TracVision® BY KVH INDUSTRIES

TracVision M5/M7
GyroTrac™ Configuration

TracVision M5/M7 User's Guide

TracVision M5/M7

GyroTrac Configuration

User's Guide

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

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

KVH Part # 54-0419-01 Rev. A

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1. Introduction

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

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1

Using this Manual

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

Who Should Use This Manual

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

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

The **installer** or **servicing technician** should refer to the "Advanced Settings and Functions" appendix for information on advanced setting and operational procedures.

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

Notifications Used in this Manual

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

CAUTION

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

IMPORTANT!

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

NOTE: *This is a Note. Notes contain useful information about system settings.*

TIP: *This is a Tip. These contain helpful information, allowing you to get the most out of your TracVision system.*

Typographical Conventions

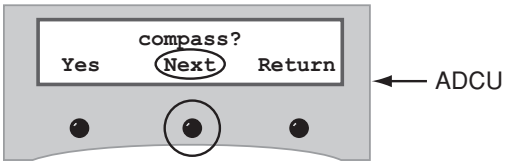
This manual uses the following typographical conventions:

Text Example	Description
`<Sat Name>` `###`	Text in brackets or the pound sign (#) indicates a variable portion of the ADCU display
HALT	Bold text in capital letters indicates a command to be entered via a PC
X	Bold text in *italicized* capital letters indicates a variable portion of a command to be entered via a PC
"Turning the System On/ Off" on page 14	Cross-reference to another chapter in the manual or to a website

ADCU (Advanced Digital Control Unit) Interface Conventions

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

Figure 1-1 Example of ADCU Menu Option and Corresponding Button.



Related Documentation

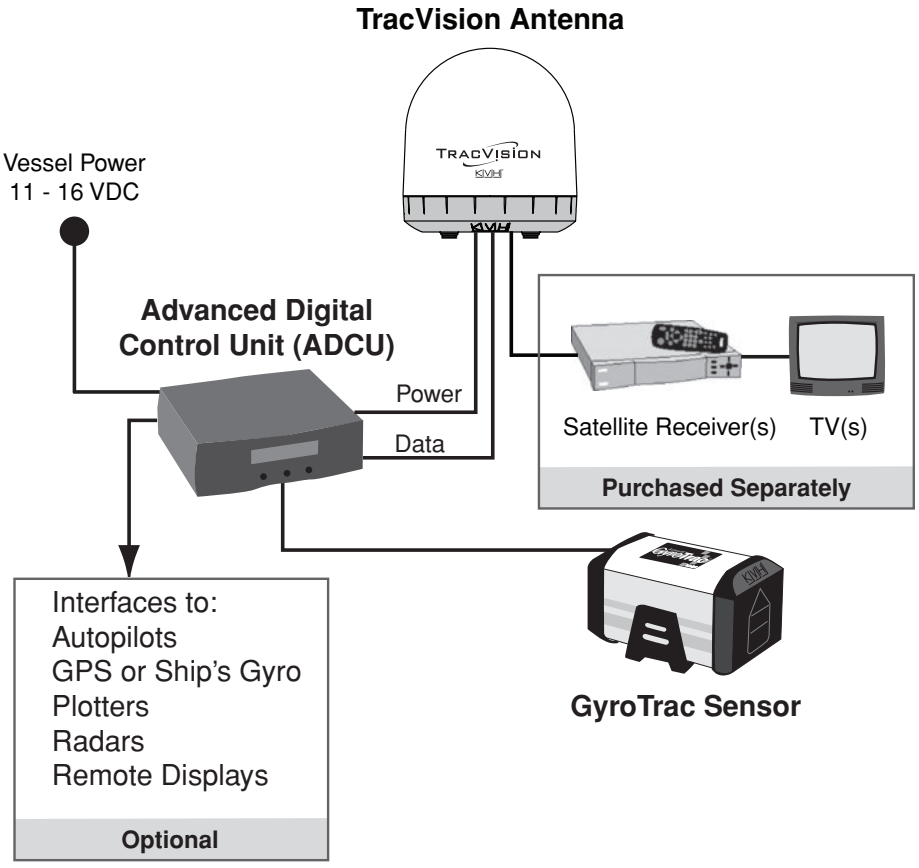
In addition to this User's Guide, the following documents are provided with your TracVision system:

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

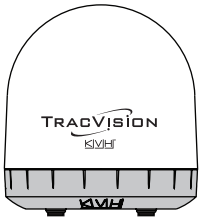
System Overview

Your TracVision system is a state-of-the-art, actively stabilized antenna system that delivers live satellite TV to your vessel's audio/video entertainment system. A basic system is illustrated below. TracVision M5 receiver wiring diagrams are provided in *"Appendix D" on page 89*. TracVision M7 receiver wiring diagrams are provided in *"Appendix E" on page 93*.

Figure 1-2 TracVision System Diagram (Typical Installation)



System Components



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

GyroTrac Sensor
The GyroTrac digital gyrocompass provides a three-axis attitude/heading reference - allowing superior open water performance in any sea conditions. The GyroTrac can also operate as a fully functional, stand-alone heading sensor.

ADCU (Advanced Digital Control Unit)
The ADCU is the system's user interface, providing access to the system and its functions through an LCD and three buttons. The ADCU also serves as the vessel's junction box, allowing the system to use vessel power, interface with the GyroTrac sensor, and supply and receive data to/from the TracVision M5/M7.

System Features

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

In-motion Tracking

The TracVision M5/M7 system uses a state-of-the-art actively stabilized antenna system. Once the satellite is acquired, the system's internal gyros continuously measure the heading, pitch, and roll of your vessel and send commands to the antenna motors, keeping the antenna pointed at the satellite at all times - even while you're on the move!

Dual Satellite Tracking

Your TracVision M5/M7 is capable of tracking two selected satellites, as long as the antenna is located within the selected satellites' coverage area. During installation, your TracVision system should have been set up to track your desired pair of satellites, allowing you to switch between your selected pair of satellites quickly and easily.

Satellite Library

The TracVision M5/M7 includes a pre-programmed satellite library of the most popular satellite services, offering a wide variety of satellite services to choose from. Using a PC, you can also add up to two additional satellites of your choice to the satellite library.

TIP: *For complete information on the satellite library, see* ***"Setting the ADCU to Track Different Satellites" on page 24****. For complete information on adding satellites to the library, see* ***"Appendix C" on page 79****.*

Navigational Data

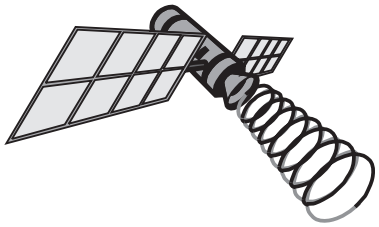
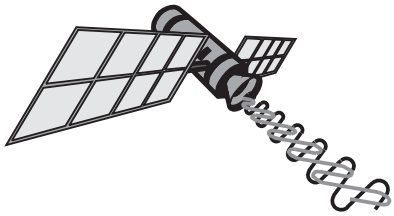
Besides displaying satellite tracking information, the ADCU can also display navigational data, including magnetic heading, true heading, pitch, roll, yaw, rate of turn, and latitude/longitude position data.

