system, be sure to use a KVH-validated receiver for your selected service type (see Figure 2-21).

Figure 2-21 KVH-Validated U.S. and Canadian Receivers

Standard-definition receivers		
DIRECTV	**DISH**	**ExpressVu**
D12 D11 D10	311	4100 3100
High-definition receivers		
DIRECTV	**DISH**	**ExpressVu**
H21 H20	211k 211	6100

NOTE: *For information on connecting different receiver models, contact KVH Technical Support at 1-401-847-3327.*

DISH Network/ExpressVu Receiver Configuration

If your TracVision M5/M7 system is set up for DISH Network or ExpressVu service, your receiver(s) should have also been configured during installation. In most cases, you do not need to reconfigure your receiver(s). However, Figure 2-22 lists special scenarios that require DISH Network/ExpressVu receiver configuration.

Figure 2-22 Receiver Configuration Requirements

Receiver Configuration is Required When...
• **DISH 1000 only -** You change satellite coverage areas (see Figure 2-5 on page 15) • You add a receiver • You have reconfigured a receiver for home use

If you need to configure a receiver(s) for DISH Network/ExpressVu use, follow the instructions for configuring the receiver for your selected service type in Chapter 3 "Settings" on page 29.

Linear Receiver Configuration

If the TracVision system does not include a multiswitch, you can configure the receiver(s) to enable automatic satellite switching. TracVision systems with a multiswitch installed require switching satellites using the MCP, which does not require receiver configuration.

To configure the receivers for automatic switching, the satellites must be set up in the receiver in the same order they were set up in the TracVision system (see Figure 2-23).

Figure 2-23 Antenna/Receiver Synchronization Settings

TracVision Satellite	Receiver Satellite	DiSEqC Setting
Satellite A	Alternative 1 or A	DiSEqC 1
Satellite B	Alternative 2 or B	DiSEqC 2
Satellite C*	Alternative 3 or C	DiSEqC 3

***NOTE:** *Only European Tri-Sat configurations track three satellites.*

Product Care

Please consider the following antenna care guidelines for maintaining peak performance:

- Periodically wash the exterior of the antenna dome with fresh water and mild detergent. Avoid harsh cleansers and volatile solvents (such as acetone) and do not spray the dome directly with high-pressure water.

- If you wish to paint the dome, use only non-metallic automotive paint without a primer coat. Any paint that contains metal will block satellite signals and impair reception.

3. Settings

This chapter contains information on system settings and how to modify them.

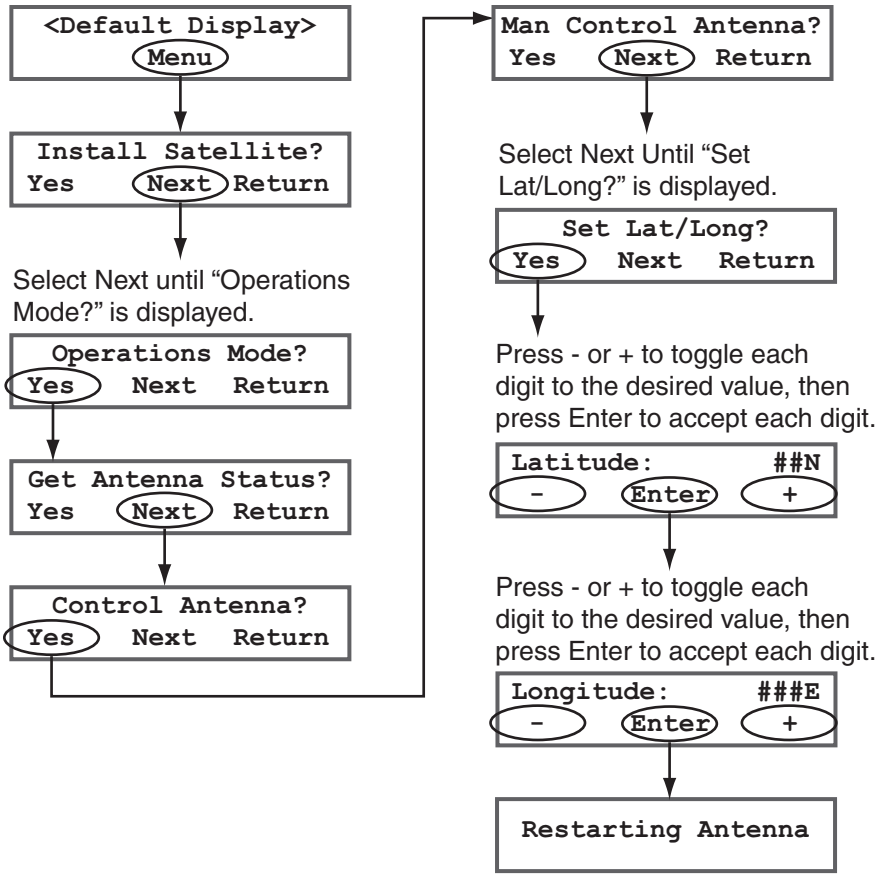
Contents

Updating Latitude and Longitude Data

Use the flowchart in Figure 3-1 if you wish to update your latitude and longitude data.

TIP: *For your convenience, you can determine your approximate latitude and longitude using the Position Grids provided in Appendix B on page 77.*

Figure 3-1 Updating Latitude and Longitude Data



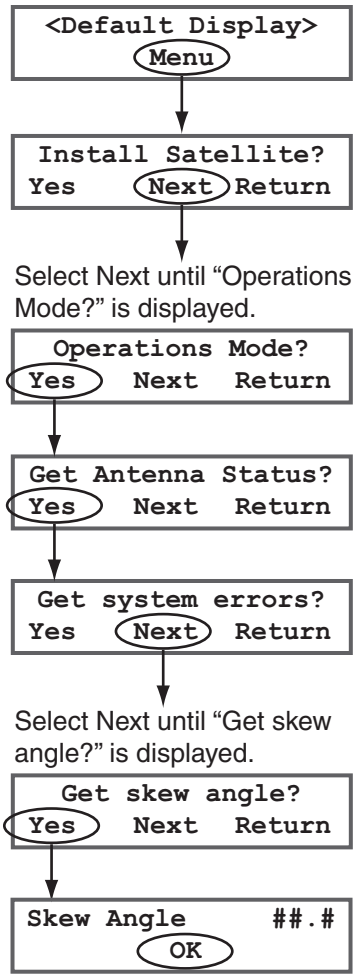
Displaying the Calculated Skew Angle

Use the flowchart in Figure 3-2 to display the average skew angle for your selected satellites. If just one satellite is configured for tracking, that satellite's skew angle is displayed.

IMPORTANT!

An accurate skew angle reading requires current latitude and longitude data. If necessary, be sure to update the latitude and longitude data before proceeding (see "Updating Latitude and Longitude Data" on page 31 for more information).

Figure 3-2 Displaying the Calculated Skew Angle



Adjusting the Skew Angle (Linear Versions)

Once you have determined the proper skew angle, follow the steps below to adjust the antenna's LNB skew angle.

TIP: *Refer to "Displaying the Calculated Skew Angle" on page 32 to determine the skew angle for the currently selected satellite. If you wish to determine the average skew angle for two or three satellites, see "European Tri-Sat Mode Setup" on page 50 or "Linear Dual-Sat Mode Setup" on page 52.*

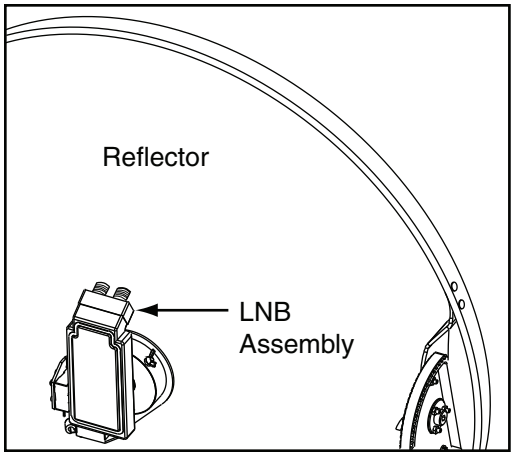
TIP: *For information on how skew works, see "LNB Skew Angle" on page 8.*

⚠ **CAUTION**
To avoid bodily injury, be sure to turn off the antenna and disconnect power to all wired components.

1. Using a Phillips-head screwdriver, remove the screws securing the radome. Then remove the radome and set it aside in a safe place.

2. Locate the LNB assembly on the back of the antenna reflector.

Figure 3-3 Location of LNB on Back of Antenna Reflector



3. Using a 2 mm allen hex key, loosen the two M4 socket set screws securing the LNB. The location of the screws varies according to TracVision model; refer to Figure 3-4 or Figure 3-5.

Figure 3-4 TracVision M5 Set Screws

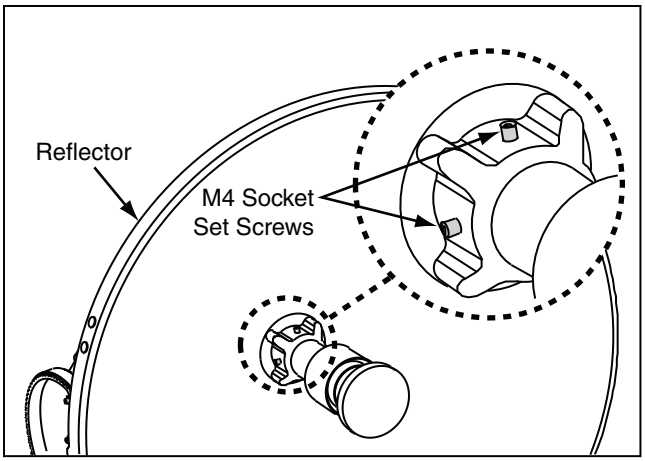
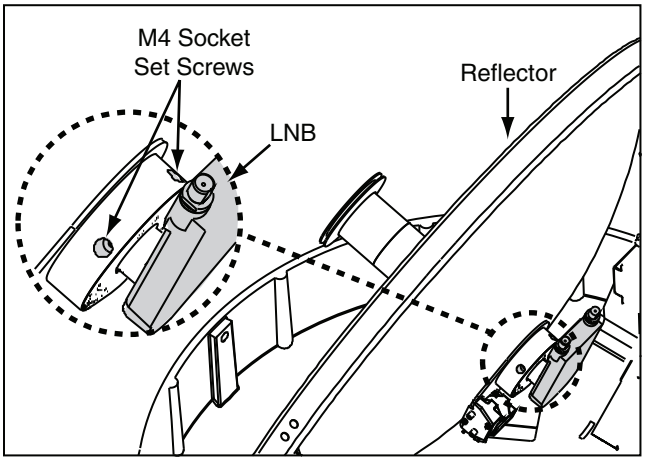


Figure 3-5 TracVision M7 Set Screws

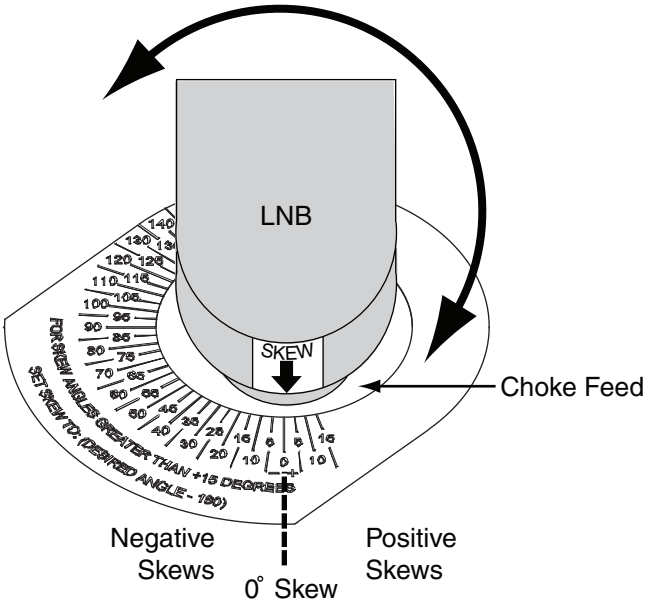


4a. TracVision M5 Only - Adjust the LNB clockwise or counter-clockwise, until the skew arrow on the LNB points to the skew angle that you determined earlier. Due to label constraints, if the skew angle is greater than +15°, you need to subtract 180 to get the equivalent negative skew angle and set the LNB to that angle instead. For example, if the skew angle is determined to be +30°, set the skew to -150°.

IMPORTANT!

Be sure to keep the LNB fully inserted in the choke feed to ensure optimum performance.

