

A Guide to TracVision® G8

owner's manual

- **Guide to Operation**
- **Guide to Technical Information**



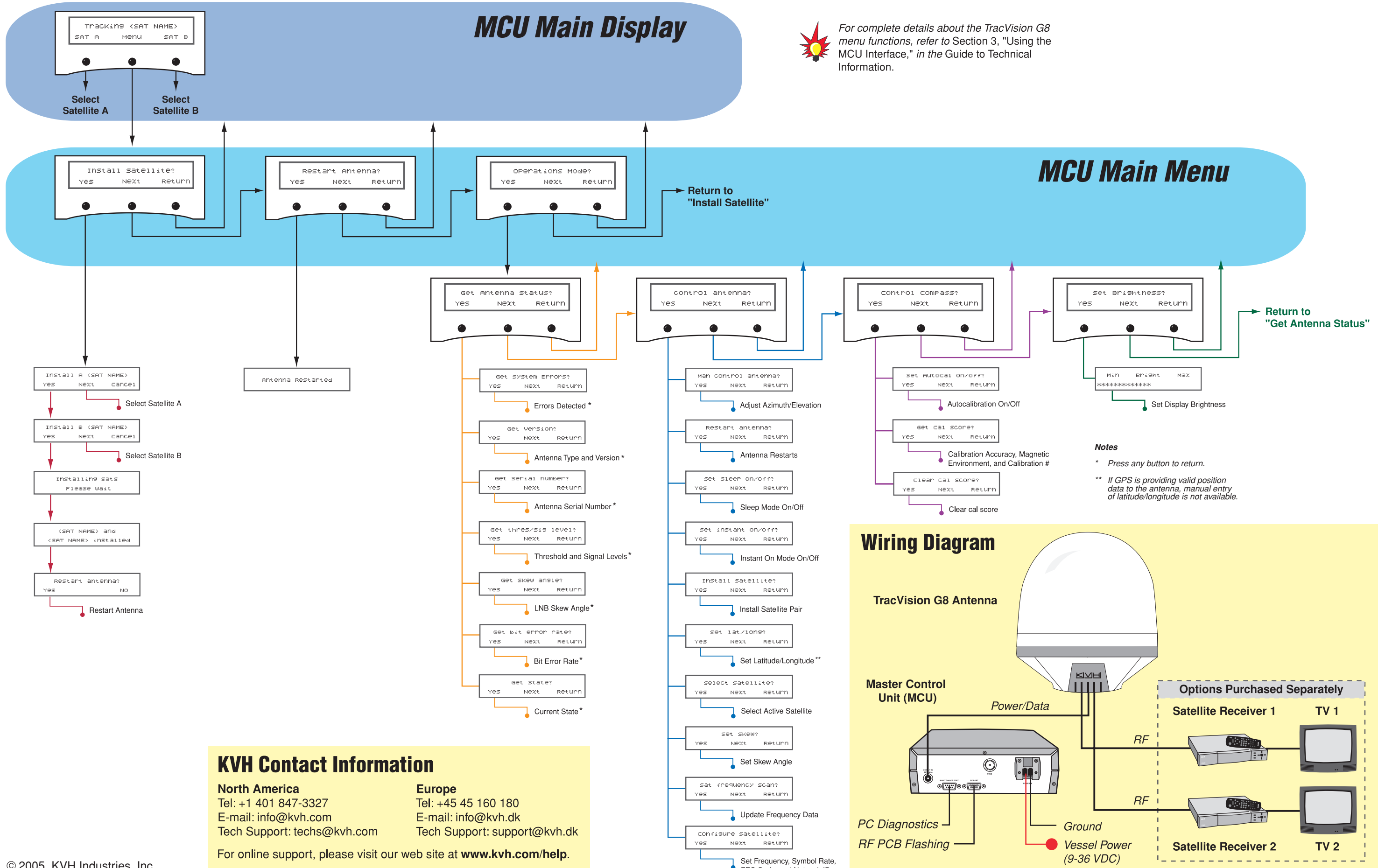
TracVision G8 Quick Reference Guide

MCU Main Display

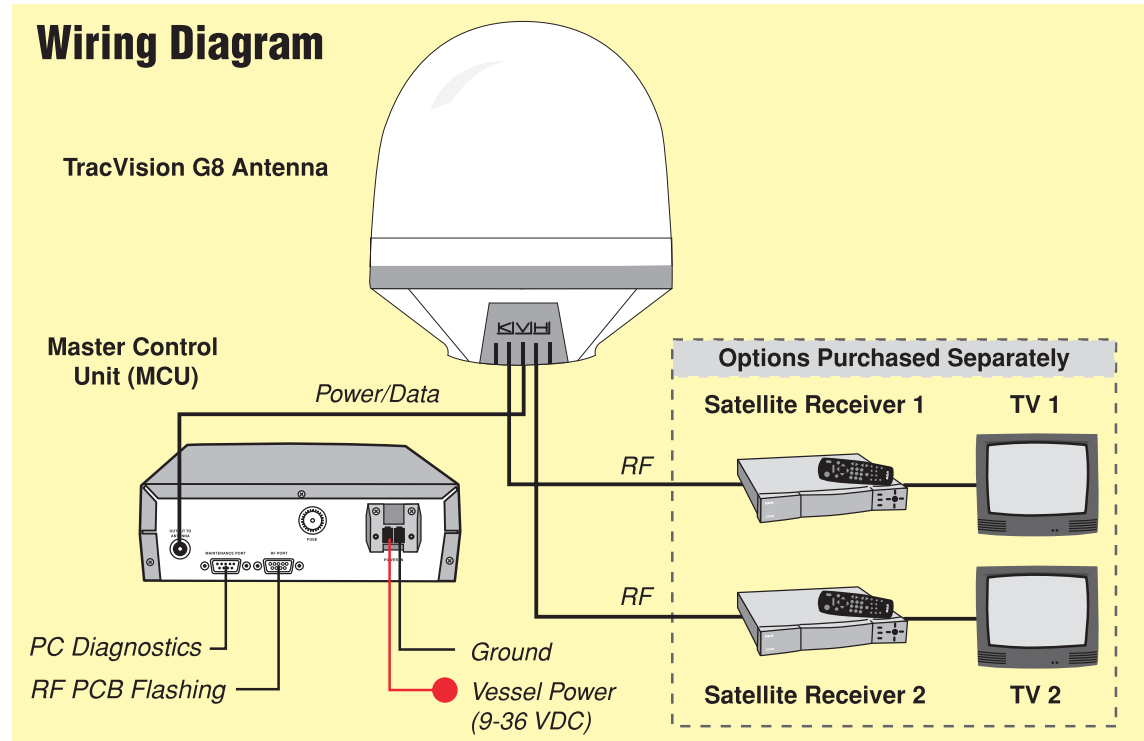


For complete details about the TracVision G8 menu functions, refer to Section 3, "Using the MCU Interface," in the Guide to Technical Information.

MCU Main Menu



Notes
 * Press any button to return.
 ** If GPS is providing valid position data to the antenna, manual entry of latitude/longitude is not available.



KVH Contact Information

North America Tel: +1 401 847-3327 E-mail: info@kvh.com Tech Support: techs@kvh.com	Europe Tel: +45 45 160 180 E-mail: info@kvh.dk Tech Support: support@kvh.dk
---	---

For online support, please visit our web site at www.kvh.com/help.

TracVision G8

Owner's Manual

This manual provides detailed instructions on the proper operation, installation, configuration, troubleshooting, and maintenance of the KVH TracVision G8 satellite TV system. For operation instructions, refer to the *Guide to Operation*. For installation, configuration, troubleshooting, and maintenance instructions, refer to the *Guide to Technical Information*.

Throughout this manual, important information is marked for your attention by these icons:



A helpful tip that either directs you to a related area within the manual or offers suggestions on getting the best performance from your system.



An alert to important information regarding procedures, product specifications, or product use.



Information about installation, maintenance, troubleshooting, or other mechanical issues.



An electrical safety warning to help identify electrical issues that can be a hazard to either this KVH product or a user.



TracVision G8 Serial Number



This serial number will be required for all troubleshooting or service calls made regarding this product.

Direct questions, comments, or suggestions to:

KVH Industries, Inc.
50 Enterprise Center
Middletown, RI 02842-5279 USA
Tel: +1 401 847-3327
Fax: +1 401 849-0045
E-mail: info@kvh.com
Internet: www.kvh.com

KVH Europe A/S
Kokkedal Industripark 2B
2980 Kokkedal, Denmark
Tel: +45 45 160 180
Fax: +45 45 160 181
E-mail: info@kvh.dk
Internet: www.kvh.com

Please e-mail your comments about this manual to manuals@kvh.com. Your feedback is greatly appreciated!



KVH Part # 54-0198 Rev. D

© 2005 KVH Industries, Inc., All rights reserved.



TracVision® and KVH® are trademarks of KVH Industries, Inc.

DVB® (Digital Video Broadcasting) is a registered trademark of the DVB Project.

DIRECTV® is a registered trademark of DIRECTV, Inc.

DISH Network™ is an official trademark of
EchoStar Communications Corporation.

ExpressVu is a property of Bell ExpressVu, a wholly owned
subsidiary of Bell Satellite Services.

Table of Contents

Guide to Operation	1
1 System Overview	3
2 Receiving Satellite Signals	5
3 Turning On the System	6
4 Changing Channels and Switching to the Second Satellite	6
5 Watching Television	8
6 Using the MCU Interface	9
Guide to Technical Information	11
1 Introduction	13
1.1 System Overview	15
1.2 System Components	17
1.3 Materials Provided with the TracVision G8	18
2 Installation	19
2.1 Planning the Installation	21
2.2 Mounting the TracVision Antenna	26
2.3 Connecting the Receiver(s)	31
2.4 Wiring the MCU	35
2.5 Mounting the MCU	38
2.6 Activating/Programming the Receiver	40
2.7 Installing Satellites Using the MCU	42
2.8 Checking Out the System	52
2.9 Changing Geographic Location	54
3 Using the MCU Interface	57
3.1 Startup and Self-test	59
3.2 Main Display and Accessing the Main Menu	60
3.3 Installing Satellites	62
3.4 Restarting the Antenna	64
3.5 Operations Mode	64

4	Troubleshooting	83
4.1	Troubleshooting Matrix	85
4.2	Causes and Remedies for Common Operational Issues	86
4.3	Receiver Troubleshooting	89
4.4	Antenna Gyro and LNB Faults	89
4.5	Computer Diagnostics	90
4.6	Maintenance Port Antenna Commands	91
5	Maintenance	93
5.1	Warranty/Service Information	95
5.2	Preventive Maintenance	95
5.3	TracVision G8 Field Replaceable Units	96
5.4	Accessing Antenna Components Through the Hatch	98
5.5	Replacing the PCB Module Fuse	98
5.6	Replacing the PCB Module	99
5.7	Replacing the RF PCB	101
5.8	Replacing the Internal Sensor	103
5.9	Replacing the Azimuth Gyro	104
5.10	Replacing the Elevation Gyro	106
5.11	Replacing the Azimuth Motor	107
5.12	Replacing the Azimuth Belt	109
5.13	Replacing the Elevation Motor	110
5.14	Replacing the Elevation Belt	112
5.15	Replacing the Skew Motor	113
5.16	Replacing the Skew Belt	116
5.17	Replacing the LNB	117
5.18	Replacing the LNB/Feed Tube Assembly	118
5.19	Preparing for Shipment	120

Appendices121

 A System Specifications123

 B MCU Flush Mount Panel Template125

 C Startup Data Sequence127

 D Maintenance Port Antenna Commands129

Index

Guide to Operation

This guide explains everything you need to know to operate your TracVision G8 system. For detailed installation, configuration, troubleshooting, and maintenance information, please refer to the *Guide to Technical Information* beginning on page 11.

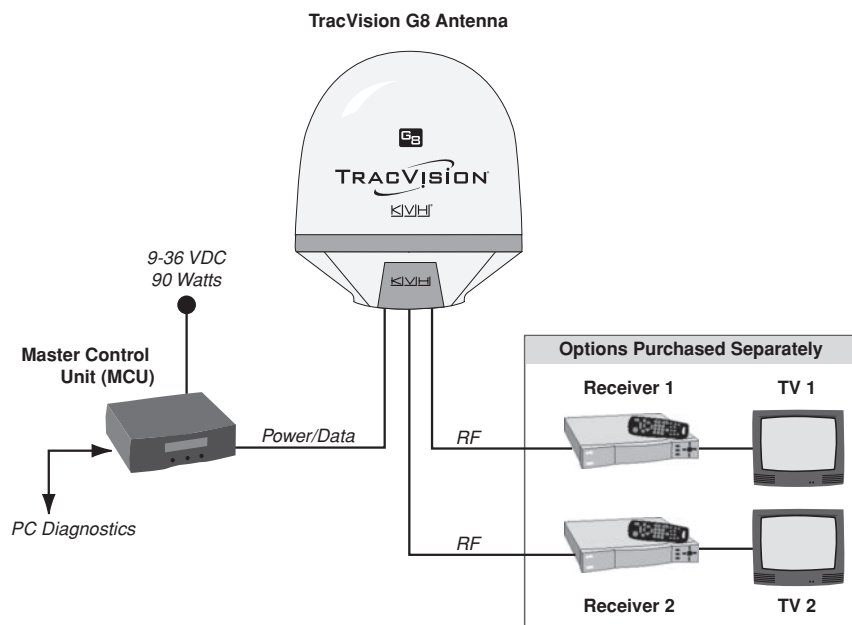
Contents

1	System Overview	3
2	Receiving Satellite Signals	5
3	Turning On the System	6
4	Changing Channels and Switching to the Second Satellite	6
5	Watching Television	8
6	Using the MCU Interface	9

1 System Overview

A complete satellite TV system, illustrated in Figure 1, includes the TracVision G8 antenna unit connected to the Master Control Unit (MCU), a satellite TV receiver (integrated receiver/decoder, or IRD), and a television set.

Figure 1 TracVision G8 System Diagram



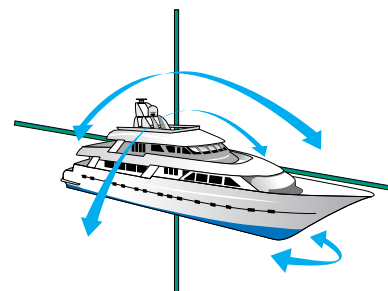
TracVision G8 systems equipped with linear quad LNBs (used in Mexico and Europe) can be connected to four receivers using four RF cables.

Satellite Compatibility

The TracVision G8 is fully compatible with Digital Video Broadcasting (DVB®) satellites, as well as DIRECTV®'s Digital Satellite Service (DSS) satellites.

In-motion Tracking

The TracVision G8 uses a state-of-the-art actively stabilized antenna system. The antenna's built-in global positioning system (GPS) allows the system to calculate the precise direction to the satellite from your vessel's current location, ensuring the shortest possible satellite acquisition time. Once the satellite is acquired, the antenna gyros continuously measure the motion of your vessel and send commands to the antenna motors to keep the antenna pointed at the satellite at all times.



Satellite Library

Your TracVision G8 includes a pre-programmed library of TV satellites from around the world. If the satellite service you wish to receive is not already in the satellite library, an authorized technician can add two additional satellites of your choice to the library.

System Components

Your TracVision G8 system includes the following components:



Antenna Unit

The antenna unit houses the antenna positioning mechanism, low noise block converter (LNB), GPS, and three-axis sensor within a molded ABS radome. Systems equipped with a linear quad LNB (*used in Europe, Australia, and Mexico*) include a skew control mechanism that automatically adjusts the LNB's skew to account for regional changes and different satellite services. Power, signal, and control cabling from belowdecks units are connected to the antenna at the rear of the baseplate.



Master Control Unit (MCU)

The MCU is the user interface, providing access to the system and its functions through an LCD and three buttons. The MCU also serves as the system's junction box, allowing the system to use ship's power and supply and receive data to/from the TracVision G8. The MCU can accept any power input between 9 and 36 volts DC; its power supply provides power to the antenna and galvanically isolates the TracVision G8 system.

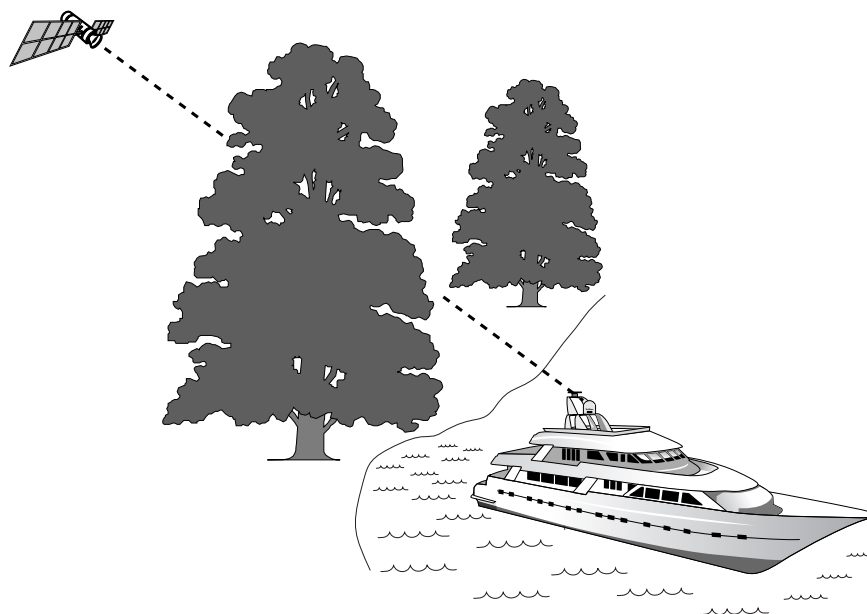
Satellite TV Receiver (IRD) – Sold Separately

The receiver (purchased separately) receives satellite signals from the antenna unit for signal processing and channel selection, and sends the signals to the TV set for viewing. Please refer to the user's manual provided with your selected receiver for complete operating instructions.

2 Receiving Satellite Signals

For TracVision G8 to receive satellite TV signals, the antenna must have a clear line of sight to the satellite. If you only receive intermittent signals or the antenna cannot find the satellite, check around your vessel for any objects that could be blocking the signal, such as other vessels, trees, buildings, other onboard equipment, etc.

Figure 2 Satellite Blockage



You must also be located within the selected satellite's coverage area in order to receive its signal. Refer to your satellite television service manual to check the viable coverage area. *For your convenience, KVH provides links to several web sites that offer satellite coverage information. Simply go to our web site at: www.kvh.com/footprint.*

3 Turning On the System

To use the TracVision G8 system, follow the steps below. *To minimize the time it takes the antenna to acquire the satellite, do not change the channel during this process.*

1. Turn on the receiver and the television. (Refer to your receiver user's manual for complete operating instructions for the receiver.)
2. Apply power to the TracVision G8 antenna.
3. Minimize turning the vessel for two minutes after turning on the antenna to allow the antenna gyros to initialize properly.



The satellite configuration on your receiver must match the satellite setting on the TracVision G8 system.

*Satellite A on the TracVision G8 must be the same satellite as receiver Alternative 1 (or A, based on your receiver) and must be assigned the receiver DiSEqC 1 setting.**

*Satellite B on the TracVision G8 must be the same satellite as receiver Alternative 2 (or B, based on your receiver) and must be assigned the receiver DiSEqC 2 setting.**

Refer to your receiver user manual for complete instructions for your receiver.

**DiSEqC settings only apply to European systems and DIRECTV DSS Plus™ receivers.*

4 Changing Channels and Switching to the Second Satellite

TracVision G8 can have a pair of satellites installed, either one of which can be the active satellite selection. There are several methods of selecting whether your TracVision G8 will track Satellite A or Satellite B based upon your location, type of install, receiver, and selected satellite service.

Europe and Australia

If you are not using a multiswitch, switching from one satellite to the other is as easy as changing the channel using the receiver's remote control. TracVision G8 will automatically switch between the two satellites as necessary to receive your selected channel. If you are using a multiswitch, however, you will need to use the MCU switching option described in "Switching Satellites Using the MCU" on page 7.

North America

DIRECTV Subscribers

DIRECTV subscribers in certain regions of the United States will require a DSS Plus™ receiver to receive broadcasts from multiple satellites. If connected to the antenna's RF1 connector, the DSS Plus receiver allows you to switch channels using the receiver's remote control. If you are a DIRECTV subscriber, but do not have a DSS Plus receiver, or you are using a multiswitch, use the MCU switching option described in "Switching Satellites Using the MCU" on page 7.

DISH Network™ (EchoStar) and ExpressVu Satellite Subscribers

DISH Network and ExpressVu subscribers will need to use the MCU switching option, as described in “Switching Satellites Using the MCU.”

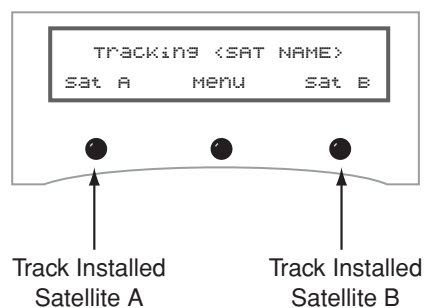
Latin America

In Latin America, including Mexico, satellite switching is unnecessary because programming is broadcast from a single satellite.

Switching Satellites Using the MCU

If you're unable to switch between satellites using the receiver's remote control, use the MCU front panel buttons to select between Satellite A and Satellite B. Press the left button to select Satellite A and the right button to select Satellite B.

Figure 3 Switching Satellites Using the MCU



Europe only:

Using the MCU to switch between satellites disables the system's DiSEqC monitoring. You will not be able to use the receiver/remote to switch between satellites unless the system is restarted.

5 Watching Television

TracVision G8 will receive satellite TV signals whether your vessel is in motion or at rest.

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 it does so, the system automatically unwraps the cable by quickly rotating the dish in the opposite direction. During this time, your TV picture will freeze momentarily.

Fine-Tuning

You might hear slight mechanical sounds from the antenna, as the antenna moves continually in a circular motion to sweep across the satellite's peak signal. The signal strength is then fed back to the control circuits to keep pointed in the direction of the strongest signal.

Sleep Mode

When the vessel has come to a stop and holds its position for one minute (e.g., at a dock), the antenna 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 RF level changes significantly, Sleep Mode automatically turns off and the system begins tracking the satellite again (or enters Search mode to find the satellite).

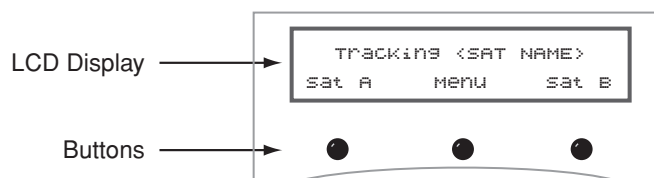


If you prefer, you may disable the Sleep Mode function. Refer to "Turning Sleep Mode On/Off" on page 69 for details.

6 Using the MCU Interface

All TracVision G8 operations are controlled and monitored using the MCU. An LCD display shows configuration data and three buttons enable you to perform menu-driven tasks.

Figure 4 MCU Front Panel



During the TracVision G8 installation process, the satellite selections should have been configured to your specifications as detailed in the *Guide to Technical Information*. Once the system is installed and functioning properly, the system will function automatically.

However, there may be instances in which you need to access certain settings or diagnostic tools via the MCU interface. To assist you, KVH has provided the following information resources:

Quick Reference Guide:

The quick reference guide on the inside front cover of this manual illustrates the main display and the overall menu structure, allowing you to easily and quickly navigate among the MCU menus.

Section 3 in the *Guide to Technical Information*:

Section 3, "Using the MCU Interface," on page 57 of the *Guide to Technical Information* provides a detailed explanation of every menu option and system configuration setting. These menus should, for the most part, be accessed by authorized technicians. The following are the most commonly used menu functions:

Menu Function	Purpose	See Page:
Install Satellite	Install a satellite to track	62
Set Sleep On/Off	Turn Sleep Mode on or off	69
Set Brightness	Adjust the MCU display's brightness	81

Guide to Technical Information

This guide explains how to install, troubleshoot, and maintain the TracVision G8 system. For complete operating instructions, please refer to the *Guide to Operation* at the front of this manual.

Contents

1	Introduction	13
2	Installation	19
3	Using the MCU Interface	57
4	Troubleshooting	83
5	Maintenance	93
	Appendices	121

1 – Introduction

This section provides a basic overview of the TracVision G8 system. It explains how the system works and describes the function of each component.

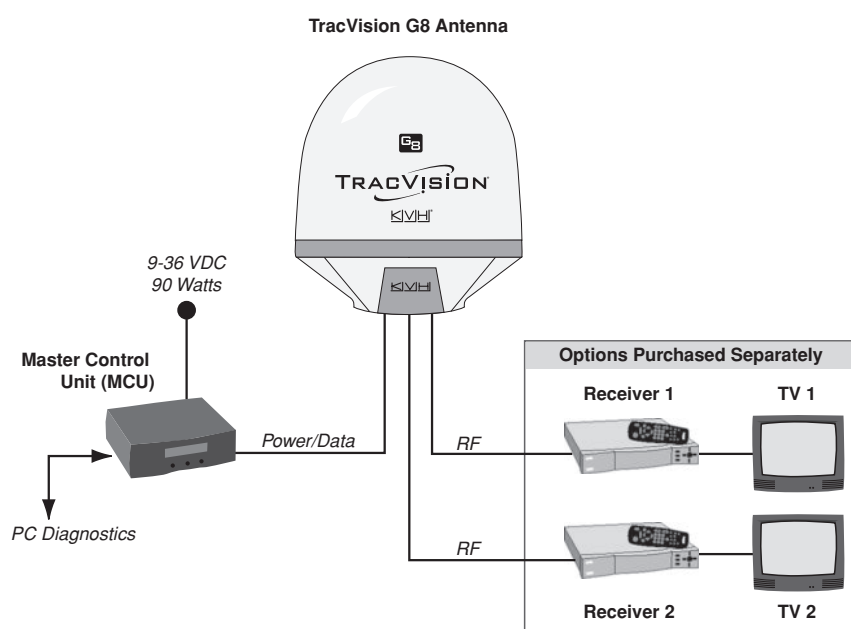
Contents

1.1	System Overview	15
1.2	System Components	17
1.3	Materials Provided with the TracVision G8	18

1.1 System Overview

A complete satellite TV system, illustrated in Figure 1-1, includes the TracVision G8 antenna unit connected to the Master Control Unit (MCU), a satellite TV receiver (integrated receiver/decoder, or IRD), and a television set. While all basic programming and first-level diagnostic functions are available through the MCU, a laptop computer can be used to conduct advanced diagnostics. *System specifications are provided in Appendix A on page 123.*

Figure 1-1 TracVision G8 System Diagram



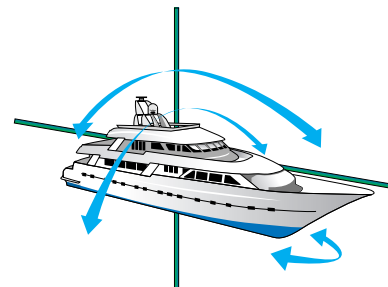
TracVision G8 systems equipped with linear quad LNBs (used in Mexico and Europe) can be connected to four receivers using four RF cables.

Satellite Compatibility

The TracVision G8 satellite antenna is fully compatible with Digital Video Broadcasting (DVB) satellites, as well as DIRECTV's Digital Satellite Service (DSS) satellites.

In-motion Tracking

The TracVision G8 uses a state-of-the-art actively stabilized antenna system. The antenna's built-in global positioning system (GPS) allows the system to calculate the precise azimuth and elevation to the satellite from your vessel's current location, ensuring the shortest possible satellite acquisition time. Once the satellite is acquired, the antenna gyros continuously measure the heading, pitch, and roll of your vessel and send commands to the antenna motors to keep the antenna pointed at the satellite at all times.





TracVision G8's default satellite pairs are:

N. America (US DIRECTV):
DSS_101 & DSS_119

Europe:
ASTRA1 & HOTBIRDWB

Mexico (Sky Mexico):
PAS_9 & NONE

L. America (DIRECTV LA):
GALAXY3CN & NONE

Satellite Library

Your TracVision G8 includes a pre-programmed library of TV satellites from around the world. When configuring the TracVision G8, you may choose a pair of satellites from the library to be active in the system and with your receiver. *If the satellite service you wish to receive is not listed in the satellite library, you may add two additional satellites of your choice to the library.*

North America

Any two of the North American satellites listed below can be paired together, as long as the satellites are within range of the antenna (*standard circular dual LNB required*):

- DSS_72
- DSS_101
- DSS_110
- DSS_119
- Echo_61
- Echo_110
- Echo_119
- Echo_148
- Expressvu
- ExpressTV

Europe

Any two of the European satellites listed below can be paired together, as long as the satellites are within range of the antenna (*linear quad LNB/feed tube assembly required*):

- Astra1
- Astra2N
- Astra2S
- Hispasat
- HotbirdWB
- Hotbird
- Sirius
- Thor
- Arabsat
- Nilesat
- Turksat
- Eutel_W3A

Mexico

In Mexico, select the satellite listed below for Sky Mexico service (*linear quad LNB/feed tube assembly required*).

- PAS_9

Latin America

In Latin America, choose one of the satellites listed below for DIRECTV Latin America (DLA) service (*DLA circular dual LNB required*).

- Galaxy3CN
- Galaxy3CS

Australia

In Australia, you can pair together the two satellites listed below (*Linear quad LNB/feed tube assembly required*).

- Optus_B1
- Optus_B3

1.2 System Components

Your TracVision G8 system includes the following components:

Antenna Unit

The antenna unit houses the antenna positioning mechanism, low noise block converter (LNB), GPS, and three-axis sensor within a molded ABS radome. Systems equipped with the linear quad LNB include a skew control mechanism that automatically adjusts the LNB's skew to account for regional changes and different satellite services. Power, signal, and control cabling from belowdecks units are connected to the antenna at the rear of the baseplate.



Master Control Unit (MCU)

The MCU is the user interface, providing access to the system and its functions through an LCD and three buttons. The MCU also serves as the system's junction box, allowing the system to use ship's power, and supply and receive data to/from the TracVision G8. The MCU can accept any power input between 9 and 36 volts DC; its power supply provides power to the antenna and galvanically isolates the TracVision G8 system.



Satellite TV Receiver (IRD) – Sold Separately

The receiver (purchased separately) receives satellite signals from the antenna unit for signal processing and channel selection, and sends the signals to the TV set for viewing. Please refer to the user's manual provided with your selected receiver for complete operating instructions.



Before you can start watching satellite TV using your TracVision antenna, you will need to activate your receiver. Refer to Section 2.6, "Activating/Programming the Receiver," on page 40 for details.

1.3 Materials Provided with the TracVision G8

Table 1-2 lists the components and materials in the TracVision G8 shipping carton.

Table 1-2 *TracVision G8 Packing List*

Component	KVH Part No.
Antenna unit	02-1262-01 [†] 02-1262-03 ^{††} 02-1262-04 ^{†††} 02-1262-05 ^{††††}
Master control unit (MCU)	02-1265
Installation kitpack	72-0127
Data/power cable, 100 ft. (30 m)	32-0744-0100
<i>TracVision G8 Owner's Manual</i>	54-0198

[†] Standard circular dual LNB (configured for North America)

^{††} DLA circular dual LNB (configured for DIRECTV Latin America)

^{†††} Linear quad LNB (configured for Europe)

^{††††} Linear quad LNB (configured for Sky Mexico)



For a list of items supplied in the kitpack, see Table 2-3 on page 22.

2 — Installation

This section explains how to install, configure, and test the TracVision G8 system. Follow the simple procedures in this section sequentially to ensure a safe and effective installation.

Contents

2.1	Planning the Installation	21
2.2	Mounting the TracVision Antenna	26
2.3	Connecting the Receiver(s)	31
2.4	Wiring the MCU	35
2.5	Mounting the MCU	38
2.6	Activating/Programming the Receiver	40
2.7	Installing Satellites Using the MCU	42
2.8	Checking Out the System	52
2.9	Changing Geographic Location	54

2.1 Planning the Installation

Who Should Install the TracVision G8?

KVH recommends that a KVH-authorized technician install the TracVision G8 system. Installers should have experience installing electronic equipment on a vessel.

Materials and Equipment Required for Installation

Before you begin installing the TracVision G8 system, you need to verify that you have all of the following tools and materials:

- Electric drill and ½" (13 mm) drill bit
- 17 mm socket wrench and ⅝" open-end wrench
- Flat head and Phillips screwdrivers
- Light hammer; center punch; tape; scribe/pencil
- Wire strippers
- A PC with KVH Flash Update Wizard or Windows HyperTerminal installed
- Quick-tripping circuit breaker or fuse rated for 15 amps
- RG-11 or RG-6 cable(s) with F-type connectors (*refer to Table 2-1 to determine the number of RF cables needed*)

Table 2-1 Number of RF Cables to Connect to the Antenna

Connecting to:	# RF Cables
System with Circular Dual LNB	
One receiver	1
Two receivers	2
Two or more receivers	2*
System with Linear Quad LNB	
One receiver	1
Two receivers	2
Three receivers	3
Four receivers	4
More than four receivers	4*

* Multiswitch required. Follow manufacturer's guidelines.