NOTE: *Some displays require an active GPS connection. For more information on display types, see* ***"ADCU Display Types" on page 17****.*

Circular and Linear Versions

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

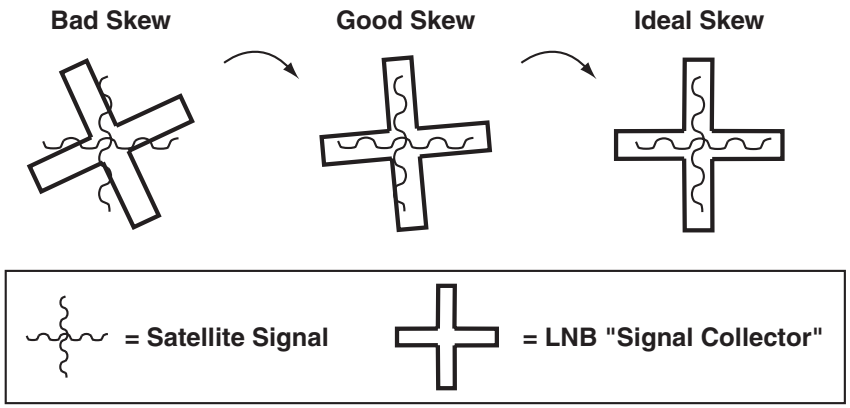
Figure 1-3 Polarizations of Satellite Signals

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

LNB Skew Angle

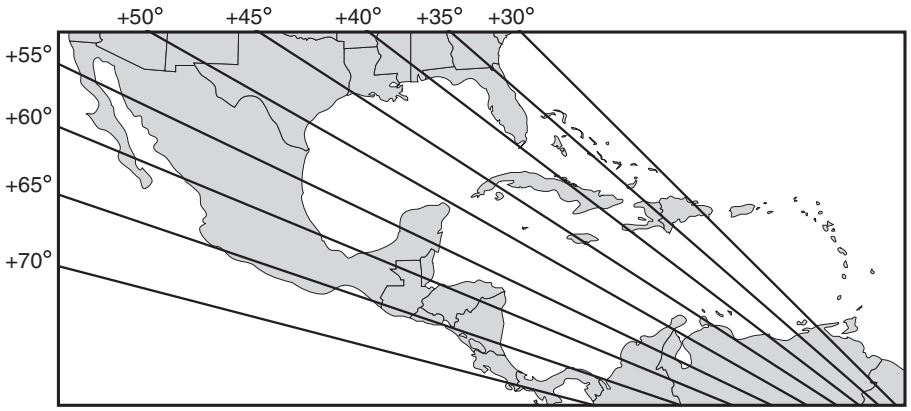
Since linear satellite signals are oriented in a precise cross pattern, the TracVision antenna's receiving element, called an LNB (low-noise block) must be oriented in the same way to optimize reception. This orientation adjustment is referred to as the LNB's "skew angle." *Figure 1-4* illustrates how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

Figure 1-4 How Skew Works



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

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



For complete details about adjusting the LNB's skew angle, see ***"Setting the LNB Skew Angle (Linear Version Only)" on page 29***.

2. Operation

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

Contents

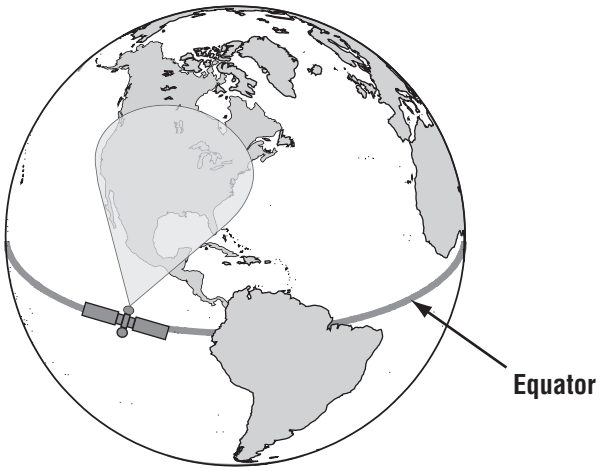
2

Receiving Satellite TV Signals

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

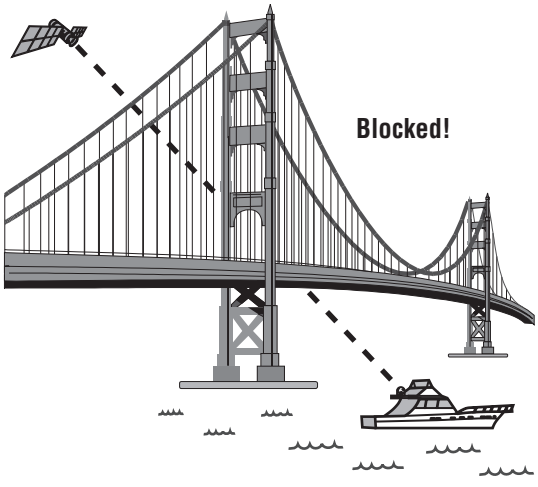
TIP: *For your convenience, KVH provides links to several websites that offer satellite coverage information. Simply visit our website at* ***www.kvh.com/footprint****.*

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



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

Figure 2-2 Example of Satellite Blockage



Turning the System On/Off

Since power to the TracVision system is controlled by the ADCU, you can turn the antenna on or off by applying/removing operating power to the ADCU.

Turning On the System

Follow the steps below to turn on your TracVision system.

1. Make sure the antenna has a clear view of the sky.
2. Turn on your satellite TV receiver and TV.

   NOTE: *If a GPS is connected, ensure the GPS receiver has obtained an accurate position before turning on the TracVision M5/M7 system.*

   IMPORTANT!

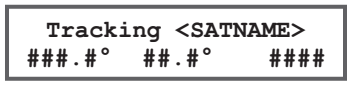
   Avoid turning the vessel or changing channels for one minute after turning on the system.

3. Apply operating power to the ADCU.

   TIP: *When operating power is applied to the ADCU, the ADCU initiates a startup sequence. The screen updates as diagnostic tests are performed.*

4. Wait one minute for system startup. The ADCU will display the Tracking Satellite screen after system testing is complete.

   Figure 2-3 Tracking Satellite Screen



Turning Off the System

Follow the steps below to turn off your TracVision system.

1. Remove operating power from the ADCU.
2. Turn off your satellite TV receiver and TV.

Changing Channels and Switching Between Satellites

During installation, your TracVision system should have been set up to track the satellite(s) of your choice and the channel guides for your selected satellite service should have been downloaded. Your TracVision system is programmed to track up to two satellites, stored in memory as Satellite A and Satellite B.

IMPORTANT!

(Linear systems only) To ensure proper operation, the receiver(s) must be set up for the same satellites, and in the same order, they are set up in the antenna:

Antenna Satellite	Receiver Satellite	DiSEqC Setting
Sat. A	Alternative 1 or A	DiSEqC 1
Sat. B	Alternative 2 or B	DiSEqC 2

Since some channels might be located on another satellite, changing channels might require switching to the second selected satellite. Most TracVision M5/M7 configurations allow automatic switching between the selected satellites by simply using the primary receiver's remote control.

NOTE: *At this time, DISH Network supports only the standard-definition model 311 receiver for mobile use. All other receiver models have been designated for home use only. DISH Network subscribers must use the ADCU to change satellites.*

TIP: *The primary receiver is the receiver connected to the antenna's RF1 connector. The primary receiver controls satellite selection; all other receivers can only receive channels carried on the satellite selected by the primary receiver.*

Using the Receiver Remote Control to Switch Between Satellites

With most TracVision M5/M7 configurations, switching between the selected satellites occurs automatically while changing channels using the primary receiver's remote control.

NOTE: *Be sure to use a single-input receiver as the primary receiver.*

Using the ADCU to Switch Between Satellites

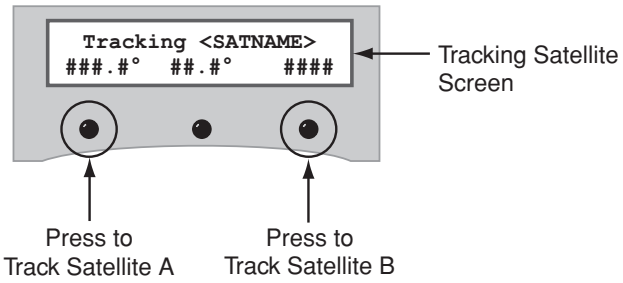
You can switch between satellites using the ADCU by pressing a single button. Follow the steps below to switch to the second satellite.