Figure 3-6 TracVision M5 LNB Skew Angle Adjustment

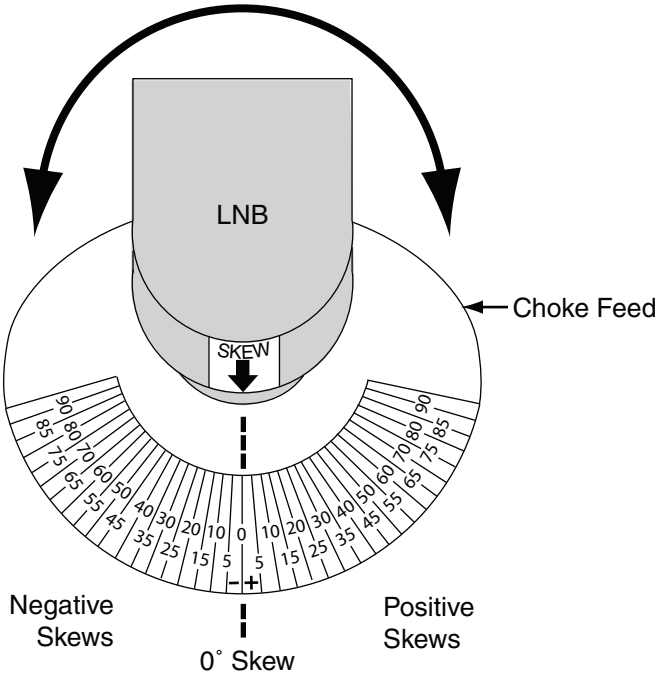


4b. TracVision M7 Only - Adjust the LNB clockwise or counter-clockwise, until the skew arrow on the LNB points to the skew angle that you determined earlier.

IMPORTANT!

Be sure to keep the LNB fully inserted in the choke feed to ensure optimum performance.

Figure 3-7 TracVision M7 LNB Skew Angle Adjustment



5. Tighten the two M4 socket set screws to secure the LNB in place. Apply 9 in-lbs (1 Nm) of torque, if possible.

6. Reinstall the radome.

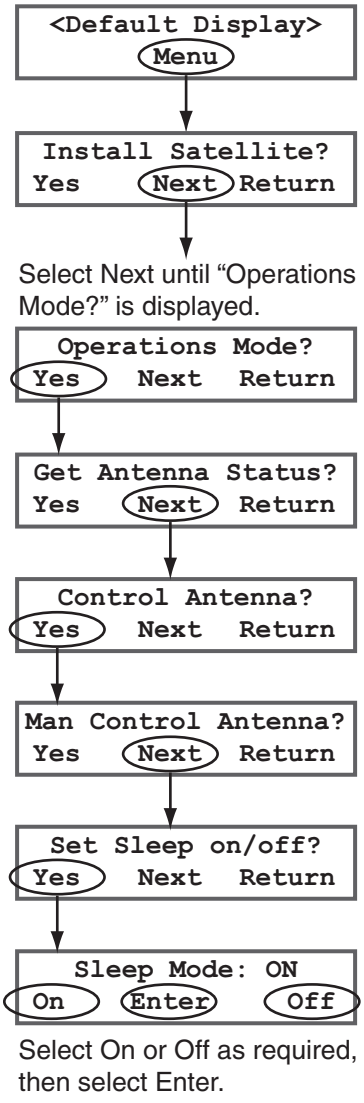
7. Restore power to the TracVision system.

Setting Sleep Mode

When the vessel has come to a stop and holds its position for one minute (e.g., at a dock), the antenna unit enters Sleep Mode, which locks the antenna in place to conserve power. As soon as the vessel moves beyond a 1° - 2° window or the signal level changes significantly, Sleep Mode automatically turns off and the system begins tracking the satellite again (or enters Search Mode to find the satellite).

Use the flowchart in Figure 3-8 if you wish to disable Sleep Mode, or if you wish to restore the original Sleep Mode setting.

Figure 3-8 Setting Sleep Mode On/Off



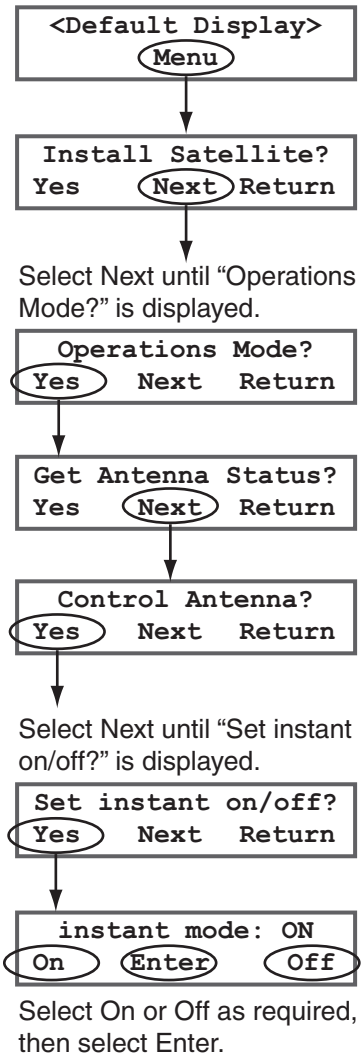
Setting Instant On

When Instant On is enabled, the antenna can immediately receive signals if the vessel has not moved since the antenna was last shut off. However, if the system is turned off, and then the vessel moves after last acquiring the satellite via Instant On, the antenna will undergo its standard initialization process once it is turned back on. This results in a brief delay.

NOTE: *Instant On is disabled by default and is not recommended for DISH Network and ExpressVu configurations.*

Use the flowchart in Figure 3-9 if you wish to enable Instant On, or if you wish to restore the original setting.

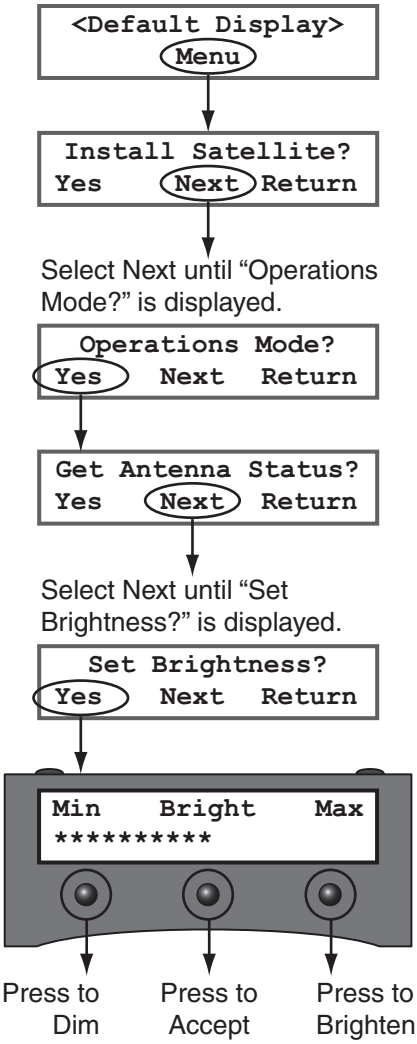
Figure 3-9 Enabling/Disabling Instant On



Adjusting Display Brightness

You can adjust the brightness of the MCP's LCD screen to suit your preferences. Use the flowchart in Figure 3-10 if you wish to adjust the display brightness.

Figure 3-10 Setting Display Brightness



DISH Network/ExpressVu Setup

This section explains how to configure the TracVision system for DISH 1000, DISH 500, or ExpressVu use. For operation instructions and additional information on DISH modes, refer to "Changing Channels and Switching Between Satellites (Circular Versions)" on page 15.

Step 1 - Configure the TracVision System

Use the flowchart in Figure 3-11 on page 41 to configure the TracVision system for DISH Network service. If you need to configure the system for ExpressVu service, see Figure 3-12 on page 42.

IMPORTANT!

This procedure must be performed while the vessel is docked in calm water.

NOTE: *For your convenience, you can determine your approximate latitude and longitude using the Position Grids provided in Appendix B on page 77.*

Figure 3-11 Configuring DISH Network

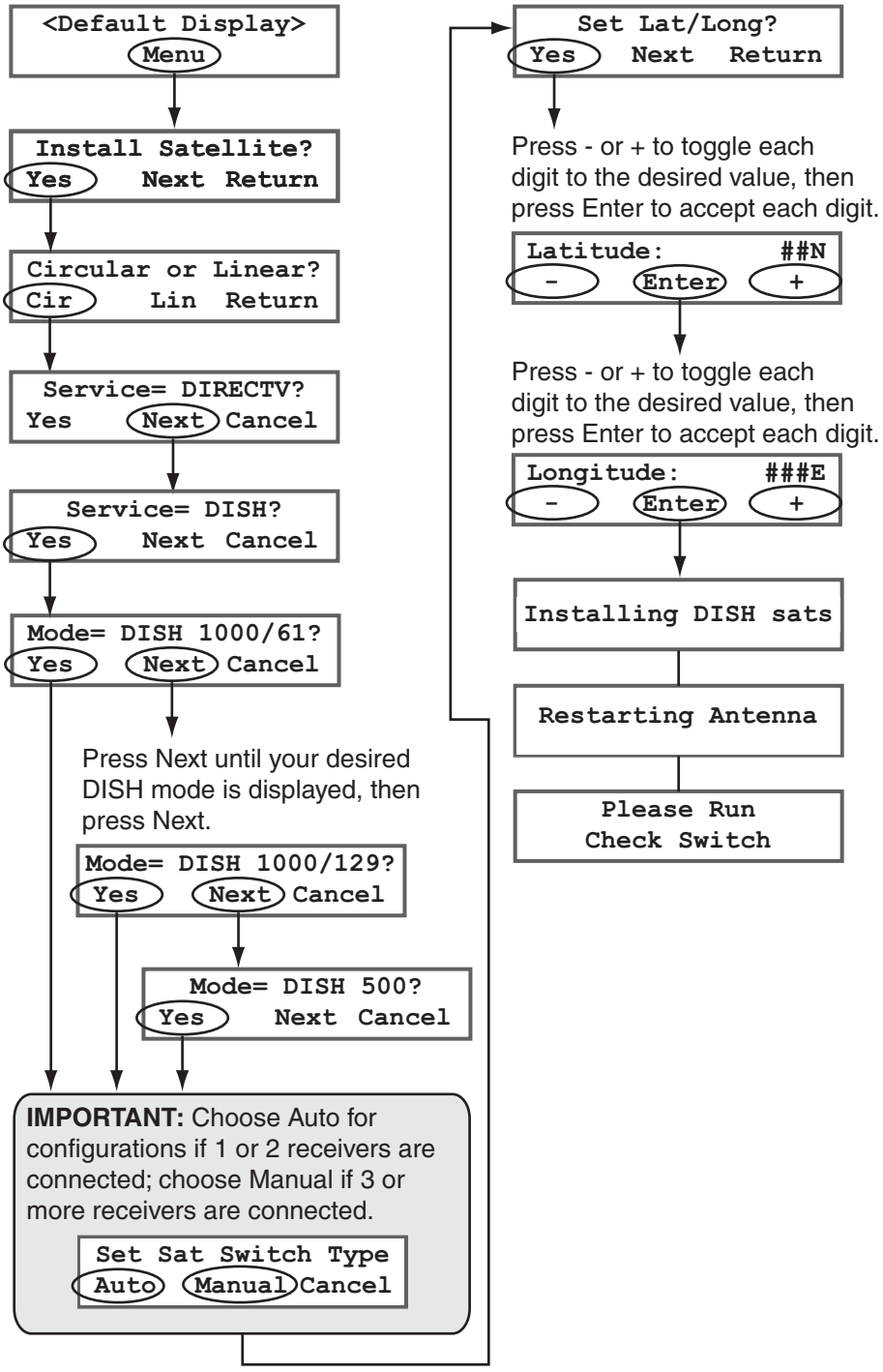
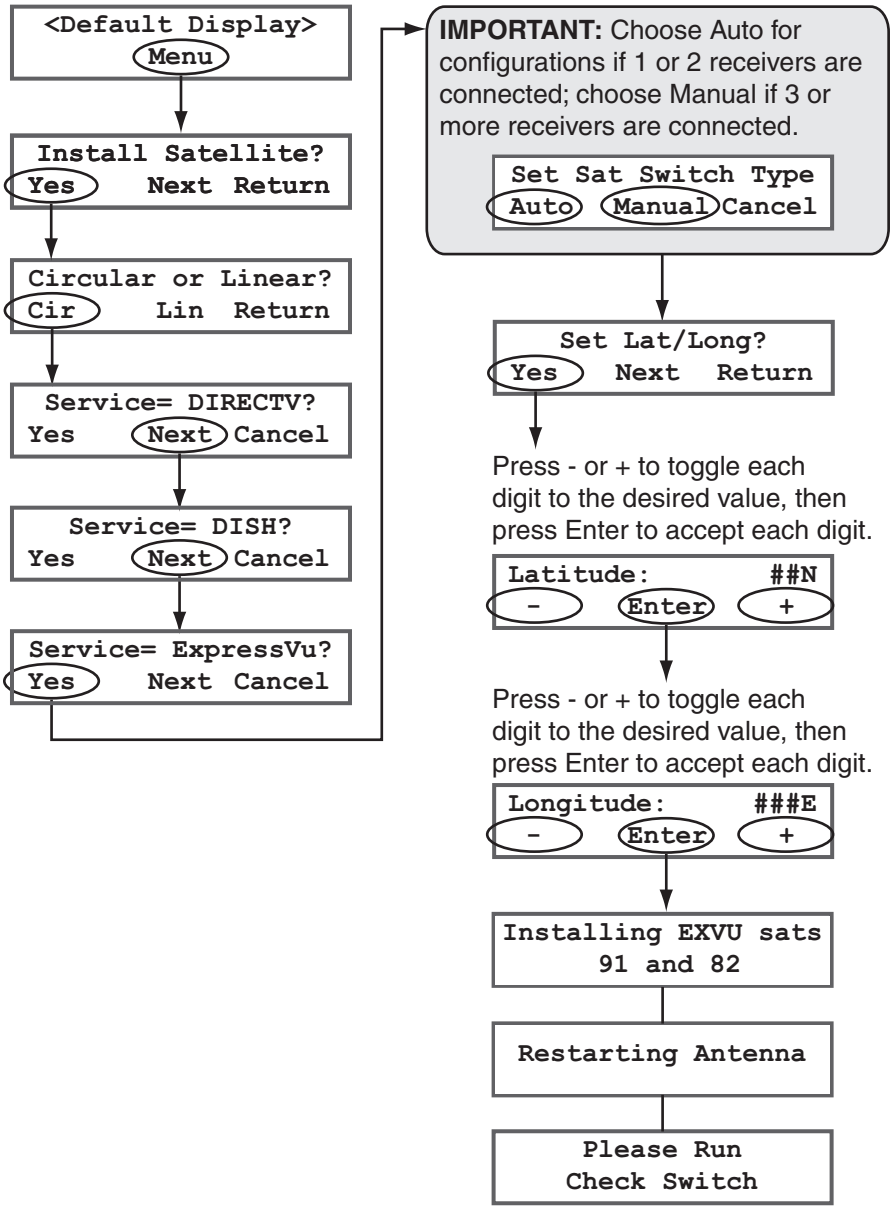