Plan the entire installation before proceeding! Take into account antenna unit placement, cable running distances between units, and accessibility to the equipment after installation.

If you are prewiring the system, be sure to route the N-type connector end of the data/power cable to the antenna location and the F-type connector end to the belowdecks MCU (see Figure 2-7 on page 28).



RG-11 or RG-6 cable with F-type connectors is required for all RF wiring. Use of any other cable will result in degraded performance. Use RG-6 cable for distances up to 75 ft (23 m); use RG-11 cable for distances greater than 75 ft (23 m). The KVH warranty does not cover degraded performance due to improper wiring.



You may want to connect four RF cables to the antenna in all cases. That way, if a receiver is added (or the system is converted from North American to European use) in the future, no additional RF cables will need to be run.

- Power cable to connect the MCU to ship's power (Table 2-2 provides proper gauge and length specifications for a 12V supply. The system will not work if the MCU receives less than 9V).

Table 2-2 Recommended Power Cable Specifications

Cable Length	Cable Gauge
to 40 ft (12 m)	12 AWG (1.5 mm ²)
up to 70 ft (21 m)	10 AWG (2.5 mm ²)

Kitpack Contents

The kitpack packaged with your system contains hardware and other materials that will be needed to complete the installation. Ensure that the kitpack contains all of the items listed below.

Table 2-3 Kitpack Contents

Part	Part #	Qty.
M10 x 1.5 x 50 mm hex head bolts	14-0342-50	4
M10 flat washers	14-0344-10	4
M10 lock washers	14-0343-10	4
M4 x 0.7 x 8 mm pan-head Phillips screws	14-0075-08	6
Plastic screw covers	19-0088	8
Rear logo plate	20-0885-02	1
Power connector plug	23-0497-02	1
Receiver ground cable	32-0583-50	1
PC cable (<i>for diagnostics</i>)	32-0628-06	1
PC cable gender changer	23-0517-09	1
Flush mount MCU bracket	20-0667	1
Velcro self-adhesive backings	19-0146	4
Velcro washers	19-0147	4
#4-24 thread-forming screws	14-0150-06	4
Tie-wraps	22-0006	5
#8 type A screws	14-0047-08	4
#8 lock washers	14-0038	4
#6-32 x 1/2" pan head screws	14-0029-08	2

Table 2-3 Kitpack Contents (continued)

Part	Part #	Qty.
#6 flat washers	14-0024	2
Small Ferrite Coil	29-0088	1
Large Ferrite Coil	29-0090	1
F-type connector	23-0213	1

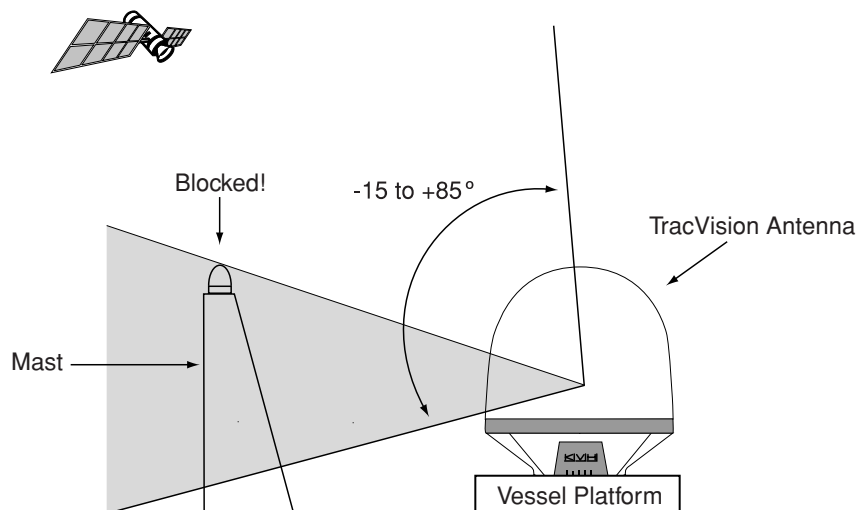
Choosing Component Locations

When choosing component locations, first keep in mind accessibility and cable lengths between units. For example, since the data/power cable is 100 ft (30 m) long, the MCU must be located within 100 ft (30 m) of the antenna. The major considerations in locating system components are noted below.

Choosing the Best Location for the TracVision Antenna

There are several factors to consider when choosing the location for the TracVision antenna.

- Since the TracVision antenna requires a clear view of the sky to receive satellite signals, the ideal antenna site has an unobstructed view of the horizon/satellite all around. The less blockage, the better the system performs.
- Keep the antenna clear of any obstructions above decks. The antenna requires a -15° to $+85^{\circ}$ look angle to receive satellite signals.

Figure 2-1 Antenna Blockage

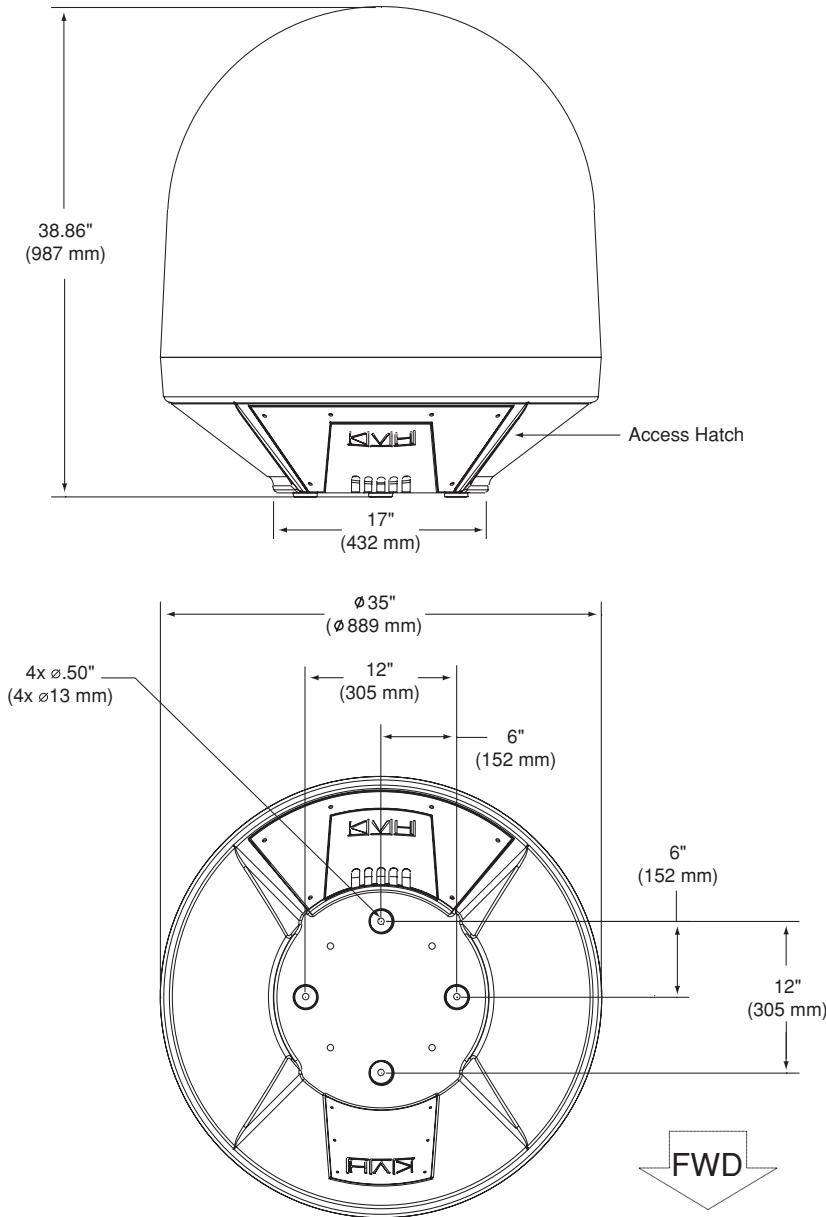
- To minimize tracking errors, place the antenna unit as close as possible to the intersection of the vessel's fore-and-aft centerline and midships. In addition, do not mount the antenna too high off the water (*limit height above the waterline to less than half the vessel length*).
- The mounting surface should be flat and strong enough to carry the complete assembly (85 lbs/ 38.6 kg). To prevent warpage to the antenna baseplate, make sure that the mounting surface is rigid so that it cannot flex when the vessel vibrates. If necessary, add a strength member to the mounting site to stiffen it.
- Be sure to account for the height and base dimensions (see Figure 2-2 on the following page). Also be sure to leave enough space outside the access hatch to allow a technician to remove the hatch screws and perform maintenance through the hatch.
- Maintain at least four feet (1.3 m) separation between the antenna and any magnetized materials, large ferrous masses, cranes, engines, derricks, other antennas, cables carrying high amperage direct current, or battery banks. Take extra care when mounting the antenna on a steel vessel; use an aluminum, brass, plastic, or wood (NOT steel or iron) platform to position the antenna at least four feet (1.2 m) above and six feet (1.8 m) away from the steel surface.
- Be alert for devices that change their magnetic characteristics when in use, such as CRTs (computer and TV screens), radar magnetrons, electric winches, loudspeakers, windshield wipers, and other devices with DC motors. The antenna's internal sensor cannot compensate for changing magnetic fields created by these devices.

Radar Concerns

The TracVision antenna must be kept out of line with nearby radars, as their energy levels (from both the main beam and its side lobes) may overload the antenna's front-end circuits. In an ideal installation, the antenna is mounted four feet (1.2 m) above and four feet (1.2 m) away from the radar (measured from the center of the antenna dome to the center of the radar).

The best placement for the TracVision antenna is above the radar. However, if there will be a significant horizontal separation between the radar and TracVision dome (i.e., at least 8 to 10 feet (2.4 to 3 meters)), the TracVision antenna can be placed below the radar as there will be little chance of signal blockage.

Figure 2-2 Antenna Unit Dimensions



The radome exterior is treated with a special finish selected for compatibility with the dome material and transparency to the satellite signals. Application of additional paints or finishes WILL degrade performance, potentially beyond acceptable limits.



A full-size template of the baseplate mounting holes has been provided at the back of this manual.



Four small holes have been drilled into the bottom of the baseplate to ensure that any moisture that enters the antenna unit is able to drain. Be sure these drain holes do not become blocked.

Choosing the Best Location for the MCU

- The MCU should be mounted in a dry location, allowing enough room at the back for connecting system cables. Also be sure to mount the MCU in a well-ventilated area to prevent overheating, which will damage the system.
- The MCU should be placed so that the LCD display is visible and the buttons are accessible to the user.
- The MCU is not susceptible to magnetic interference and does not need to be mounted on a level surface.

2.2 Mounting the TracVision Antenna

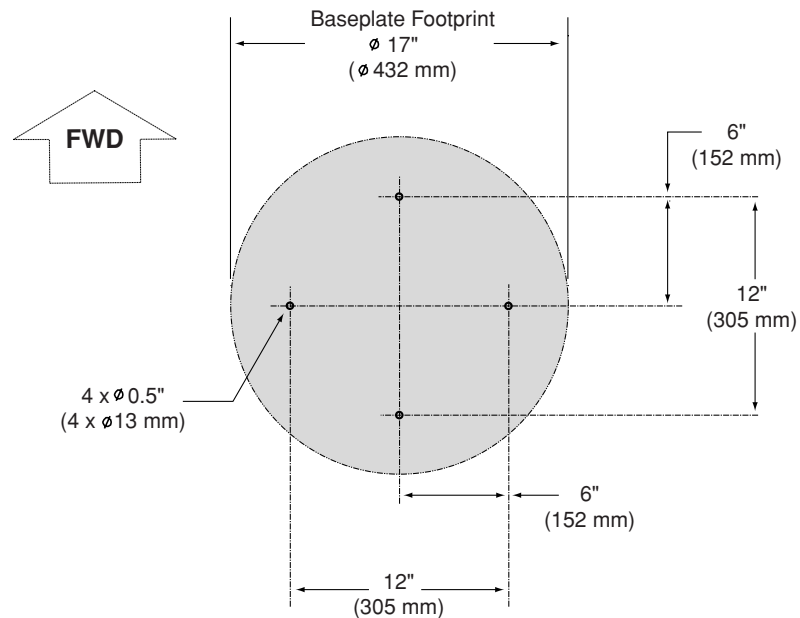
To mount the antenna to the vessel, follow the steps below.



For the antenna to work properly, the "Forward" arrow **MUST** be parallel with the vessel's centerline and pointed toward the bow.

1. Make sure that you have chosen a suitable mounting location based upon the guidelines in "Choosing the Best Location for the TracVision Antenna" on page 23.
2. Using the template provided at the back of this manual or the dimensions shown in Figure 2-3, lay out the four mounting bolt holes. Make certain that the "Forward" arrow is parallel with the vessel's centerline and pointed toward the bow.

Figure 2-3 Antenna Mounting Holes Layout

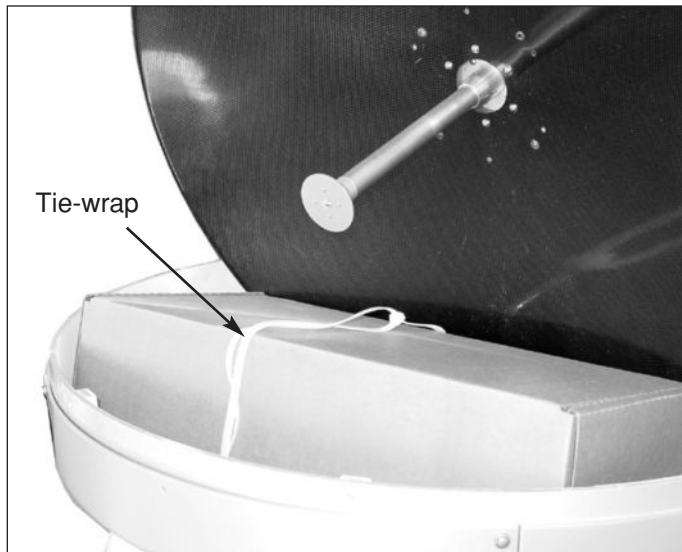


A full-size template of the baseplate mounting holes has been provided at the back of this manual.

3. Drill the four $\frac{1}{2}$ " (13 mm) bolt holes following the layout in Step 2.
4. **If mounting the antenna on a deck:**
 Mark a location aft of the antenna for the cable access hole. The hole must be large enough to accommodate the data/power cable and all required RF cables (see Table 2-1 on page 21 to determine the number of RF cables required). Cut out the access hole and smooth the edges of the hole to protect the cables.
5. Remove the antenna unit from its shipping carton.

6. Remove the eight screws securing the radome to the baseplate. Carefully lift the radome straight up until clear of the antenna assembly and set it aside in a safe place. *If you bring the radome topside, secure it with a lanyard to prevent it from falling overboard.*
7. Remove the tie-wrap securing the MCU/kitpack box to the antenna baseplate. Remove the box.

Figure 2-4 MCU/Kitpack Box

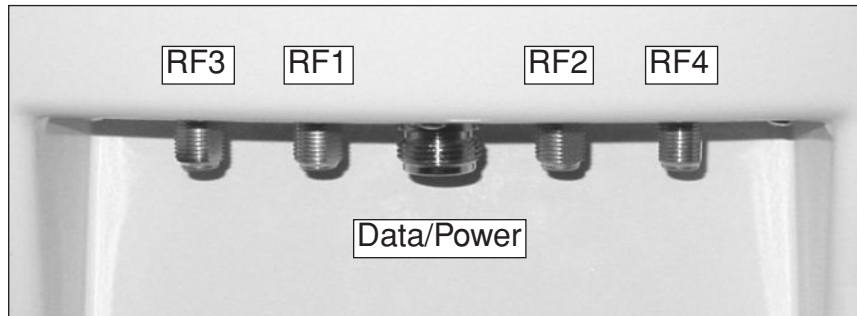


8. Inspect the antenna unit for any signs of shipping damage.
9. Position the baseplate assembly in place over the mounting holes, with the baseplate's connectors (shown in Figure 2-5) facing the stern. Ensure that all mounting holes line up and make any necessary adjustments.

Figure 2-5 Location of Baseplate Connectors

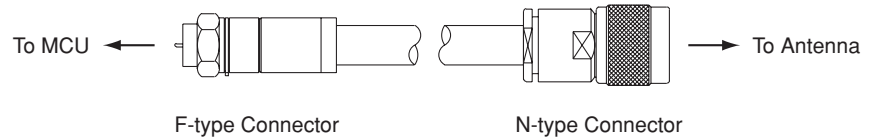


Figure 2-6 Baseplate Connectors



10. Connect the N-type connector end of the data/power cable to the baseplate, as shown in Figures 2-7 and 2-8.

Figure 2-7 Data/power Cable Connectors



Be sure to properly align the data/power cable with the baseplate connector before tightening. Connecting the cable at an angle may damage the cable's center lines.

Figure 2-8 Connecting the Data/Power Cable

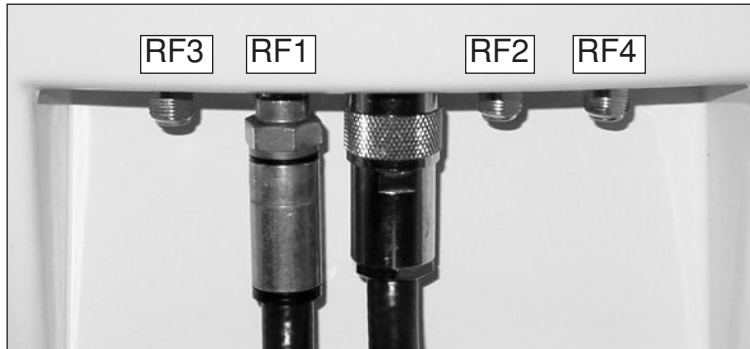


11. Using a $\frac{1}{8}$ " wrench, connect the RF cable(s) from belowdecks to the baseplate. If you connect more than one RF cable, label both ends of each RF cable to match its antenna baseplate connector (RF1, RF2, RF3, or RF4). Figure 2-9 shows an RF cable connected to the RF1 connector.



Do NOT use teflon gel on the cable fittings as it reduces signal strength at higher frequencies.

Figure 2-9 Connecting the RF1 Cable



12. Route the other ends of the data/power and RF cables belowdecks (if mounting the antenna to the deck, route the cables into the cable access hole that you cut out in Step 4).
13. Place the rear logo plate over the cables, so that each cable exits the proper opening (see Figure 2-10). Using the six M4 screws supplied in the kitpack, attach the logo plate to the baseplate as shown in Figure 2-10.

Figure 2-10 Attaching the Logo Plate

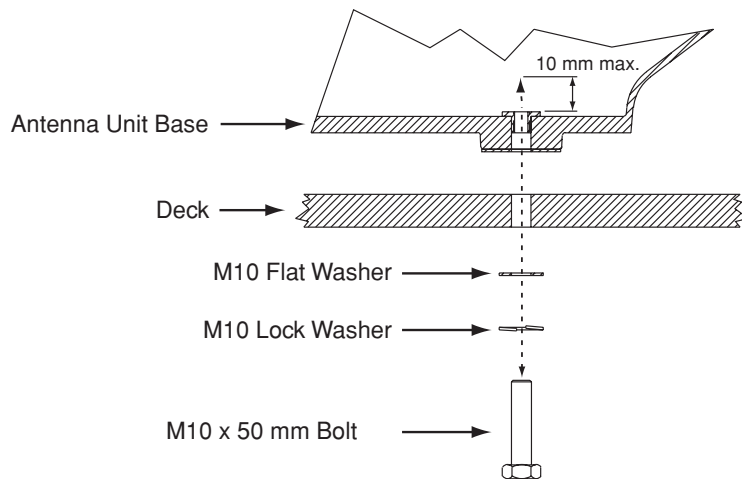


14. Place the antenna baseplate over the mounting holes drilled in the foundation, ensuring the connectors face the stern.
15. At each of the four baseplate mounting holes, place an M10 lock washer and flat washer on an M10 bolt and insert the bolt into the hole from below, as shown in Figure 2-11. Tighten all four bolts securely until the four feet are bottomed against the mounting surface.

Figure 2-11 Bolting the Antenna Unit to the Deck (Side View)

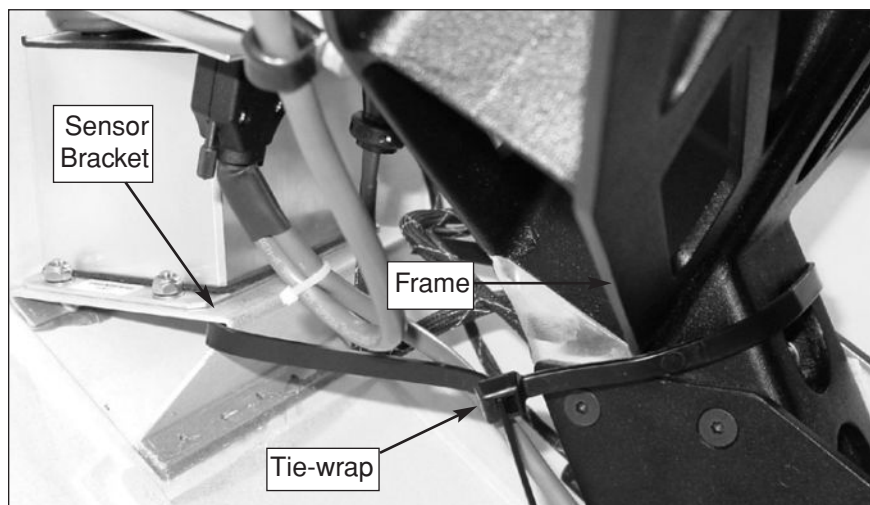


Ensure the mounting screws do not extend further than 0.4" (10 mm) into the antenna baseplate. Inserting the screws any further will damage the antenna.



16. Unfasten the tie-wrap securing the antenna frame to the sensor bracket (*release the tab using a flat-head screwdriver*). Save the tie-wrap in case the antenna needs to be reshipped someday.

Figure 2-12 Antenna Frame Shipping Restraint



17. Reinstall the radome. Secure in place with the eight screws you removed in Step 6. Install a protective plastic screw cap from the kitpack over each screw.

2.3 Connecting the Receiver(s)

Connecting the RF Cable(s)

Each RF cable must be an RG-11 (75 ohms) or RG-6 (75 ohms) cable fitted with F-type connectors. The RF cables should already be connected to the antenna baseplate (see Step 11 of *Section 2.2, "Mounting the TracVision Antenna,"* on page 29). The following sections explain how to connect the RF cable(s) to your satellite TV receiver(s).

To connect the TracVision antenna to your receiver(s), choose one of the following configurations (based on the number of receivers you will connect to the antenna):

Option 1 - Connecting One Receiver

Option 2 - Connecting Two Receivers

Option 3 - Connecting Three or More Receivers

Option 1 - Connecting One Receiver

One end of the RF cable should already be connected to the RF1 plug on the TracVision antenna. Connect the other end of the RF1 cable to the receiver plug labeled "LNB," "ANT/SAT," or "SATELLITE IN."

Option 2 - Connecting Two Receivers

Two RF cables should already be connected to the RF1 and RF2 plugs on the TracVision antenna. Connect the other ends of these RF cables to the plug labeled "LNB," "ANT/SAT," or "SATELLITE IN" on both receivers.

The receiver that is connected to the RF1 cable controls which satellite the antenna is tracking. This is the master receiver. The receiver connected to RF2 can select different channels on that satellite but not change the satellite selection itself.



*Before you connect an RF cable to a receiver, turn on the receiver and TV and verify that there is no AC voltage present on the receiver's input connector, measured between center conductor and shield. If AC voltage is present on the connector, **DO NOT** connect the RF cable until you have corrected the problem. This is a potentially dangerous condition that will damage the antenna's electronics.*

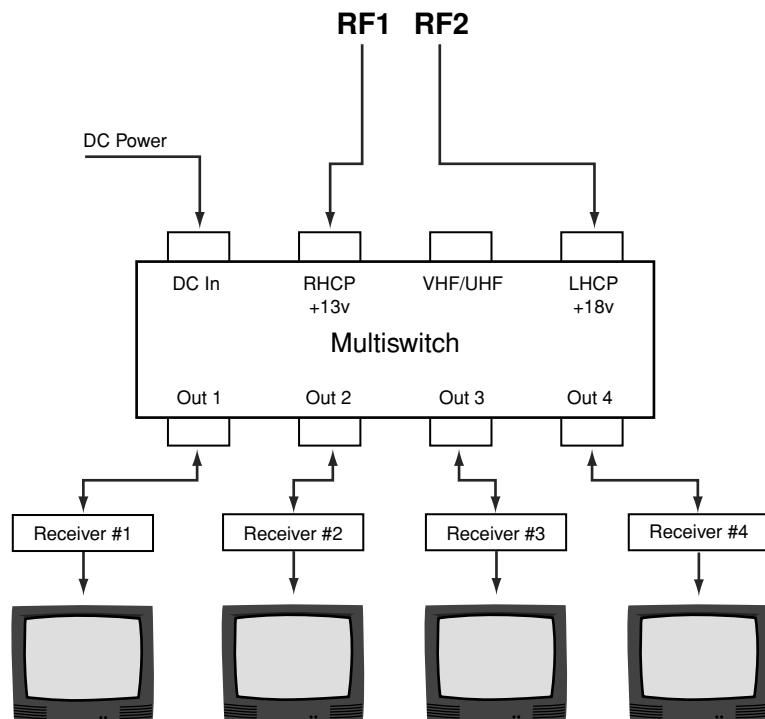
Option 3 - Connecting Three or More Receivers (System Equipped with Circular Dual LNB)

To connect three or four receivers to the TracVision antenna, you will need to install an active multiswitch (Channel Master model 6214IFD or equivalent) between the antenna and the receivers. Two RF cables should already be connected to the RF1 and RF2 plugs on the TracVision antenna. Figure 2-13 shows a typical wiring arrangement for three or four receivers. Mount the multiswitch unit in accordance with the manufacturer's instruction sheet.

Figure 2-13 Single Multiswitch Installation (Circular Dual LNB System)



The use of an active multiswitch will interfere with the 22 KHz tone sent by DIRECTV DSS Plus™ receivers to the antenna. As a result, the antenna will not receive the signal to change satellites when you change channels using your DIRECTV DSS Plus remote.

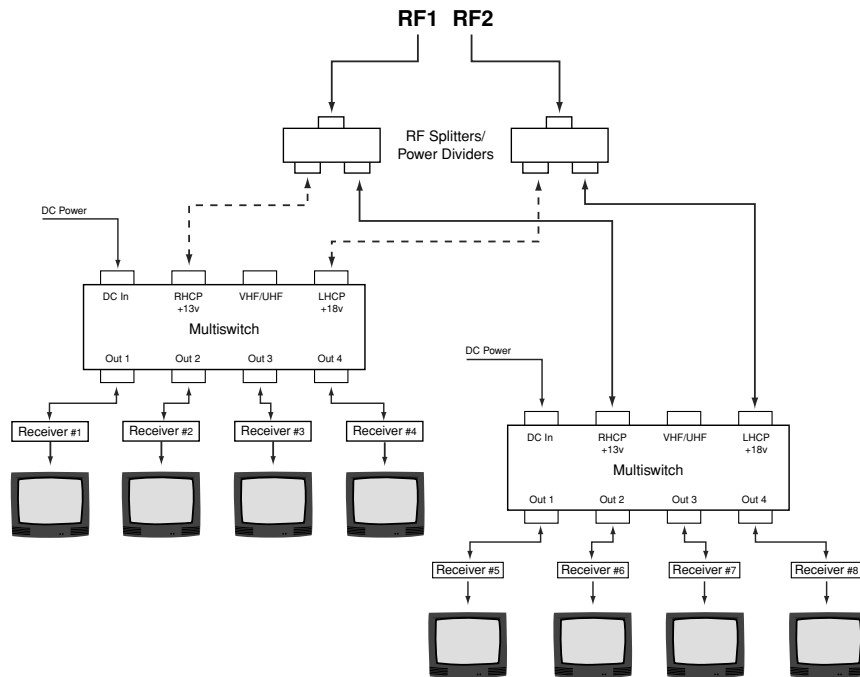


1. Connect the RF cable labeled "RF1" to the multiswitch input labeled "LNB RHCP +13V."
2. Connect the RF cable labeled "RF2" to the multiswitch input labeled "LNB LHCP +18V."
3. Connect the multiswitch outputs to individual receiver inputs. Use RG-11 or RG-6 cable with F-type connectors for all RF connections. Terminate all unused output connectors with 75 ohm DC blocks (Channel Master #7184, Radio Shack #15-1259 or equivalent).

Multiple Multiswitch Installation

If you need to connect more than four receivers to the TracVision antenna, you may carry out a multiple multiswitch installation, as shown in Figure 2-14.

Figure 2-14 Multiple Multiswitch Installation (Circular Dual LNB System)



Option 3 - Connecting Three or More Receivers (System Equipped with a Linear Quad LNB)

Systems equipped with a linear quad LNB have four RF outputs that can be connected to individual receivers.

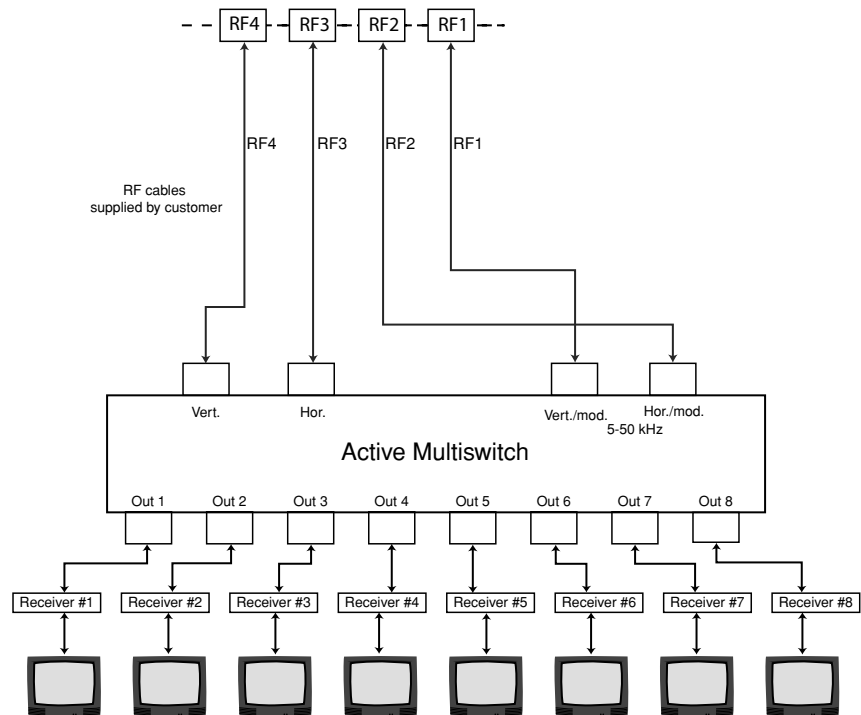
Connecting Three or Four Receivers

To connect a third receiver, a third RF cable should already be connected to the RF3 plug on the TracVision antenna. Connect the other end of the RF3 cable to the plug labeled "LNB," "ANT/SAT," or "SATELLITE IN" on the third receiver. To connect a fourth receiver, use the fourth RF cable, which should already be connected to the RF4 plug on the antenna.

Connecting More than Four Receivers

To connect more than four receivers, you will need to install an active multiswitch that generates a 22 KHz tone (for example, Spaun models 5602NF or 5802NF). Connect the multiswitch unit in accordance with the manufacturer's instructions. Figure 2-15 shows an example of a European multiswitch configuration.

Figure 2-15 Multiswitch Installation (Linear Quad LNB System)



2.4 Wiring the MCU

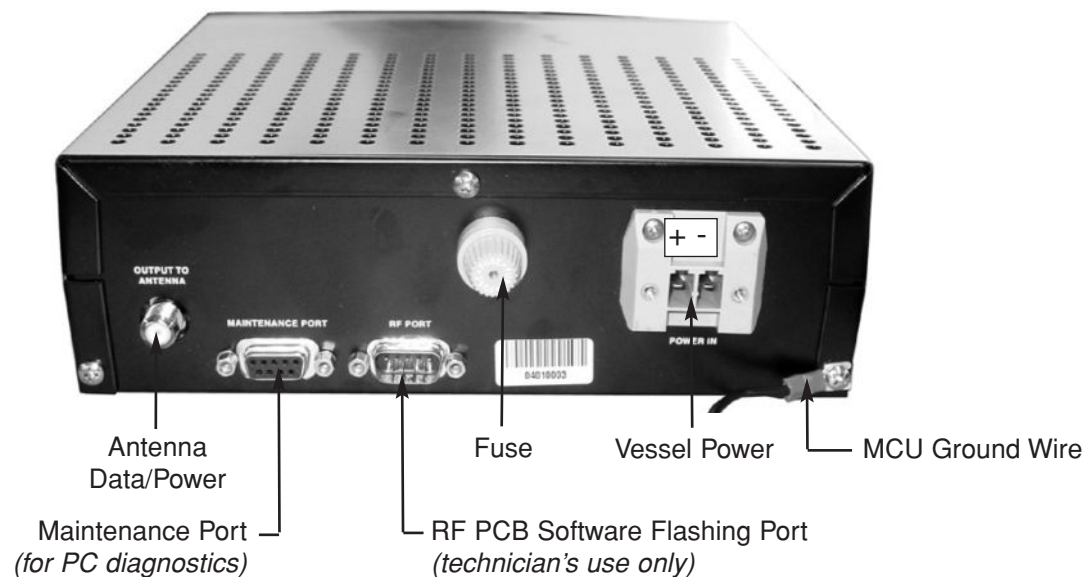
All other wiring for the TracVision system connects at the rear panel of the MCU.