NOTE: *If you use the ADCU to manually switch between satellites, automatic satellite switching is disabled until the system is restarted. For more information on restarting the system, see* ***"Restarting the Antenna" on page 36***.

1. Ensure the Tracking Satellite screen is displayed.

   TIP: *For information on changing display types, see* ***"ADCU Display Types" on page 17***.

Figure 2-4 Tracking Satellite Screen



2. Press the appropriate ADCU button (see above) to switch to the second satellite.
3. The antenna shifts to track the second satellite. Wait for the Tracking Satellite screen to reappear with the name of the second satellite displayed.

ADCU Display Types

The ADCU has several display types. The antenna display type is the default display type, which displays the satellite tracking information. The ADCU can also display navigational data when one of the following display types is selected: compass; pitch, roll and yaw; rate of turn; and latitude/longitude.

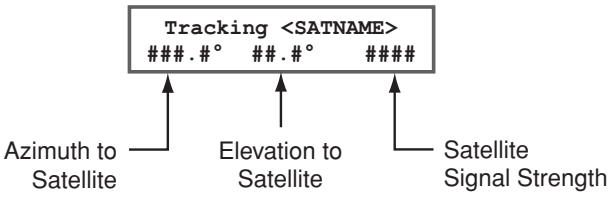
Display Type Data

This section describes each display type and the data displayed. If you wish to change the display type, refer to *"Changing Display Types" on page 19*.

Antenna Display Type

The antenna display type is the TracVision M5/M7 system's default display type. When the ADCU is set to the antenna display type, satellite tracking information is displayed.

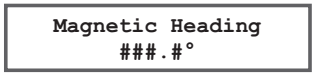
Figure 2-5 Tracking Satellite Screen



Compass

The compass display type displays the vessel's heading information. If GPS is not connected or if GPS is connected but was not properly initialized prior to turning on the TracVision system, the Compass screen displays the magnetic heading value.

Figure 2-6 Compass Screen with Magnetic Heading



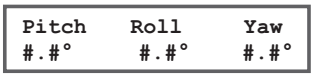
When GPS is connected and is properly initialized (see *"Turning the System On/Off" on page 14* for details), the Compass screen displays both magnetic heading and true heading values.

Figure 2-7 Compass Screen with Magnetic and True Heading

Pitch, Roll, and Yaw

When the pitch, roll, and yaw display type is selected, the vessel's pitch, roll, and yaw values are displayed.

Figure 2-8 Pitch, Roll, and Yaw Screen



Rate of Turn

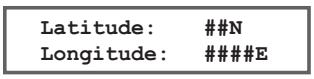
The rate of turn display type displays the vessel's magnetic heading and rate of turn values.

Figure 2-9 Rate of Turn Screen

Latitude Longitude

When GPS is connected and is properly initialized (see *"Turning the System On/Off" on page 14* for details), the Latitude/Longitude screen displays the vessel's latitude and longitude values.

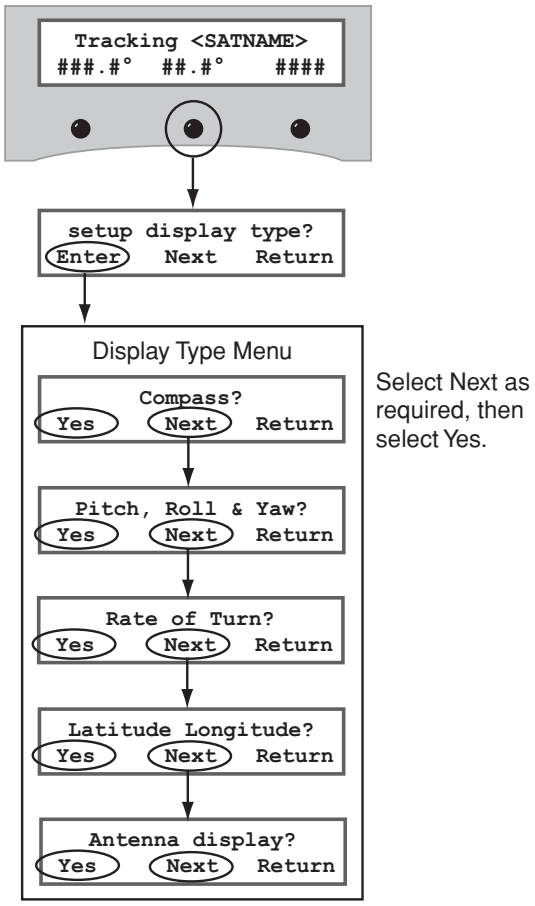
Figure 2-10 Latitude Longitude Screen



Changing Display Types

If you wish to change the display type, use the flowchart in *Figure 2-11*.

Figure 2-11 Changing Display Types



Product Care

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

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

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

3. Settings

This chapter explains system settings and how to modify them using the ADCU.

Contents

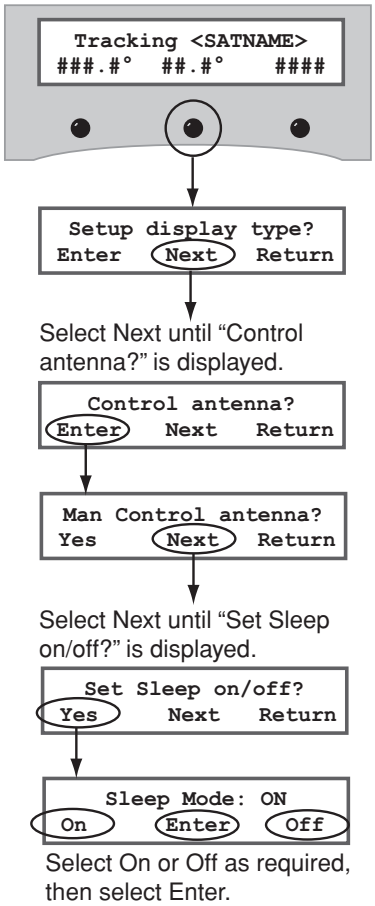
Changing the Sleep Mode Setting

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

KVH recognizes that some customers might not want to take advantage of this convenient feature. In this case, it is possible to disable Sleep Mode.

Use the flowchart in *Figure 3-1* if you wish to disable Sleep Mode, or if you wish to restore the original Sleep Mode setting.

Figure 3-1 Setting Sleep Mode On/Off



Setting the ADCU to Track Different Satellites

You can change which satellites your TracVision M5/M7 system tracks by choosing up to two satellites from the appropriate satellite library (your TracVision M5/M7 system is configured for either circular satellite reception or linear satellite reception).