Figure 3-12 Configuring ExpressVu



Step 2 - Configure the Receiver(s)

NOTE: *If you are connecting multiple receivers, repeat this process for each additional receiver. You will need to connect each receiver, one at a time, to the RF1 cable and perform the steps below. Then, once you have completed this process for each receiver, you can reconnect them as desired.*

1. Ensure the receiver you wish to configure is connected to the TracVision system's RF1 cable.
2. Turn on the TV(s) and receiver(s).
3. Using the receiver's remote, go to the "Point Dish/ Signal Strength" screen (press MENU, 6, 1, 1 on most models).
4. Choose **Check Switch**, then press SELECT.
5. Choose **Test**, then press SELECT. The MCP displays the "Check Switch Running" screen (see Figure 3-13).

Figure 3-13 Check Switch Running Screen

6. After waiting 15 minutes, check the MCP display. If the "Please Run Check Switch" screen is displayed, repeat Steps 3-5.

IMPORTANT!

Please be patient. The Check Switch test takes approximately 15 minutes to complete. Disregard any messages on the TV stating the test is complete; the antenna must perform additional operations before proceeding.

Figure 3-14 Please Run Check Switch Screen

7. Refer to the tables in Figures 3-15 through Figure 3-18 (on the following page) to verify the values on your TV screen match those required for your selected satellite TV service. If your values do not match, turn off the TracVision system, then turn it back on and repeat Steps 3-6.

Figure 3-15 DISH 1000/61 Expected Check Switch Results on TV Screen

Port	1	2	3
Satellite	119	110	61
Trans	OK	OK	OK
Status	Reception Verified		
Switch	SW64		

Figure 3-16 DISH 1000/129 Expected Check Switch Results on TV Screen

Port	1	2	3
Satellite	119	110	129
Trans	OK	OK	OK
Status	Reception Verified		
Switch	SW64		

Figure 3-17 DISH 500 Expected Check Switch Results on TV Screen

Port	1	1	2	2
Satellite	119	119	110	110
Trans	Odd	Even	Odd	Even
Status	Reception Verified			
Switch	SW42			

Figure 3-18 ExpressVu Expected Check Switch Results on TV Screen*

Port	1	1	2	2
Satellite	91	91	82	82
Trans	Odd	Even	Odd	Even
Status	Reception Verified			
Switch	SW21			

***NOTE:** If you installed just one ExpressVu satellite, the TV screen will display an error message instead; this is normal.*

8. Exit the menu and allow the receiver to download the program guide.

***NOTE:** You do not need to configure the receiver again unless you add another receiver, you reconfigure a receiver for home use, or you move to a different DISH 1000 satellite coverage area (see "DISH 1000" on page 15).*

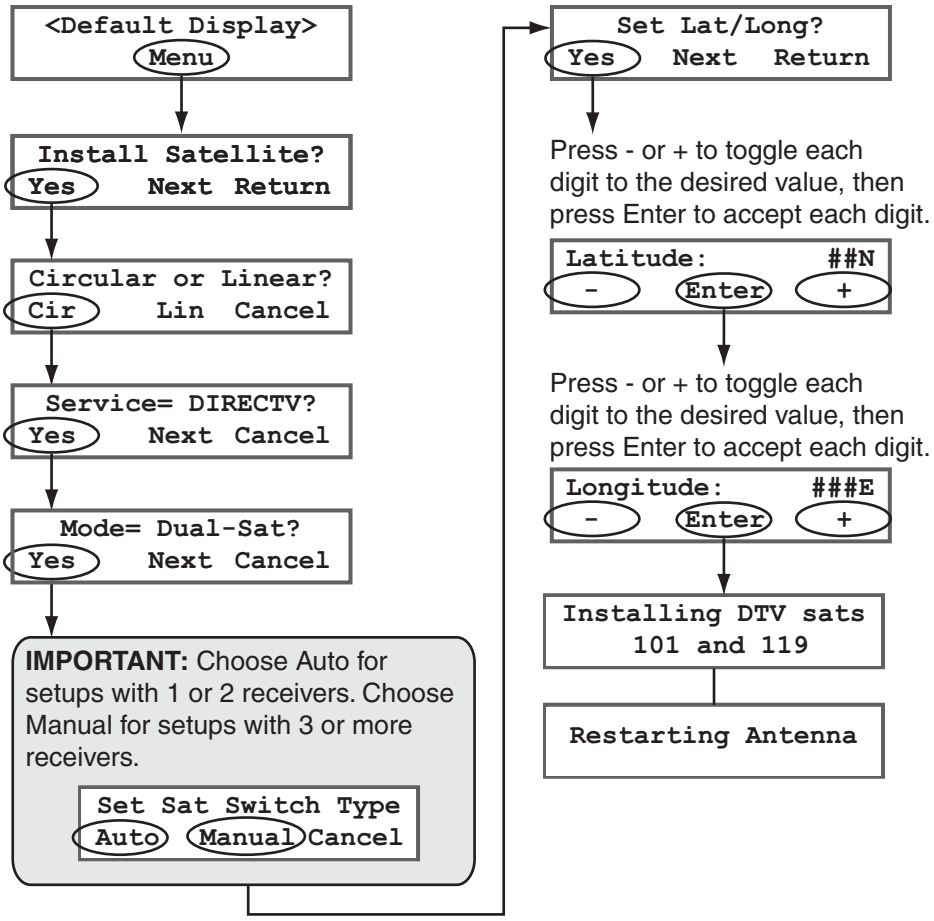
DIRECTV Dual-Sat Mode Setup

This section explains how to configure the TracVision system to track the DIRECTV 101 and 119 satellites. Use the flowchart in Figure 3-19 to configure the TracVision system for DIRECTV Dual-Sat Mode. For operation instructions, refer to "Changing Channels and Switching Between Satellites (Circular Versions)" on page 15.

NOTE: *If your TracVision system includes the Tri-Sat AutoSwitch Kit, please refer to the instructions provided in the kit for configuration and operation instructions.*

NOTE: *For your convenience, you can determine your approximate latitude and longitude using the Position Grids provided in Appendix B on page 77.*

Figure 3-19 Configuring DIRECTV Dual-Sat Mode



Circular Custom Dual-Sat Setup

The following instructions explain how to configure the TracVision system to track any two satellites of your choice from the circular antenna's circular satellite library (shown in Figure 3-20 on page 48). For operation instructions, refer to "Changing Channels and Switching Between Satellites (Circular Versions)" on page 15.

IMPORTANT!

Most DIRECTV, DISH Network, and ExpressVu subscribers should refer the previous sections for setup information. The TracVision system should only be configured for Custom Dual-Sat Mode if you wish to install just one satellite or install different satellites than those specified for your satellite service. Refer to "DISH Network/ExpressVu Setup" on page 40 or "DIRECTV Dual-Sat Mode Setup" on page 46 for more information.

NOTE: *Be sure to only install satellites that your TracVision M5/M7 system can track in your geographic location. For your convenience, KVH provides links to several websites that offer satellite coverage information. Simply visit our website at* ***www.kvh.com/footprint****.*

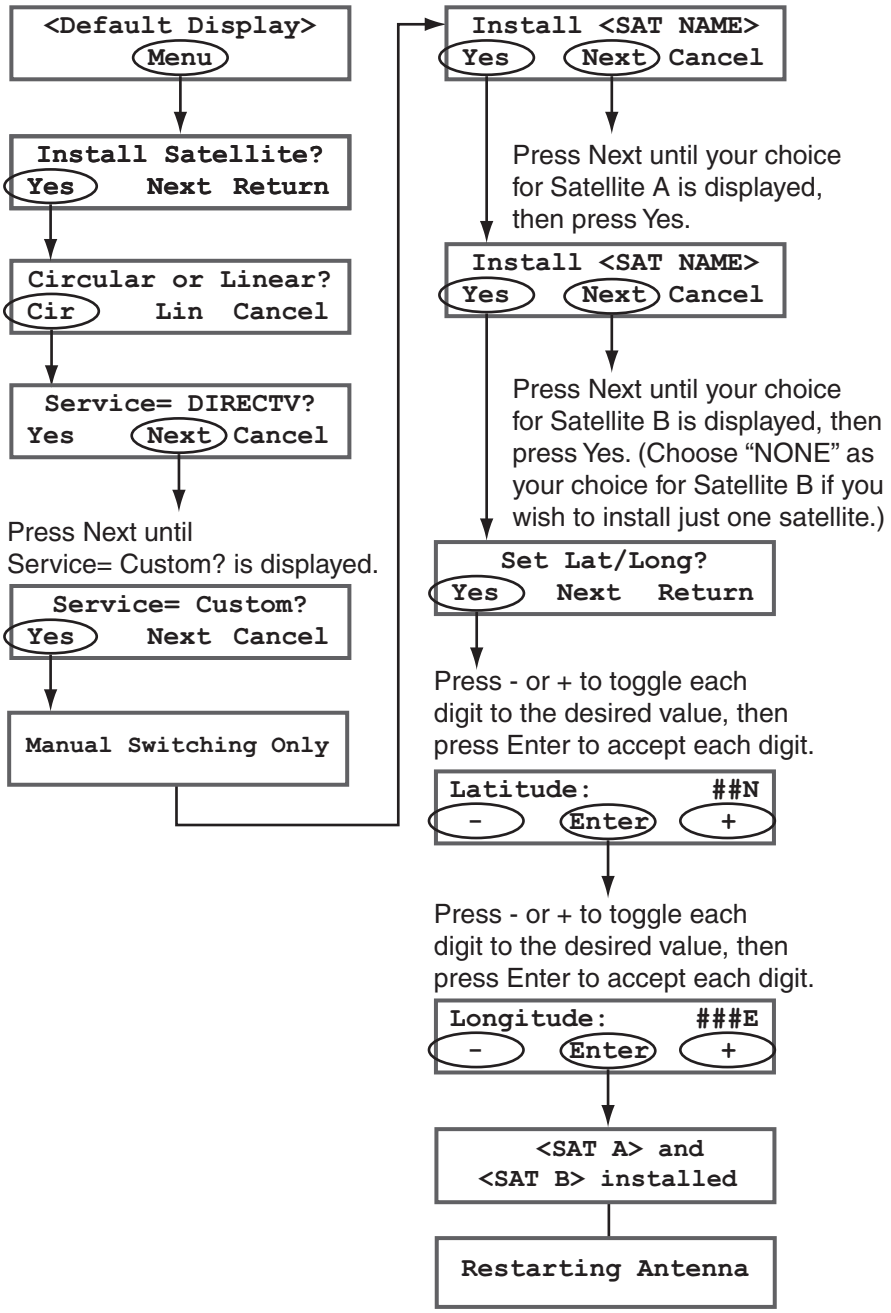
Figure 3-20 Circular Satellite Library

Satellite Service	Satellite Location	Installation Name
AsiaSat 4	122.2° E	ASIASAT*
DIRECTV	72.0° W	DSS_72
	101.0° W	DSS_101
	110.0° W	DSS_110*
	119.0° W	DSS_119
DIRECTV Latin America	95.0° W	GALAXY3CN*
DISH Network	61.5° W	ECHO_61
	110.0° W	ECHO_110
	119.0° W	ECHO_119
	129.0° W	ECHO_129
ExpressVu	91.0° W	EXPRESSTV
	82.0° W	EXPRESSVU

***NOTE:** Reception of these satellites requires special hardware. Please contact your local KVH-authorized dealer or KVH Technical Support for details.*

Use the flowchart in Figure 3-21 to configure the TracVision system for your custom pair of satellites (or single satellite).