For the TracVision system to work properly, you must connect the following cables to the MCU:

- Antenna data/power cable
- Vessel power cable

Figure 2-16 shows the MCU's rear panel connectors. Refer to this figure when wiring components to the MCU.

Figure 2-16 MCU Rear Panel



Connecting the Antenna Data/Power Cable

Connect the antenna data/power cable to the data/power connector on the MCU's rear panel (see Figure 2-16). Do not overtighten; finger-tight is sufficient.



Before connecting the power cable, turn off vessel power and test the circuit to ensure that no power is present.



*KVH recommends a 12 VDC (5 amps) or a 24 VDC (2.5 amps) power input to the TracVision G8 (supplying not less than 9 VDC at the MCU). Power supplied to the TracVision G8 **MUST NOT** exceed 36 VDC or the TracVision power supply will suffer serious damage!*

Connecting Vessel Power and the MCU Ground Wire

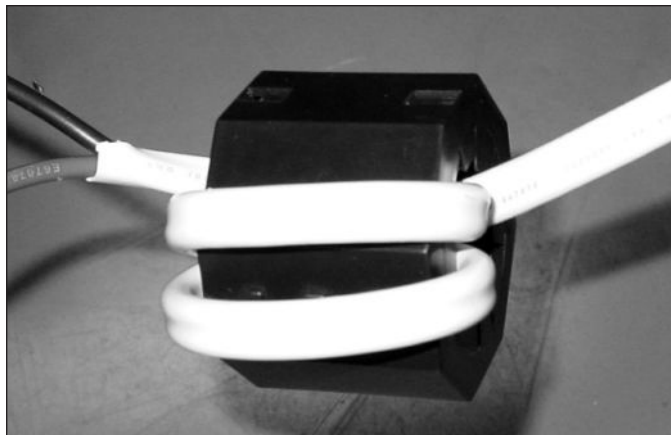
Short circuits may result in severe electrical shock or burns. Turn off vessel power and test the circuit to ensure that no power is present before connecting any power cables. **Do NOT reapply power until all system wiring is completed.**

The TracVision G8 system requires a 9-36 VDC power input. Since it does not have a dedicated power control (ON/OFF switch), a quick-tripping circuit breaker or fuse should be installed between vessel power and the MCU. Circuit overload protection should be rated for 15 amperes. For recommended power cable specifications, refer to Table 2-2 on page 22.

A power connector plug has been supplied in the kitpack to make connecting power to the MCU a snap. To connect vessel power and the ground wires, follow the steps below.

1. A large ferrite coil is supplied in the kitpack to help reduce conducted emissions from the vessel power cable. This ferrite coil needs to be installed for the system to comply with CE standards. To install the ferrite coil, make two loops in the vessel power cable and clamp the ferrite coil around the loops (see Figure 2-17). The cable, with both positive and negative wires, must pass through the ferrite coil three times to be effective.

Figure 2-17 Large Ferrite Coil Clamped onto Vessel Power Cable



2. Find the power plug provided in the kitpack and insert your vessel power wires into the plug's (+) and (-) terminals (see Figure 2-18).

Figure 2-18 Power Plug



3. Secure the wires in place by tightening the plug's terminal screws.
4. After inserting and securing the wires, tug gently to ensure that the connections are solid. Also make certain that the wire insulation is not pinched in the connector.
5. Plug the power connector plug into the power jack on the MCU's rear panel (see Figure 2-16 on page 35).
6. Secure the plug in place with the two retaining screws.
7. The MCU has a ground wire preattached to one of its retaining screws (see Figure 2-19). Be sure to connect this wire to a suitable ground.

Figure 2-19 MCU Ground Wire



2.5 Mounting the MCU

Mount the MCU using either of the following options:

Option 1 - Velcro Fastening on a Horizontal Surface

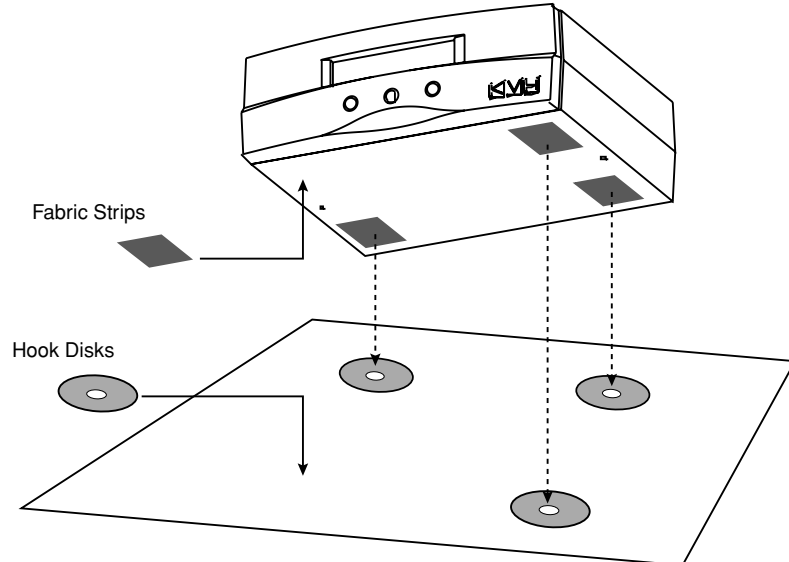
Option 2 - Flush-mounting

The following sections describe how to mount the MCU for both of these options.

Option 1 - Velcro Fastening on a Horizontal Surface

1. Choose a location based upon the guidelines in “*Choosing the Best Location for the MCU*” on page 25.
2. Remove the four squares of Velcro fabric from the kitpack. Clean the bottom of the housing with a mild detergent and water to remove oils, etc. Peel the protective backing from the squares and apply them to the bottom of the housing at each of the four corners (see Figure 2-20).

Figure 2-20 Mounting the MCU with Velcro Attachments

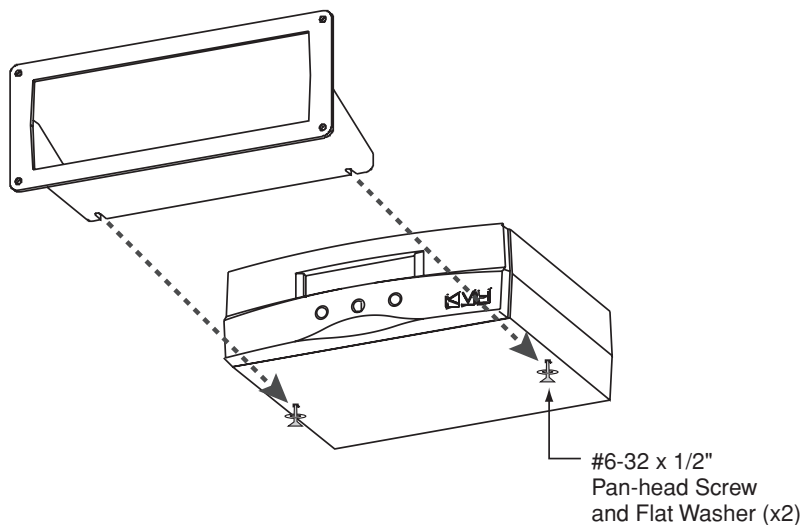


3. Position the four Velcro hook disks where the MCU will be mounted. Drill screw holes for the disks and secure in place with the #4-24 screws supplied in the kitpack.
4. Press the MCU firmly into place so that the loop material engages the hook disks.

Option 2 - Flush-mounting

1. Choose a location based upon the guidelines in “*Choosing the Best Location for the MCU*” on page 25.
2. A template has been provided in *Appendix B on page 125* as a guide to mark and cut the proper hole for the flush mount bracket. Cut the hole and make certain the bracket and MCU will fit easily.
3. At the two holes in the bottom of the MCU, place a #6 flat washer on a #6-32 screw and insert the screw into the hole from below, as shown in Figure 2-21. Do not tighten the screws yet; just a few turns is sufficient.

Figure 2-21 Securing the MCU to the Flush Mount Bracket



4. Slide the flush mount bracket backward onto the MCU until the two notches meet the screws as shown in Figure 2-21.
5. Tighten the screws to secure the MCU to the bracket.
6. Insert the MCU and bracket into the mounting hole and secure the unit to the mounting surface with the #8 (black) screws and #8 washers supplied in the kitpack.

2.6 Activating/Programming the Receiver

Before it can be used, your satellite TV receiver must be activated and/or programmed, as described below.

DIRECTV Activation

KVH makes it easy to activate a DIRECTV receiver. Just call KVH at 1-888-584-4163 and select the **TracVision Product Activation Department** (Monday - Friday, 8:30 a.m. - 5:00 p.m. EST).

DISH Network Activation

To activate a DISH Network receiver, please call DISH Network directly at 1-800-333-DISH (3474).

Other Receiver Activations

Please refer to the user manual that accompanied your receiver for activation instructions.

Programming European or Australian Receivers

Before the TracVision G8 system can be used in Europe or Australia, the receiver must be programmed to receive signals from the selected DVB satellite services. Programming is conducted using menu selections displayed on the TV screen. Please refer to your receiver owner's manual for specific instructions.

Table 2-4 provides some key data for use when programming the receiver.

Table 2-4 Key Receiver Settings

Configuration Item	Setting
Antenna Alternative 1	DiSEqC 1
Antenna Alternative 2	DiSEqC 2
LNB Frequency	Universal

It is also important that the receiver's settings for Antenna Alternatives 1 and 2 match the MCU's installed satellite settings as follows:

- Antenna Alternative 1 = Satellite A
- Antenna Alternative 2 = Satellite B

Section 2.7, "Installing Satellites Using the MCU," on page 42 provides details on the satellite installation process.

Programming DSS Plus receivers

If you are using multiple DSS Plus receivers and intend to shift from one satellite to another, **only one** of the receivers can be configured as a two-satellite receiver. All other receivers must be configured as one-satellite receivers. The two-satellite receiver will determine which satellite the antenna is tracking while the other receivers can watch any channels available via that satellite. Refer to your receiver owner's manual for complete details on this process.



If you use an active multiswitch to connect three or more receivers, the multiswitch will interfere with the 22 KHz tone sent by DIRECTV DSS Plus™ receivers to the antenna. As a result, the antenna will not receive the signal to change satellites when you change channels using your DIRECTV DSS Plus remote. You will need to use the MCU buttons to change satellites.



TracVision G8's default satellite pairs are:

N. America (US DIRECTV):
DSS_101 & DSS_119

Europe:
ASTRA1 & HOTBIRDWB

Mexico (Sky Mexico):
PAS_9 & NONE

L. America (DIRECTV LA):
GALAXY3CN & NONE

2.7 Installing Satellites Using the MCU

The TracVision G8 can track a variety of DVB-compatible and DSS (DIRECTV) satellites. The system contains a preprogrammed library of various satellites. It also has two open slots that you may use to program two additional satellites of your choice.

North America

Any two of the North American satellites listed below can be paired together, as long as the satellites are within range of the antenna (*standard circular dual LNB required*):

- DSS_72
- DSS_101
- DSS_110
- DSS_119
- Echo_61
- Echo_110
- Echo_119
- Echo_148
- Expressvu
- ExpressTV

Europe

Any two of the European satellites listed below can be paired together, as long as the satellites are within range of the antenna (*linear quad LNB/feed tube assembly required*):

- Astra 1
- Astra 2N
- Astra 2S
- Hispasat
- Hotbird WB
- Hotbird
- Sirius
- Thor
- Arabsat
- Nilesat
- Turksat
- Eutel_W3A

Mexico

In Mexico, select the satellite listed below for Sky Mexico service (*linear quad LNB/feed tube assembly required*).

- PAS_9

Latin America

In Latin America, choose one of the satellites listed below for DIRECTV Latin America (DLA) service (*DLA circular dual LNB required*).

- Galaxy3CN
- Galaxy3CS

Australia

In Australia, you can pair together the two satellites listed below (*Linear quad LNB/feed tube assembly required*).

- Optus_B1
- Optus_B3

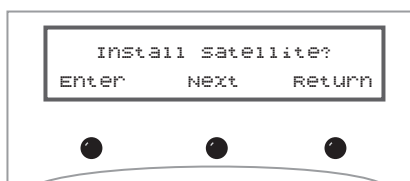
The satellites listed in TracVision G8's preprogrammed satellite library will be sufficient for most users. However, if you wish to install one or two satellites that are not in the library, skip to "*Programming User-defined Satellites*" on page 45. After configuring these user-defined satellites, return to the satellite installation process in "*Installing Your Selected Satellites*" below.

Installing Your Selected Satellites

To install your selected satellites as Satellite A and Satellite B, follow the steps below.

1. Apply power to the MCU.
2. Following the startup sequence, press the center button to bring up the "Install Satellite?" screen.

Figure 2-22 Install Satellite Screen

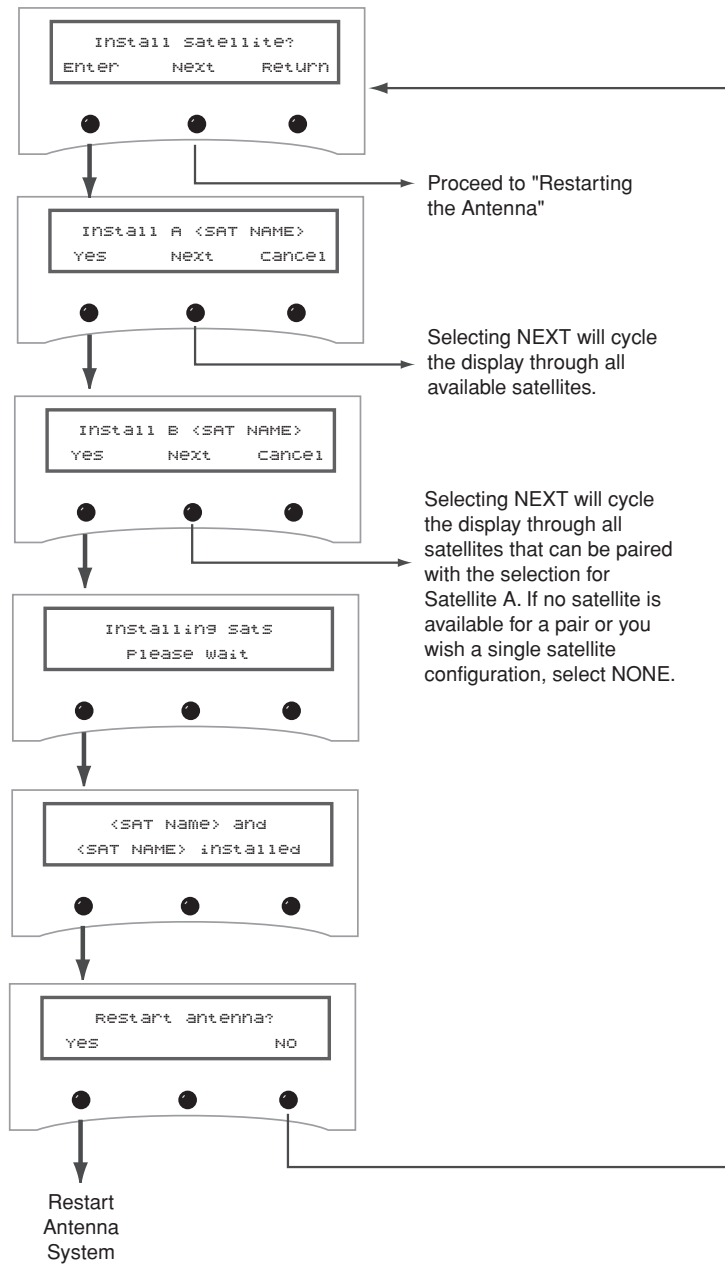


3. Follow the process shown in Figure 2-23 on the following page to install your selected satellites. At the end of the process, be sure to press the **YES** button to restart the antenna.



Section 3, "Using the MCU Interface," provides complete details on the use of the MCU menus, including complete antenna control details in "Control Antenna Mode" on page 67.

Figure 2-23 Install Satellite Pair Process



Programming User-defined Satellites

The TracVision G8 satellite library has the capacity for two user-defined satellites in case you want to track a satellite that is not currently preprogrammed in the library. User-defined satellites can only be configured via the MCU's maintenance port. To configure a user satellite, information about the satellite must be provided, including:

- Satellite name
 - Satellite position (longitude)
 - Transponder information for each of the following polarizations/frequencies:
 - vertical high
 - vertical low
 - horizontal high
 - horizontal low
- OR**
- right
 - left
- Transponder information includes:
 - frequency
 - symbol rate
 - FEC code
 - network ID (in hexadecimal format)

This information can be obtained from your satellite service provider or from a number of sites on the Internet, such as www.satcodx.com.



How to tell the difference between High and Low bands:

High: 11.700 - 12.750 GHz

Low: 10.700 - 11.700 GHz



For your reference, the satellite configuration information for the predefined satellites is available on our web site at www.kvh.com/ footprint.



You can download the latest KVH Flash Update Wizard at www.kvh.com/wizard.



If your computer does not have a DB9 serial COM port, you can use the following USB-to-RS232 adapter:

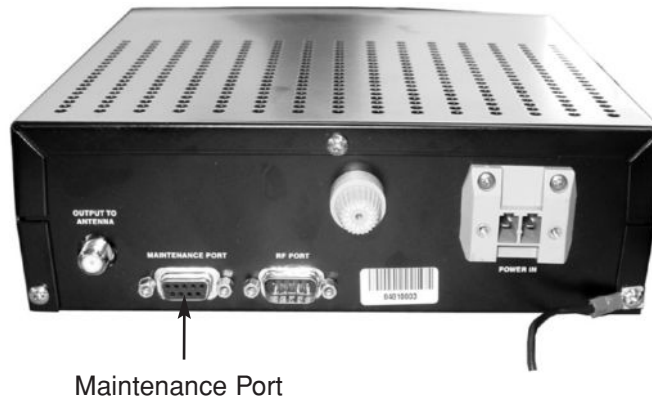
IOGear part number GUC232A (visit www.iogear.com)

Connecting a PC to the MCU Maintenance Port

To program your user-defined satellites into the TracVision G8 satellite library, you need to connect a PC to the MCU's maintenance port. This procedure requires either the KVH Flash Update Wizard or Windows HyperTerminal. Use the settings appropriate to your application and follow the steps below.

1. Connect one end of the PC data cable to the DB9 maintenance port connector on the rear of the MCU. Connect the other end to the serial port on your PC (a 9-pin/25-pin connector adapter may be needed for some PCs).

Figure 2-24 MCU Maintenance Port



2. If you are using **HyperTerminal**, open HyperTerminal and establish the following settings:
 - Bits per second: 9600
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None



If you are using the **KVH Flash Update Wizard**, double-click the "KVH Flash Update Wizard" shortcut on your computer's desktop to start the wizard. Then go to the "Select board to flash" screen.

3. Apply power to the TracVision G8 system and allow the system to complete full initialization. Data should be scrolling on the PC display to identify any system problems detected. If no data appears, recheck your connections and setup.

Entering User-defined Satellite Data

Enter the following antenna commands to configure your user-defined satellites. *If you're using HyperTerminal, type the command in the HyperTerminal window then press **Enter**. If you're using the KVH Flash Update Wizard, type the command in the "Command" box, then press **Enter**.*

1. Enter the SATCONFIG parser command as follows:

Command:	SATCONFIG,USERX,YYY,Z,D,L<Enter> (<i><Enter> indicates press the Enter key</i>)
Where:	X = 1 (USER1 satellite) or 2 (USER2 satellite) YYY = longitude (0-180) Z = E (East) or W (West) D = decoding type (0 = test, 1 = DSS-A, 2 = DSS-B, 3 = DVB) L = LNB polarization (C = circular, L = linear)
Function:	configures one of the user-configurable satellites with the longitude provided
Response:	if valid entry, echoes the input data if invalid entry, returns error message

2. Type **@DEBUGON<Enter>** to enter DEBUG mode.
3. Enter the satellite's transponder information as follows:

Command:	@SATCONFIG,X,N,F,S,C,ID,P,B,D<Enter>
Where:	@SATCONFIG = directs data to the RF Board X = satellite location (A = USER1, B = USER2) N = satellite table # (98 = USER1, 99 = USER2) F = frequency in MHz (either 00000 or within the range 10700 - 12700) S = the satellite transponder symbol rate in Mbit/second (01000 - 29999) C = the FEC code (e.g., 12, 23, 34, 56, 67, 78) ID = the satellite network ID in hexadecimal format (0x####) P = the LNB polarization (v = vertical, h = horizontal, r = right, l = left) B = the LNB down conversion frequency (l = low, h = high, G = Latin America, U = USA) D = decoding type (1 = DSS-A, 2 = DSS-B, 3 = DVB)

4. Repeat Step 3 for each of the following transponder categories:

- vertical high
- vertical low
- horizontal high
- horizontal low

OR

- right
- left

TracVision G8 requires that the data fields for all transponder categories be provided. If the selected satellite does not have information for one or more of the transponder categories, default information should be entered in the fields as follows:

Transponder Data	Default Value
Frequency	00000
Symbol Rate	27500
FEC Code	the same value as provided for those transponders with data
Network ID	0x0000
Polarity and Band	whichever combinations are not already provided

5. Type **ZAP<Enter>** to restart the antenna.
6. If you need to configure a second user-defined satellite, repeat this procedure starting with Step 1 to enter data for the USER2 satellite.

You have now added your user-defined satellite(s) to the system's satellite library.

If you want the antenna to track one or both of these user-defined satellites, you need to install it. To install a satellite, you can use either the MCU, as described in *"Installing Your Selected Satellites"* on page 43, or you can use the SATINSTALL command, as described on the following page.

1. Type **HALT<Enter>** to put the antenna in Idle mode.
2. Enter the **SATINSTALL** parser command as follows:

Command: **SATINSTALL,<satA_name>,<satB_name><Enter>**

Where:	<satA_name> = the name of your choice for Satellite A (for example: USER1)
	<satB_name> = the name of your choice for Satellite B (for example: USER2)

If you only want to install and track one satellite, enter **NONE** as the name of Satellite B.

3. Once you've assigned satellites as Satellite A and Satellite B, you need to tell the antenna which of the two satellites it should initially acquire and track. This step should be performed the first time a satellite is selected, allowing the system to download the channel guide. To do so, enter the following parser command:

Command: **@L,A or B<Enter>**

Where:	A = track Satellite A
	B = track Satellite B

4. Type **ZAP<Enter>** to restart the antenna.

Examples of the user-defined satellite configuration process are provided for reference in the next two sections.



European systems only:

If DiSEqC is active on your receiver, once the antenna restarts, the antenna starts tracking the satellite currently selected by the receiver, overriding the @L command.

An Example of Configuring a User-defined Satellite (N. America)

The following is an example of configuring the fictional YOURSAT 123 as the USER1 configured satellite. Prior to configuring this satellite or any others, be certain to get the most up-to-date information from one of the sources previously discussed.

YOURSAT 123 at 122 West, DVB Decoder, Circular Polarization LNB

<i>Right</i>	
Frequency	12.225 GHz
Symbol Rate	20000
FEC Code	5/6
Network ID	4100(dec) = 0x1004
<i>Left</i>	
Frequency	12.456 GHz
Symbol Rate	20000
FEC Code	5/6
Network ID	4100(dec) = 0x1004

Based on this information, the data entered via the PC would look like this:

```
SATCONFIG,USER1,122,W,3,C
@DEBUGON
@SATCONFIG,A,98,12225,20000,56,0x1004,R,U,3
@SATCONFIG,A,98,12456,20000,56,0x1004,L,U,3
@SAVE,A
ZAP
```

To install and start tracking the USER1 satellite, the following additional data would be entered:

```
HALT
SATINSTALL USER1,NONE
@L,A
ZAP
```

An Example of Configuring a User-defined Satellite (Europe)

The following is an example of configuring the fictional YOURSAT 123 as the USER1 configured satellite. Prior to configuring this satellite or any others, be certain to get the most up-to-date information from one of the sources previously discussed.

Yoursat 123 at 7 West, DVB Decoder, Linear Polarization LNB

<i>Horizontal High</i>	
Frequency	11.966 GHz
Symbol Rate	27500
FEC Code	3/4
Network ID	2048 (dec) = 0x0800
<i>Vertical High</i>	
Frequency	11.823 GHz
Symbol Rate	27500
FEC Code	3/4
Network ID	2048(dec) = 0x0800
<i>Vertical Low</i>	
No Data Listed	
<i>Horizontal Low</i>	
No Data Listed	

Based on this information, the data entered via the PC would look like this:

```
SATCONFIG,USER1,7,W,3,L
@DEBUGON
@SATCONFIG,A,98,11966,27500,34,0x0800,H,H,3
@SATCONFIG,A,98,11823,27500,34,0x0800,V,H,3
@SATCONFIG,A,98,00000,27500,34,0x0000,V,L,3
@SATCONFIG,A,98,00000,27500,34,0x0000,H,L,3
@SAVE,A
ZAP
```

To install and start tracking the USER1 satellite, the following additional data would be entered:

```
HALT
SATINSTALL USER1,NONE
@L,A
ZAP
```



You can download the latest KVH Flash Update Wizard at www.kvh.com/wizard.



If your computer does not have a DB9 serial COM port, you can use the following USB-to-RS232 adapter:

IOGear part number GUC232A
(visit www.iogear.com)

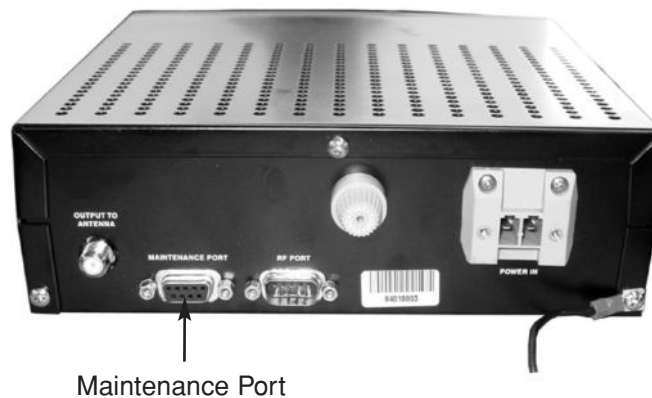
2.8 Checking Out the System

Now that you've installed the TracVision G8, you need to verify that the system functions properly. Check the system startup sequence to ensure that the system is operating within normal parameters.

To view the startup sequence, connect a PC to the MCU's maintenance port. This procedure requires either the KVH Flash Update Wizard or Windows HyperTerminal. Use the settings appropriate to your application.

1. Connect one end of the PC data cable to the DB9 maintenance port connector on the rear of the MCU. Connect the other end to the serial port on the PC (a 9-pin/25-pin connector adapter may be needed for some PCs).

Figure 2-25 MCU Maintenance Port



2. If you are using **HyperTerminal**, open HyperTerminal and establish the following settings:
 - Bits per second: 9600
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None



If you are using the **KVH Flash Update Wizard**, double-click the "KVH Flash Update Wizard" shortcut on your computer's desktop to start the wizard. Then go to the "Select board to flash" screen.

3. Apply power to the TracVision G8 system and allow the system to complete full initialization. Data should be scrolling on the PC display to identify any system problems detected. If no data appears, recheck your connections and setup.
4. After completing the review of the startup and operational routines, turn on the receiver and television and check the channels on the selected satellites. For linear quad LNB systems, check both horizontally and vertically polarized channels, if possible.
5. When all checks are completed, shut down the system.

Checking the Calibration Score

Once the vessel is moving, the TracVision G8's internal sensor calibrates itself automatically to compensate for minor magnetic distortions. Since a well-calibrated sensor is important to maintain system performance, the "calibration score" should be checked the first time the vessel is underway. See "Viewing the Calibration Score" on page 79 for details.



A sample startup sequence has been provided in Appendix C on page 127 with the typical ranges and responses for the TracVision G8 during startup and operation.



Be sure to register the system for product warranty validation. When you register, you'll also be added to our customer contact list, which will be used only to notify you of any product updates. Please refer to the Product Registration Form or visit www.kvh.com/register.

2.9 Changing Geographic Location

If you move to a different geographic area, you will need to modify your TracVision G8 system to receive satellite TV signals in the new location. To begin receiving satellite signals in the new area, perform the following steps.

Swap LNB/Feed Tube Assembly

To receive the proper satellite signals in the new geographic location, your TracVision antenna must be equipped with the appropriate LNB/feed tube assembly for that location:

Table 2-6 Required LNB or LNB/Feed Tube Assembly for New Geographic Location

Moving from:	Moving to:	Order from KVH:
North America	Latin America	DLA circular dual LNB
North America Latin America	Europe Mexico Australia	Linear quad LNB/feed tube
Latin America	North America	Standard circular dual LNB
Europe Mexico Australia	North America	Standard circular dual LNB/feed tube
Europe Mexico Australia	Latin America	DLA circular dual LNB/feed tube

Table 2-7 lists the part numbers for ordering these various options.

Table 2-7 LNB and LNB/Feed Tube Assembly Part Numbers

Part Name	Part Number
Standard circular dual LNB	02-0870
Standard circular dual LNB/feed tube assembly	02-1282-01
DLA circular dual LNB	02-0870-01
DLA circular dual LNB/feed tube assembly	02-1282-03
Linear quad LNB/feed tube assembly*	02-1282-04

* The linear quad LNB/feed tube assembly includes a skew control mechanism that allows the antenna to automatically adjust skew for changes in region and satellite service.

Install New Satellites

When you move to a new area, the list of available satellites changes. For details on available satellites by region and installing these new satellites, refer to *Section 2.7, "Installing Satellites Using the MCU,"* on page 42.

Replace the Receiver

In order to receive satellite TV service in your new geographic location, you will need to purchase a receiver designed for that location. You will also need to activate the receiver for a satellite TV service that is available in that region. Refer to your selected satellite TV service provider for more information.



You may also need to replace your television when changing geographic location. In North America, your TV must support the NTSC video standard. In Europe, your TV must support the PAL video standard.

3 — Using the MCU Interface

This section explains how to use all of the MCU functions. You will use the MCU to operate, control, and monitor the TracVision G8.

Contents

3.1	Startup and Self-test	59
3.2	Main Display and Accessing the Main Menu	60
3.3	Installing Satellites	62
3.4	Restarting the Antenna	64
3.5	Operations Mode	64

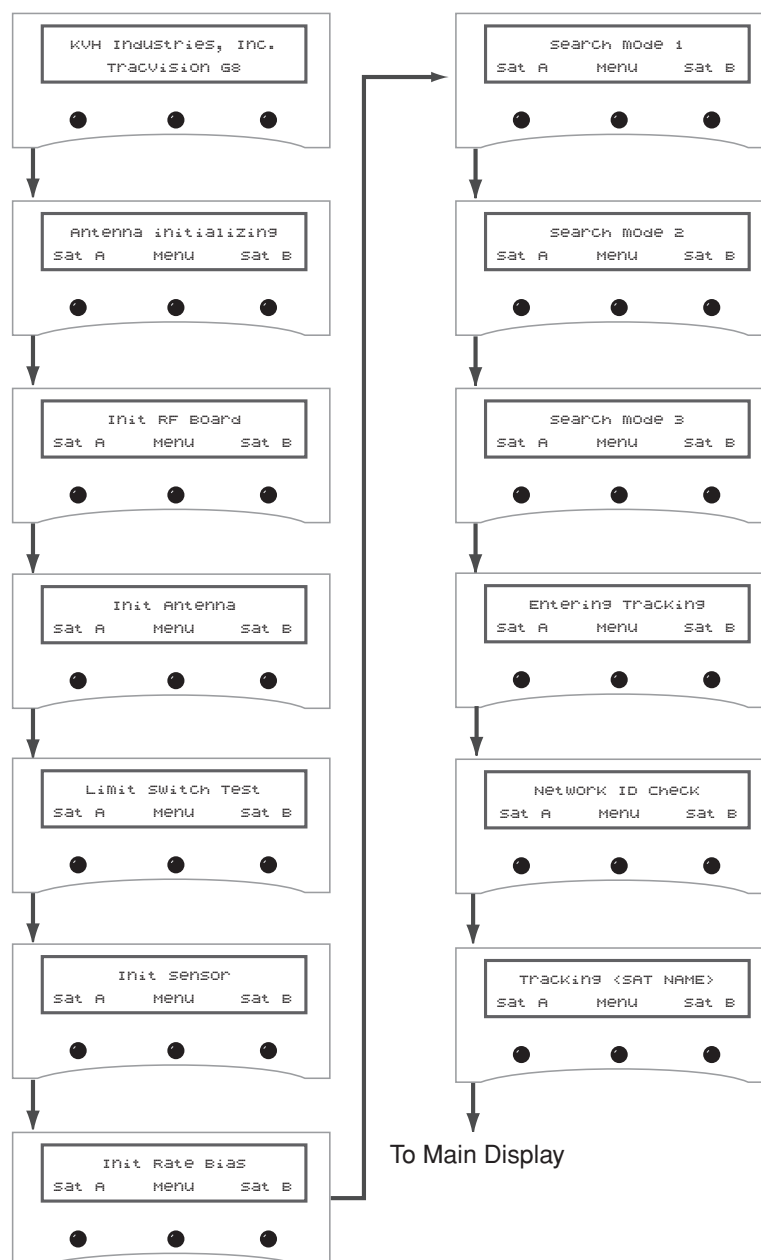
3.1 Startup and Self-test

To turn on the TracVision G8, follow the steps below.