NOTE: *This procedure requires latitude and longitude data. If a GPS receiver is not installed, you must determine your latitude and longitude. For your convenience, you can determine your approximate latitude and longitude using the Position Grids provided in* ***"Appendix G" on page 103****.*

TIP: *If the satellite you wish to track is not listed, you can use a PC to set up one or two special user-defined satellites. See* ***"Appendix C" on page 79*** *for details.*

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

Figure 3-2 Circular Satellite Library

Satellite Service	Satellite Location	Installation Name
AsiaSat 4	122.2° E	ASIASAT*
DIRECTV	72.0° W	DSS_72
	101.0° W	DSS_101
	110.0° W	DSS_110*
	119.0° W	DSS_119
DIRECTV Latin America	95.0° W	GALAXY3CN*
DISH Network	61.5° W	ECHO_61
	110.0° W	ECHO_110
	119.0° W	ECHO_119
	148.0° W	ECHO_148
ExpressVu	82.0° W	EXPRESSVU
	91.0° W	EXPRESSTV

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

Figure 3-3 Linear Satellite Library

Satellite Location	Installation Name
26.0° E	ARABSAT
19.2° E	ASTRA1
28.2° E	ASTRA2N
28.2° E	ASTRA2S
7.0° E	EUTEL_W3A
30.0° W	HISPASAT
13.0° E	HOTBIRD
13.0° E	HOTBIRDWB
7.0° W	NILESAT
160.0° E	OPTUSB1*
156.0° E	OPTUSC1
58.0°W	PAS_9
110.5° E	SINOSAT*
5.0° E	SIRIUS
0.8° W	THOR
42.0° E	TURKSAT1C

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

IMPORTANT!

Linear Systems Only - For optimal performance, you might need to adjust the skew angle if you change satellites. For information on setting the skew angle, see *"Setting the LNB Skew Angle (Linear Version Only)" on page 29*.

Programming New Satellites to be Tracked

This section explains how to program the TracVision system to track different satellites using the ADCU. Use the flowchart in *Figure 3-4 on page 27* to install satellites using the ADCU. You can also use a PC to program the system to track different satellites.

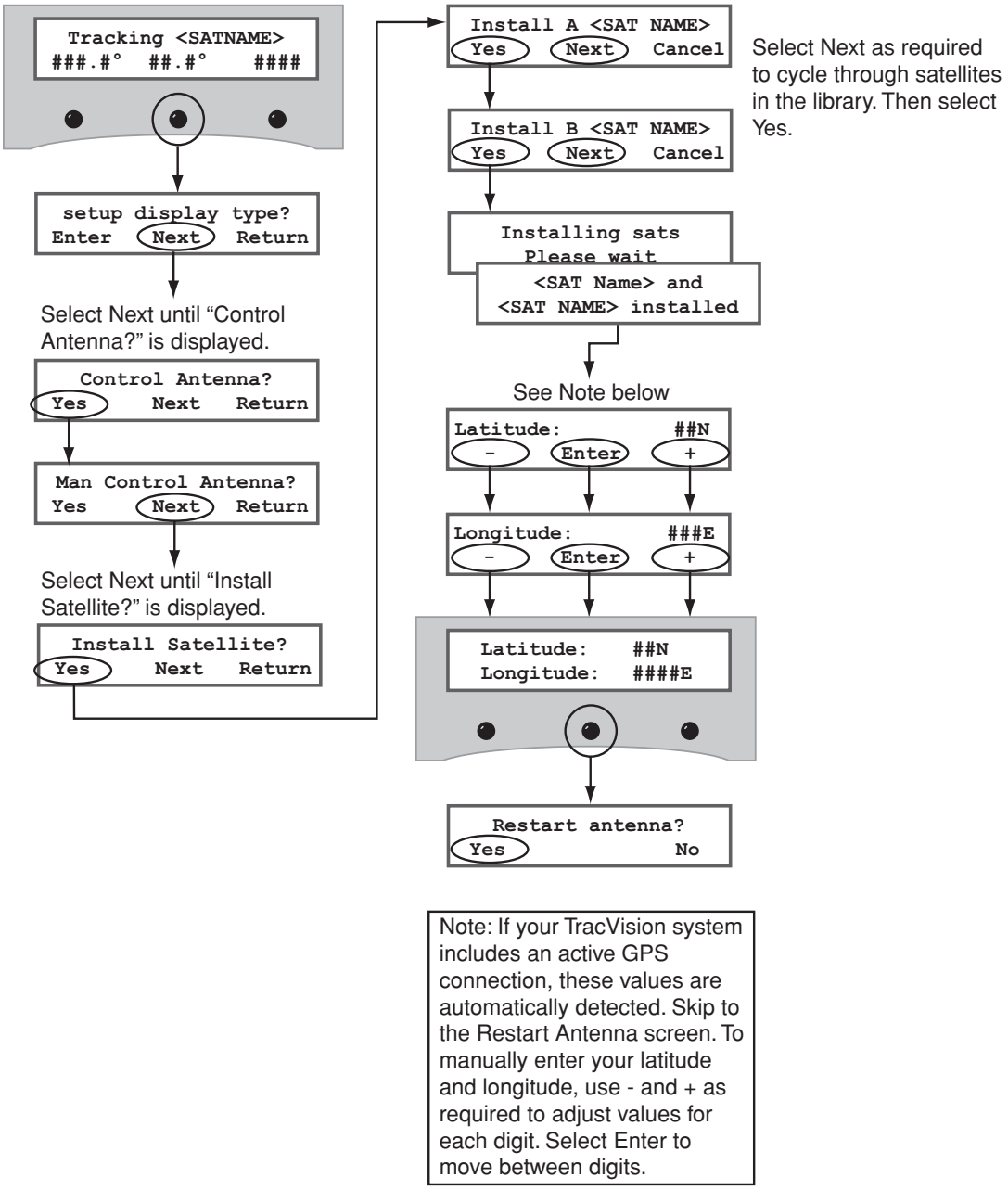
TIP: *If you wish to install just one satellite, select "None" as your choice for Satellite B.*

IMPORTANT!

(Linear systems only) To ensure proper operation, the receiver(s) must be set up for the same satellites, and in the same order, they are set up in the antenna:

Antenna Satellite	Receiver Satellite	DiSEqC Setting
Sat. A	Alternative 1 or A	DiSEqC 1
Sat. B	Alternative 2 or B	DiSEqC 2

Figure 3-4 Programming New Satellites to be Tracked

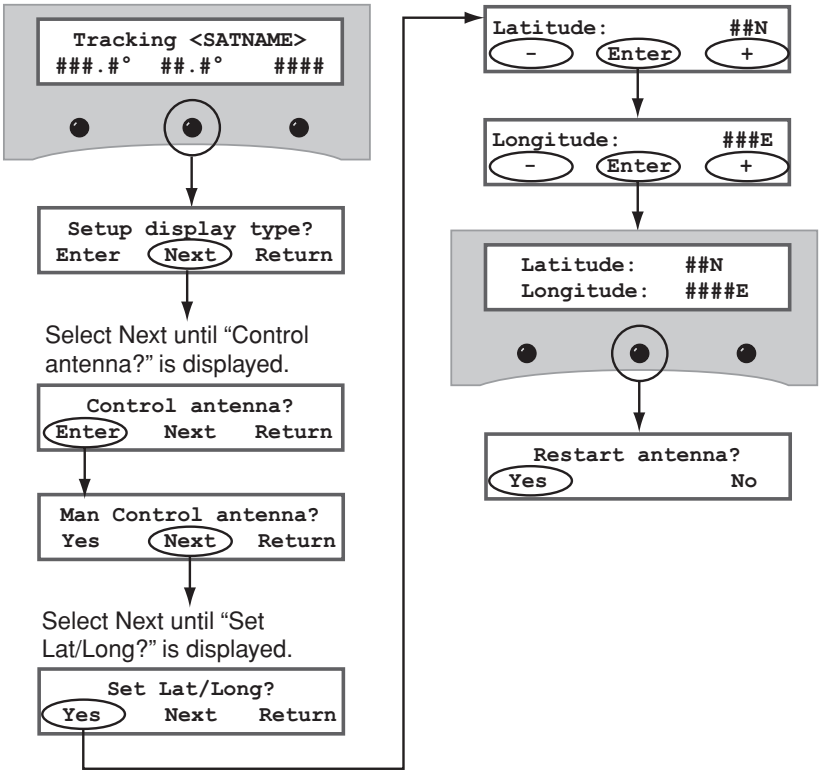


Manually Setting Latitude and Longitude

When a GPS receiver is detected, the TracVision system does not require latitude and longitude values to be set manually. However, if an active GPS connection is not present, you can use the flowchart in *Figure 3-5* to manually set latitude and longitude values.