Figure 3-21 Configuring Custom Dual-Sat Mode



European Tri-Sat Mode Setup

This section explains how to configure the TracVision system to track three satellites within predefined linear satellite groups for use in European locations. Each group includes three satellites (see Figure 3-22). For operation instructions, refer to "Changing Channels and Switching Between Satellites (Linear Versions)" on page 22.

Figure 3-22 European Tri-Sat Groups - Satellites/TracVision Position

Group Name	Satellites	Position
Europe WB	Hotbird WB	A
	Astra 1	B
	Astra 2S	C
Europe	Hotbird	A
	Astra 1	B
	Astra 2S	C
Scandinavia	Hotbird WB	A
	Sirius	B
	Thor	C

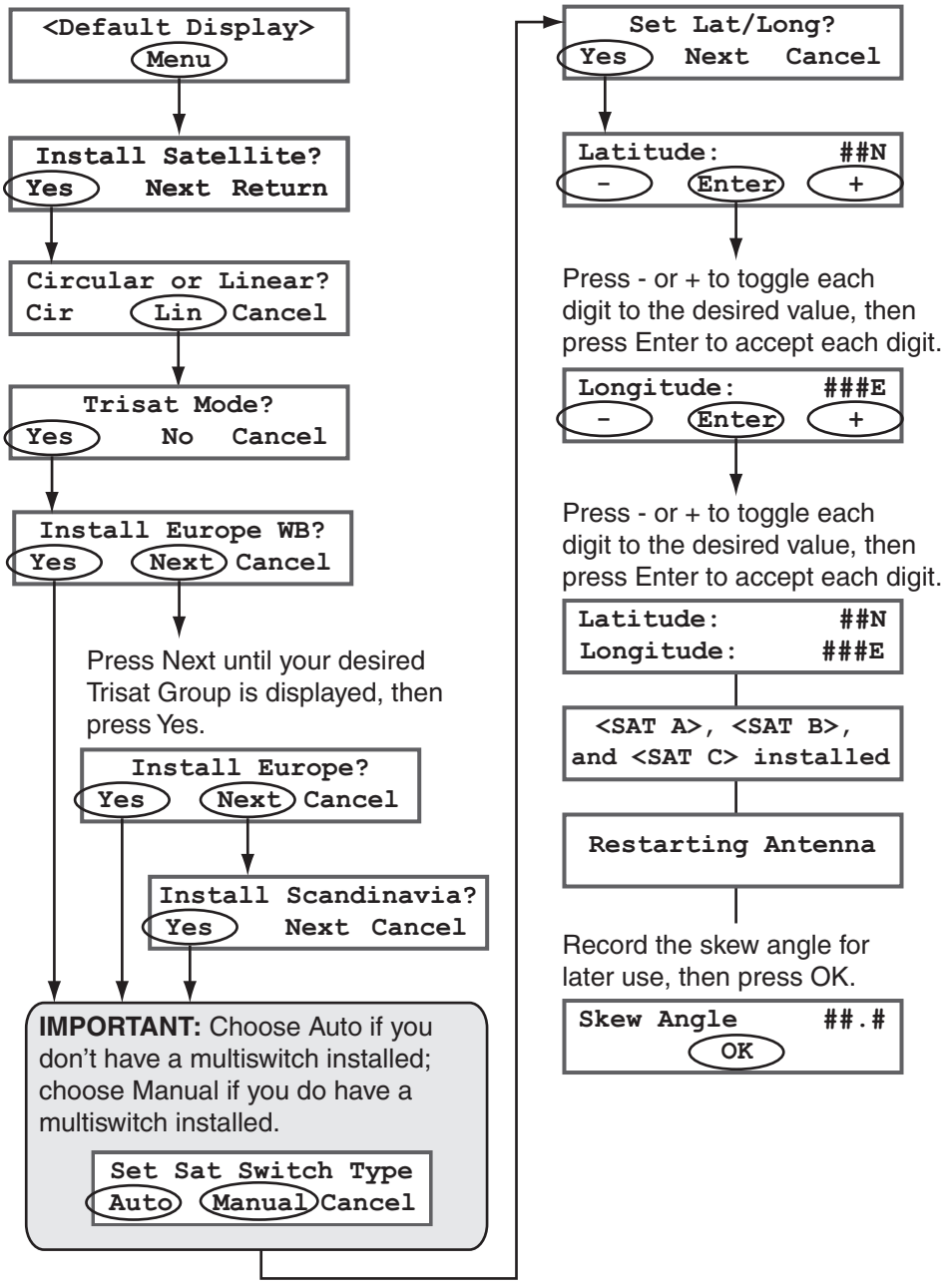
NOTE: *To enable automatic switching, the receiver must be set up to match the TracVision system's satellite position settings (A, B, or C). Refer to "Linear Receiver Configuration" on page 26 for more information.*

Step 1 - Configure the European Tri-Sat Group

Use the flowchart in Figure 3-23 on page 51 if you need to configure the TracVision system for European Tri-Sat Mode.

NOTE: *Be sure to record the skew angle (the average skew for all three satellites) that is displayed during this procedure. You will need this information to adjust the TracVision system's skew angle. See "Adjusting the Skew Angle (Linear Versions)" on page 33 for more information on setting the skew angle.*

Figure 3-23 Configuring European Tri-Sat Mode



Step 2 - Adjust the LNB Skew Angle

Now that you have installed the desired Tri-Sat group and recorded the skew angle for the Tri-Sat group, you need to adjust the antenna's LNB skew angle to optimize signal reception. Follow the instructions in "Adjusting the Skew Angle (Linear Versions)" on page 33 to adjust the skew angle.

Linear Dual-Sat Mode Setup

This section explains how to configure the TracVision system to track any two satellites from the antenna's linear satellite library (shown in Figure 3-24). For operation instructions, refer to "Changing Channels and Switching Between Satellites (Linear Versions)" on page 22.

Figure 3-24 Linear Satellite Library

Satellite Location	Satellite	Installation Name
26.0° E	Arabsat	ARABSAT
19.2° E	Astra 1	ASTRA1
28.2° E	Astra 2N	ASTRA2N
28.2° E	Astra 2S	ASTRA2S
7.0° E	Eutelsat W3A	EUTEL_W3A
30.0° W	Hispasat	HISPASAT
13.0° E	Hotbird	HOTBIRD
13.0° E	Hotbird WB	HOTBIRDWB
7.0° W	Nilesat	NILESAT
160.0° E	Optus D1	OPTUSD1*
156.0° E	Optus C1	OPTUSC1
58.0°W	Pas 9	PAS_9
110.5° E	Sinosat 1	SINOSAT*
5.0° E	Sirius	SIRIUS
0.8° W	Thor	THOR
42.0° E	Turksat 1C	TURKSAT1C

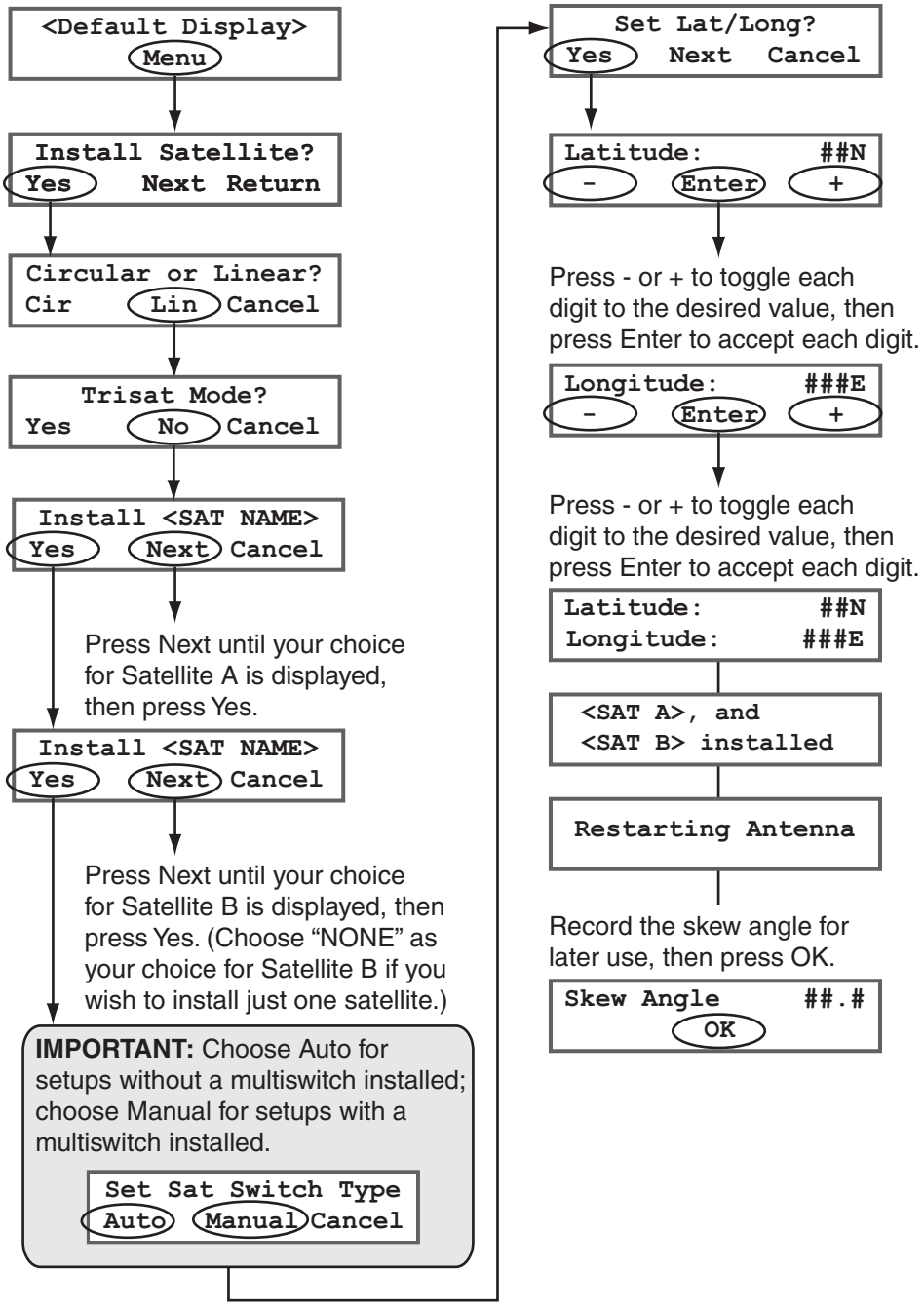
***NOTE:** Reception of these satellites requires special hardware. Please contact your local KVH-authorized dealer/distributor or KVH Technical Support for details.*

Step 1 - Configure the Satellites

Use the flowchart in Figure 3-25 to configure the TracVision system for linear Dual-Sat Mode.

NOTE: *Be sure to record the skew angle (the average skew for both satellites) reported during this procedure. You will need this information to adjust the TracVision system's skew angle.*

Figure 3-25 Configuring Linear Dual-Sat Mode



Step 2 - Adjust the LNB Skew Angle

Now that you have installed the desired satellites and recorded the skew angle, you need to adjust the antenna's LNB skew angle to optimize signal reception. Follow the instructions in "Adjusting the Skew Angle (Linear Versions)" on page 33 to adjust the skew angle.