1. Turn on the satellite TV receiver and the television.
2. Apply operating power to the MCU.
3. Wait while the system initializes and searches for the satellite.

The MCU displays the following screens during system startup:

Figure 3-1 TracVision G8 Startup Screens

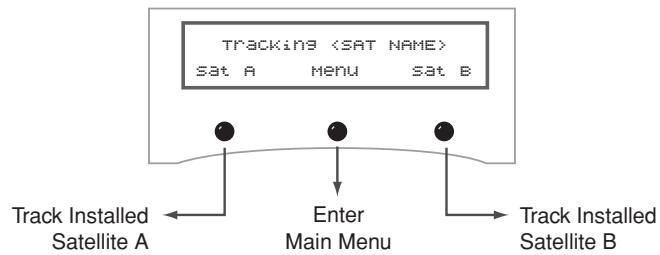


“Search Mode” screens may not appear during every startup.

3.2 Main Display and Accessing the Main Menu

As soon as the startup routine is completed, the LCD panel shows the main display, which shows which satellite the antenna is currently tracking. The buttons allow you to switch between the two installed satellites as well as enter the main menu. The button functions are as follows:

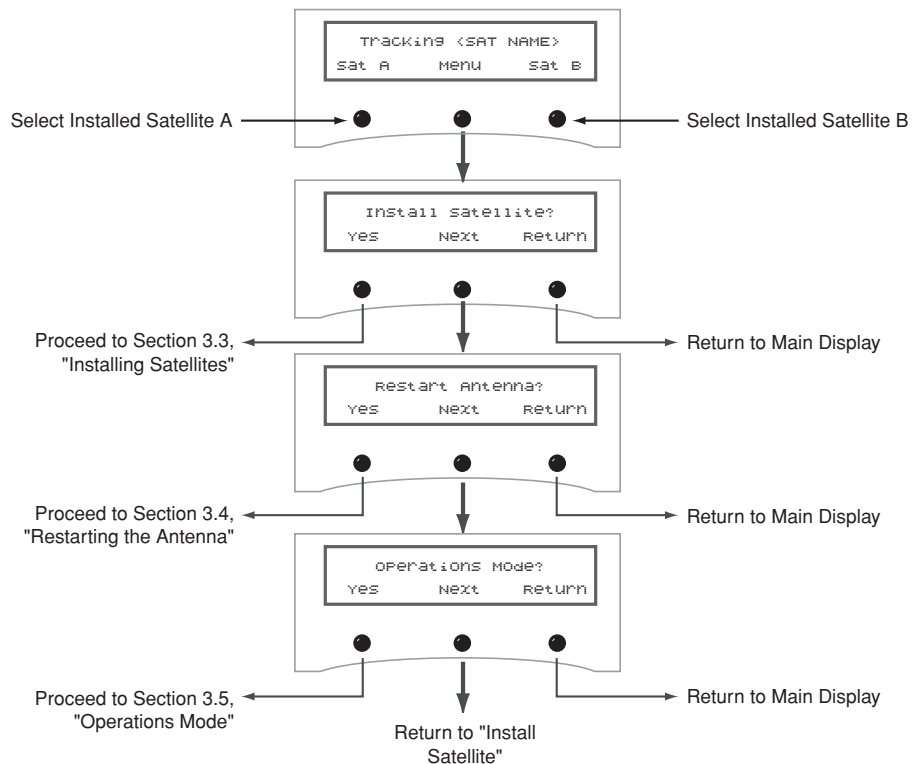
Figure 3-2 Main Display and Button Functions



Main Menu

Pressing the center button will cycle the main menu through the available functions as follows:

Figure 3-3 Main Menu Functions



The RETURN and CANCEL Buttons

Throughout the menus, the right-hand button will often be designated as either RETURN or CANCEL. These options have the following functions:

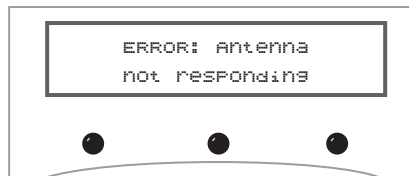
- **RETURN** – Returns to the main menu or display. If no buttons are pressed within 10 seconds, the menu will automatically default to the main display.
- **CANCEL** – Cancels the current action and returns to the start of the action without making any changes.

Antenna Error Messages

At times, the MCU might display error messages alerting you to a specific problem (e.g., you have selected an invalid satellite pair).

“Antenna not responding” (shown in Figure 3-4) indicates that no messages are being received from the antenna. This is usually the result of the antenna not being powered up or the antenna being disconnected from the MCU. This error message might also appear if the antenna hasn’t completed its limit switch test.

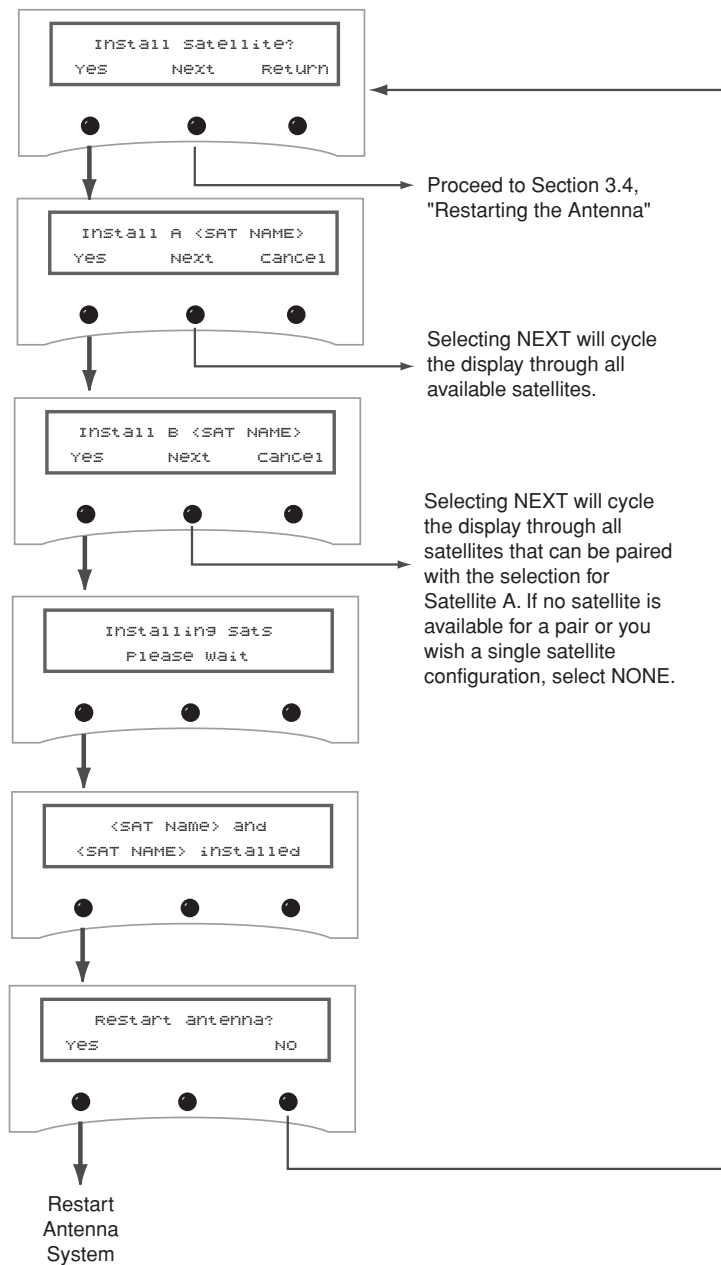
Figure 3-4 *Non-responsive Antenna Error Message*



3.3 Installing Satellites

TracVision G8 permits two satellite services (Satellites A and B) to be installed simultaneously. There is also an option for **NONE** on Satellite B, permitting single satellite operation.

Figure 3-5 Install Satellite Pair Process



Available Satellite Pairs

North America

Any two of the North American satellites listed below can be paired together, as long as the satellites are within range of the antenna (*standard circular dual LNB required*):

- DSS_72
- DSS_101
- DSS_110
- DSS_119
- Echo_61
- Echo_110
- Echo_119
- Echo_148
- Expressvu
- ExpressTV

Europe

Any two of the European satellites listed below can be paired together, as long as the satellites are within range of the antenna (*linear quad LNB/feed tube assembly required*):

- Astra1
- Astra2N
- Astra2S
- Hispasat
- HotbirdWB
- Hotbird
- Sirius
- Thor
- Arabsat
- Nilesat
- Turksat
- Eutel_W3A

Mexico

In Mexico, select the satellite listed below for Sky Mexico service (*linear quad LNB/feed tube assembly required*).

- PAS_9

Latin America

In Latin America, choose one of the satellites listed below for DIRECTV Latin America (DLA) service (*DLA circular dual LNB required*).

- Galaxy3CN
- Galaxy3CS

Australia

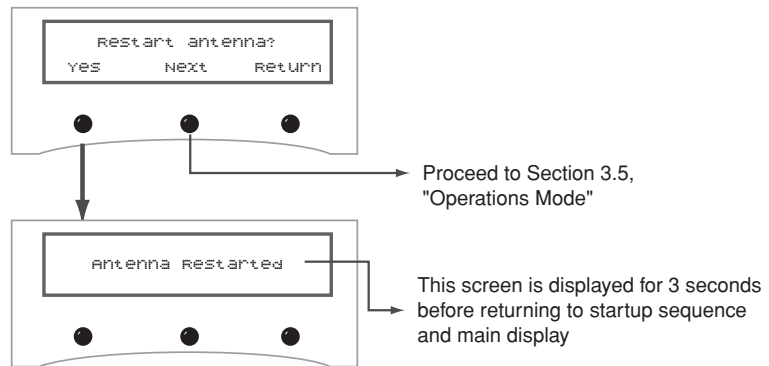
In Australia, you can pair together the two satellites listed below (*Linear quad LNB/feed tube assembly required*).

- Optus_B1
- Optus_B3

3.4 Restarting the Antenna

To restart the antenna, use the Restart Antenna menu. The antenna will re-initialize and reacquire the satellite.

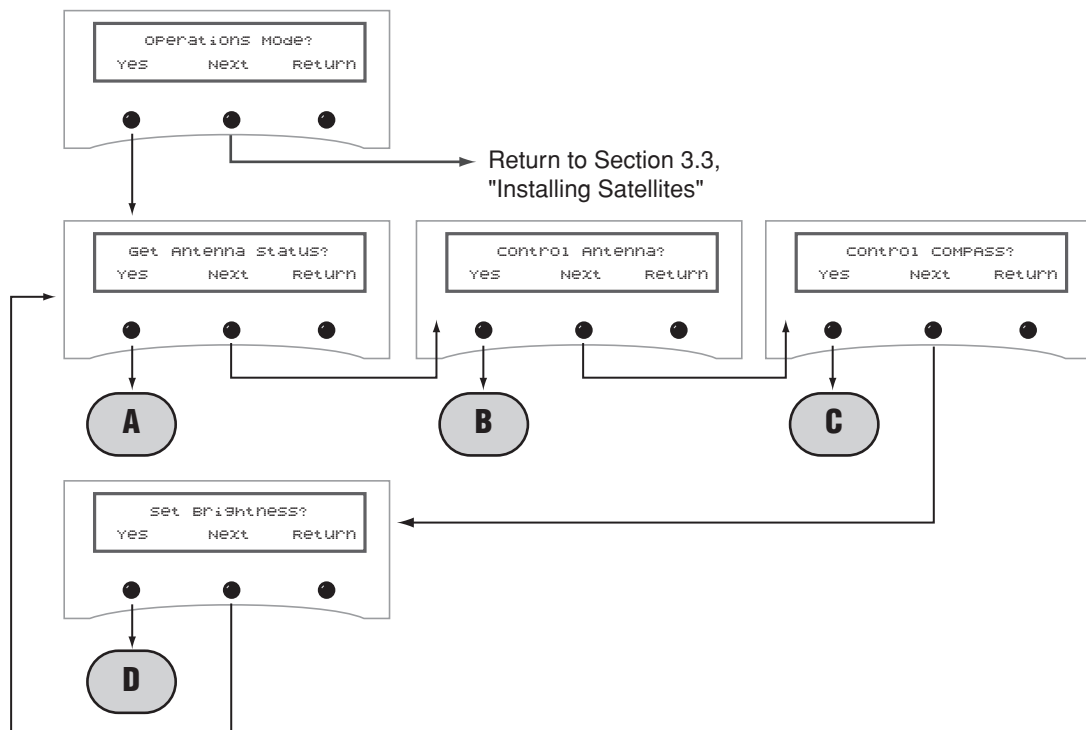
Figure 3-6 Restart Antenna Menu



3.5 Operations Mode

This sequence of menus allows a user to view system information, perform various antenna functions, access internal sensor functions, and set the display brightness.

Figure 3-7 Operational Mode Sequence



Antenna Status Mode

This sequence of menus allows a user to do the following:

- Scan for system errors
- Access antenna type, version, and serial number information
- Check signal/noise levels
- View the skew angle
- Display the bit error rate
- Display the antenna's current state

Figure 3-8 Antenna Status Mode Menu Sequence

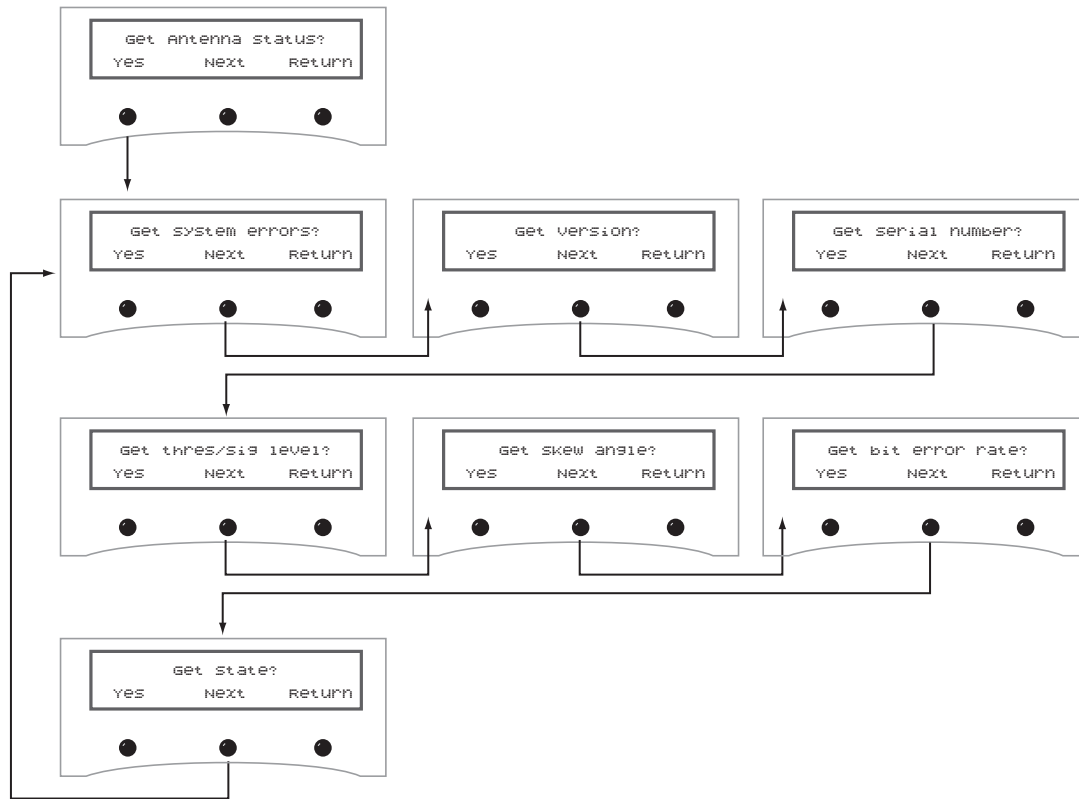
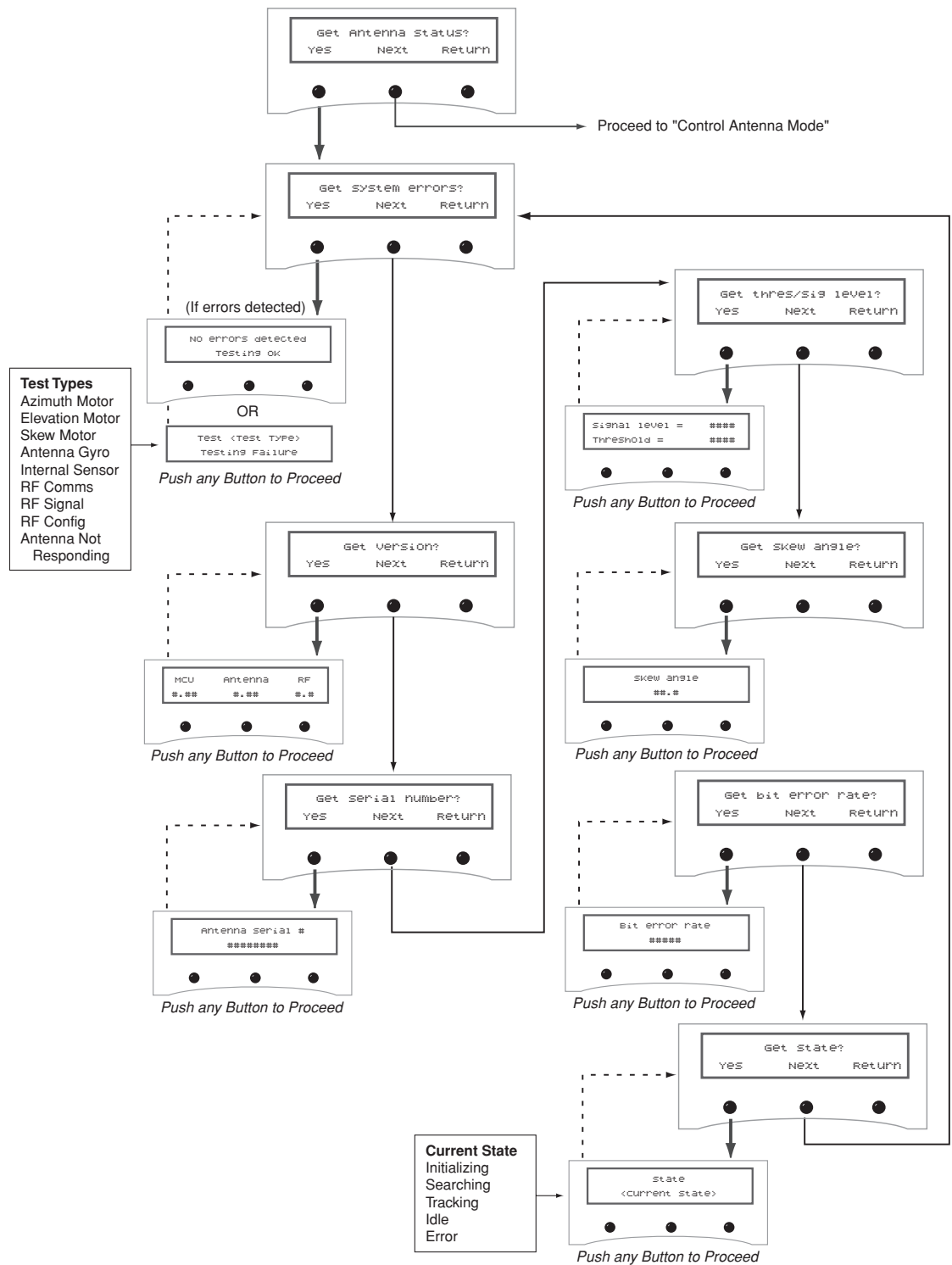


Figure 3-9 on the next page details each of these functions.

Antenna Status Data Screens

Figure 3-9 shows the information available through the Get Antenna Status mode. This information is valuable for basic troubleshooting and diagnostics.

Figure 3-9 Antenna Status Data Screens

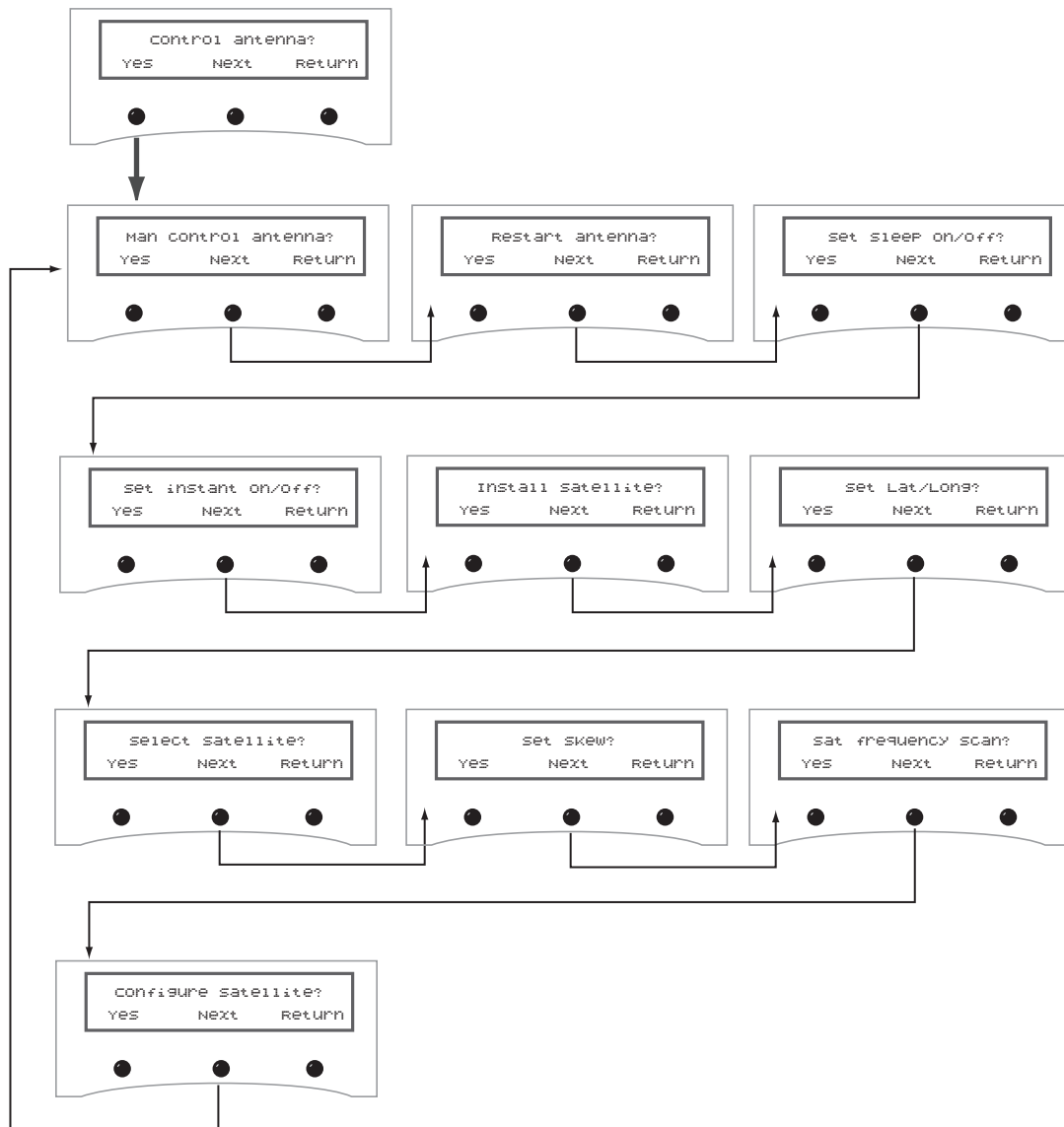


Control Antenna Mode

This sequence of menus allows a user to do the following:

- Adjust the antenna's azimuth and elevation
- Restart the antenna
- Turn Sleep mode on/off
- Turn Instant On Mode on/off
- Install a new satellite pair
- Set latitude/longitude
- Select the active satellite
- Adjust the skew angle
- Update satellite frequency data
- Change satellite configuration settings

Figure 3-10 Control Antenna Mode Menu Sequence



Figures 3-11 through 3-20 on the following pages detail each of these functions.

Manually Controlling the Antenna

In certain circumstances, you may need to control the azimuth, elevation, and tracking of the TracVision G8 antenna manually, using the process shown in Figure 3-11. Wait until the antenna has fully initialized, then use the + and - buttons to manually move the dish. Azimuth measurements are reported as relative to the bearing of the vessel's bow.



Wait until the antenna has fully initialized before making manual adjustments.



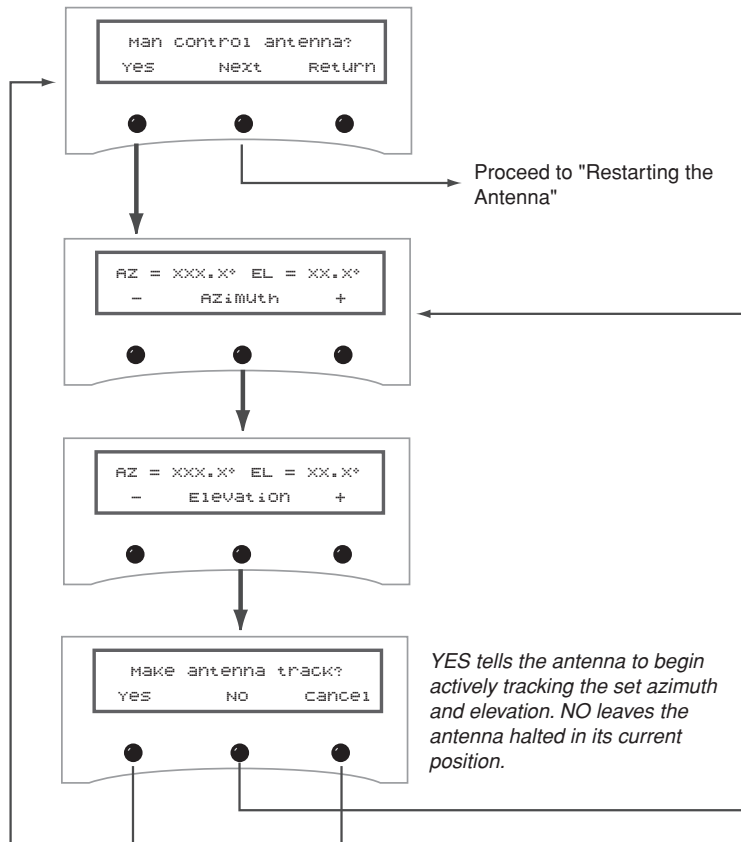
If the manual adjustment of the antenna reached the maximum rotation (720°), the antenna will rotate 360° and return to the Manual Control Antenna screens.



If the system started up in Instant On mode, the following message may be displayed:



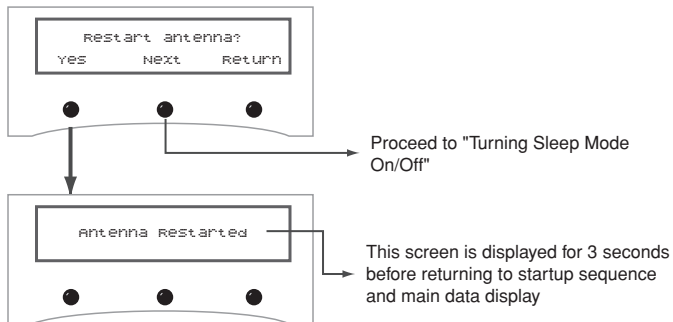
Figure 3-11 Manual Antenna Control Procedure



Restarting the Antenna

After resetting satellite parameters, it is necessary to restart the antenna before the new settings take effect.

Figure 3-12 Restart Antenna Menu

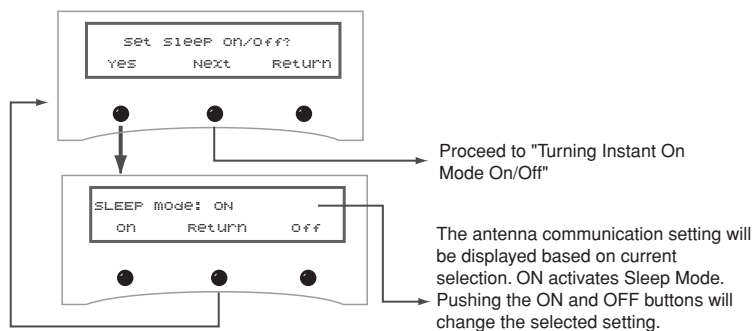


Turning Sleep Mode On/Off

Sleep Mode, if activated, turns off conical scan tracking if the antenna holds the same position for one minute. As soon as the vessel moves, the system will automatically begin tracking the satellite again.

The factory default setting for Sleep Mode is ON for North American and Latin American systems and OFF for European systems.

Figure 3-13 Sleep Mode Menu

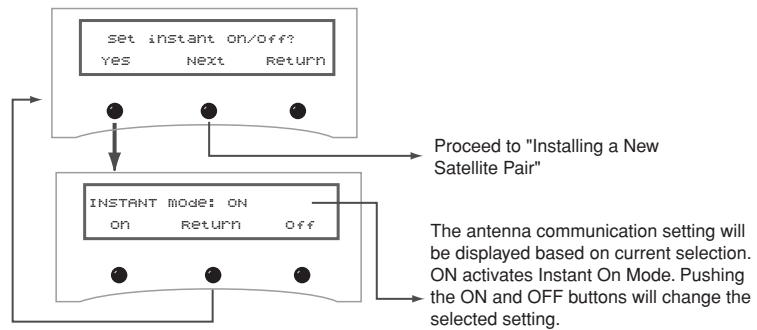


Turning Instant On Mode On/Off

Instant On allows the antenna to immediately receive a TV signal if the vessel has not moved since the antenna was last shut off. If the vessel moves after acquiring the satellite via Instant On, the antenna will undergo its standard initialization process, resulting in a brief interruption of the TV signal.

The factory default setting for Instant On Mode is OFF.

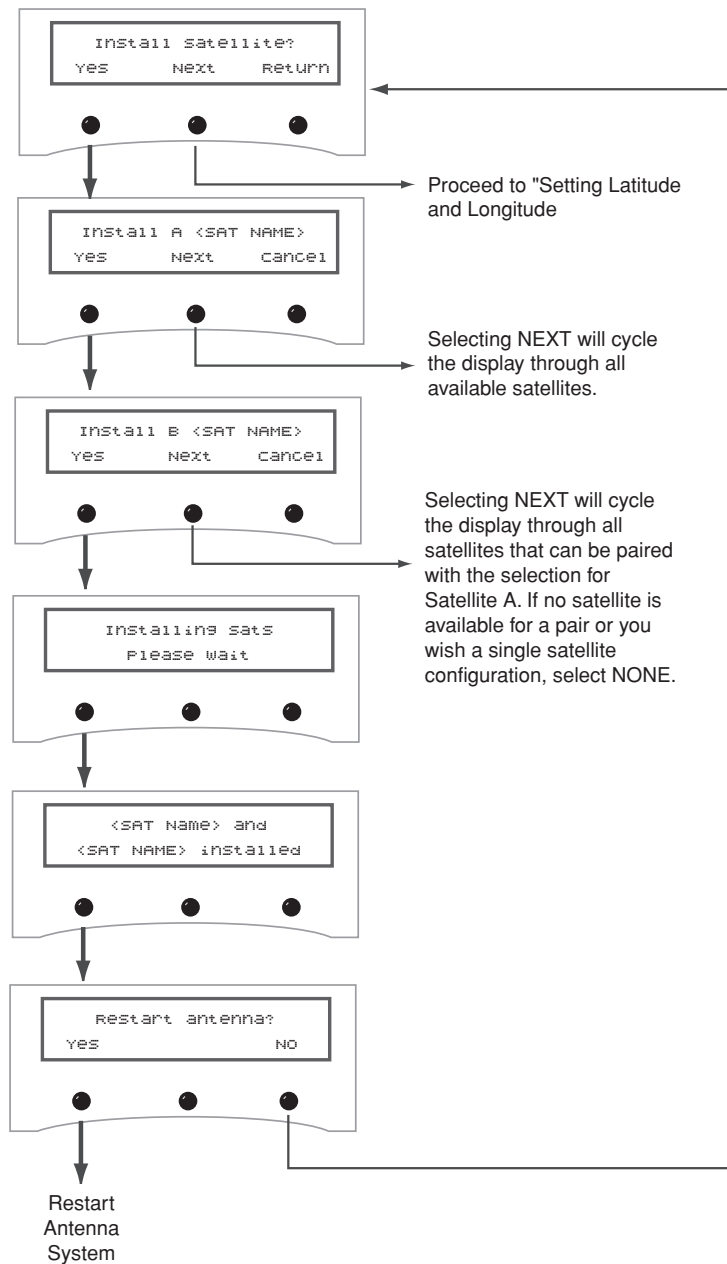
Figure 3-14 Instant On Mode Menu



Installing a New Satellite Pair

TracVision G8 permits two satellite services (Satellites A and B) to be installed simultaneously. There is also an option for **NONE** on Satellite B, permitting single satellite operation.