TIP: *For your convenience, you can determine your approximate latitude and longitude using the Position Grids provided in* *"Appendix G" on page 103*.

Figure 3-5 Setting the Latitude and Longitude Manually



Setting the LNB Skew Angle (Linear Version Only)

To optimize satellite signal reception, you need to adjust LNB (low-noise block) skew angle whenever you change your geographic location or change which satellites are set up for tracking.

IMPORTANT!

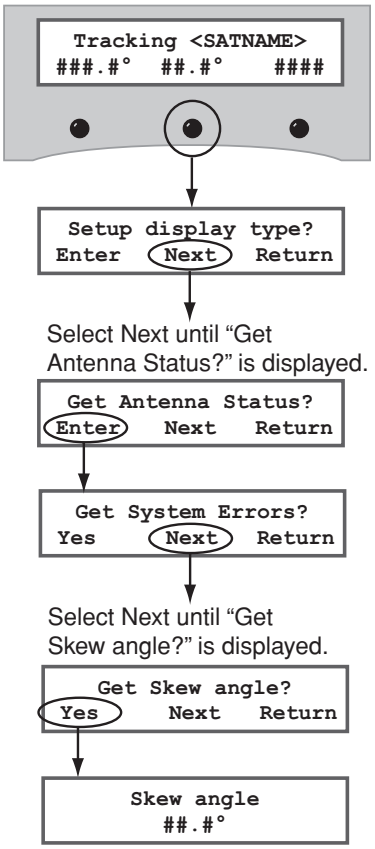
If an active GPS connection is not present, be sure to enter your latitude and longitude manually before performing this procedure (see *"Manually Setting Latitude and Longitude" on page 28*).

Determining the Skew Angle

Use the flowchart in *Figure 3-6* to determine the skew angle for the selected satellite(s) using the ADCU.

TIP: *Sky Mexico subscribers can also refer to* ***Figure 1-4 on page 8*** *for approximate skew setting for the PAS_9 satellite.*

Figure 3-6 Determining the Skew Angle Using the ADCU



Adjusting the Skew Angle

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

CAUTION

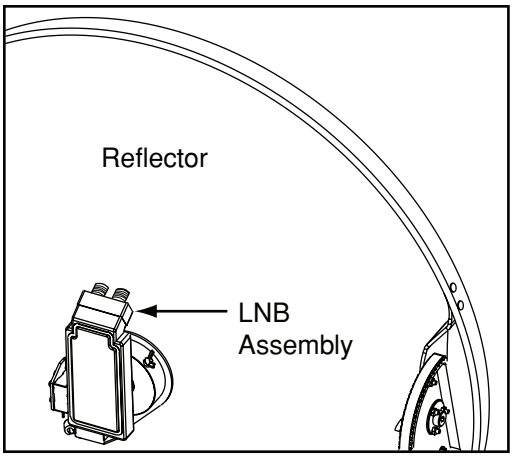
To avoid bodily injury, be sure to turn off the antenna and disconnect power to all wired components.

1. Turn off the antenna and disconnect power to all wired components.

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

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

Figure 3-7 Location of LNB on Back of Antenna Reflector



4. Loosen the two choke feed wing screws. The location of the wing screws varies according to TracVision model. Refer to *Figure 3-8* and *Figure 3-9*.

Figure 3-8 TracVision M5 Wing Screws

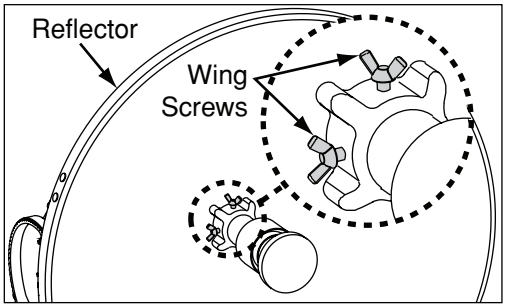
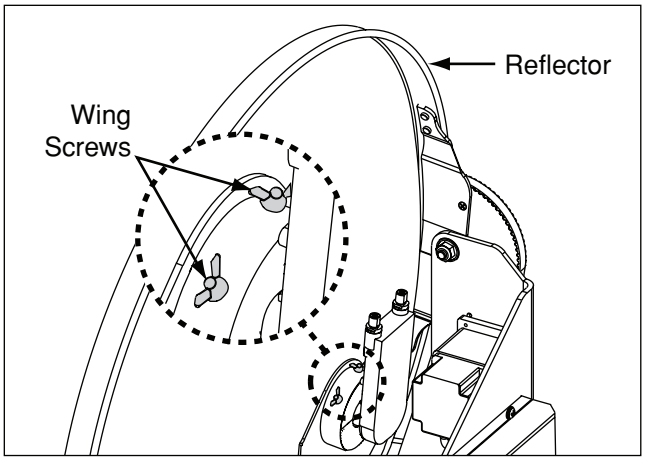


Figure 3-9 TracVision M7 Wing Screws



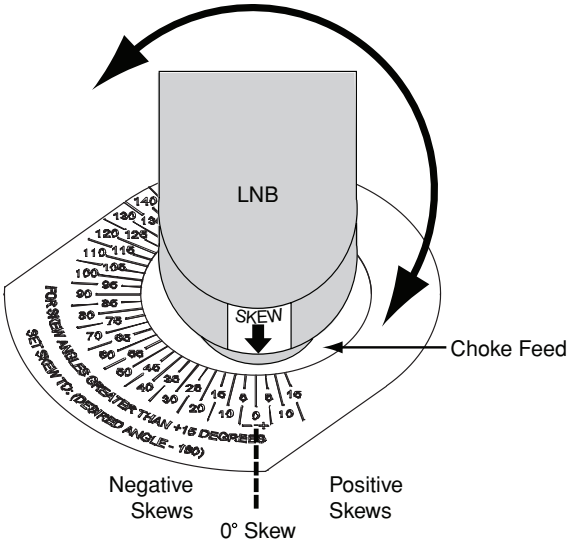
Linear Version Only

5a. TracVision M5 Only - Adjust the LNB clockwise or counter-clockwise, until the skew arrow on the LNB points to the skew angle that you determined earlier. If the skew angle is greater than +15° subtract 180 to get the equivalent negative skew angle and set the LNB to that angle instead.

IMPORTANT!

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

Figure 3-10 TracVision M5 LNB Skew Angle Adjustment

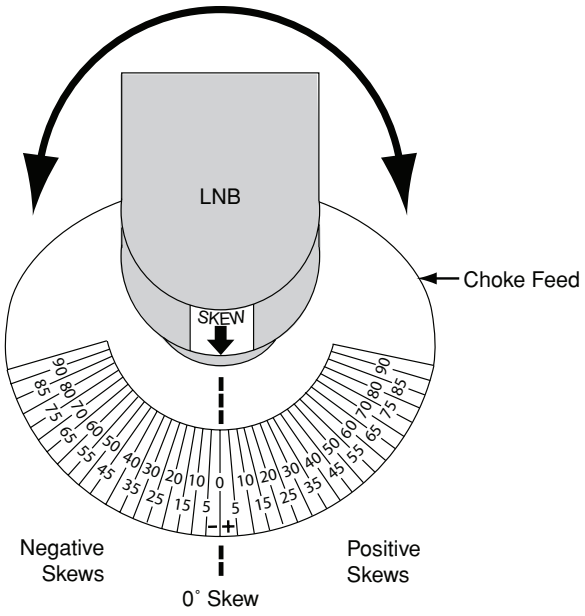


5b. TracVision M7 Only - Adjust the LNB clockwise or counter-clockwise, until the skew arrow on the LNB points to the skew angle that you determined earlier.