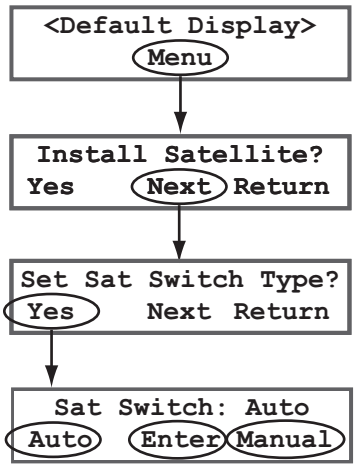
NOTE: *To enable automatic satellite switching, the receiver must be set up to match the TracVision system's satellite settings. Refer to "Linear Receiver Configuration" on page 26 for more information.*

Selecting Automatic or Manual Satellite Switching

When your TracVision system was configured, the satellite switching method (automatic or manual) was also selected. However, you can use the flowchart in Figure 3-26 to change the satellite switching method for your selected service, if desired.

NOTE: *While most TracVision configurations support automatic switching, Custom Dual-Sat configurations and any configurations with a multiswitch installed require manual switching. For more information on satellite switching options for your selected configuration, refer to the applicable service setup instructions in this chapter.*

Figure 3-26 Setting the Satellite Switching Method

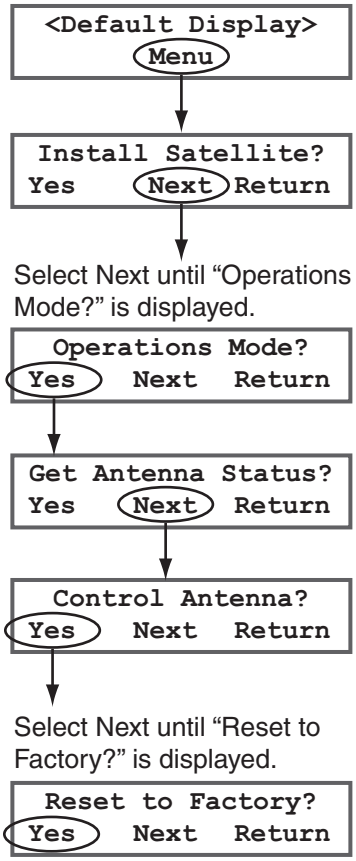


Choose your satellite switching method, then press Enter.

Resetting to Factory Default Settings

Use the flowchart in Figure 3-27 if you wish to reset the TracVision system to the factory default satellite service (DIRECTV Dual-Sat Mode) and LCD brightness settings.

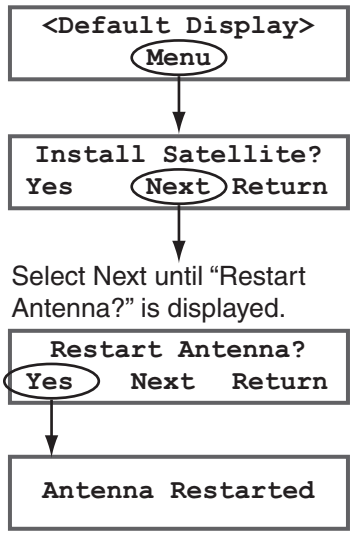
Figure 3-27 Resetting to Factory Default Settings



Restarting the TracVision System

Use the flowchart in Figure 3-28 if you wish to restart the TracVision system.

Figure 3-28 Restarting the TracVision System



4. Troubleshooting

This chapter identifies potential basic problems along with their possible causes and solutions. It also explains how to get technical support.

Contents

4

Five Simple Checks

If you are experiencing a problem receiving satellite TV with your TracVision system, perform the five simple checks below.

TIP: *You can also try resetting the satellite TV receiver. Turn off and unplug the receiver, wait one minute, then plug it back in and turn it back on.*

Can the antenna see the satellite?

The antenna requires an unobstructed view of the sky to receive satellite TV signals. Common causes of blockage include trees, buildings, bridges, and mountains.

Is there excessive dirt or moisture on the antenna dome?

Dirt buildup or moisture on the dome can reduce satellite reception. Clean the exterior of the dome periodically.

Is it raining heavily?

Heavy rain or snow can weaken satellite TV signals. Reception should improve once the inclement weather subsides.

Is everything turned on and connected properly?

Make sure your TV and receiver are both turned on and set up for the satellite input. Finally, check any connecting cables to ensure none have come loose.

(Linear Versions Only) Is the antenna's LNB set to the correct skew angle?

To optimize reception, the antenna's LNB needs to be set to the correct skew angle for the satellite(s) you want to track. See "Adjusting the Skew Angle (Linear Versions)" on page 33 for details.

Troubleshooting Matrix

The troubleshooting matrix in Figure 4-1 identifies potential operational symptoms and their causes and remedies. "Causes and Remedies for Operational Issues" on page 63 contains detailed information on the causes and remedies listed below.

Figure 4-1 Troubleshooting Matrix

SYMPTOM / CAUSES AND REMEDIES	Receiver fault or improper receiver configuration	Satellite coverage issue	Satellite signal blocked	Radar interference	Satellite frequency data changed	Vessel turning during startup	Insufficient power	Improper wiring	Loose RF connectors	Type of multiswitch used	Cable unwrap
Antenna non-functional							x	x			
Antenna not switching satellites	x	x	x				x	x	x	x	
No picture on TV set	x	x	x	x	x			x	x	x	
Certain channels do not work	x	x	x		x		x	x	x		
Intermittent picture for short intervals		x	x	x		x			x	x	x
System works at dock but not on the move			x			x					
System will not find satellite	x	x	x	x	x	x	x	x	x	x	
Snowy television picture	x						x	x	x		
Pixelating television picture	x	x	x	x		x	x	x	x		

Causes and Remedies for Operational Issues

This section addresses the most common operational issues that can affect the performance of the TracVision M5/M7 system. If your TracVision system requires service, you can visit any KVH-authorized dealer or distributor for assistance. To find a KVH-authorized dealer near you, visit ***www.kvh.com/wheretogetservice***.

Receiver Fault or Improper Receiver Configuration

Receiver Fault

Your satellite TV receiver might be set up incorrectly or defective. First check the receiver's configuration to ensure it is set up for the desired programming. In the case of a faulty receiver, refer to your selected receiver's user manual for service and warranty information.

Improper Receiver Configuration (Linear Versions Only)

To enable automatic satellite switching, the receiver(s) must be set up for the same satellites, and in the same order, they are set up in the antenna.

NOTE: *Linear TracVision systems with a multiswitch installed require switching satellites using the MCP, which does not require receiver configuration.*

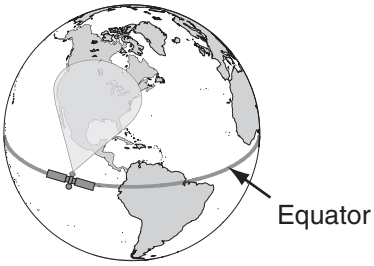
TracVision Satellite	Receiver Satellite	DiSEqC Setting
Satellite A	Alternative 1 or A	DiSEqC 1
Satellite B	Alternative 2 or B	DiSEqC 2
Satellite C	Alternative 3 or C	DiSEqC 3

Satellite Coverage Issue

Television satellites are located in fixed positions above the Earth's equator and beam TV signals down to certain regions of the planet (not worldwide). To receive TV signals from a satellite, you must be located within that satellite's unique coverage area.

TIP: *For your convenience, KVH provides links to several websites that offer satellite coverage information. Simply visit our website at* ***www.kvh.com/footprint****.*

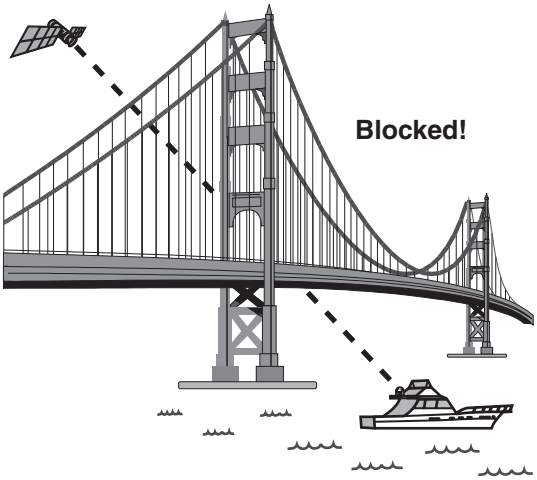
Figure 4-2 Location and Coverage Area of DIRECTV 101 Satellite



Satellite Signal Blocked

Since TV satellites are located above the equator, the TracVision antenna must have a clear view of the sky to receive satellite TV signals. Anything that stands between the antenna and the satellite can block the signal, resulting in lost reception. Common causes of blockage include boat masts, trees, buildings, and bridges. Heavy rain, ice, or snow might also temporarily interrupt satellite signals.

Figure 4-3 Example of Satellite Blockage



Radar Interference

The TracVision M5/M7 antenna must be kept out of line with nearby radars, as their energy levels might overload the antenna's front-end circuits. Refer to the TracVision M5/M7 Installation Guide for details, or visit any KVH-authorized dealer or distributor for assistance. To find a KVH-authorized dealer near you, visit ***www.kvh.com/wheretogetservice***.

Satellite Frequency Data Changed

If some channels work, while one or more other channels do not, or if the antenna cannot find the selected satellite, the satellite's frequency data might have changed. You can visit any KVH-authorized dealer or distributor for assistance. To find a KVH-authorized dealer near you, visit ***www.kvh.com/wheretogetservice***.

Vessel Turning During Startup

If you turn the vessel during the first minute after system startup, the gyro calibration that occurs during startup might be invalid, causing the TracVision M5/M7 system to track improperly. To solve this problem, simply turn off the TracVision M5/M7 system for at least ten seconds. Then turn on the TracVision system, ensuring the vessel is either motionless or traveling in a straight line for the first minute after startup.

Insufficient Power

If the power cable to the antenna unit is more than 50 ft (15 m) long, the power level can decrease over the length of the cable, resulting in a voltage level at the antenna that is too low to power the system. Refer to the TracVision M5/M7 Installation Guide for details on supplying adequate power to the antenna, or visit any KVH-authorized dealer or distributor for assistance. To find a KVH-authorized dealer near you, visit ***www.kvh.com/wheretogetservice***.

Improper Wiring

If the system has been improperly wired, the antenna will not operate correctly. Refer to the TracVision M5/M7 Installation Guide for complete system wiring information, or visit any KVH-authorized dealer or distributor for assistance. To find a KVH-authorized dealer near you, visit ***www.kvh.com/wheretogetservice***.

Loose RF Connectors

KVH recommends periodically checking the system's cable connections. A loose RF connector can reduce signal quality or prevent automatic satellite switching using the receiver's remote control. Refer to the TracVision M5/M7 Installation Guide for complete system wiring information, or visit any KVH-authorized dealer or distributor for assistance. To find a KVH-authorized dealer near you, visit *www.kvh.com/wheretogetservice*.

Type of Multiswitch Used

If your TracVision system's configuration requires a multiswitch, an active (powered) multiswitch must be used to ensure proper antenna performance. Refer to the M5 Wiring Diagrams in Appendix C on page 81 or the M7 Wiring Diagrams in Appendix D on page 85 for detailed information.

Cable Unwrap

If your vessel makes several consecutive circles in the same direction, the antenna will rotate 720° before reaching the end of its internal cable. If this occurs, the system will automatically unwrap the cable by quickly rotating the antenna dish in the opposite direction. During this time, your TV picture will freeze momentarily.

Technical Support

The TracVision M5/M7 antenna is a sophisticated electronic device. KVH-authorized technicians have the specialized tools and expertise necessary to diagnose and repair a system fault. Therefore, if you experience any operating problem or require technical assistance, please call or visit your local authorized TracVision dealer or distributor. To find a KVH-authorized dealer near you, visit ***www.kvh.com/wheretogetservice*.**

If you need help finding an authorized technician, please contact KVH Technical Support:

North American, South America, Australia, New Zealand:
Phone: +1 401 847-3327
E-mail: ***techs@kvh.com***

Europe, Middle East, Asia:
Phone: +45 45 160 180
E-mail: ***support@kvh.dk***

Please have your antenna serial number handy before you call (see "Displaying the Antenna Serial Number" on page 76 for more information).

Appendix A Advanced Settings and Functions

This appendix contains information on advanced settings and functions. This information should only be utilized by KVH-authorized technicians.