Figure 3-15 Install Satellite Pair Process

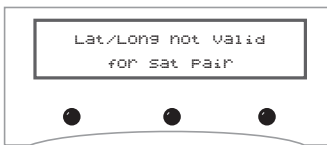




If GPS is providing valid position data to the antenna, manual entry of latitude/longitude is not available.



If the latitude and/or longitude entered is not valid for the installed satellite pair, the following screen will appear:

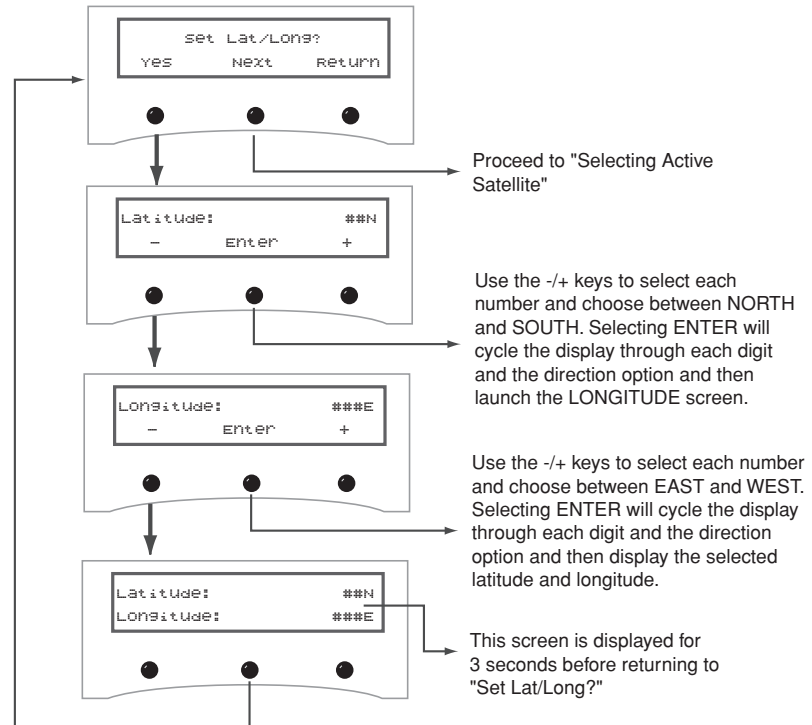


Recheck and re-enter your latitude and longitude and verify your installed satellite pair to resolve this issue.

Setting Latitude and Longitude

If the GPS is blocked, faulty, or unavailable, you can enter the vessel's latitude and longitude to ensure that the installed satellites are viewable, as well as to permit the system to set several internal parameters.

Figure 3-16 Set Latitude/Longitude



Selecting Active Satellite

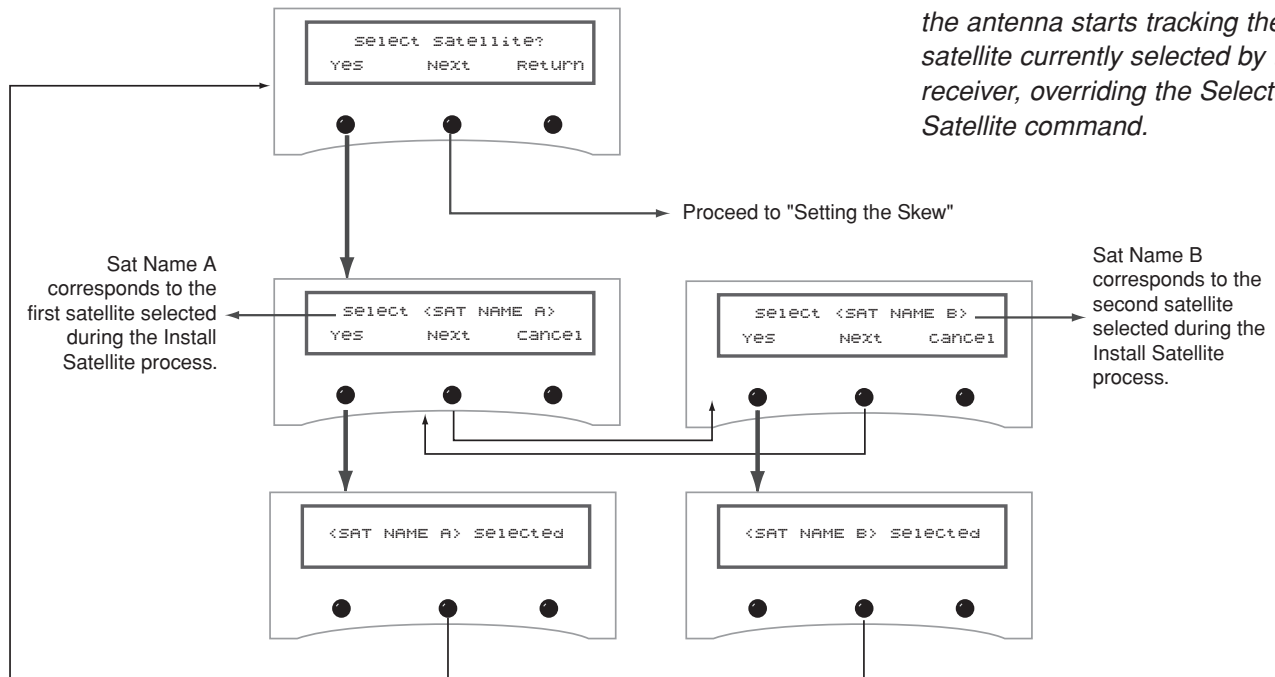
After installing the active pair of satellites, use the Select Satellite menu to choose which of the installed satellites will be active.



European systems only:

If DiSEqC is active on your receiver, once the antenna restarts, the antenna starts tracking the satellite currently selected by the receiver, overriding the Select Satellite command.

Figure 3-17 Select Active Satellite

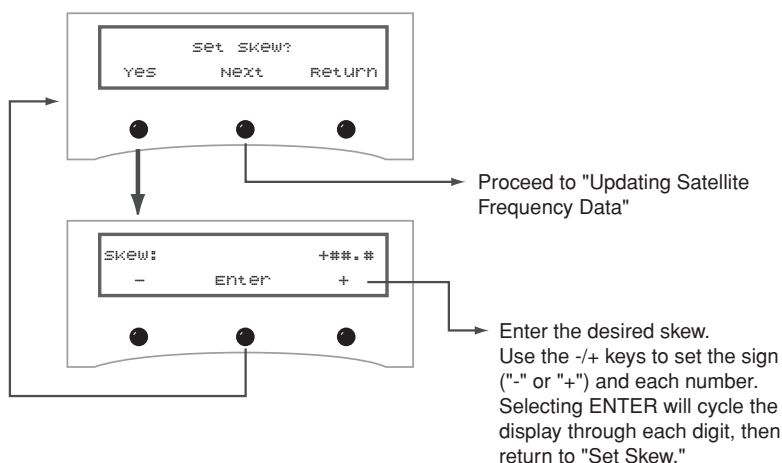


Setting the Skew

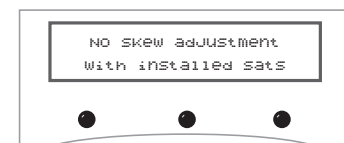
The Set Skew menu allows you to manually adjust the skew of the antenna's LNB.



Figure 3-18 Set Skew Menu



The skew can only be set on a system equipped with a linear quad LNB/feed tube assembly. Otherwise the following screen will appear:





Do **NOT** use this function unless directed by KVH Technical Support or a KVH-authorized technician. Improper data selection may affect the system's operation.

Updating Satellite Frequency Data

If the antenna is unable to find a satellite, the satellite's frequency data may have changed. The Satellite Frequency Scan feature allows you to update the frequency data of any satellite stored in the system's library.

This function should not be used unless directed by KVH Technical Support or a KVH-authorized technician.

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.

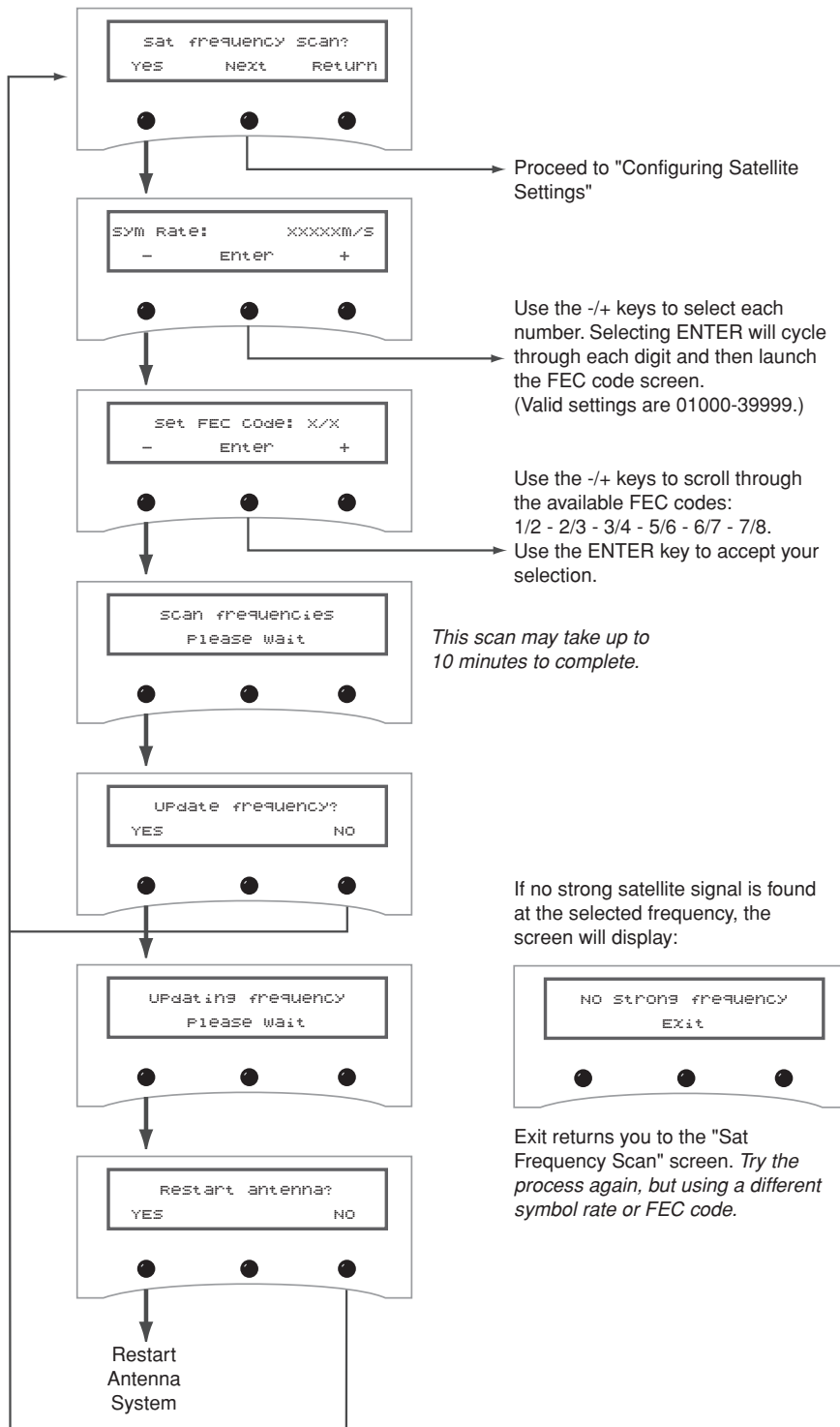
To update the satellite frequency data, follow the steps below:

1. Place your receiver in the satellite signal meter mode.
2. Select the desired satellite on the MCU. *Ensure the TV signal meter indicates that you have a strong signal.*

If the antenna is unable to find the selected satellite automatically, you can manually point the antenna (see "Manually Controlling the Antenna" on page 68).

3. Select the desired polarization and band on the receiver.
4. *Do not move the vessel.* Your boat must remain motionless during the entire Satellite Frequency Scan process.
5. Follow the MCU menus on the next page. The scan itself will take a couple of minutes. Once complete, restart the antenna and ensure the antenna will track the new frequency.

Figure 3-19 Satellite Frequency Scan



To find a valid symbol rate and FEC code, refer to an up-to-date satellite information table. Data for satellites stored in the antenna's library is available for download at www.kvh.com/footprint. For other satellites, you might refer to an Internet resource such as www.lyngsat.com or www.satcodx.com (these sites are not managed by KVH).



The vessel must remain stationary during this process.



North American satellites have two polarizations:

- *Left-hand Circular (LHC)*
- *Right-hand Circular (RHC)*

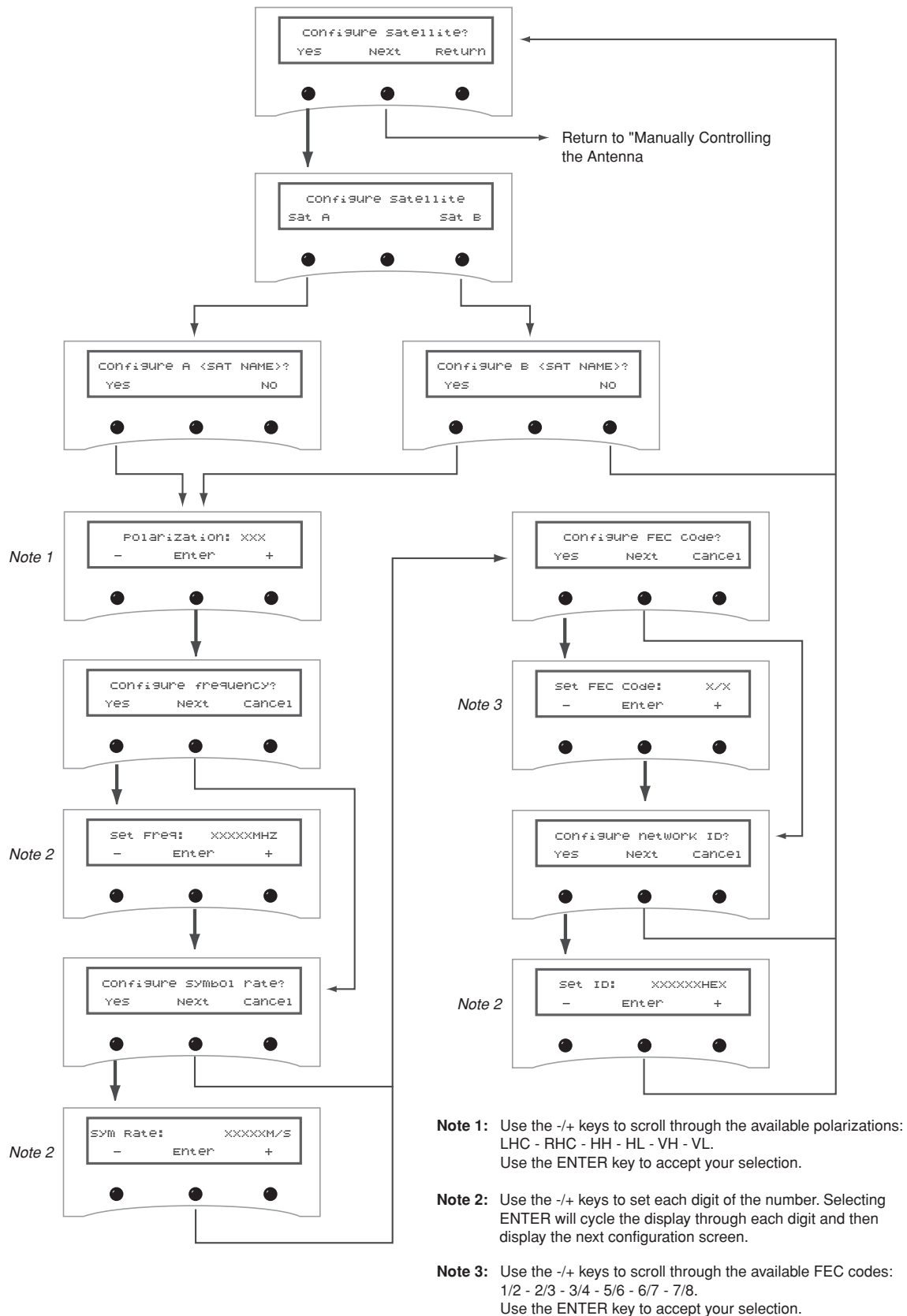
European satellites have four polarizations:

- *Horizontal High (HH)*
- *Horizontal Low (HL)*
- *Vertical High (VH)*
- *Vertical Low (VL)*

Configuring Satellite Settings

The Configure Satellite menu allows you to change the configuration settings for your installed satellites. For each polarization, you can change the following settings:

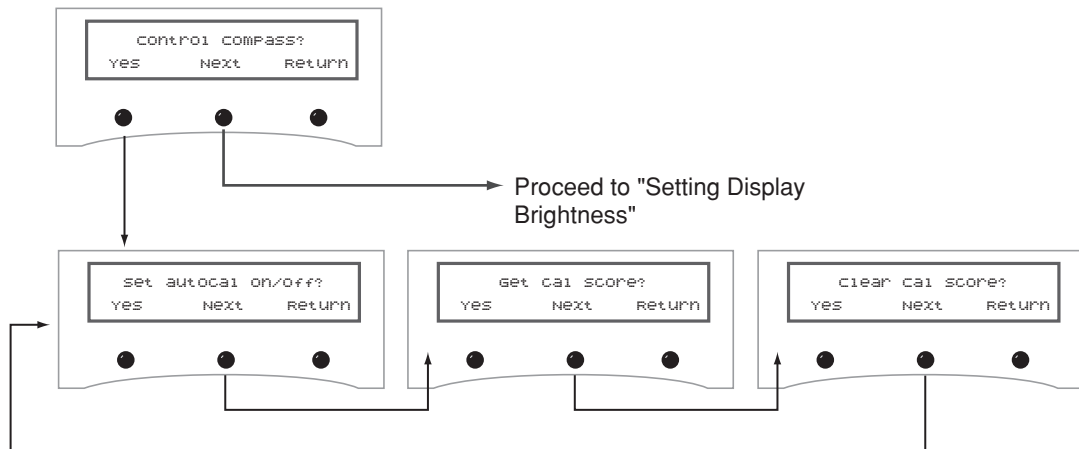
- **Frequency**
(either 00000 or a number between 10700 - 12700 MHz)
- **Symbol Rate**
(01000 - 45000 Mbit/sec)
- **FEC Code**
(1/2, 2/3, 3/4, 5/6, 6/7, or 7/8)
- **Satellite Network ID**
(0x0000 - 0xffff hex)

Figure 3-20 Configure Satellite

C Control Compass Mode

The Control Compass function allows you to turn autocalibration on/off, read the calibration score, and clear the calibration.

Figure 3-21 Control Compass Mode Menu Sequence



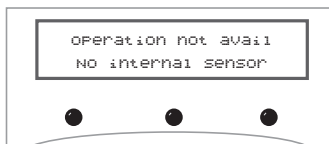
Selecting Autocalibration

Every antenna's internal sensor module is calibrated at the factory in a perfect-world environment. However, hard and soft iron effects on your vessel can distort the local magnetic field, causing errors in the reported heading. These errors are minimized by mounting the antenna in a suitable location and are further removed by the system's autocalibration feature, which compensates for minor magnetic distortions while your vessel is moving. The more the vessel moves with autocalibration turned on, the more accurate the sensor will become.

The factory default setting for Autocalibration is ON.

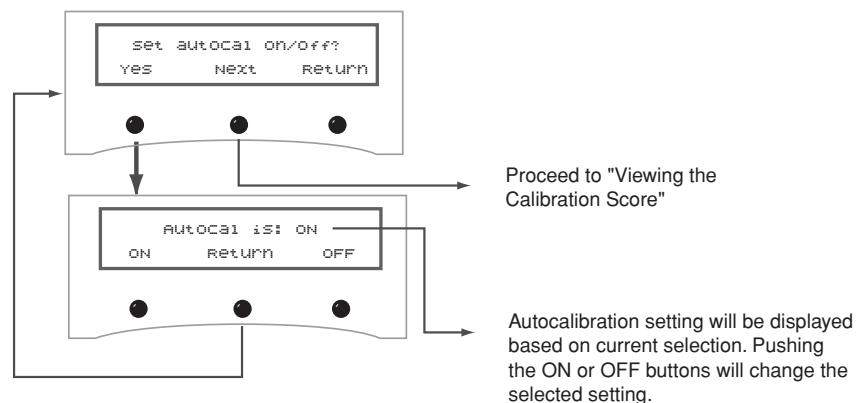


If the antenna's internal sensor is not working, the following screen will appear:



A well-calibrated sensor is crucial to system performance. If you shift, remove, or add equipment near the antenna, KVH suggests keeping autocalibration ON so that the sensor will automatically recalibrate itself.

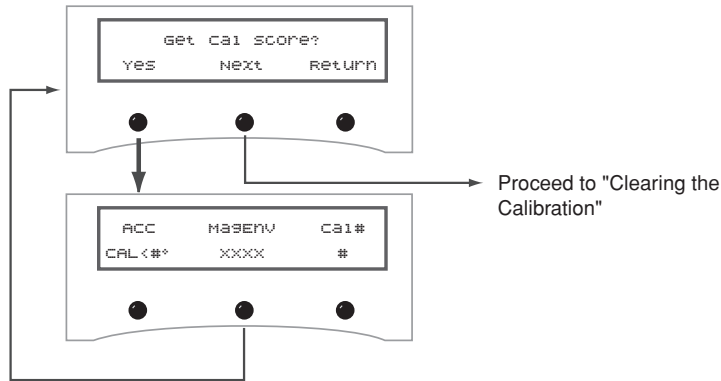
Figure 3-22 Setting Autocalibration



Viewing the Calibration Score

The calibration score should be checked the first time you are underway after installing the TracVision G8 and whenever adjustments are made to vessel equipment that can affect the sensor's accuracy.

Figure 3-23 Viewing Calibration Score



If the system has never been calibrated in the field, the following screen will appear:

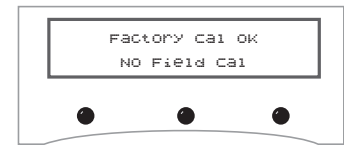
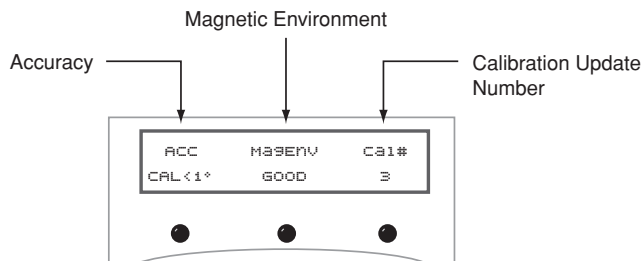


Figure 3-24 Sample Calibration Score Screen



Accuracy (ACC)

The ACC data indicates the sensor's degree of accuracy. Table 3-2 lists the five possible accuracy levels.

Table 3-2 Possible Compass Accuracy Levels

ACC Score	Accuracy
<1°	Better than 1°
<2°	Better than 2°
<4°	Better than 4°
<8°	Better than 8°
BAD CAL	Poor cal

Magnetic Environment (MAGENV)

The MAGENV score (GOOD, OK, POOR, BAD) indicates the quality of the installation location. If the quality is POOR or BAD, the antenna may need to be moved to a more favorable magnetic environment, or the source of magnetic interference needs to be relocated.

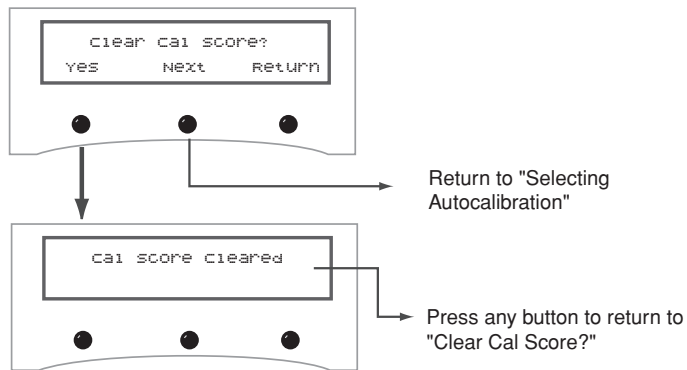
Calibration Update Number (CAL #)

The CAL # indicates the number of times the sensor has calibrated itself. It is used primarily to verify whether a new calibration has been accepted by the system.

Clearing the Calibration

Clearing the calibration resets the system to the factory defaults.

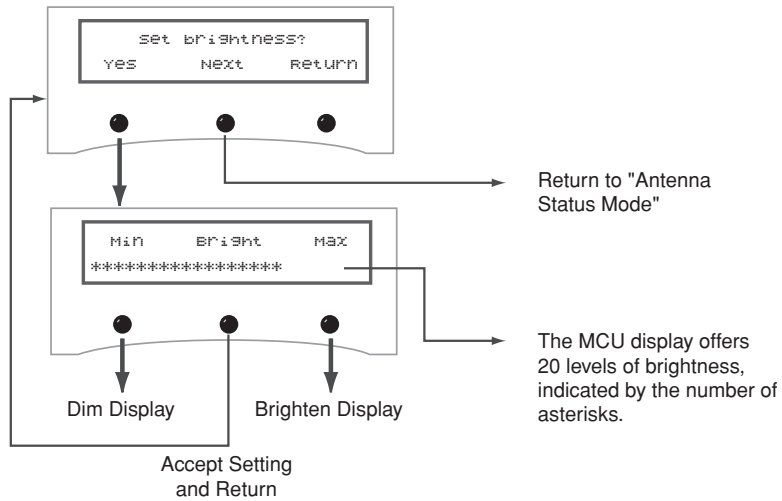
Figure 3-25 *Clearing the Calibration*



Setting Display Brightness

The MCU display's brightness may be adjusted to suit your preferences. Press the right-hand button to make the display brighter; press the left-hand button to make it dimmer. When you are satisfied with the setting, press the center button to accept the setting.

Figure 3-26 *Setting Display Brightness*



4 — Troubleshooting

This section identifies basic trouble symptoms and lists their possible causes and solutions.

Contents

4.1	Troubleshooting Matrix	85
4.2	Causes and Remedies for Common Operational Issues	86
4.3	Receiver Troubleshooting	89
4.4	Antenna Gyro and LNB Faults	89
4.5	Computer Diagnostics	90
4.6	Maintenance Port Parser Commands	91

4.1 Troubleshooting Matrix

The troubleshooting matrix shown in Table 4-1 identifies some trouble symptoms, their possible causes, and references to troubleshooting solutions.

Table 4-1 Troubleshooting Matrix

SYMPTOM	Section 4.2													
	POSSIBLE CAUSE (AND SOLUTION)													
	Power disturbance, blown fuse, or low power	Improper wiring	Vessel turning during startup	Data/power cable interference	Incorrect satellite configuration	Satellite signal blocked	Satellite coverage issue	Radar interference	Satellite frequency data changed	Incorrect or loose RF connectors	Type of multiswitch used	Receiver faulty/improperly configured (Section 4.3)	Antenna gyro faulty (Section 4.4)	LNB assembly faulty (Section 4.4)
Antenna non-functional	1	2												
Antenna not switching satellites via remote		2			1	1	1		3	2	2	2		2
Antenna not switching satellites via MCU		2			1	1	1		3					2
No picture on TV set					1	1	2		2	2	2			2
Certain channels do not work		2			1	1	1		3	2		2		2
Intermittent picture for short intervals			1			1	1	2		2	2		3	2
System works at dock but not on the move						1							3	
System will not find satellite		2	1		1	1	1	2	3	2	2	2	3	2
Snowy television picture		2		1						2		2		
Pixelating television picture		2				1		2		2		2	3	2

Key
 1 = Anyone can do
 2 = Electronics know-how recommended
 3 = Dealer service recommended

4.2 Causes and Remedies for Common Operational Issues

There are a number of common issues that can affect the performance of the TracVision G8. The following sections address these issues and potential solutions.

Power Disturbance, Blown Fuse, or Low Power

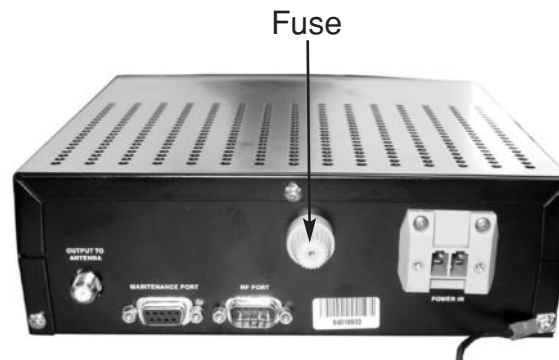
Power Disturbance

If the MCU detects a short in the output to the antenna, the MCU's resettable fuse trips. If this occurs, remove the short then wait one minute for the fuse to reset. If the MCU detects any other power disturbance, such as a voltage spike, the system shuts itself down. If this occurs, simply disconnect power from the MCU, **wait 20 seconds**, then restore power.

Blown Fuse

The antenna unit is equipped with a 5-amp, 125-volt fast-blow fuse on the PCB module. The MCU is equipped with a 15-amp, 125-volt fast-blow fuse on its rear panel. If either of these fuses has blown or been broken, the system will not work. To access the MCU fuse, simply unscrew the fuse holder cap on the rear panel. For details on accessing the antenna's PCB module fuse, refer to *Section 5.5, "Replacing the PCB Module Fuse,"* on page 98.

Figure 4-1 MCU Fuse



Low Power

If the power cable from vessel power to the MCU is more than 50 ft (15 m) in length, the power level can decrease over the course of the cable, resulting in a voltage level at the antenna unit that is too low to power the system. Refer to *"Connecting Vessel Power and the MCU Ground Wire"* on page 36 for details on supplying adequate power to the antenna unit.

Improper Wiring

If the system has been improperly wired, the antenna unit will not operate correctly. Refer to *Section 2.4, "Wiring the MCU,"* on page 35 for complete system wiring information.

Vessel Turning During Startup

If the vessel turns during the two-minute startup sequence that occurs immediately after turning on the power to the TracVision G8, the antenna will record that variable motion as "standing still." This may cause the antenna to track improperly. To solve this problem, turn the TracVision G8 off for at least 10 seconds. Then turn the system back on, ensuring that the vessel is either motionless or traveling in a straight line for the two minutes immediately following power-up.

Data/Power Cable Interference

Depending on how cables are routed, conducted emissions from the system's data/power cable may cause reduced picture quality on your TV screen. If the picture quality degrades only when the TracVision G8 is operating, try installing the small ferrite coil supplied in the kitpack. Simply clamp it onto the data/power cable to reduce its conducted emissions (see Figure 4-2). You might also try grounding the receiver to a suitable earth ground.

Figure 4-2 Small Ferrite Coil



Incorrect Satellite Configuration (European Systems Only)

The satellite configuration on European receivers must match the satellite settings on the TracVision G8 system.

- Satellite A on the TracVision G8 must be the same satellite as receiver Alternative 1 (or A, based on your receiver) and must be assigned the receiver DiSEqC 1 setting.
- Satellite B on the TracVision G8 must be the same satellite as receiver Alternative 2 (or B, based on your receiver) and must be assigned the receiver DiSEqC 2 setting.

Refer to your receiver's user manual for complete instructions on configuring your receiver.

Satellite Signal Blocked

Satellite signals can be blocked or degraded by buildings, other vessels, or equipment on the vessel itself. Refer to *"Choosing the Best Location for the TracVision Antenna"* on page 23 to make certain that the TracVision G8 antenna unit is in the optimal location. Simply moving the vessel to clear an external obstruction will also restore signal quality.



For your convenience, KVH provides links to several web sites that offer satellite coverage information. Simply go to our web site at www.kvh.com/footprint.

Satellite Coverage Issue

TracVision G8 will provide outstanding reception within the 32" (82 cm) antenna coverage area for your satellite television service of choice. However, signal quality can be degraded as you approach the fringe coverage areas. Refer to your satellite television service manual to check the viable coverage area for a 32" (82 cm) antenna.