IMPORTANT!

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

Figure 3-11 TracVision M7 LNB Skew Angle Adjustment



6. Tighten the wing screws.

7. Reinstall the radome.

NOTE: *For more information about how skew works, see* ***"Circular and Linear Versions" on page 9***.

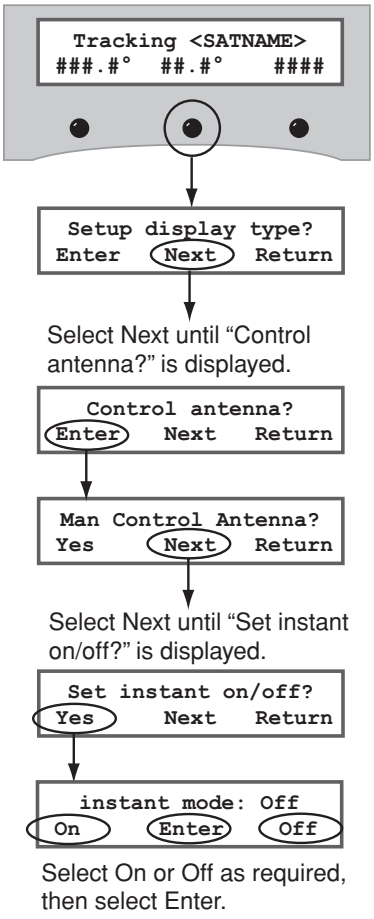
Changing the Instant On Setting

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

TIP: *The default Instant On setting is off.*

Use the flowchart in ***Figure 3-12*** if you wish to enable Instant On, or if you wish to restore the original setting.

Figure 3-12 Instant On/Instant Off

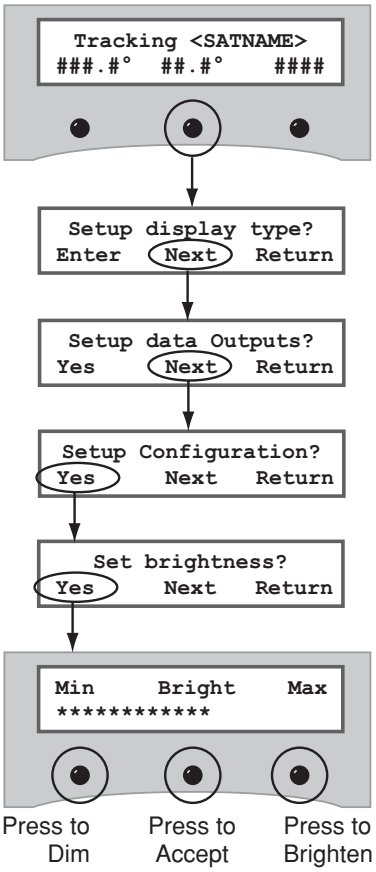


Adjusting Display Brightness

The ADCU display brightness can be adjusted to suit your preferences.

Use the flowchart in *Figure 3-13* if you wish to adjust the display brightness, or if you wish to restore the original brightness setting.

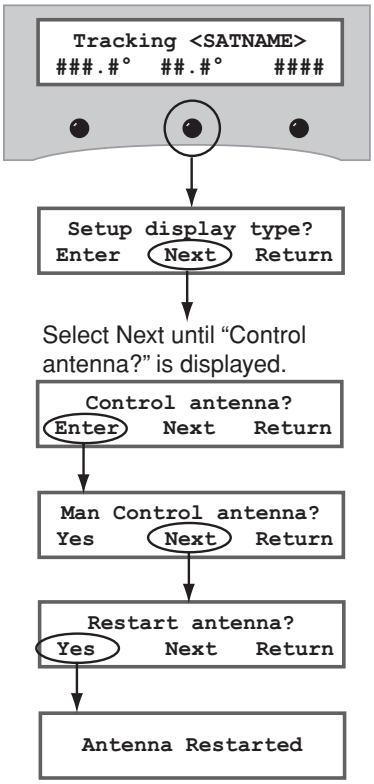
Figure 3-13 Setting Display Brightness



Restarting the Antenna

Use the flowchart in *Figure 3-14* if you wish to restart the antenna.

Figure 3-14 Restarting the Antenna



4. Troubleshooting

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

Contents

Five Simple Checks

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

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

Can the antenna see the satellite?

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

Is there excessive dirt or moisture on the antenna dome?

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

Is it raining heavily?

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

Is everything turned on and connected properly?

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

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

To optimize reception, the antenna's LNB needs to be set to the correct skew angle for the satellite(s) you want to track. See ***"Setting the LNB Skew Angle (Linear Version Only)" on page 29*** for details.

Error Messages

This section describes potential error messages displayed on the ADCU.

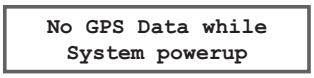
"No GPS Data While System Powerup"

The "No GPS data while system powerup" message is not a true error message. This indicates that during the TracVision M5/M7 initialization, no GPS was detected. If no GPS receiver is connected, or if the GPS receiver was not initialized prior to turning on the TracVision system, some navigational display types will be unavailable.

TIP: *For more information on ADCU display types, refer to* ***"ADCU Display Types" on page 17****.*

If a GPS receiver is connected but was not initialized prior to turning on the TracVision system, simply turn off the TracVision system, then turn it back on. The TracVision system will detect the GPS sensor during initialization. Refer to ***"Turning the System On/Off" on page 14*** for more information.

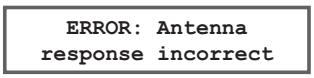
Figure 4-1 No GPS Data While System Powerup Screen



"Antenna Response Incorrect"

The "Antenna response incorrect" error message indicates the ADCU received an incorrect response from the antenna when requesting data. To correct this, simply repeat the requested operation.

Figure 4-2 Antenna Response Incorrect Screen



"Antenna Not Responding"

The "Antenna not responding" error message indicates a communication failure between the ADCU and the antenna. This is usually the result of either the antenna being disconnected from the ADCU or the antenna not being turned on (when the antenna is not configured to receive power directly from the ADCU). If the antenna is intentionally turned off, switch to one of the navigational display types to utilized the navigational displays.

TIP: *For more information on ADCU display types, refer to* ***"ADCU Display Types" on page 17****.*

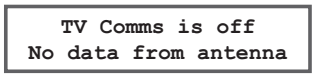
Figure 4-3 Antenna Not Responding

"TV Comms is Off No Data from Antenna"

The "TV comms is off no data from antenna" error message indicates a communication failure between the ADCU and the antenna. This is usually the result of either the antenna being disconnected from the ADCU or the antenna not being turned off (when the antenna is not configured to receive power directly from the ADCU). If the antenna is intentionally turned off, switch to one of the navigational display types to utilized the navigational displays. If the antenna is not intentionally turned off, check for loose cable connections or restart the system. For more information on restarting the system, refer to ***"Restarting the Antenna" on page 36****.*

TIP: *For more information on ADCU display types, refer to* ***"ADCU Display Types" on page 17****.*

Figure 4-4 TV Comms is Off No Data from Antenna



Troubleshooting Matrix

The troubleshooting matrix identifies potential operational symptoms and their causes and remedies. *"Causes and Remedies for Operational Issues" on page 43* contains detailed information on the causes and remedies listed below.