Contents

A

Manually Controlling the Antenna

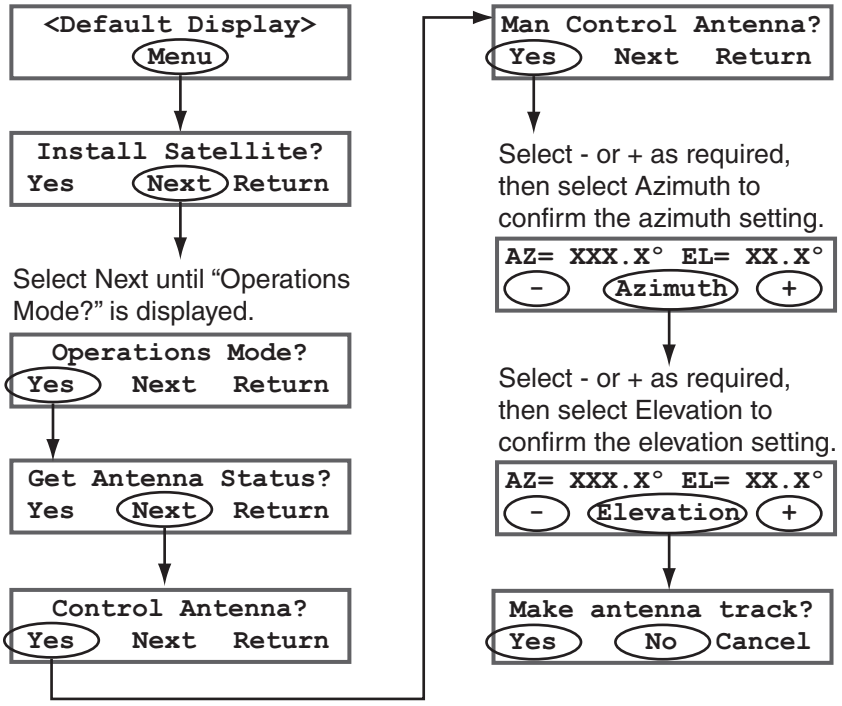
Use the flowchart in Figure A-1 if you wish to control the antenna manually.

NOTE: *If you are performing this procedure as part of the satellite frequency scan update procedure, be sure to select "NO" at the "Make Antenna Track?" screen.*

NOTE: *Azimuth is referenced to forward, not a true compass heading.*

TIP: *Once you have finished positioning the antenna, the system will revert to automatic control.*

Figure A-1 Manually Controlling the Antenna



Updating Satellite Frequency Data

If the antenna is unable to find a satellite, or if you are unable to receive certain channels, the satellite's frequency data might have changed. The satellite frequency scan feature allows you to update the frequency data of any satellite stored in the system's library.

With the desired satellite, band, and polarization selected, the system will automatically search for the frequency with the strongest signal. The system will then update that satellite's programmed data with the new frequency (and associated network ID) and store it in the satellite library.

You will need to enter the following information:

- Symbol rate
- FEC code

TIP: *You can find satellite information on the web at* ***www.lyngsat.com*** *or* ***www.satcodx.com*** *(neither website is affiliated with KVH).*

To update the satellite frequency data, follow the steps below.

IMPORTANT!

The vessel must remain stationary throughout this procedure.

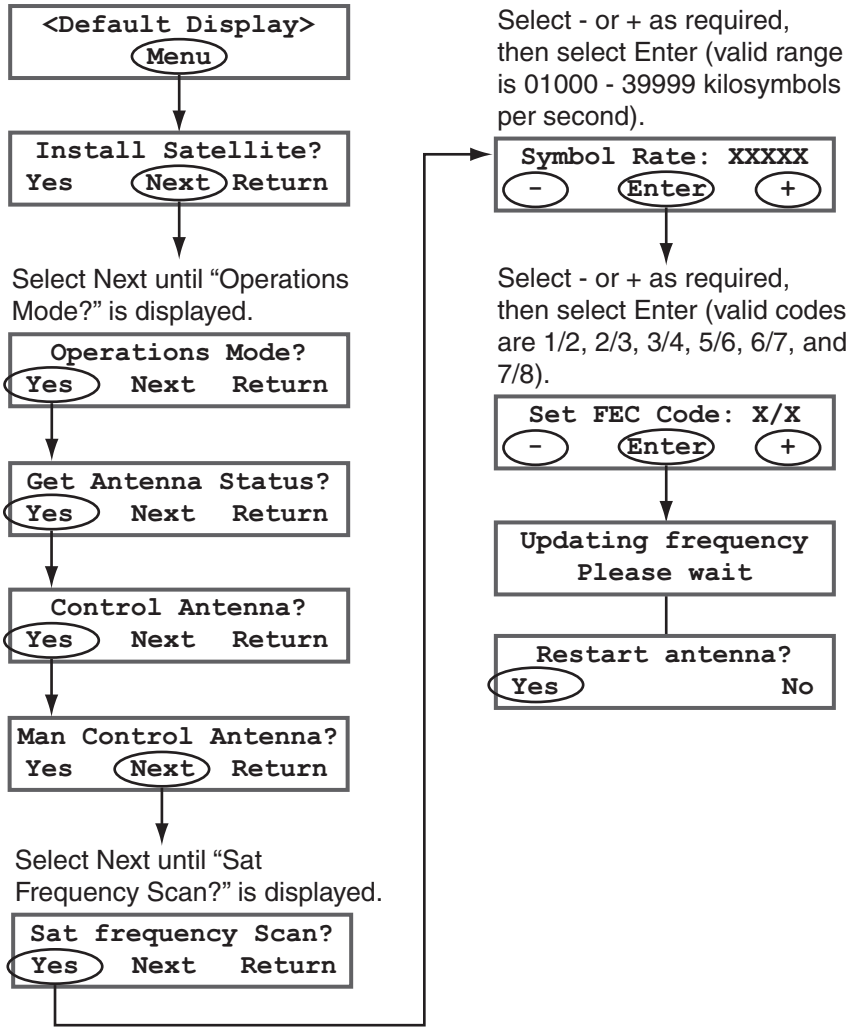
1. Track the satellite you wish to update by choosing a valid polarization/band.
2. Set your satellite receiver to signal meter mode. Refer to your selected receiver's user manual for details.
3. Ensure your TV signal meter indicates that you have a strong signal.
4. Using the receiver, select the desired polarization and band you wish to update. Refer to your selected receiver's user manual for details.

5. Use the flowchart in Figure A-2 to scan the frequency data of the selected satellites.

TIP: *If you know the satellite configuration data, you can configure the satellite without scanning frequency data (see "Configuring Satellite Settings" on page 74).*

TIP: *Scanning satellite frequencies might take up to 10 minutes.*

Figure A-2 Scanning Frequency Data

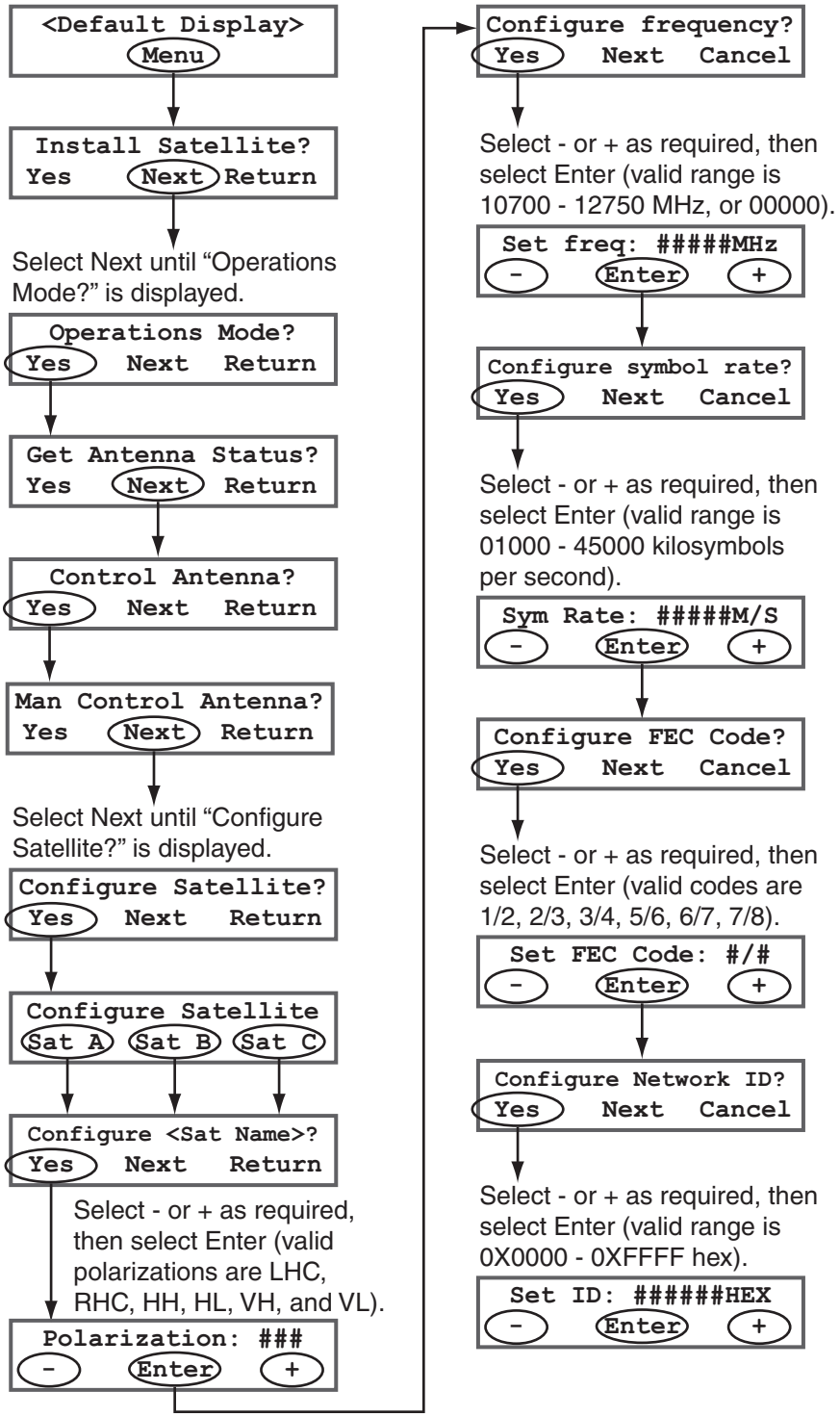


Configuring Satellite Settings

Use the flowchart in Figure A-3 to configure one of the satellites selected for tracking.

TIP: *Linear satellites use the following polarization/band combinations: vertical high, vertical low, horizontal high, and horizontal low. Circular satellites use the following polarization/band combinations: right and left.*

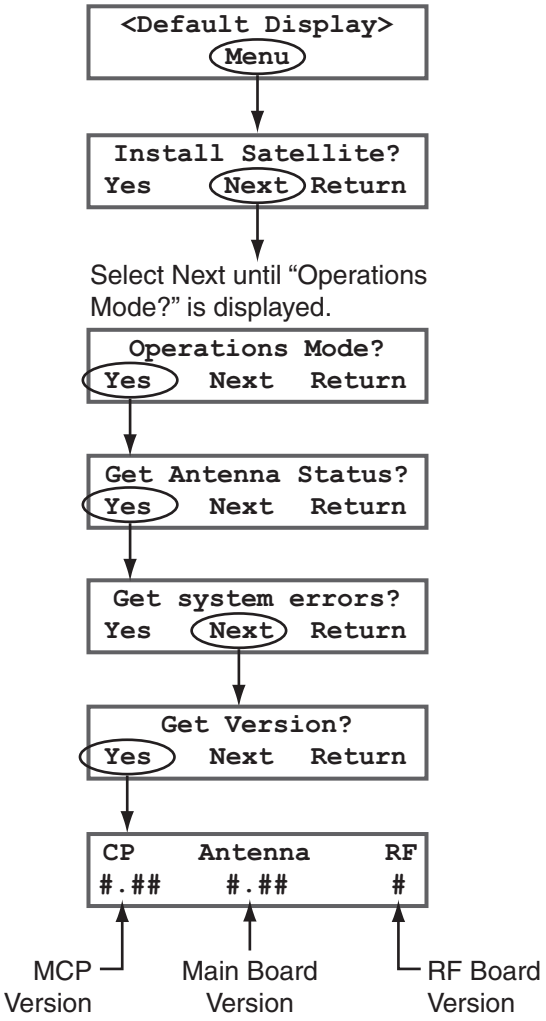
Figure A-3 Configuring Satellite Settings



Displaying Software Version Information

Use the flowchart in Figure A-4 if you wish to display software version information.