Radar Interference

The energy levels radiated by radar units can overload the antenna's front-end circuits. Refer to *"Choosing the Best Location for the TracVision Antenna"* on page 23 to make certain that the TracVision G8 antenna unit is in the optimal location with regard to your radar unit.

Satellite Frequency Data Changed

If some channels work, while one or more other channels do not, or the antenna cannot find the satellite, the selected satellite's frequency data may have changed. To update this frequency data, refer to *"Updating Satellite Frequency Data"* on page 74.

Incorrect or Loose RF Connectors

As part of preventive maintenance (described in *Section 5.2, "Preventive Maintenance,"* on page 95) KVH recommends checking the antenna unit's cable connections. A loose RF connector can reduce the signal quality. In addition, if you are unable to switch satellites using your receiver's remote, make sure that your receiver's RF cable is connected to the antenna's RF1 connector (see *Section 2.3, "Connecting the Receiver(s),"* on page 31).

Type of Multiswitch Used

An active (not passive) multiswitch must always be used to connect the TracVision G8 system to multiple receivers. Refer to *Section 2.3, "Connecting the Receiver(s),"* on page 31 for directions on proper multiswitch/multiple receiver cabling.

4.3 Receiver Troubleshooting

The receiver that was provided with your satellite television service may also be the cause of less-than-ideal operation. 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 receiver's user manual for service and warranty information. If the receiver is both configured properly and fully functional, contact your local KVH dealer or service center for assistance.

4.4 Antenna Gyro and LNB Faults

Section 5, "Maintenance," provides detailed instructions for authorized service personnel who may be required to replace one of the antenna gyros or the LNB.



You can download the latest KVH Flash Update Wizard at www.kvh.com/wizard.



If your computer does not have a DB9 serial COM port, you can use the following USB-to-RS232 adapter:

IOGear part number GUC232A (visit www.iogear.com)

4.5 Computer Diagnostics

TracVision G8 provides advanced diagnostic readouts viewed on a PC with an RS-232 serial communication port. If you are unable to isolate a system problem, set up for computer diagnostics as described below. System problems will most likely be found through the diagnostic readouts.

The diagnostics procedure requires either the KVH Flash Update Wizard or Windows HyperTerminal. Use the settings appropriate to your application.

1. Connect one end of the PC data cable to the DB9 maintenance port connector on the rear of the MCU. Connect the other end to the serial port on your PC (a 9-pin/25-pin connector adapter may be needed for some PCs).

Figure 4-3 MCU Maintenance Port



2. If you are using **HyperTerminal**, open HyperTerminal and establish the following settings:
 - Bits per second: 9600
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None



If you are using the **KVH Flash Update Wizard**, double-click the "KVH Flash Update Wizard" shortcut on your computer's desktop to start the wizard. Then go to the "Select board to flash" screen.

3. Apply power to the TracVision G8 system and allow the system to complete full initialization. Data should be scrolling on the PC display to identify any system problems detected. If no data appears, recheck your connections and setup.

4.6 Maintenance Port Antenna Commands

TracVision G8 system antenna commands are detailed in *Appendix D on page 129*.

5 — Maintenance

This section identifies system components that may be replaced in the field, details how to replace those components, and lists preventive maintenance routines.

Contents

5.1	Warranty/Service Information	95
5.2	Preventive Maintenance	95
5.3	TracVision G8 Field Replaceable Units	96
5.4	Accessing Antenna Components Through the Hatch	98
5.5	Replacing the PCB Module Fuse	98
5.6	Replacing the PCB Module	99
5.7	Replacing the RF PCB	101
5.8	Replacing the Internal Sensor	103
5.9	Replacing the Azimuth Gyro	104
5.10	Replacing the Elevation Gyro	106
5.11	Replacing the Azimuth Motor	107
5.12	Replacing the Azimuth Belt	109
5.13	Replacing the Elevation Motor	110
5.14	Replacing the Elevation Belt	112
5.15	Replacing the Skew Motor	113
5.16	Replacing the Skew Belt	116
5.17	Replacing the LNB	117
5.18	Replacing the LNB/Feed Tube Assembly	118
5.19	Preparing for Shipment	120

5.1 Warranty/Service Information

For information on KVH warranty, repair, and liability policies, please refer to the complete warranty statement provided with the product. If you have any questions, please call your local authorized dealer/installer or distributor, or contact KVH or KVH Europe directly.

IMPORTANT! Before returning the product, be sure to obtain an RMA number from KVH's Technical Support Department and write the number on the outside of the box. Shipments received without an RMA number will be returned to you at your expense.

5.2 Preventive Maintenance

TracVision G8 requires minimal preventive maintenance. The following tasks are sufficient to maintain peak performance.

Monthly

- Wash the exterior of the radome and baseplate assembly with fresh water; a mild detergent may be added to remove grime. Use caution when spraying the radome directly with high-pressure water.
- Do not apply abrasive cleaners or volatile solvents such as acetone to the ABS radome.
- Check all connectors at the MCU and receiver. Remove connectors and examine for signs of corrosion; clean as needed.

Semi-Annually

- Remove the radome and examine the interior of the antenna unit for signs of corrosion, loose connections, or frayed or broken wires.
- Check the connectors at the antenna baseplate. Remove connectors and examine for signs of corrosion; clean as needed.



Detailed information on KVH's global support program and how to contact KVH or a dealer near you is available at www.kvh.com/global_support.



When cleaning the radome, avoid any compounds that react with plastic.



The serial number for your TracVision G8 will be required during any troubleshooting or service calls. You will find the serial number on the first page of this manual. (You can also find the serial number by using the MCU's Get Antenna Status mode; see "Antenna Status Data Screens" on page 66 for details.)

5.3 TracVision G8 Field Replaceable Units

If you experience an operating problem or need technical assistance, please contact your local authorized TracVision G8 dealer/installer or distributor. If one is not located nearby, contact KVH or KVH Europe directly at the phone, fax, or e-mail listings on the first page of this manual. Field replaceable units that can be serviced in the field are listed in Table 5-1.

Table 5-1 TracVision G8 Field Replaceable Units

FRU	Part Number
Radome	02-1255
PCB Module	02-1264
RF PCB	02-1342
Master Control Unit (MCU)	02-1265
Azimuth or Elevation Gyro	19-0222
Internal Sensor (with GPS)	02-1266
Azimuth Motor	02-1351
Azimuth Belt	24-0187-0161
Elevation Motor	02-1350
Elevation Belt	24-0105-0137
Skew Motor	19-0110
Skew Belt	24-0124-0144
Standard Circular Dual LNB	02-0870
Standard Circular Dual LNB/Feed Tube Assembly	02-1282-01
DLA Circular Dual LNB Assembly	02-0870-01
DLA Circular Dual LNB/Feed Tube Assembly	02-1282-03
Linear Quad LNB Assembly	02-1323
Linear Quad LNB/Feed Tube Assembly	02-1282-04
Data/power Cable	32-0744-0100
PC Cable	32-0628-06
Receiver Ground Wire	32-0583-50
MCU Fuse	16-0029-15
PCB Module Fuse	16-0029-05



To help us continually improve the quality and reliability of our systems, please return any failed component to KVH or KVH Europe (in care of the mailing address listed on the first page of this manual) after you receive your replacement part.

All field replaceable units may be removed and replaced on site using common hand tools. Other service must be done by your authorized dealer/installer, distributor, or by KVH. Evidence of tampering or unauthorized repairs will void the warranty.

The following sections provide step-by-step procedures for replacing field replaceable units. Figures 5-1 and 5-2 show the locations of a number of components within the antenna unit.



TracVision G8 components receive power from multiple sources. Do not open any electrical assemblies or attempt servicing until receiver power and vessel input power are disconnected.

Figure 5-1 TracVision G8 Antenna Unit (Front View)

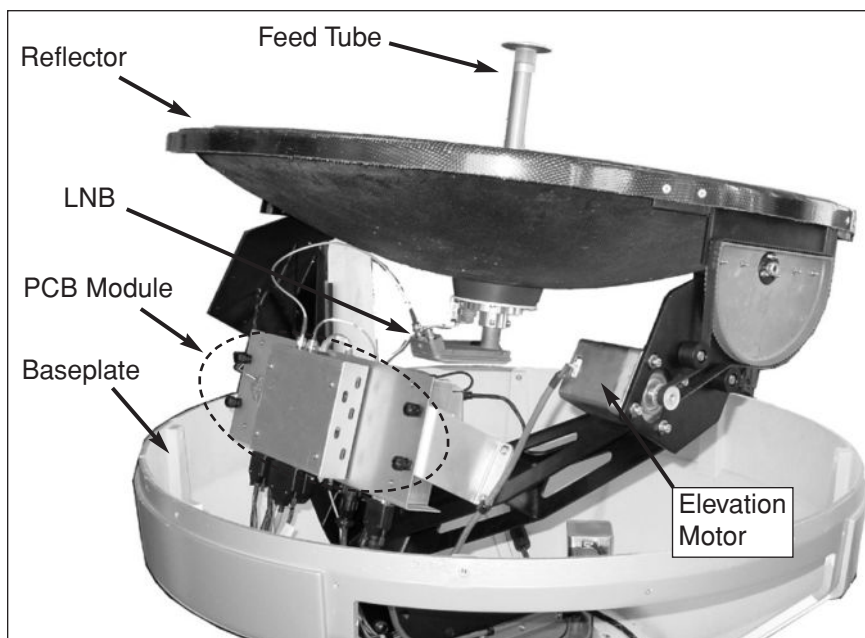
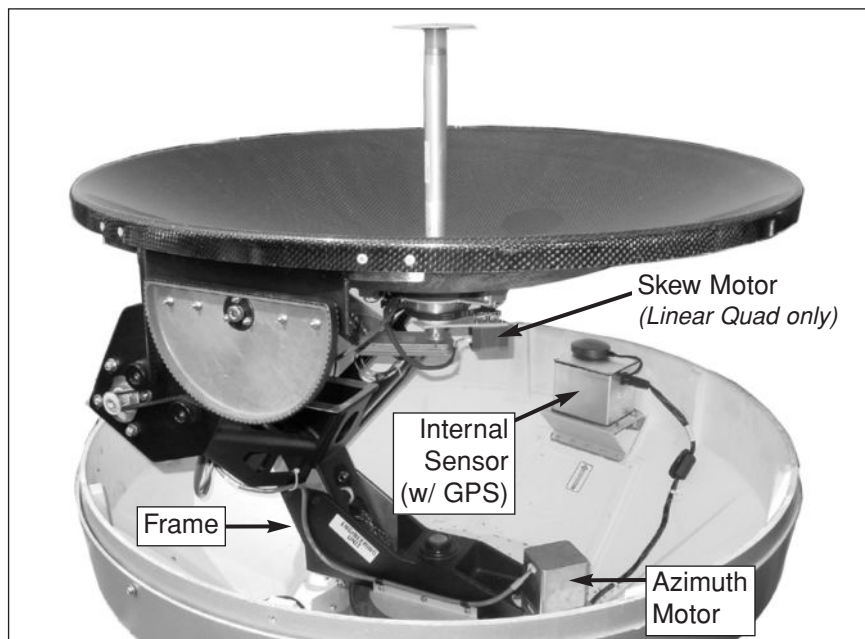


Figure 5-2 TracVision G8 Antenna Unit (Rear View)



5.4 Accessing Antenna Components Through the Hatch

You can access all field replaceable units through the large hatch on the antenna baseplate. You do not need to remove the radome. To remove the hatch cover, simply remove the eleven M4 screws securing the hatch cover to the baseplate.

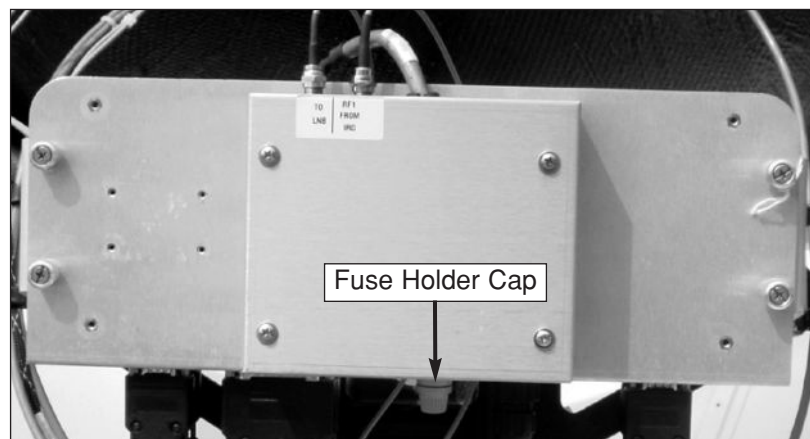
Figure 5-3 Baseplate Access Hatch



5.5 Replacing the PCB Module Fuse

The PCB module is equipped with a 5-amp, 125-volt fast-blow fuse. If this fuse has blown or been broken, simply unscrew the fuse holder cap on the PCB module and replace the fuse.

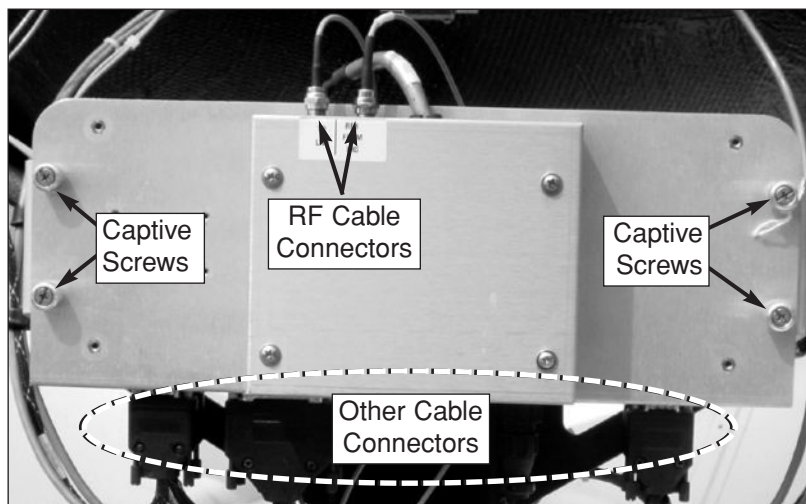
Figure 5-4 PCB Module Fuse Location



5.6 Replacing the PCB Module

1. Follow the steps in *Section 4.5, "Computer Diagnostics,"* on page 90 to connect a PC to the MCU's maintenance port and apply power to the antenna unit.
2. Record the serial number for later re-entry.
3. Disconnect power from the antenna unit and the receiver.
4. Disconnect all cables from the PCB module. Use a $\frac{7}{16}$ " wrench to **carefully** disconnect the two RF cables.

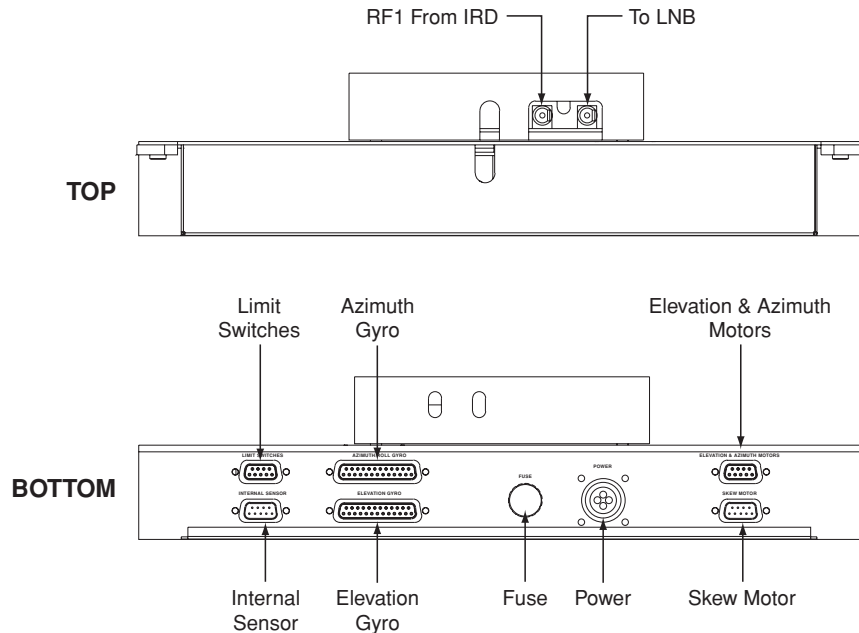
Figure 5-5 PCB Module Connections



5. Loosen the four captive screws securing the PCB module to the antenna frame. Remove the PCB module.
6. Attach the new PCB module to the antenna frame using the module's four captive screws.

7. Reconnect the cables that you removed in Step 4. Be sure to reconnect all cables in their proper positions. Figure 5-6 shows the proper connector assignments.

Figure 5-6 PCB Module Connectors



8. Apply power to the antenna unit.
9. Using the PC connected to the maintenance port, type **HALT** then press Enter.
10. Type **DEBUGON** then press Enter.
11. Type **=TVG8SS** then press Enter.
12. Type **=SERNUM,<serial number>**, where <serial number> = the serial number you recorded in Step 2. Then press Enter.
13. Type **ZAP** then press Enter to restart/reinitialize the system.
14. Calibrate the antenna gyros as explained in "Calibrating the Gyros" on page 105.
15. Reinstall your selected satellites as explained in Section 2.7, "Installing Satellites Using the MCU," on page 42.

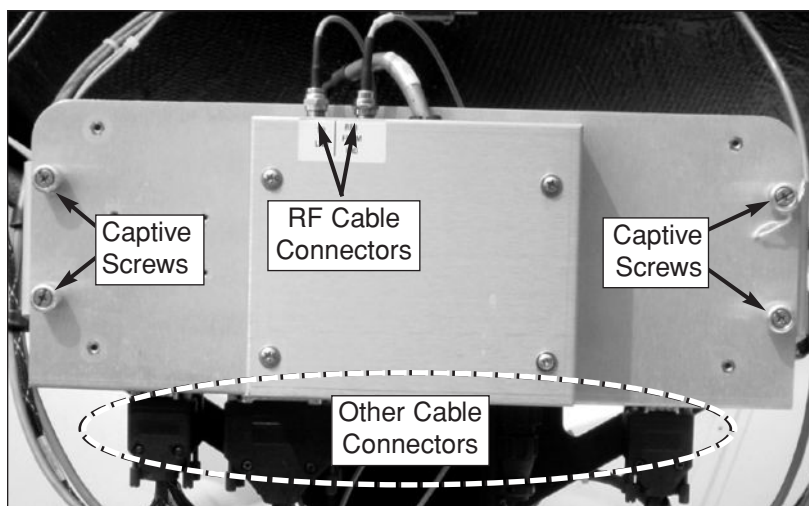
5.7 Replacing the RF PCB

1. Disconnect power from the antenna unit and the receiver.

The RF PCB is protected within a metal enclosure that is fastened to the antenna frame. This PCB module, which contains the main and RF PCBs, must be removed to gain access to the RF PCB.

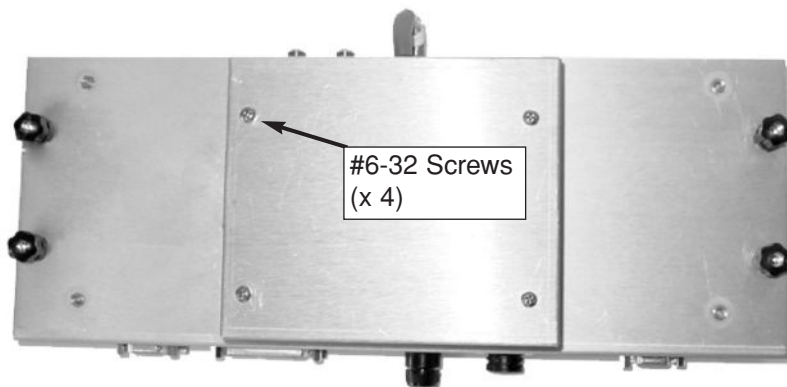
2. Disconnect all cables from the PCB module. Use a $\frac{7}{16}$ " wrench to **carefully** disconnect the two RF cables.

Figure 5-7 PCB Module Connections



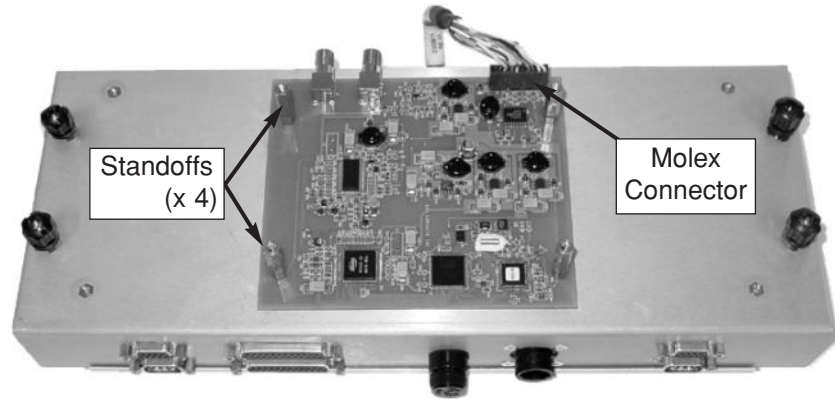
3. Loosen the four captive screws securing the PCB module to the antenna frame. Remove the PCB module and bring it belowdecks for bench work.
4. Remove the four #6-32 screws and flat washers securing the RF PCB cover to the PCB module. Set aside the RF PCB cover.

Figure 5-8 RF PCB Cover



5. Disconnect the Molex connector from the RF PCB.

Figure 5-9 RF PCB

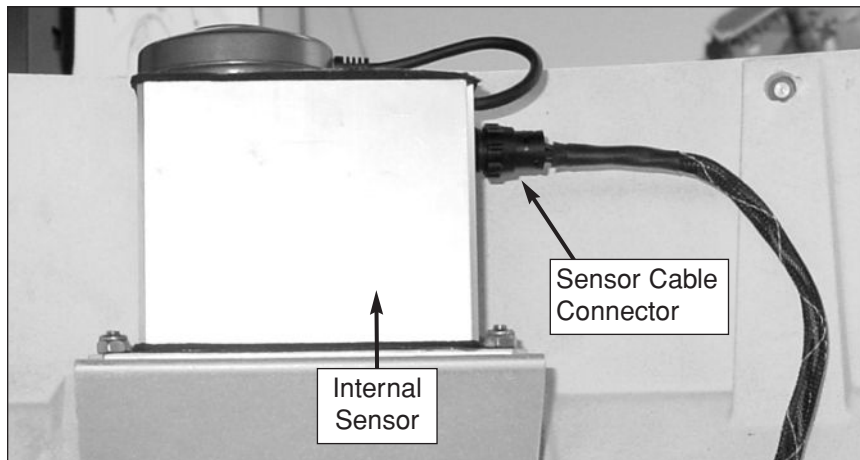


6. Using a $\frac{1}{4}$ " nut driver/socket, remove the four #6-32 standoffs securing the RF PCB to the PCB module (see Figure 5-9). Remove the old RF PCB.
7. Apply a drop of Loctite threadlocker to the screw ends of the four standoffs and secure the new RF PCB to the PCB module with the standoffs.
8. Reconnect the Molex connector that you removed in Step 5, and reinstall the PCB cover that you removed in Step 4.
9. Reattach the PCB module to the antenna frame using the module's four captive screws.
10. Reconnect the cables that you removed in Step 2. Be sure to reconnect all cables in their proper positions. Figure 5-6 on page 100 shows the proper connector assignments.

5.8 Replacing the Internal Sensor

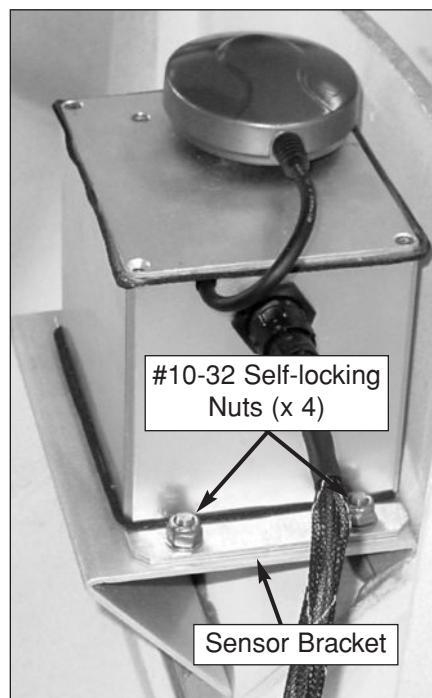
1. Disconnect the sensor cable from the internal sensor assembly.

Figure 5-10 Internal Sensor Assembly (Side View)



2. Using a $\frac{3}{8}$ " nut driver/socket, remove the four #10-32 self-locking nuts and flat washers securing the internal sensor assembly to the sensor bracket. Remove the old internal sensor.

Figure 5-11 Internal Sensor Assembly (Top View)

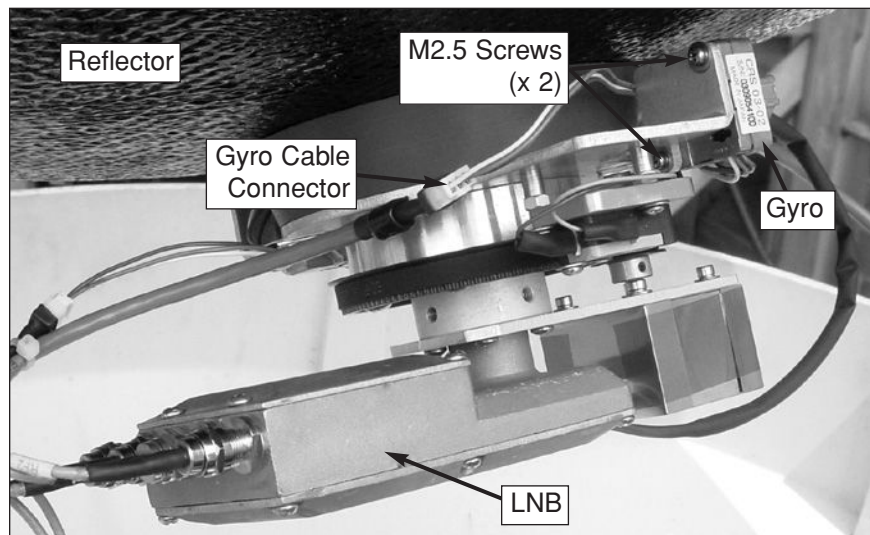


3. Install the new internal sensor. Secure in place with the nuts/washers that you removed in Step 2 and reconnect the sensor cable.
4. With Autocalibration set to "ON," the sensor will calibrate itself when you power up the antenna and maneuver the vessel. The factory default setting for Autocalibration is "ON" (see "Selecting Autocalibration" on page 78).

5.9 Replacing the Azimuth Gyro

1. Disconnect the gyro cable from the in-line connector.

Figure 5-12 Azimuth Gyro



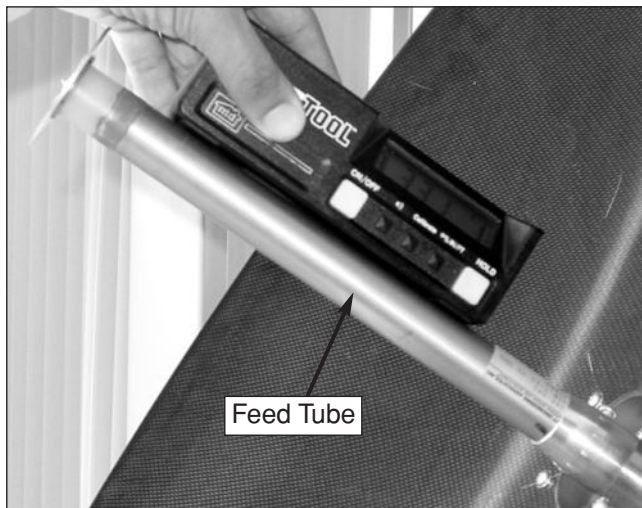
2. Remove the two M2.5 screws securing the gyro to the LNB/feed tube assembly. Remove the old gyro.
3. Apply a drop of Loctite threadlocker to the threads of the screws that you removed in Step 2. Install the new azimuth gyro and secure in place with the two screws.
4. Connect the new gyro cable to the in-line connector that you disconnected in Step 1.
5. Calibrate the gyro as described in "Calibrating the Gyros" on page 105.

Calibrating the Gyros

To calibrate the azimuth and elevation gyros, follow the steps below.

1. Follow the steps in *Section 4.5, "Computer Diagnostics,"* on page 90 to connect a PC to the MCU's maintenance port and apply power to the antenna unit.
2. Type **HALT** then press Enter while the system is performing the limit switch initialization routine. The system will complete the initialization function by finding the azimuth and elevation switch limits and then go to the home position.
3. Type **DEBUGON** then press Enter to enter the Debug Mode.
4. Type **EL,300** then press Enter.
5. Using a digital level (or equivalent), measure and record the angle of the feed tube, as shown in Figure 5-13.

Figure 5-13 Measuring Feed Tube Angle

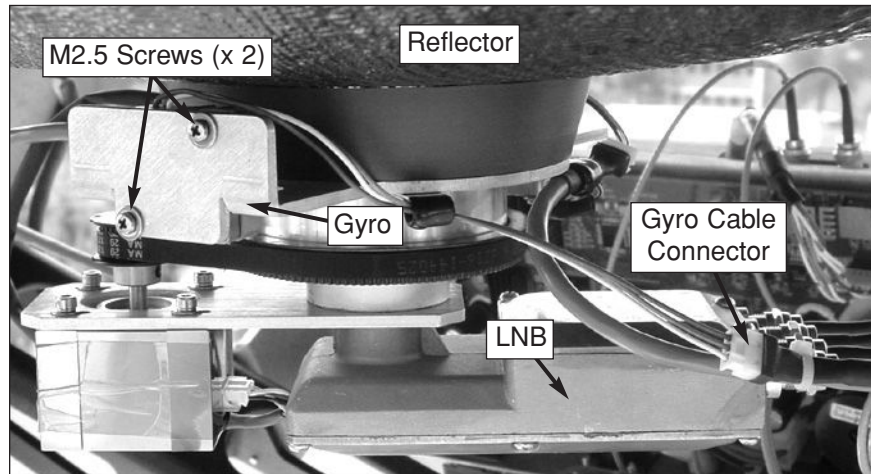


6. Type **=CALUP,XX.X**, where XX.X is the number you recorded in Step 5. Then press Enter.
7. Type **=CALGYRO** then press Enter. Verify that the Antenna Gyro Azimuth scale factor is between -0.00090 and -0.00110 and the Antenna Gyro Elevation scale factor is between 0.00090 and 0.00110.
8. Type **ZAP** then press Enter to restart/reinitialize the system.

5.10 Replacing the Elevation Gyro

1. Disconnect the gyro cable from the in-line connector.

Figure 5-14 Elevation Gyro

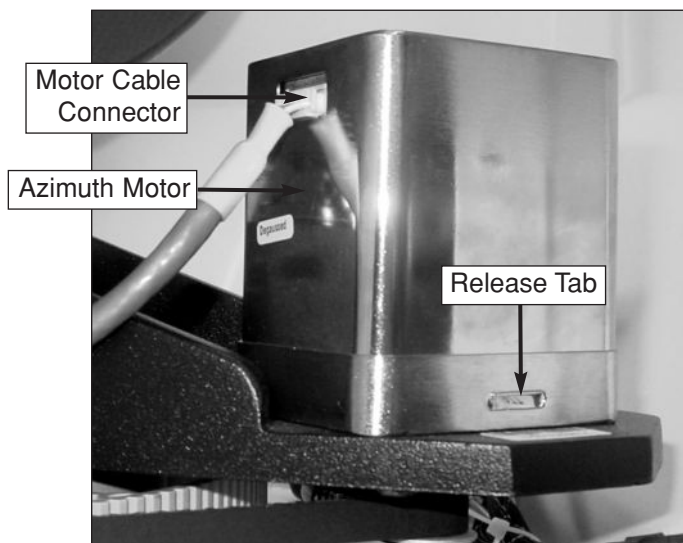


2. Remove the two M2.5 screws securing the gyro to the LNB/feed tube assembly. Remove the old gyro.
3. Apply a drop of Loctite threadlocker to the threads of the screws that you removed in Step 2. Install the new elevation gyro and secure in place with the two screws.
4. Connect the new gyro cable to the in-line connector that you disconnected in Step 1.
5. Calibrate the gyro as described in *“Calibrating the Gyros”* on page 105.

5.11 Replacing the Azimuth Motor

1. Disconnect the motor cable from the azimuth motor.

Figure 5-15 Azimuth Motor Cable



2. Remove the motor shield by pressing on the two sides of the shield above the release tabs.
3. Remove the four #8-32 screws and locking nuts securing the motor to the antenna frame. Remove the old azimuth motor.