Figure 4-5 Troubleshooting Matrix

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

Causes and Remedies for Operational Issues

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

Receiver Fault or Improper Receiver Configuration

Receiver Fault

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

Improper Receiver Configuration (Linear Systems Only)

To ensure proper operation, the receiver(s) must be set up for the same satellites, and in the same order, they are set up in the antenna:

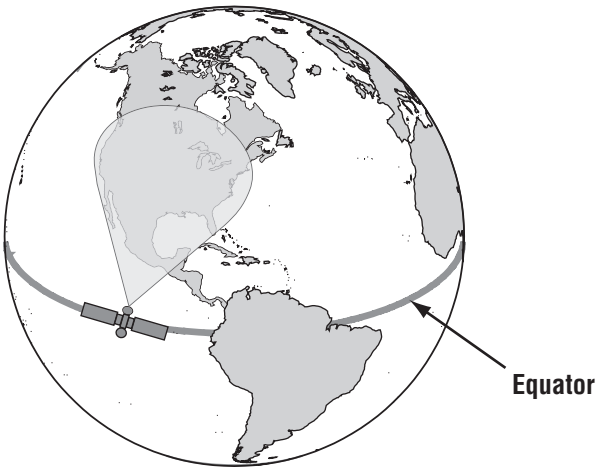
Antenna Satellite	Receiver Satellite	DiSEqC Setting
Sat. A	Alternative 1 or A	DiSEqC 1
Sat. B	Alternative 2 or B	DiSEqC 2

Satellite Coverage Issue

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

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

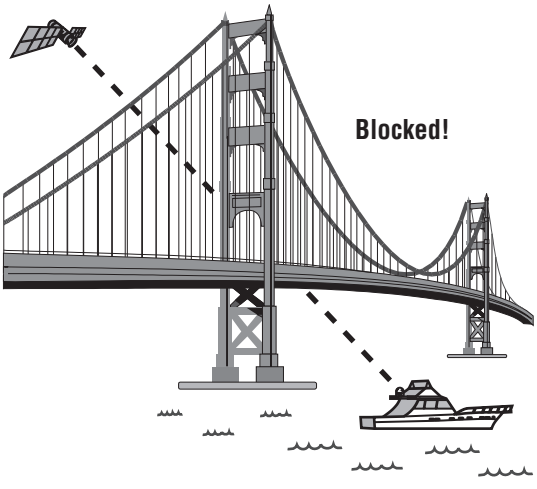
Figure 4-6 Location and Coverage Area of DIRECTV 101 Satellite



Satellite Signal Blocked

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

Figure 4-7 Example of Satellite Blockage



Radar Interference

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

Satellite Frequency Data Changed

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

Vessel Turning During Startup

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

Insufficient Power

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

Improper Wiring

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

Loose RF Connectors

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

Type of Multiswitch Used

If your TracVision system's configuration requires a multiswitch, an active (powered) multiswitch must be used to ensure proper antenna performance. TracVision M5 receiver wiring diagrams are provided in ***"Appendix D" on page 89***. TracVision M7 receiver wiring diagrams are provided in ***"Appendix E" on page 93***.

Cable Unwrap

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

Technical Support

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

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

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

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

Please have your antenna serial number handy before you call. For information on retrieving your antenna serial number, refer to *"Displaying the Antenna Serial Number" on page 64*.

Field Replaceable Units

If you experience any operating problem or require technical assistance, please call or visit your local authorized TracVision dealer or distributor. To find a KVH-authorized dealer near you, visit *www.kvh.com/wheretogetservice*.

Part numbers for field replaceable units (FRUs) that can be serviced in the field are listed in *Figure 4-8* and *Figure 4-9 on page 49*. These parts can be obtained from any KVH-authorized dealer or distributor.

Figure 4-8 Field Replaceable Units (continued on next page)

Part	Part Number
Radome (TracVision M5 Only)	02-0925-07†
Radome (TracVision M7 Only)	02-1047-05†
Main PCB (printed circuit board)	72-0258
RF PCB (printed circuit board)	72-0259
Inverter PCB (printed circuit board)	72-0260
Gyro	72-0261
Elevation drive belt	72-0263
Elevation motor	72-0262
Azimuth limit switch (TracVision M7 Only)	72-0264

†Specify color when ordering

Figure 4-8 Field Replaceable Units (continued)

LNB - circular dual-output	72-0265
LNB - Galaxy circular dual-output	72-0266
LNB - linear dual-output	72-0267
LNB - linear quad-output (TracVision M7 Only)	72-0268
Feed tube	72-0269
Antenna data cable, 50 ft.	32-0619-50
Antenna data cable, 100 ft.	32-0619-100
Antenna power cable, 100 ft.	32-0510-100
Ground cable, 50 ft.	32-0583-50

Figure 4-9 GyroTrac Field Replaceable Units

Part	**Part Number**
ADCU	02-0961
GyroTrac sensor	02-1154
Sensor cable, 30 ft.	32-0623-30
PC data cable, 6 ft.	32-0628-06
RF flash cable, 15 ft.	32-0618-15

Appendix A Advanced Settings and Functions

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

Contents

A

Data Output Settings

This section explains how to modify the GyroTrac sensor's data output settings.

Overview

The TracVision system's GyroTrac sensor transmits up to five selectable message types simultaneously to external navigation devices connected to the ADCU. One output port is dedicated to the sine/cosine signal format. One is dedicated to the Furuno® AD10S signal format. Three serial ports allow outputs of NMEA 0183, KVH RS-422, and Cetrek proprietary signal formats. Each of these message formats is described in the following sections.

NOTE: *Serial port 3 is disabled when the antenna is connected to the ADCU.*

Sine/Cosine Data Output

The TracVision system's GyroTrac sensor can be configured to provide either 3-wire or 4-wire sine/cosine output, but not both. The sine/cosine output is commonly used in ComNav®, Robertson®, and other autopilot systems.

TIP: *The B&G 4-wire sine/cosine output (also know as "differential sine/cosine") is a substitute of the Halcyon® compass output. The reference voltage should be set to 3.5 volts.*

NOTE: *The maximum current that can be drawn from the sine/cosine output is 10 mA.*

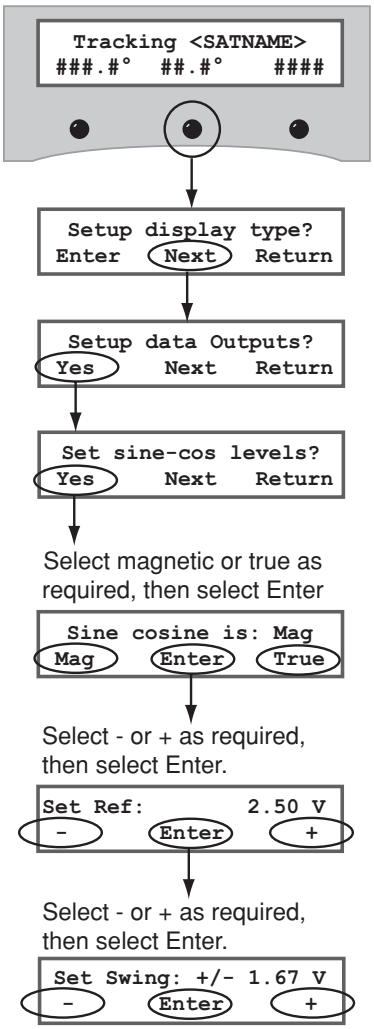
Sine/cosine setup requires the following be selected:

- Magnetic or true heading
- Reference voltage (valid range is 0 - 6.5 volts, default value is 2.5 volts)
- Swing voltage (valid range is 0 - 6.5 volts, default value is ±1.67 volts)

Use the flowchart in ***Figure A-1*** to modify the sine/cosine data output settings, or if you wish to restore the original sine/cosine settings.