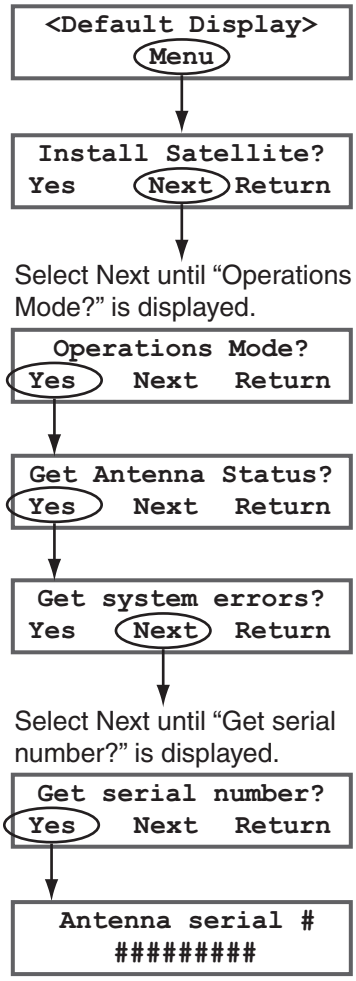
Figure A-4 Displaying Software Version Information



Displaying the Antenna Serial Number

Use the flowchart in Figure A-5 if you wish to view the antenna serial number.

Figure A-5 Displaying Antenna Serial Number



Appendix B
Position Grids

This appendix contains European and North American position grids for determining your approximate latitude and longitude.

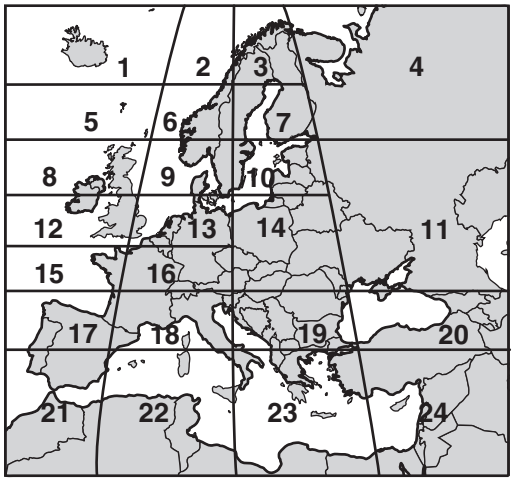
Contents

B

European Position Grid

If you wish to determine your approximate latitude and longitude, use the position grid and table in Figure B-1.

Figure B-1 Approximate Latitude and Longitude

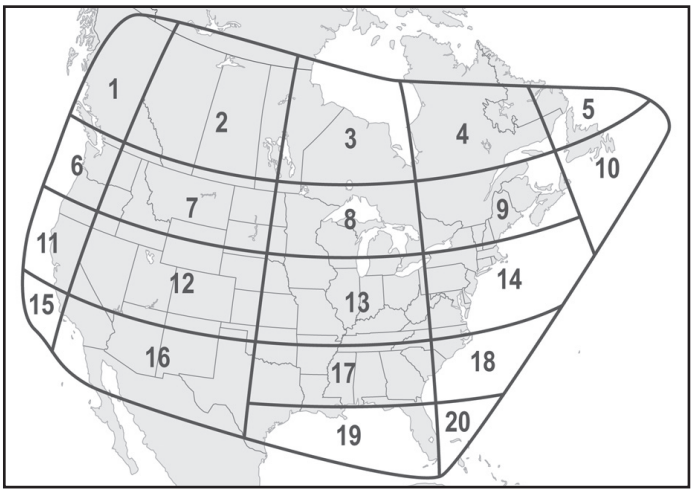


Grid #	Latitude	Longitude
1	67° N	7° W
2	67° N	7° E
3	67° N	22° E
4	65° N	45° E
5	63° N	7° W
6	63° N	7° E
7	63° N	22° E
8	57° N	7° W
9	57° N	7° E
10	57° N	22° E
11	55° N	40° E
12	53° N	7° W
13	53° N	7° E
14	50° N	22° E
15	47° N	7° W
16	47° N	7° E
17	43° N	7° W
18	43° N	7° E
19	43° N	22° E
20	43° N	37° E
21	36° N	7° W
22	36° N	7° E
23	36° N	22° E
24	36° N	37° E

North American Position Grid

If you wish to determine your approximate latitude and longitude, use the position grid and table in Figure B-2.

Figure B-2 Approximate Latitude and Longitude



Grid #	Latitude	Longitude
1	55° N	125° W
2	55° N	110° W
3	55° N	90° W
4	55° N	70° W
5	55° N	55° W
6	45° N	125° W
7	45° N	110° W
8	45° N	90° W
9	45° N	70° W
10	45° N	50° W
11	40° N	125° W
12	40° N	110° W
13	40° N	90° W
14	40° N	70° W
15	32° N	125° W
16	32° N	110° W
17	32° N	90° W
18	32° N	75° W
19	27° N	83° W
20	27° N	78° W

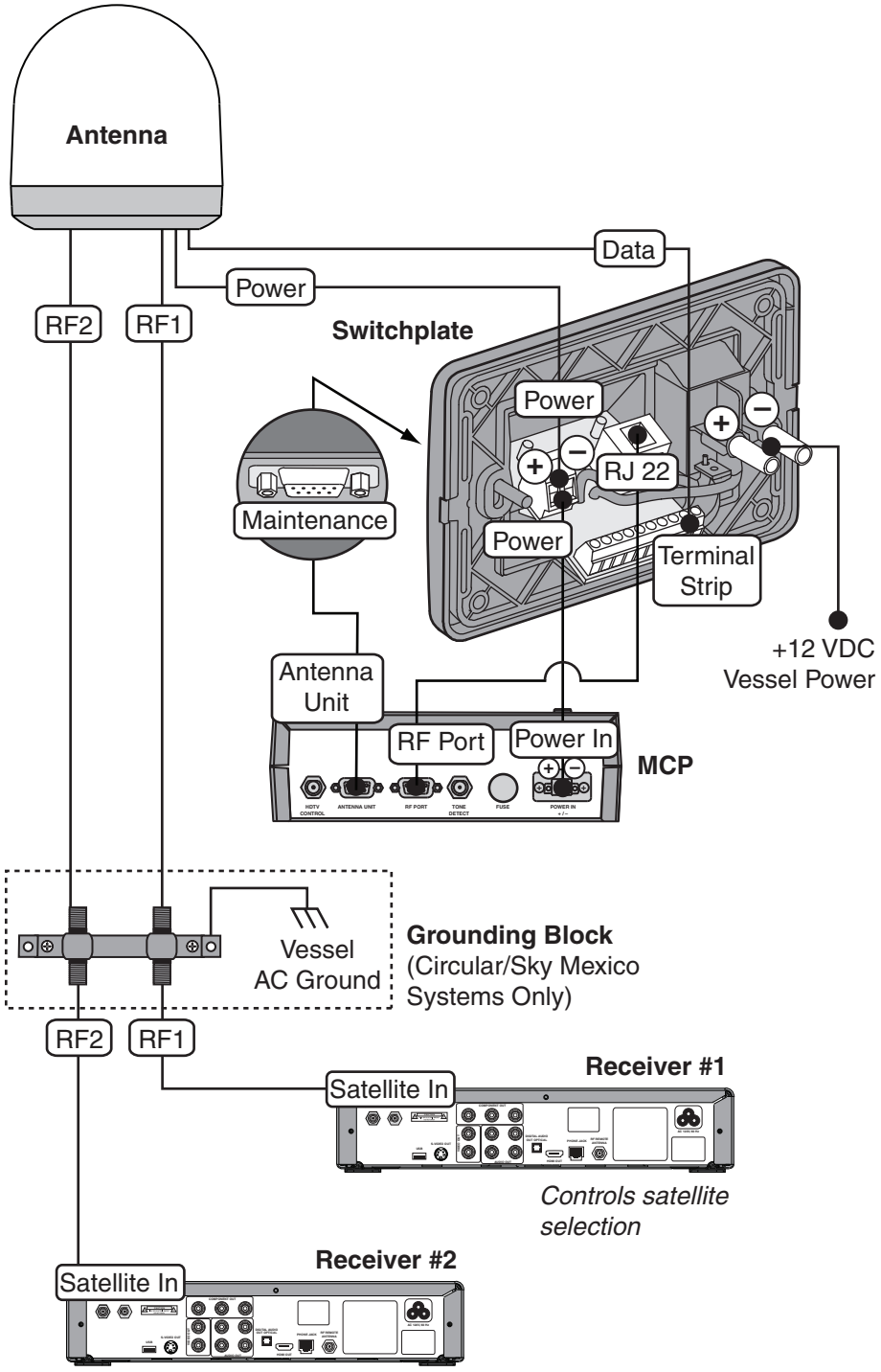
Appendix C TracVision M5 Wiring Diagrams

This appendix provides receiver wiring diagrams for basic TracVision M5 configurations. Wiring diagrams vary according to the number of receivers installed and the TracVision system configuration (circular/linear and dual/quad-output). For installation instructions, refer to the TracVision M5/M7 Installation Guide.

Contents

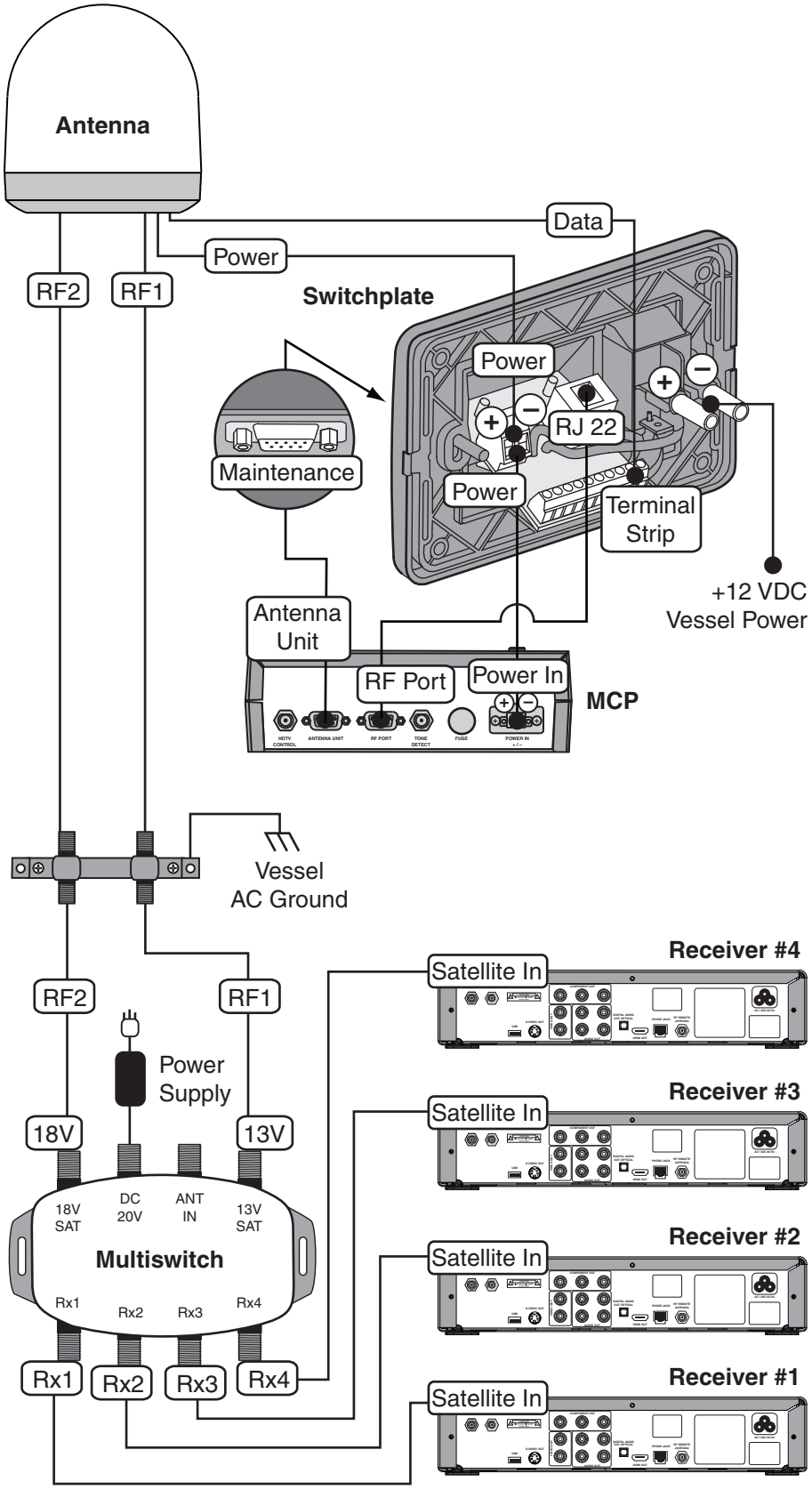
C

TracVision M5 Wiring Diagram for One or Two Receivers



Circular Versions Only

TracVision M5 Wiring Diagram for Three or Four Receivers (Circular Versions Only)*