Figure 5-16 Azimuth Motor (Shield Removed)

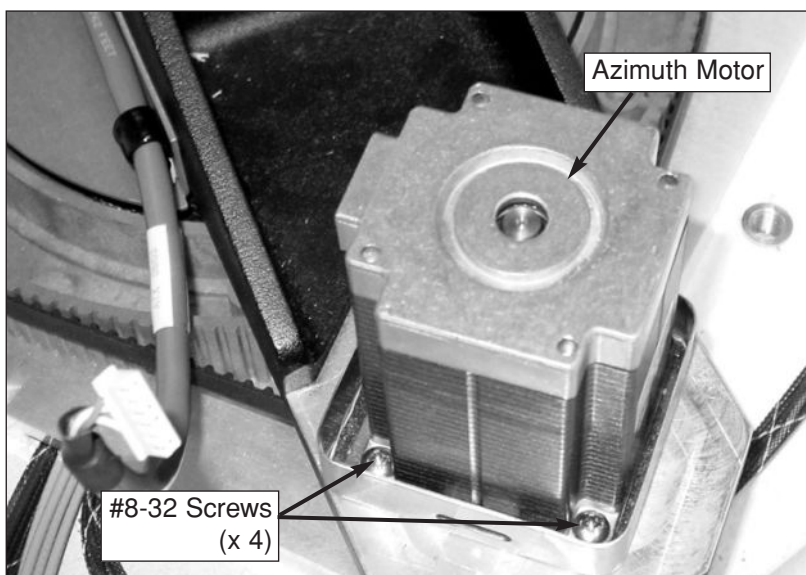
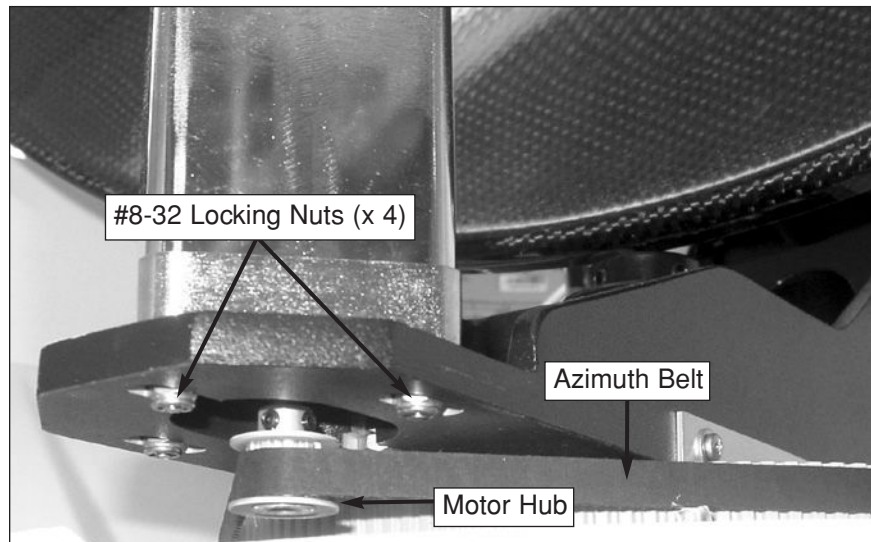
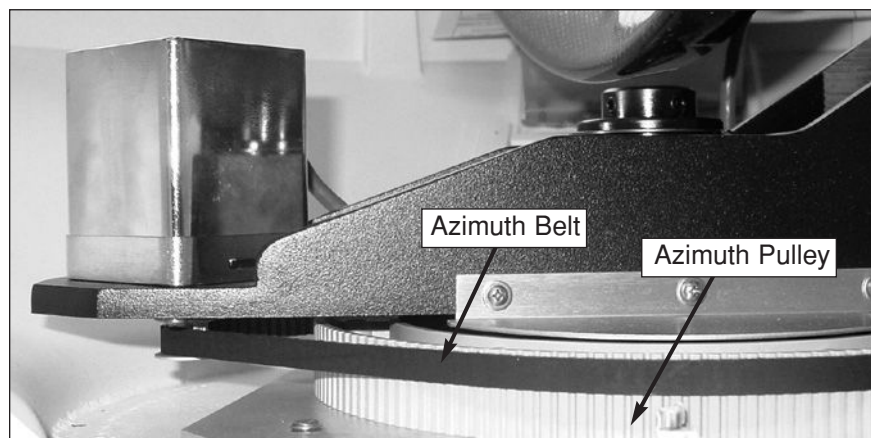


Figure 5-17 Azimuth Motor and Belt



4. Install the new azimuth motor with the belt positioned around the outer lip of the motor hub (see Figure 5-17). Reinstall the screws and locking nuts that you removed in Step 3, but do not tighten them yet.
5. Slide the motor until the belt is tight around the motor hub and azimuth pulley. Then tighten the screws and locking nuts. *Some readjustment may be necessary if the belt tension results in excessive vibration.*

Figure 5-18 Azimuth Belt

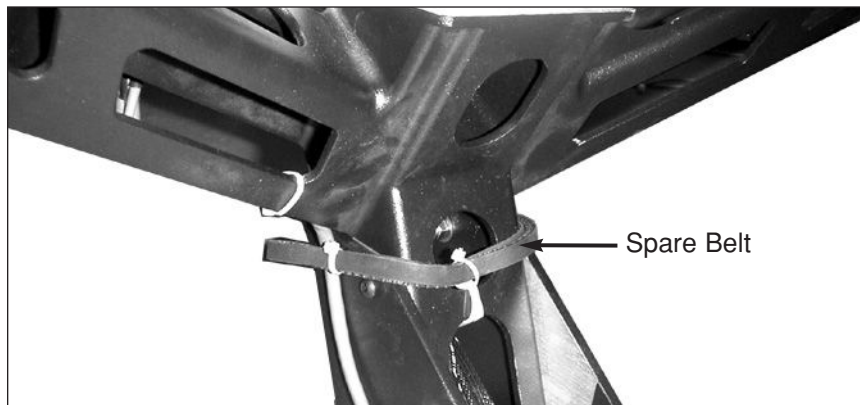


6. Reinstall the shield that you removed in Step 2.
7. Reconnect the motor cable that you removed in Step 1.

5.12 Replacing the Azimuth Belt

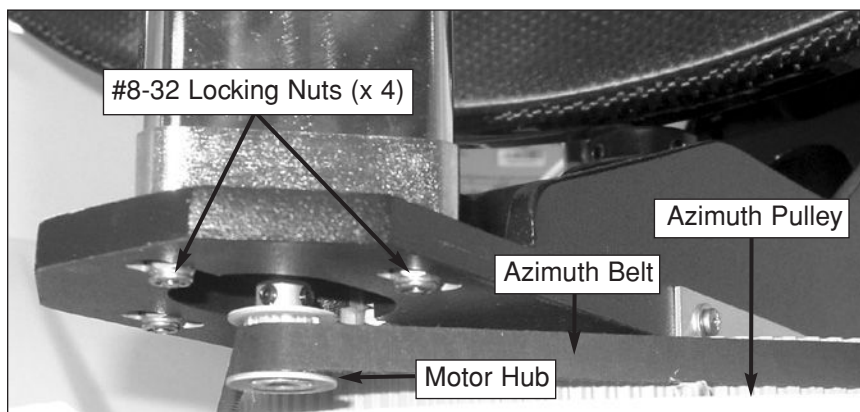
1. Cut and discard the old belt.
2. Cut the tie-wraps securing the spare belt to the antenna frame.

Figure 5-19 Spare Azimuth Belt Attached to Frame



3. Carefully work the spare belt around the azimuth motor hub and around the azimuth pulley. Ensure that the teeth are on the inside of the belt. Once the belt is in place, work it back and forth to ensure that the belt is aligned and the teeth are engaged with the pulley and motor hub. Ensure that the belt fits tightly around the pulley and hub. (To tighten the belt, loosen the azimuth motor's #8-32 locking nuts, slide the motor until the belt is tight, then retighten the locking nuts.)

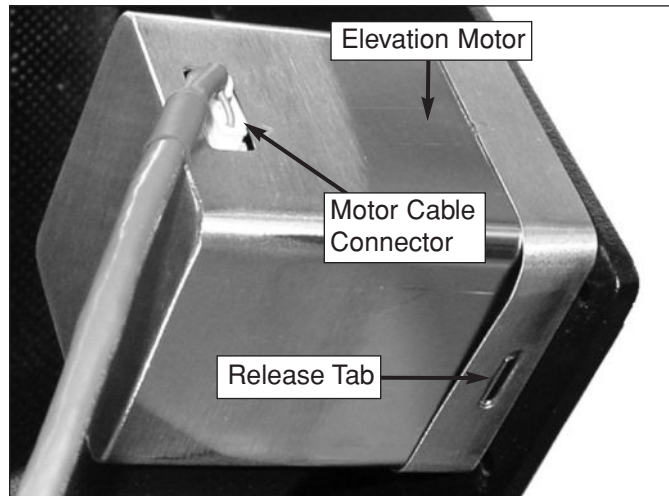
Figure 5-20 Azimuth Belt



5.13 Replacing the Elevation Motor

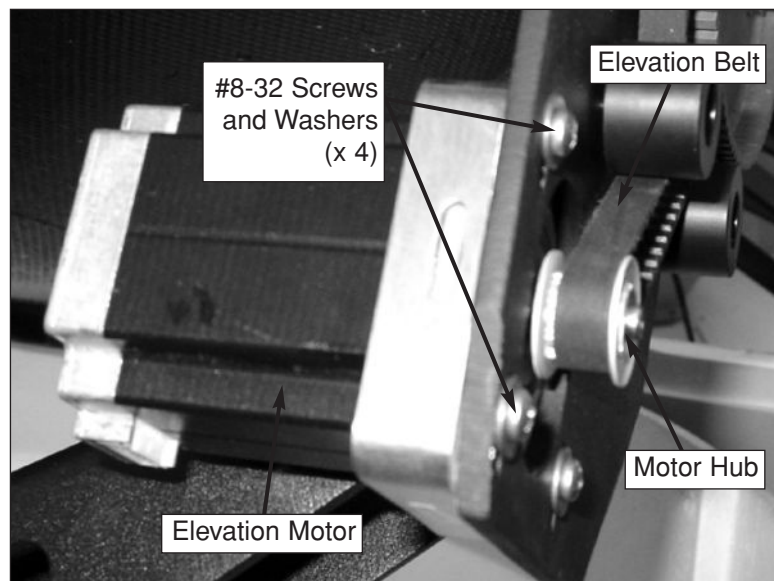
1. Disconnect the motor cable from the elevation motor.

Figure 5-21 Elevation Motor Cable



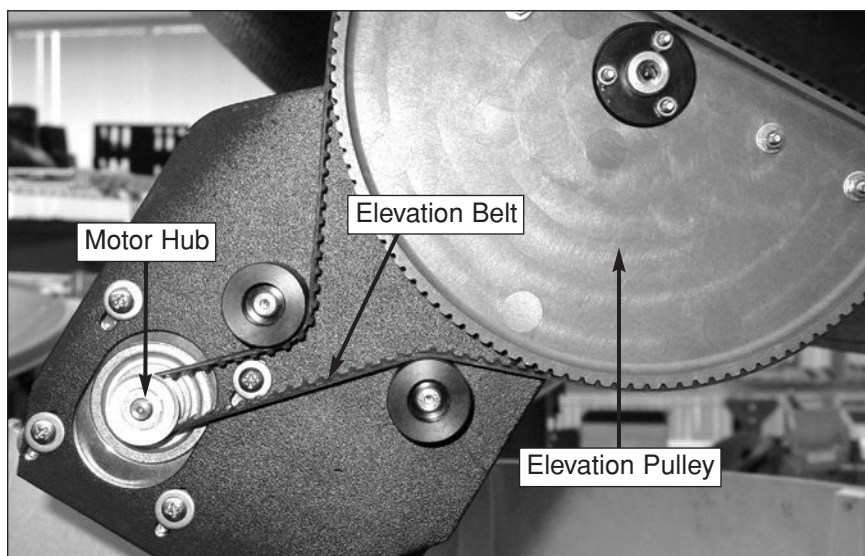
2. Remove the motor shield by pressing on the two sides of the shield above the release tabs.
3. Remove the four #8-32 screws and washers securing the motor to the antenna frame. Remove the old elevation motor.

Figure 5-22 Elevation Motor (Shield Removed)



4. Install the new elevation motor with the belt positioned around the outer lip of the motor hub. Reinstall the screws and washers that you removed in Step 3, but do not tighten them yet.
5. Slide the motor until the belt is tight around the motor hub and elevation pulley. Tighten the screws. *Some readjustment may be necessary if the belt tension results in excessive vibration.*

Figure 5-23 Elevation Belt

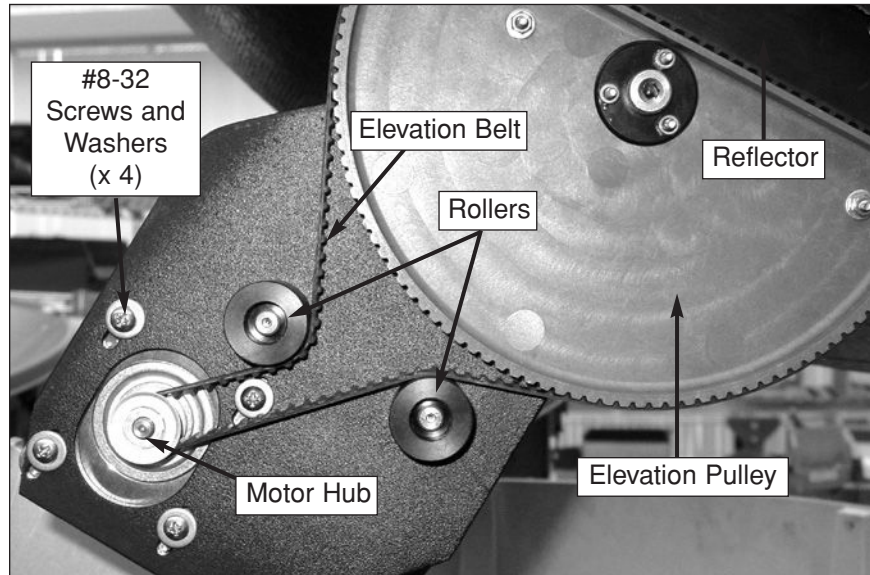


6. Reinstall the shield that you removed in Step 2.
7. Reconnect the motor cable that you removed in Step 1.

5.14 Replacing the Elevation Belt

1. Loosen (do not remove) the four #8-32 screws securing the motor to the antenna frame until the motor is free to slide upward. Raise the motor to the top of the slots and retighten the screws to hold it in place.

Figure 5-24 Elevation Belt

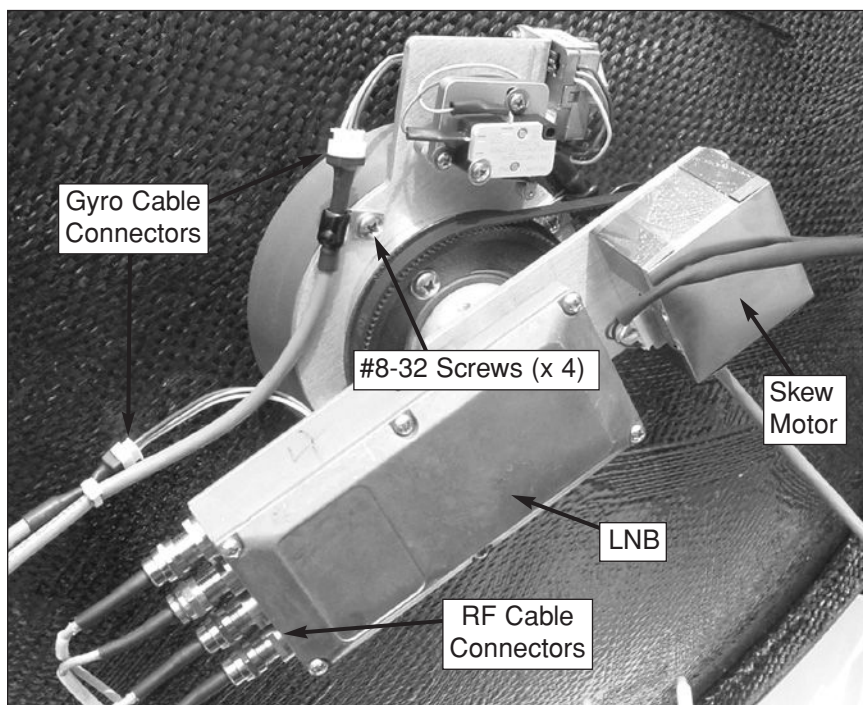


2. Roll the belt over the motor hub, then over the elevation pulley. Discard the old belt.
3. Carefully work the new belt around the elevation pulley, between the rollers, and around the motor hub. Ensure that the teeth are on the inside of the belt. Once the belt is in place, work it back and forth to ensure that the belt is aligned and the teeth are engaged with the pulley.
4. Loosen the #8-32 screws and slide the motor downward until the belt is tight around the motor hub and the elevation pulley. *Some readjustment may be necessary if the belt tension results in excessive vibration.*
5. Tighten the motor screws.

5.15 Replacing the Skew Motor (Linear Quad LNB Systems Only)

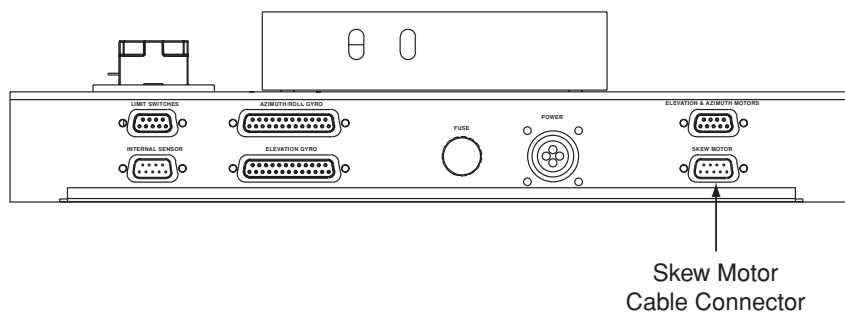
1. Using a $\frac{7}{16}$ " wrench, carefully disconnect the four RF cables from the LNB.

Figure 5-25 Linear Quad LNB/Feed Tube Assembly



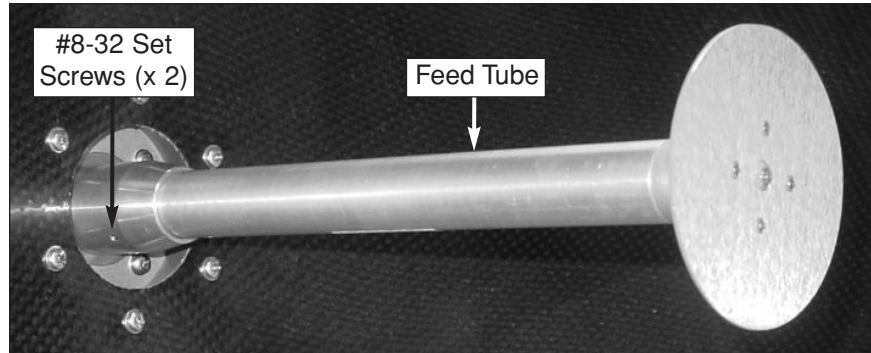
2. Disconnect the elevation and azimuth gyro cables from the in-line connectors.
3. Disconnect the skew motor cable from the PCB module.

Figure 5-26 Skew Motor Cable Connector on PCB Module



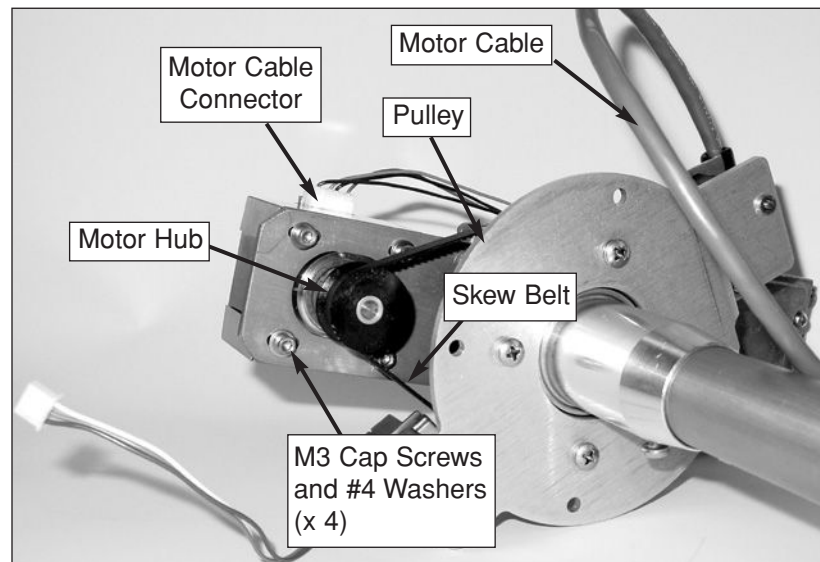
- Using a $\frac{3}{4}$ " allen key, loosen the two #8-32 set screws securing the feed tube in the LNB/feed tube assembly collar. Remove the feed tube.

Figure 5-27 Removing the Feed Tube



- Remove the four #8-32 screws securing the LNB/feed tube assembly to the reflector base (see Figure 5-25). Remove the LNB/feed tube assembly.
- Disconnect the motor cable from the skew motor.

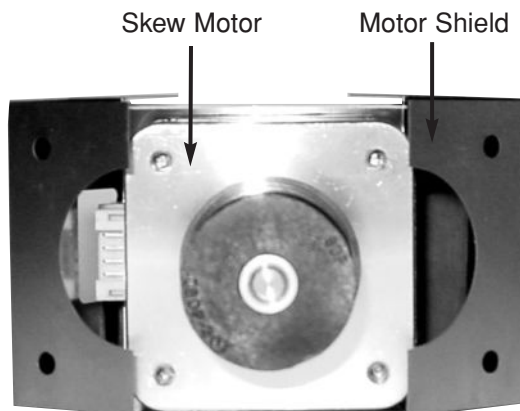
Figure 5-28 Skew Motor and Belt



- Using a 2.5 mm allen wrench, remove the four M3 cap screws and #4 washers securing the motor to the LNB/feed tube assembly (see Figure 5-28). Remove the old skew motor.

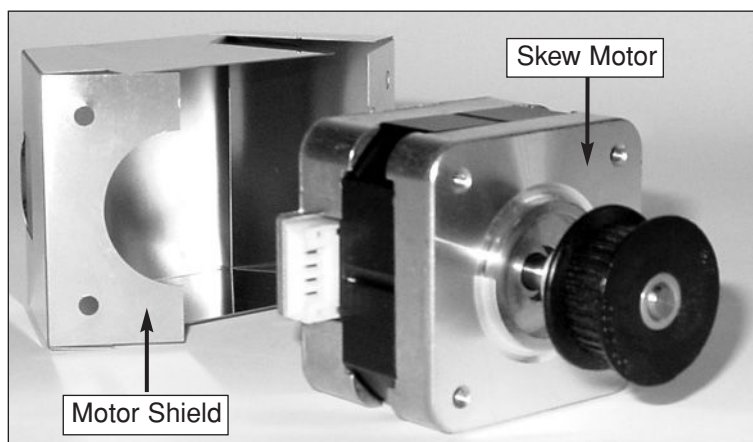
8. Gently extend the two sides of the motor shield and remove the shield from the old skew motor.

Figure 5-29 Removing the Skew Motor Shield



9. Place the new skew motor inside the motor shield. The motor's connector should pass through the small opening in the shield.

Figure 5-30 Installing the Skew Motor Shield



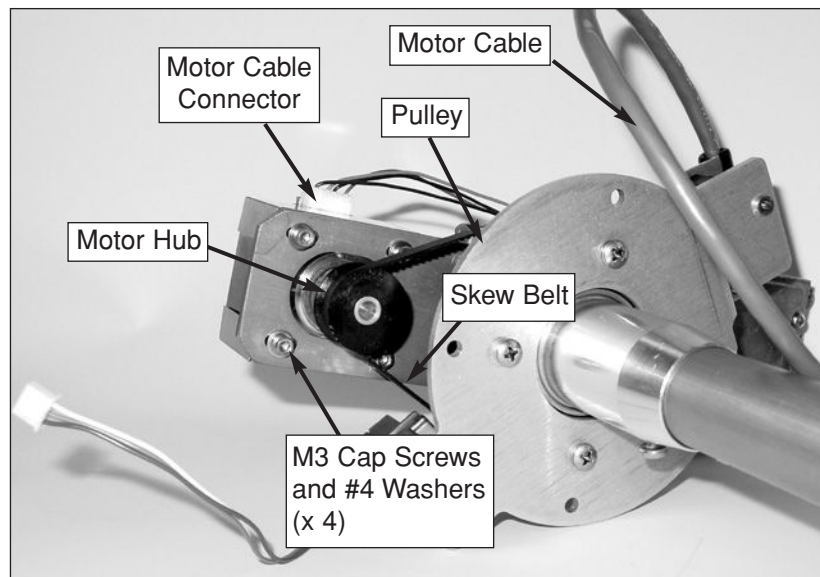
10. Attach the new skew motor to the LNB/feed tube assembly with the belt positioned around the outer lip of the motor hub. Ensure that the motor's connector is facing the motor cable, as shown in Figure 5-28. Reinstall the washers and screws that you removed in Step 7, but do not tighten them yet.
11. Slide the motor to adjust the belt tension until the belt teeth fully engage the motor hub and the pulley. Tighten the motor cap screws. *Some readjustment may be necessary if the belt tension results in excessive vibration.*

12. Reconnect the motor cable that you removed in Step 6.
13. Apply a small amount of Loctite threadlocker to the threads of the four #8-32 screws that you removed in Step 5.
14. Carefully reattach the LNB/feed tube assembly to the antenna reflector and secure in place with the four #8-32 screws.
15. Apply a small amount of Loctite threadlocker to the threads of the two #8-32 set screws that you loosened in Step 4.
16. Carefully insert the feed tube into the feed tube assembly collar and secure in place with the #8-32 set screws.
17. Reconnect the cables you removed in Steps 1, 2, and 3.

5.16 Replacing the Skew Belt (Linear Quad LNB Systems Only)

1. Follow Steps 1 through 5 of the previous section.
2. Using a 2.5 mm allen wrench, loosen (do not remove) the four M3 cap screws securing the motor to the bracket until the motor is free to slide back and forth. Slide the motor toward the pulley to loosen the belt.

Figure 5-31 Skew Motor and Belt

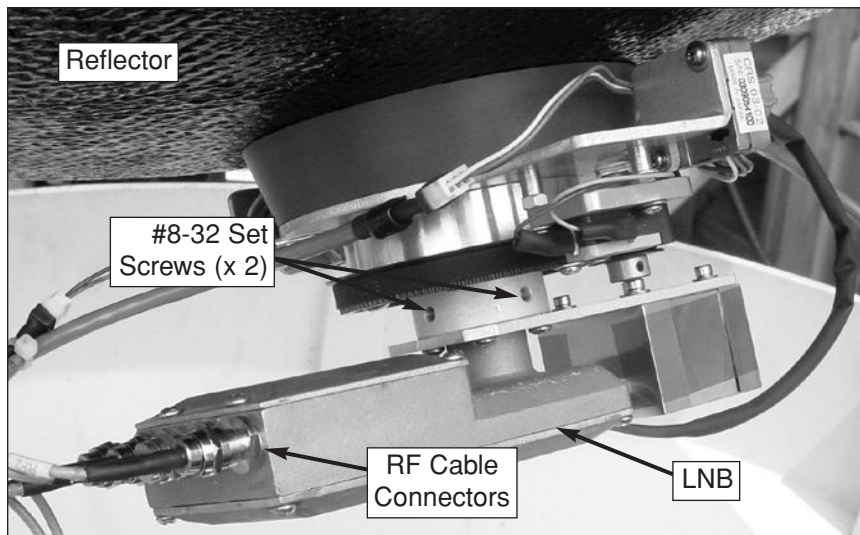


3. Roll the belt over the motor hub, then over the pulley. Remove and discard the old belt.
4. Place the new belt around the pulley and around the motor hub. Ensure that the teeth are on the inside of the belt.
5. Slide the motor back until the belt is set at the proper tension. Adjust the belt tension until the belt teeth fully engage the motor hub and the pulley. *Some readjustment may be necessary if the belt tension results in excessive vibration.*
6. Once the belt is at the proper tension, tighten the motor's four M3 cap screws.
7. Follow Steps 13 through 17 of the previous section.

5.17 Replacing the LNB

1. Using a $\frac{7}{16}$ " wrench, carefully disconnect the RF cables from the LNB.

Figure 5-32 LNB (Linear Quad Version Shown)

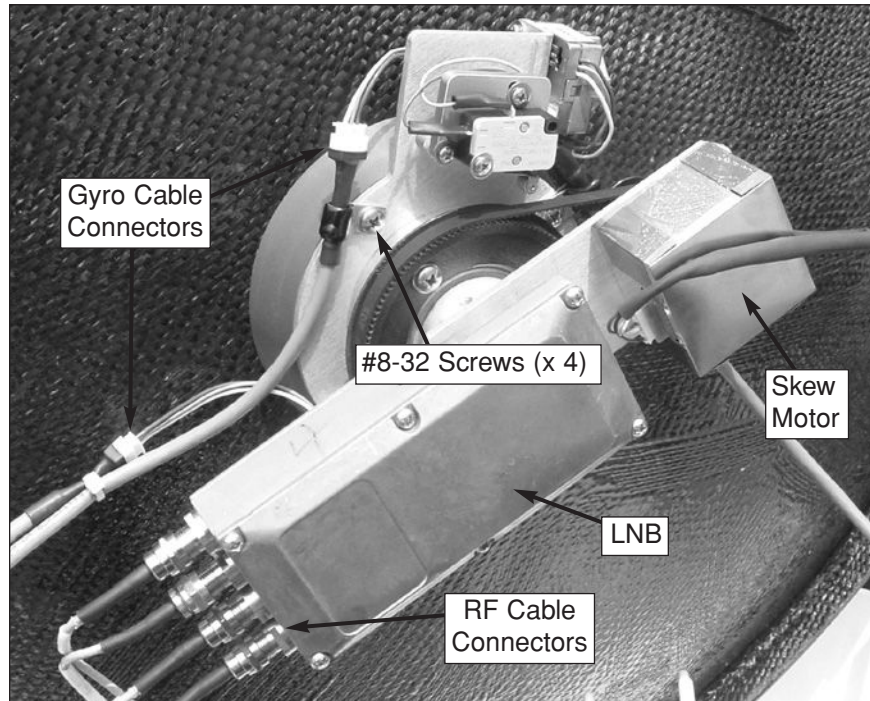


2. Using a $\frac{3}{4}$ " allen key, loosen the two #8-32 set screws securing the LNB in place. Remove the old LNB.
3. Install the new LNB and secure in place with the #8-32 set screws.
4. Using a $\frac{7}{16}$ " wrench, carefully reattach the RF cables that you removed in Step 1.

5.18 Replacing the LNB/Feed Tube Assembly

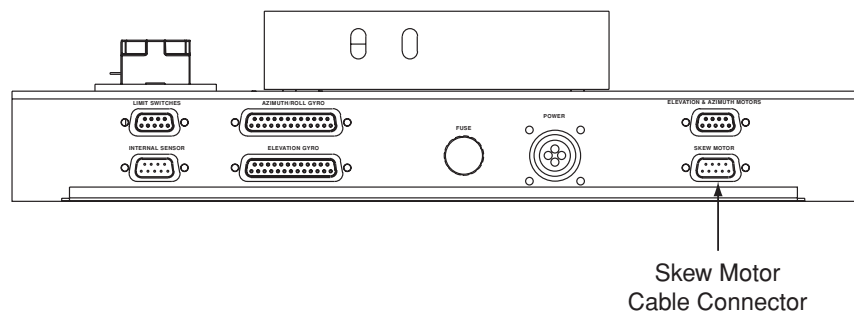
1. Using a $\frac{3}{16}$ " wrench, carefully disconnect the RF cables from the LNB.

Figure 5-33 LNB (Linear Quad version Shown)



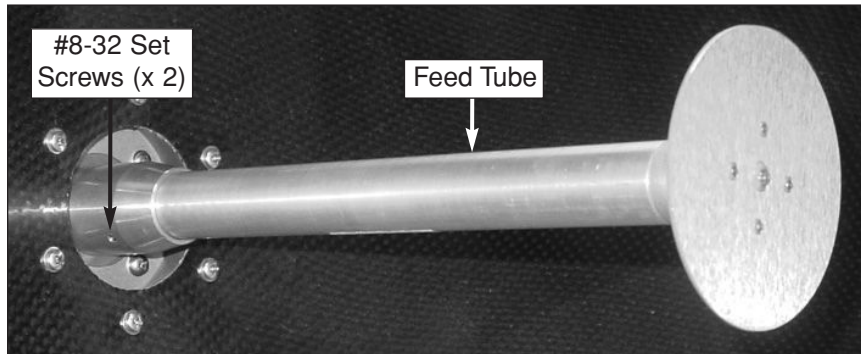
2. Disconnect the azimuth and elevation gyro cables from the in-line connectors.
3. *Linear quad LNB systems only:*
Disconnect the skew motor cable from the PCB module (see Figure 5-34).