**NOTE:* *Only the Eagle Aspen multiswitch (KVH Part #72-0310) is approved for this configuration.*

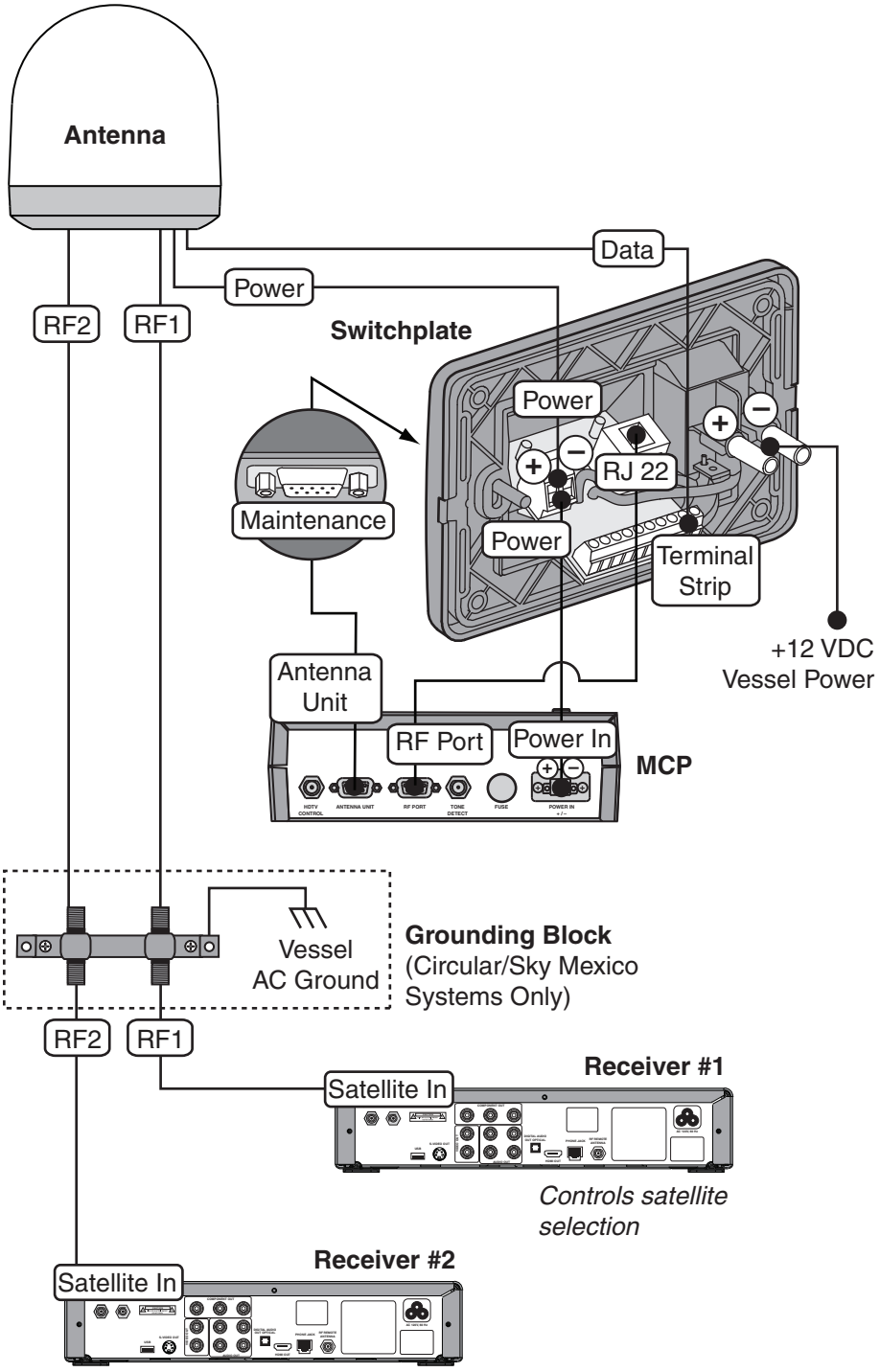
Appendix D TracVision M7 Wiring Diagrams

This appendix provides receiver wiring diagrams for basic TracVision M7 configurations. Wiring diagrams vary according to the number of receivers installed and the TracVision system configuration (circular/linear and dual/quad-output). For installation instructions, refer to the TracVision M5/M7 Installation Guide.

Contents

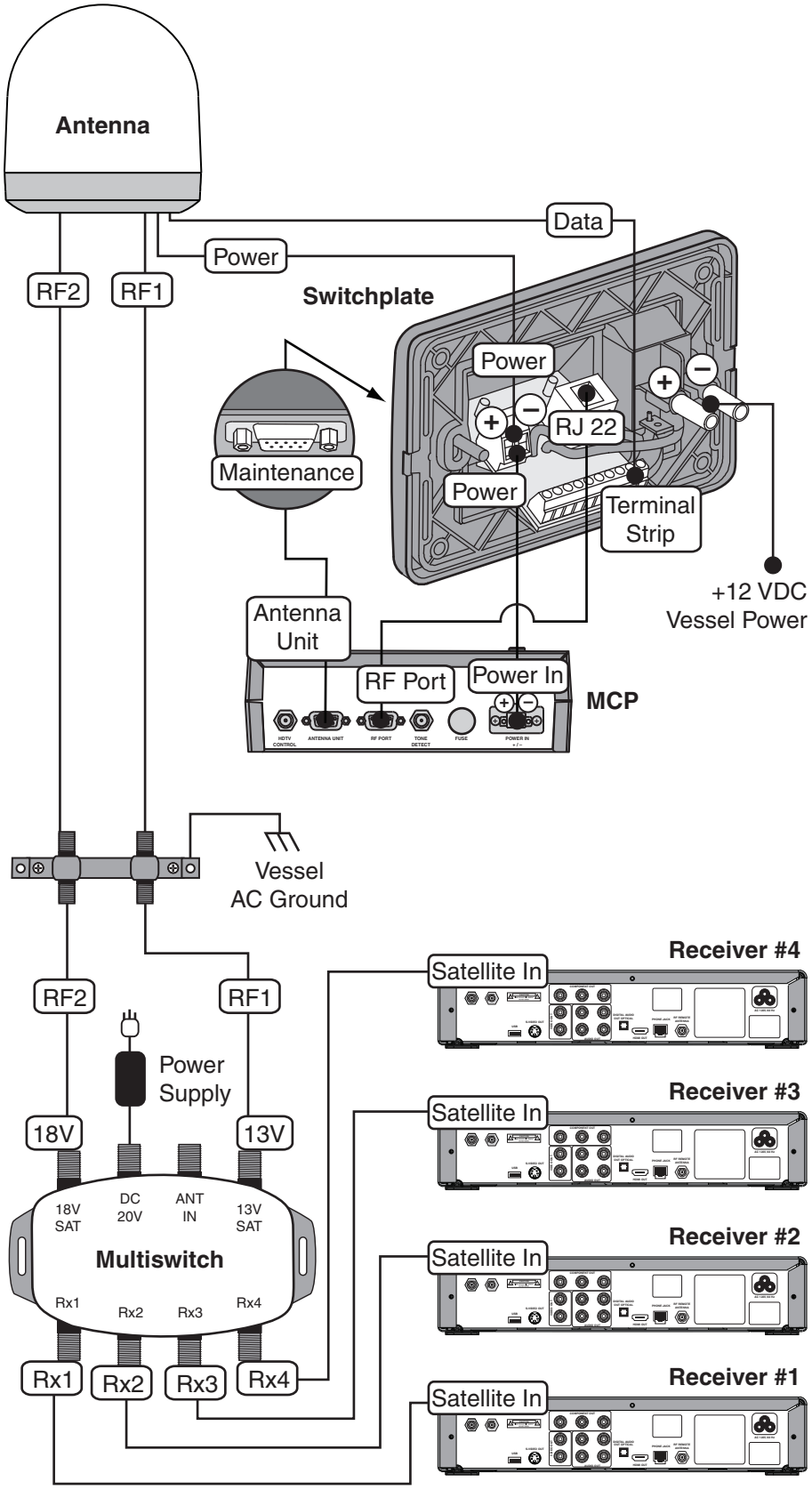
D

TracVision M7 Wiring Diagram for One or Two Receivers



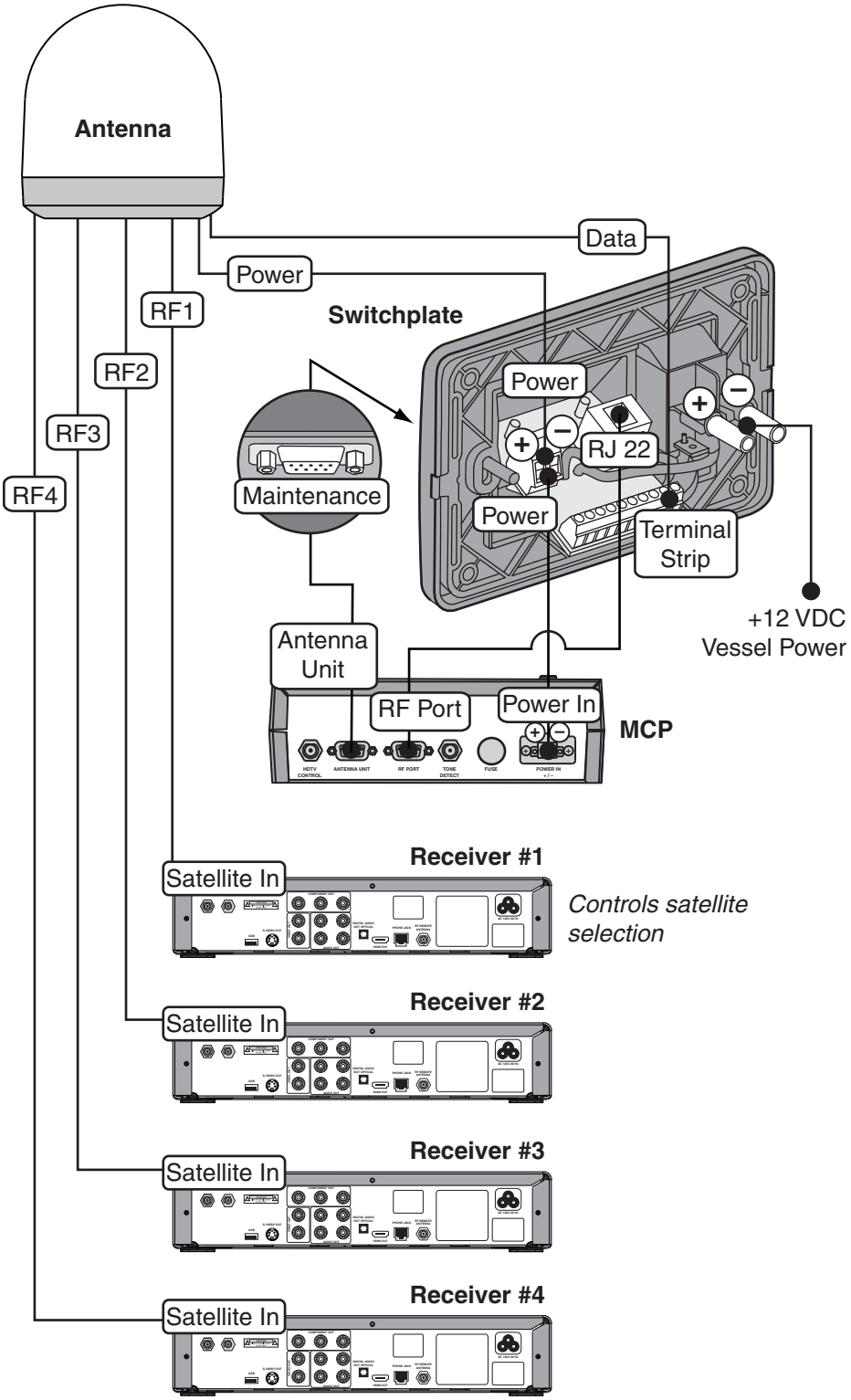
Circular Versions Only

TracVision M7 Wiring Diagram for Three or Four Receivers (Circular Versions Only)*



**NOTE:* *Only the Eagle Aspen multiswitch (KVH Part #72-0310) is approved for this configuration.*

TracVision M7 Wiring Diagram for Three or Four Receivers (Linear Quad-output Versions Only)



NOTE: *If you wish to connect more than four receivers, you will need to install an active (powered) multiswitch, such as Spaun model 5602NF. You can purchase this multiswitch from KVH (KVH Part #19-0413).*

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