Figure 5-34 Skew Motor Cable Connector on PCB Module



- Using a $\frac{5}{16}$ " allen key, loosen the two #8-32 set screws securing the feed tube in the LNB/feed tube assembly collar. Remove the feed tube.

Figure 5-35 Removing the Feed Tube



- Remove the four #8-32 screws securing the LNB/feed tube assembly to the reflector base (see Figure 5-33). Remove the LNB/feed tube assembly.
- Apply a small amount of Loctite threadlocker to the threads of the four #8-32 screws that you removed in Step 5.
- Install the new LNB/feed tube assembly and secure in place with the #8-32 screws.
- Apply a small amount of Loctite threadlocker to the threads of the two #8-32 set screws that you loosened in Step 4.
- Carefully insert the new feed tube into the feed tube assembly collar and secure in place with the #8-32 set screws.
- Reconnect the cables you removed in Steps 1, 2, and 3.



When rotating the azimuth mechanism by hand, go slowly! Hitting the mechanical stops with excessive force will damage the azimuth limit switch.



KVH is not liable for damage caused by improper shipping.



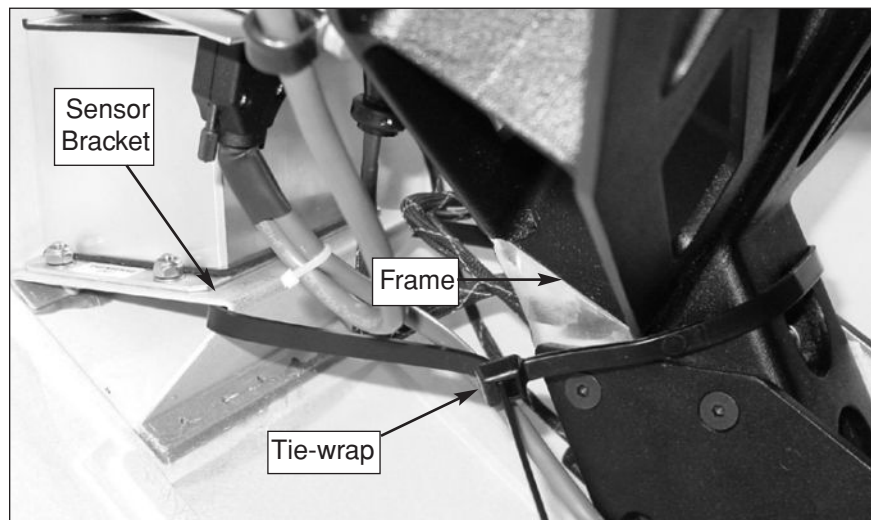
Before returning the product, be sure to obtain an RMA number from KVH's Technical Support Department and write the number on the outside of the box. Shipments received without an RMA number will be returned to you at your expense.

5.19 Preparing for Shipment

If you need to repack the antenna unit for shipment, the shipping restraint that was removed during installation must be reattached. Follow the steps below to reinstall the restraint and get the antenna unit ready for shipping.

1. Using a heavy-duty tie-wrap (which was detached at the time of installation), secure the antenna frame to the internal sensor's mounting bracket.

Figure 5-36 Azimuth Shipping Restraint



2. Place some foam between the reflector and the baseplate to keep the reflector from moving.
3. Pack the TracVision G8 antenna unit in its original package. Secure the box to a pallet to ensure upright transport.
4. As detailed in the warranty accompanying this product, a Return Material Authorization (RMA) number is required prior to the return of the TracVision G8 system to KVH. Contact the KVH Technical Support Department at +1 401 847-3327 or via e-mail at techs@kvh.com to obtain the RMA number. Please review your warranty to familiarize yourself with all requirements, liabilities, and policies.

Appendices

This section contains several appendices of supplemental information, including a mounting template, startup data, and antenna commands.

Contents

A	System Specifications	123
B	MCU Flush Mount Panel Template	125
C	Startup Data Sequence	127
D	Maintenance Port Antenna Commands	129

Appendix A

System Specifications

Physical Characteristics

Antenna Unit	39" (99 cm) h x 35" (89 cm) dia; 85 lbs (38.6 kg)
MCU	7.3" (18.5 cm) d x 8.2" (20.8 cm) w x 2.6" (6.6 cm) h
Operating temperature	-13°F to +130°F (-25°C to +55°C)
Storage temperature	-40°F to +185°F (-40°C to +85°C)

Input Power

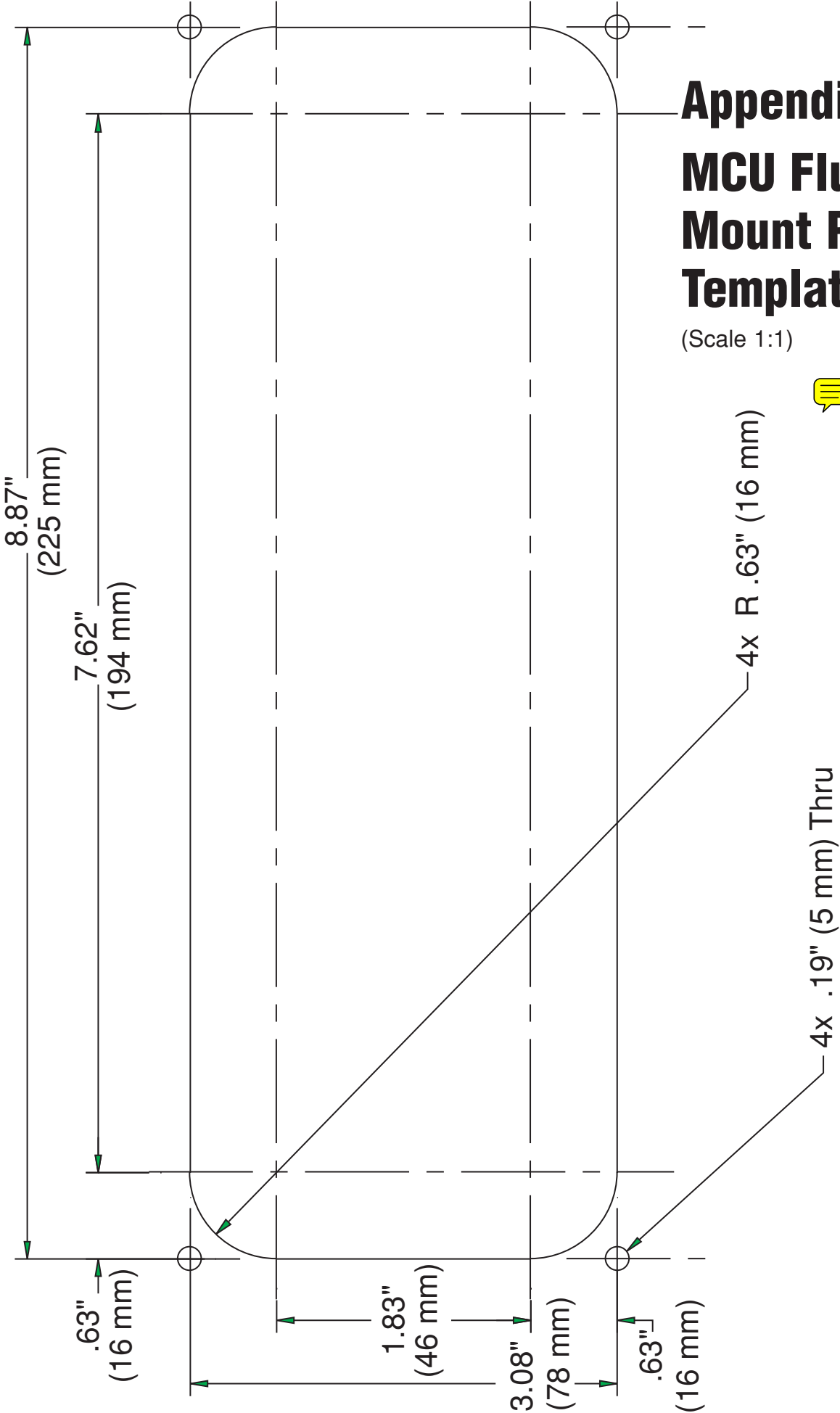
Input	9-36 VDC, 120 W max. (90 W typical) Power to the antenna is galvanically isolated from input power
-------	--

Antenna System Performance

Minimum EIRP	44 dBW
Elevation range	-15° to +85°
Azimuth range	720°
Tracking rate	30°/second
Position repeatability	0.1°
Skew control	Automatic
GPS	Internal
Antenna dish	32" (82 cm) dia
LNB	Three variations: <ul style="list-style-type: none"> • Standard circular dual LNB • DLA circular dual LNB • Linear quad LNB
Surge/sway/heave	±0.2 G
Shock	20 G, 11 msec
Vibration	0.9 G rms over 5-33 Hz

Appendix B MCU Flush Mount Panel Template

(Scale 1:1)



Appendix C

Startup Data Sequence

The data on the following pages presents a sample startup data sequence registered by the TracVision G8. This sequence may vary based on the software version loaded onto the TracVision G8 system. This data can be recorded using the maintenance port and a PC.

```
TracVision G8 Controller Rev X - Ver X.XX - Serial number XXXXXXXX - HW Rev XX
*** Init RF Board ***
RF: S,A,H,U,V
RF: SATINSTALL,55,C,57,C
RF: L,A-----Identifies Satellite A or B as currently
RF: SATCONFIG                               loaded for acquisition
RF: F,A,12368,20000,67,0xFFFE,R,U,2-----Satellite Configuration Data, Satellite A
RF: F,A,12368,20000,67,0xFFFE,R,U,2
RF: F,A,12238,20000,67,0xFFFE,L,U,2
RF: F,A,12238,20000,67,0xFFFE,L,U,2
RF: F,B,12370,20000,56,0x1004,R,U,3-----Satellite Configuration Data, Satellite B
RF: F,B,12370,20000,56,0x1004,R,U,3
RF: F,B,12326,20000,56,0x1004,L,U,3
RF: F,B,12326,20000,56,0x1004,L,U,3
RF: RF PCB Version X.X-----Current RF software revision
RF COMM: PASS-----PASS is expected
RF: DVB/DSS 5
*** Init Antenna ***
*** NO GPS-Default Used ***-----GPS has no lock upon power-up
GPS(DEFAULT),41,N, 71,W,083000.00
GPS: DSS_101 AZ = 220.8, EL = 33.4
GPS: DSS_119 AZ = 238.9, EL = 22.1
Saved Position: DSS_101 AZ = 232.2, EL = 37.7
Saved Position: DSS_119 AZ = 250.3, EL = 26.4
*** Limit Switch Test ***
Limit Switch Status: PASS-----PASS is expected
*** Init Sensor ***
Sensor Status = @@
CAL SCORE = 100-----Internal sensor data (100 = no field cal)
SENSOR: PASS-----PASS is expected
*** Init Rate Bias ***
RF: First lock-----Indicates satellite found that has the
RF: S,A,H,U,V                               frequency, symbol rate, and FEC code
BIAS/RF: 2056 2134 2577                               of the selected satellite
BIAS/RF: 2082 2053 2584
BIAS/RF: 2092 1990 2564
BIAS/RF: 2086 2029 2573
BIAS/RF: 2065 2082 2543
```



```

BIAS/RF: 2057 2185 2583
BIAS/RF: 2032 2146 2572
Check cal gyro to rate bias
BiasLimit =      8.00 BiasFOGLimit =      0.0003 BiasCorrection =      5.00
Gyro Bias: Az = 2069.15, Cal Az = 2067.98 -----Expected range is 1700-2300
Gyro Bias: El = 2050.04, Cal El = 2049.54
Gyro Bias: Az = 2069.15, El = 2050.04, Az FOG =      0.000300
Gyro Uncertainty: Az =      3.00, El =      3.00
GPS(ACTIVE),41.52,N, 71.28,W, 083000.00-----GPS position data (latitude, longitude, UTC)
GPS: DSS_101 AZ = 259.4, EL = 34.1 -----Calculated satellite position based on GPS
*** Entering Tracking ***
+POS: 351.2  37.2 2531
%PRY:  1.2  -2.1 242.4 -----Internal sensor data (pitch, roll, and yaw)
*** Network ID Check ***-----Comparing the tracked satellite's network ID to
+POS: 351.2  36.8 2554                                     the selected satellite's network ID
%PRY:  1.4  -2.2 242.3
RF: Y,0xFFFE-----Indicates positive satellite identification
*** Tracking DSS_101 ***-----Identifies satellite currently tracked
Avg:  37.6  0.0  0.0  0.0  0.0                                     (TV broadcast image should be available)
Set con radius to 0.250 and 0.250
RF: IGNORE ID,0x0000
+POS: 352.0  35.8 2634
%PRY:  1.2  -2.2 242.2
Avg:  37.6  37.1  36.9  36.5  37.0
Saved Sat Pos: AZ = 233.0, EL = 37.0
+POS: 351.9  36.2 2606
%PRY:  1.2  -1.8 242.2
Rate Bias (Before): Az = 2.0692e+03 EL = 2.0500e+03
Rate Bias (After): Az = 2.0692e+03 EL = 2.0500e+03
Gyro Bias Residue: Az = -1.7217e-01 EL = 2.8887e-01
+POS: 352.0  36.1 2600
%PRY:  1.6  -2.3 242.3
+POS: 351.5  35.8 2576
%PRY:  1.2  -2.2 242.2
Conscan=>sleep: sat in 1.75 deg window.
+POS: 351.8  35.9 2611
%PRY:  1.2  -1.9 242.2
Sleeping
Old Gyro Bias: Az = 2069.20 EL = 2049.97
New Gyro Bias: Az = 2069.37 EL = 2049.68
RF: AGC=58792
Avg:  36.7  37.1  36.9  36.5  37.0
Saved Sat Pos: AZ = 232.6, EL = 36.9
+POS: 351.8  35.9 2610
%PRY:  1.2  -2.0 242.4

```

Appendix D

Maintenance Port Antenna Commands

The TracVision G8 system commands are parsed when the system receives an ASCII carriage return (Hex 0D). An ASCII line feed (Hex 0A) is permitted but is ignored in any transmitted command. All system responses are terminated with an ASCII carriage return followed by a line feed and ending with either an acknowledge character (ASCII > (Hex 3E)) or a not-acknowledge character (ASCII ? (Hex 3F)). The parser commands are shown below in boldface capital letters but they are not case-sensitive. In most cases, the command is responded to with an echo; that is, if you type **ZAP**, for example, and press “ENTER” the response will be the command you have entered. For other commands, the response is specific for each command, such as **VERSION**, **STATUS** or **HELP**.

D.1 System Commands

Software Version

Function:	reports software revision, version, and system type
Command:	VERSION
Argument:	none
Response:	KVH TVG8 Rev X - Version X.XX

System State

Function:	reports antenna operational state
Command:	STATE
Argument:	none
Response:	system state: Initializing, Searching, Tracking, Idle, or Error

Initialize/Restart the System

Function:	initializes the system (perform a soft reset)
Command:	ZAP
Argument:	none
Response:	echoes the command, then reinitializes the system

Help on Parser Commands

Function:	lists parser commands
Command:	HELP
Argument:	none
Response:	print a list of all parser commands

Calculate Skew Angle

Function:	report skew angle of the current satellite
Command:	SKEWANGLE
Argument:	none
Response:	SKEW ANGLE = XXXX.X

D.2 Manual Positioning Commands

To execute the following commands, first put the antenna unit in idle mode by typing **HALT** and pressing "ENTER." Positioning commands may be entered after the antenna comes to rest.

Azimuth Angle

Function:	commands a manual azimuth angle
Command:	AZ,xxx (range is 0000-3599)
Argument:	desired azimuth angle of the mechanism relative to baseplate fwd, 000°-359.9°
Response:	echoes the command; mechanism moves at a fixed velocity



If you enter the **AZ**, **EL**, or **SKEW** command without any parameters, the system reports the current position for azimuth, elevation, or skew.



The **SKEW** command is only available if the antenna is equipped with a linear quad LNB/feed tube assembly.

Elevation Angle

Function:	commands a manual elevation angle
Command:	EL,xxx (range is 100-850)
Argument:	desired elevation angle of the mechanism relative to up, 10.0°-85.0°
Response:	echoes the command; mechanism moves at a fixed velocity

Skew Angle

Function:	commands a manual LNB skew angle
Command:	SKEW,xxx (range is -1450 to 1450)
Argument:	desired skew angle of the LNB relative to up, -145.0° to 145.0°
Response:	echoes the command; LNB moves at a fixed velocity



Azimuth CW Step

Function:	commands a 0.1 deg CW manual step in azimuth angle
Command:	6
Argument:	none
Response:	echoes the command

Azimuth CCW Step

Function:	commands a 0.1 deg CCW manual step in azimuth angle
Command:	4
Argument:	none
Response:	echoes the command

Elevation UP Step

Function:	commands a 0.1 deg UP manual step in elevation angle
Command:	8
Argument:	none
Response:	echoes the command

Elevation DOWN Step

Function:	commands a 0.1 deg DOWN manual step in elevation angle
Command:	2
Argument:	none
Response:	echoes the command

D.3 Operational Commands

Tracking Mode

Function:	starts active tracking of the satellite
Command:	TRACK
Argument:	none
Response:	echoes the command

Idle Mode

Function:	halts active tracking and conical scan, then enters idle mode
Command:	HALT
Argument:	none
Response:	echoes the command

Current Cable Wrap Angle

Function:	sets or reports current cable wrap angle, defined as 0° (CCW limit) to 700° (CW limit); the value is expressed as 0000-7000 with an implied decimal
Command:	WRAPANGLE,xxxx
Argument:	the desired cable wrap angle setting
Response:	Wrap Angle = xxxx

D.4 Tracking and Conical Scan Commands

Target Location

Function:	reports the target location in antenna frame. Data format is E### for elevation in degrees 000-900 and A##### for azimuth in degrees 0000-3599 with implied decimals
Command:	TGTLOCATION
Argument:	none
Response:	Target Location = A = E###, A##### B = E###, A#####

Analog Signal Strength Report

Function:	reports signal strength from RF detector circuit in A/D counts (000-FFF Hex)
Command:	SIGLEVEL
Argument:	none
Response:	Signal Strength = xxxx



D.5 Sensor Module Commands

Report Platform Attitude

Function:	reports vessel attitude indicated by sensor module
Command:	ATTITUDE
Argument:	none
Response:	Pitch +/-pp.p, Roll +/-rr.r, Yaw yyy.y

Compass Calibration Score

Function:	reports compass calibration score
Command:	CALSCORE
Argument:	none
Response:	Cal Score = xxx

Compass Calibration Enable

Function:	enables the sensor module compass calibration
Command:	CALON
Argument:	none
Response:	echoes the command

Compass Calibration Disable

Function:	disables the sensor module compass calibration
Command:	CALOFF
Argument:	none
Response:	echoes the command

D.6 RF Board Commands

Serial Communications, Status/Polarization Report, Tone Changes

Function:	start serial communications, reports status & polarization/tone changes
Command:	@S
Response:	S,s,p,b,m <cr> every 5 seconds until ><cr>is returned from system software
Where:	s = Satellite (A = Satellite A, B = Satellite B) p = Polarization (V = Vertical, H = Horizontal, R = Right, L = Left, X = No LNB Power) b = Band (H = High Band, L = Low band, G = Latin America, U = USA) m = Mode (V = Valid, I = Invalid)*

* The Mode bit is used to evaluate the Satellite, Polarization & Band combination vs. the Frequency/Symbol Rate/FEC currently in RAM. This bit will be set to invalid if the Frequency for the selected combination is set to 0x0000; otherwise it will be set to valid. For example the Mode bit will be set to invalid when the frequency is set to 00000 to indicate that there is not a frequency to track for the LNB tone and voltage setting.

Report RF Tracking Parameters

Function:	reports all RF tracking parameters for primary & secondary satellites*
Command:	@SATCONFIG
Response:	F,x,fffff,S,C,ID,P,B,D<cr>
Where:	x = Satellite (A = Satellite A, B = Satellite B) fffff = Frequency in MHz (00000 and 10700 to 12700) S = Symbol rate in Mbit/Sec (1000 to 29999) C = FEC code rate (valid rates = 12, 23, 34, 56, 67, 78) ID = Satellite Network ID in hexadecimal format (valid range = 0X0000 to 0XFFFF hex) P = LNB Polarization (V = Vertical, H = Horizontal, R = Right, L = Left) B = the LNB down conversion frequency (L = low, H = high, G = Latin America, U = USA) D = decoding type (1 = DSS-A, 2 = DSS-B, 3 = DVB)

* This command reports all eight combinations of the Satellite/Freq/Sym/FEC/ID/POL/Band/Decode currently stored in RAM.



Set RF Tracking Parameters

Function:	sets RF tracking parameter
Command:	@SATCONFIG,X,N,F,S,C,ID,P,B,D<cr>
Response:	Echoes the input data
Where:	<p>@SATCONFIG = directs data to the RF Board</p> <p>X = satellite A or B</p> <p>N = satellite table # (98 & 99 are slots for user-configured satellites)</p> <p>F = frequency in MHz (either 00000 or a range from 10700 - 12700)</p> <p>S = the satellite transponder symbol rate in Mbit/second (01000 - 29999)</p> <p>C = the FEC code (e.g., 12, 23, 34, 56, 67, 78)</p> <p>ID = the satellite network ID in hexadecimal format (0x####)</p> <p>P = the LNB polarization (V = vertical, H = horizontal, R = right, L = left)</p> <p>B = the LNB down conversion frequency (L = low, H = high, G = Latin America, U = USA)</p> <p>D = decoding type (1 = DSS-A, 2 = DSS-B, 3 = DVB)</p>

ID Match/Decoded Network ID

Function:	report ID match and decoded network ID
Command:	@CHECKID
Response:	<p>one of the following:</p> <p>Y,0X####</p> <p>N,0X####</p> <p>Y,NoID</p> <p>N,NoID</p> <p>N,NoLock</p>
Where:	<p>Y = yes</p> <p>N = no</p> <p>0X#### = network ID</p> <p>NoID = satellite unidentified</p> <p>NoLock = satellite not found</p>

D.7 Installation Commands

Set/Report GPS Position

Function:	reports or sets default GPS position
Command:	GPS<cr> GPS,XX,D,YYY,E
Response:	GPS(Default or Active),XX.XX,D,YYY.YY,E, ZZZZZZ.ZZ GPS: XXD YYYE
Where:	XX.XX = latitude (0-90) D = S (South) or N (North) YYY.YY = longitude (0-180) E = E (East) or W (West) ZZZZZZ.ZZ = UTC (universal time coordinated) of position

Report Satellite Names

Function:	report names for satellites A and B
Command:	SATINSTALL
Response:	SATINSTALL,<sat_a_name>,<sat_b_name>

Report Configured Satellite Names

Function:	report names for all configured satellites
Command:	SATLISTA
Response:	SATLISTA,<sat_name1>,...,<sat_nameX>

Report Valid Satellite B Selections

Function:	report names for all valid satellite B selections for a given satellite A selection
Command:	SATLISTB,<sat_a_name>
Response:	SATLISTB,<sat_a_name>,<sat_b_name1> ...,<sat_b_nameX>

Install Satellite Pair

Function:	installs satellites A and B as the satellite pair
Command:	SATINSTALL,<sat_a_name>,<sat_b_name>
Response:	if valid pair, echoes the input data if invalid pair, returns error message



Configure Longitude of a User-configurable Satellite

Function:	configures one of the user-configurable satellites with the longitude provided
Command:	SATCONFIG,USERX,YYY,Z,D,L
Response:	if valid pair, echoes the input data if invalid pair, returns error message
Where:	X = 1 or 2 YYY = longitude (0-180) Z = E (East) or W (West) D = decoding type (0 = test, 1 = DSS-A, 2 = DSS-B, 3 = DVB) L = LNB polarization (C = circular, L = linear)

D.8 Debug Commands

Report Offset Angles

Function:	reports system offset angles
Command:	OFFSETS OFFSETS,XXXXX,YYYY
Response:	Offsets = XXXXX.X XXXXX.X
Where:	X = new azimuth offset (-1800 - 1800) Y = new elevation angle (-450 - 450)

Install Default Satellites

Function:	Installs predefined satellite pairs
Command:	SATPAIR,X
Response:	displays numerous frequency commands and reports "Satellite Installation Complete"
Where:	X = 0 (satellites default to Astra1 & Hotbird) or X = 1 (satellites default to Echo_119 & Expressvu) or X = 2 (satellites default to DSS_101 & DSS_119) or X = 3 (satellites default to Galaxy3CN & None) or X = 4 (satellites default to PAS_9 & None)

Report Last Satellite Tracked/Update Value

Function:	reports the last satellite tracked or updates the last tracked satellite to the value input if it is different from the current value
Command:	LASTSAT LASTSAT,X
Response:	Last = <sat_name>
Where:	X = A (updates to Satellite A) <i>or</i> X = B (updates to Satellite B)

Index

A

- accessing components, 98
- AC ripple, 31
- accuracy levels, compass, 79
- activating the receiver(s), 40
- activation department, KVH, 40
- “Antenna Not Responding” message, 61
- antenna unit
 - cleaning, 95
 - components, 97
 - connectors, 28
 - description, 4
 - dimensions, 25
 - drain holes, 25
 - hatch access, 98
 - locating, 23-24
 - mounting, 26-31
 - noise, 8
 - painting, 25
 - specifications, 123
- Australian satellites, 17
- autocalibration, 78
- azimuth gyro, replacing, 104
- azimuth motor, replacing, 107-108
- azimuth belt, replacing, 109

B

- bands, frequency, 45
- block diagram, 3
- blockage, satellite, 5, 23, 88
- brightness, MCU display, 81
- buttons, MCU, 60

C

- cable unwrap, 8
- cables, connecting. *See wiring*
- cal score, 53, 79
- calibration, 78-80, 105
- CANCEL key, 61
- caution, 31, 36, 97
- changing channels, 6-7
- changing geographic location, 54-55
- checking out the system, 52-53
- choosing locations, 23-25
- circuit breaker, 36
- cleaning the antenna, 95
- clearing the calibration, 80
- commands, maintenance port, 129-138
- commissioning the receiver(s), 40
- components, 4, 97
- computer diagnostics, 90
- configuring satellite data, 76-77
- connecting a PC, 46
- connecting cables. *See wiring*
- connectors
 - antenna unit, 28
 - MCU, 35
 - PCB module, 100
- contacting a dealer, 95
- controlling the antenna, 67-77
- coverage area, satellite, 5

D

- data/power cable, 28, 35
- DC blocks, 32
- DC power, 36
- dealer, contacting, 95
- default satellite pairs, 16
- diagram, system block, 3

D (continued)

dimensions

antenna unit, 25, 123

MCU, 123

DIRECTV, 6

DiSEqC, 6, 7, 49, 73

DISH Network, 7, 40

drain holes, antenna, 25

DSS (Digital Satellite Service), 3

DVB (Digital Video Broadcasting), 3

E

EchoStar, 7

elevation belt, replacing, 112

elevation gyro, replacing, 106

elevation motor, replacing, 110-111

error messages, 61

European satellites, 16

ExpressVu, 7

F

FEC code, 76

feed tube, removing, 114

ferrite coil, large, 36

ferrite coil, small, 87

field replaceable units, 96

flash update wizard, 90

flush mount bracket, MCU, 39

flush mount template, 125

“Forward” arrow, 26

frequency, 76

F-type connector, 21, 29

fuse, 36, 86, 98

G

geographic location, changing, 54

global support program, 95

GPS, 3, 72

grounding, 35, 37

H

hatch, 98

HyperTerminal settings, 46

I

installer qualifications, 21

installing satellites, 42-51

Instant On mode, 70

interface, user, 10

interference, 87

internal sensor, replacing, 103-104

K

kitpack box, location, 27

kitpack contents, 22

L

Latin American satellites, 17

latitude/longitude, setting, 72

library, satellite, 16

line of sight, 5

LNB, defined, 4

LNB/feed tube assembly, ordering, 54

LNB/feed tube assembly, replacing, 118-119

LNB, replacing, 117

LNB type, 123

locations, mounting, 23-25

logo plate, 29

M

magnetic concerns, 24, 80
main menu, 60
maintenance port, MCU, 46
maintenance, corrective, 96-119
maintenance, preventive, 95
manual control of antenna, 68
master receiver, 31
materials needed for install, 21-22
materials provided, 18, 22
MCU (master control unit)
 adjusting display brightness, 81
 connectors, 35
 description, 4
 dimensions, 123
 flush mount bracket, 39
 flush mount template, 125
 front panel, 9, 60
 location, mounting, 25
 maintenance port, 46
 mounting, 38-39
 satellite switching, 7
 wiring, 35-37
menus
 Control Antenna, 67
 Control Compass, 78
 Get Antenna Status, 66
 Install Satellite, 62
 main menu, 60
 Operations Mode, 64
 Restart Antenna, 64
 Set Brightness, 81
Mexican satellite, 16
mounting holes, antenna, 26
mounting template, antenna, 26
mounting the antenna, 26-31
mounting the MCU, 38-39

moving to another region, 54
multiswitch, 32-34, 89

N

noise, antenna, 8
North American satellites, 16
N-type connector, 28

O

overload protection, 36

P

packing list, 18
painting the antenna, 25
parser commands, 129-138
part numbers, 18, 22-23, 54, 96
parts, replacement, 96
PCB module connectors, 100
PCB module, replacing, 99-100
PCB module fuse, replacing, 98
planning the installation, 21-25
polarizations, satellite, 76
power cable specifications, 22
power problem, 86
power plug, 37
power requirements, 36
power, connecting, 36-37
powering on the system, 6
prerequisites, installation, 21
preventive maintenance, 95
rewiring, 21
programming satellites, 42-51
programming the receiver(s), 40-41

Q

qualifications, installer, 21

R

- radar concerns, 24
- radome
 - cleaning, 95
 - description, 4
 - painting, 25
- receiver
 - activating, 40
 - description, 4
 - master, 31
 - programming, 40-41
 - troubleshooting, 89
- receiving satellite TV signals, 5
- repacking the antenna, 120
- replacement parts, 96
- replacing
 - azimuth belt, 109
 - azimuth gyro, 104
 - azimuth motor, 107-108
 - elevation belt, 112
 - elevation gyro, 106
 - elevation motor, 110-111
 - fuse, MCU, 86
 - fuse, PCB module , 98
 - internal sensor, 103-104
 - LNB, 117
 - LNB/feed tube assembly, 118-119
 - PCB module, 99-100
 - PCB module fuse, 98
 - RF PCB, 101-102
 - skew belt, 116-117
 - skew motor, 113-116
- restarting the antenna, 64, 69
- restraint, shipping, 27, 120
- RETURN key, 61
- returning components, 96
- returning the antenna, 120
- RF cables, 21, 29, 31-34

- RF flash port, 35

- RF PCB, replacing, 101-102

- RMA number, 95, 120

S

- safety warning, 31, 36, 97

- satellite

- Australia, 17

- coverage area, 5, 88

- Europe, 16

- Latin America, 17

- library, 16

- Mexico, 16

- North America (U.S.), 16

- polarizations, 76

- programming, 42-51

- switching, 6-7

- satellite frequency data changes, 89

- Satellite Frequency Scan, 74-75

- satellite network ID, 76

- selecting active satellite, 73

- serial number, antenna, 66, 96

- setting display brightness, 81

- setting latitude/longitude, 72

- settings, HyperTerminal, 46

- shield

- azimuth motor, 107

- elevation motor, 110

- skew motor, 115

- shipping restraint, 27, 120

- shipping the antenna, 120

- skew setting, 73

- skew belt, replacing, 116-117

- skew motor, replacing, 113-116

- Sleep mode, 8, 69

- software versions, 66

- specifications, 123

S (continued)

startup screens, 59
startup sequence, 127-128
state, antenna, 66
steel vessel, mounting considerations, 24
switching satellites, 6-7
symbol rate, 76

T

technical support, 95, 96
teflon gel, 29
testing, 52-53
tools needed for install, 21
tracking, 3
transponder information, 45
troubleshooting, 83-91
troubleshooting matrix, 85
turning during startup, 87
turning Instant On on/off, 70
turning on the system, 6
turning Sleep Mode on/off, 69

U

updating satellite frequency data, 74
U.S. satellites, 16

V

Velcro fastening, MCU, 38
vibration, minimizing, 24
video standards, 55
voltage level, 36, 86, 123

W

warning, safety, 31, 36, 97
watching TV, 8

wiring

data/power cable, 28, 35
receiver(s), 31-34
MCU, 35-37
power, 36-37
RF cables, 29, 31-34



KVH Industries, Inc.

50 Enterprise Center • Middletown, RI 02842-5279 • U.S.A.
Phone: +1 401 847-3327 • Fax: +1 401 849-0045
E-mail: info@kvh.com • Internet: www.kvh.com

KVH Europe A/S

Kokkedal Industripark 2B • 2980 Kokkedal • Denmark
Phone: +45 45 160 180 • Fax: +45 45 160 181
E-mail: info@kvh.dk • Internet: www.kvh.com