NOTE: *If an active GPS connection is not detected, "Only Mag Available" is displayed. If the ADCU is receiving data from an external gyro, all compass outputs are automatically configured as True North causing "Only True Available" to be displayed.*

Figure A-1 Sine/Cosine Data Output Settings



Serial Port Outputs

Serial ports 1 and 2 can be individually programmed to output any of the message formats described below (serial port 3 is disabled when a TracVision system is connected to the ADCU). Up to four NMEA 0183 listening devices can be connected to each of the serial ports. Serial port 1 also has a pass-through duplicate port.

Each serial port can be independently programmed to output data at a rate from 1 Hz to 20Hz, selectable in 1 Hz increments. The default data rate is 10 Hz.

NOTE: *Serial port 3 is disabled. If Serial Port 3 is selected, the "No Port 3. TV Setup" screen will be displayed. Press any key to exit the screen.*

Message Formats

NMEA

The NMEA message format conforms to the NMEA 0183 version 2.20 standard for message structure. The following NMEA outputs can be selected: BWC, GGA, GLL, HDG, HDM, HDT, VTG, and XTE.

TIP: *The data rate of serial port 1 is 4800 baud. If serial port 2 is selected for NMEA output, the baud rate is automatically changed to 4800 baud from the default of 9600 baud.*

KVH RS-422

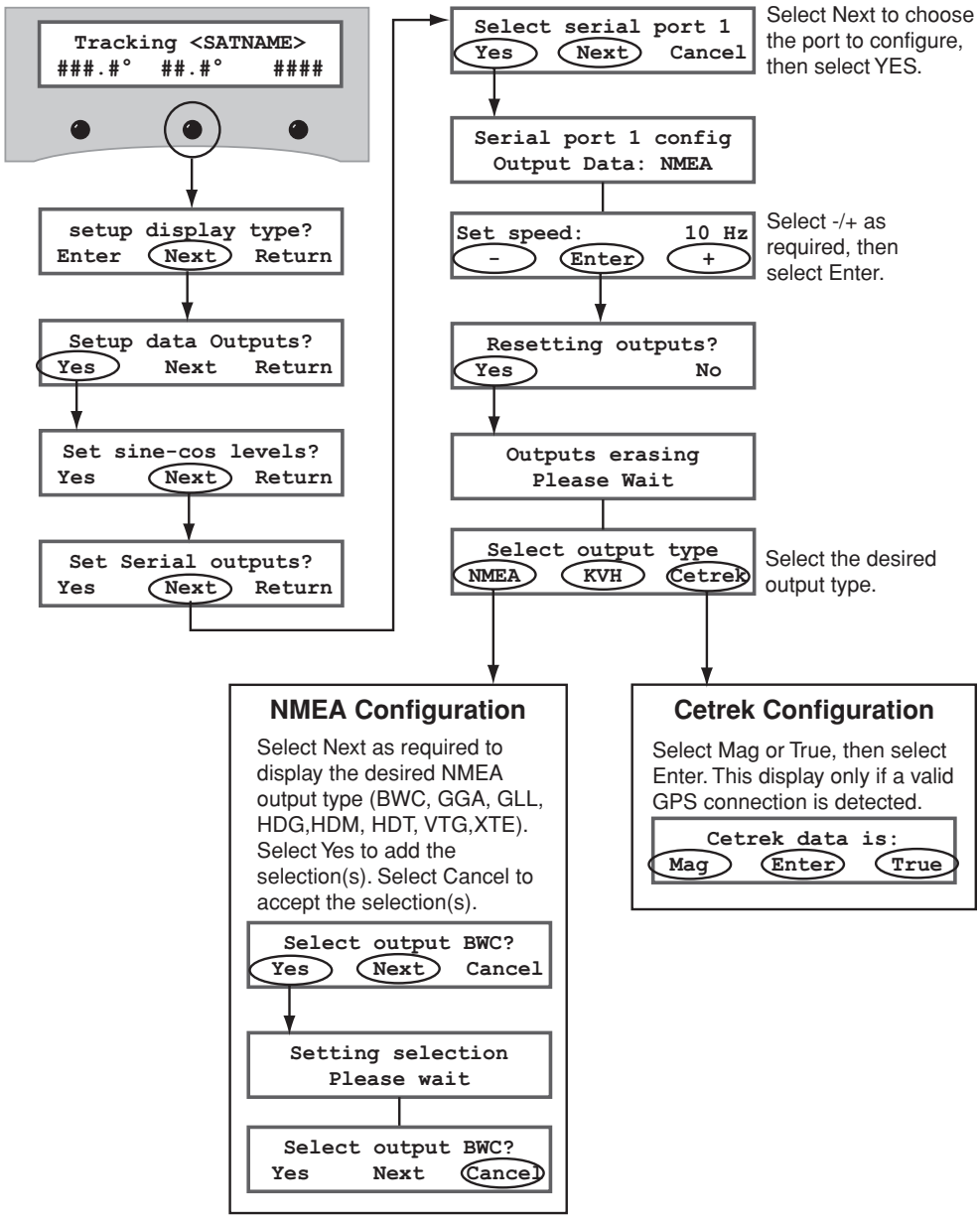
The KVH message format is an RS-422 message format giving stabilized pitch, roll, and yaw data. Data output from Port 1 will be 4800 baud while data port 2 will be 9600 baud; this message can be used for any device able to receive this data rate.

Cetrek Proprietary

The Cetrek proprietary message format is a stabilized heading output for use with Cetrek autopilot systems. If an active GPS connection is detected, you can select either magnetic or true heading data.

Use the flowchart in *Figure A-2* to modify the serial output settings, or if you wish to restore the original output settings.

Figure A-2 Serial Output Settings



Furuno Output

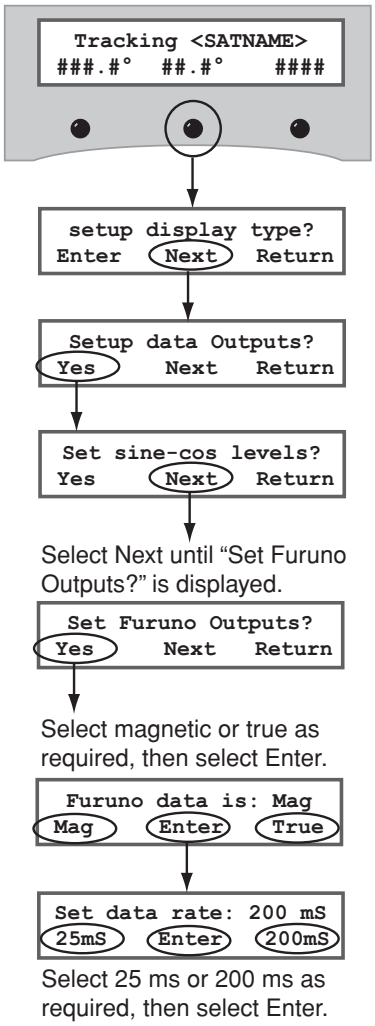
The Furuno output is a proprietary message format typically used with Furuno and other brands of radar and autopilot systems. Two user-configurable options are available: magnetic or true heading and 25 millisecond (40 Hz) or 200 millisecond (5 Hz) data rates.

NOTE: *If you need to connect a second Furuno radar, you can install an optional stepper interface unit (KVH Part #19-0078. This device connects to any NMEA serial port (configured for an HDM or HDT message) and generates a stepper output of 3, 6, 12, and 24 steps/degree with a 5V reference voltage. An in-line voltage converter (KVH Part #19-0089) is also available to provide a 30-70V reference instead of the unit's standard 5V.*

Use the flowchart in ***Figure A-3*** to modify the Furuno output settings, or if you wish to restore the original furuno output settings.

NOTE: *If an active GPS connection is not detected, "Only Mag Available" is displayed.*

Figure A-3 Furuno Output Settings

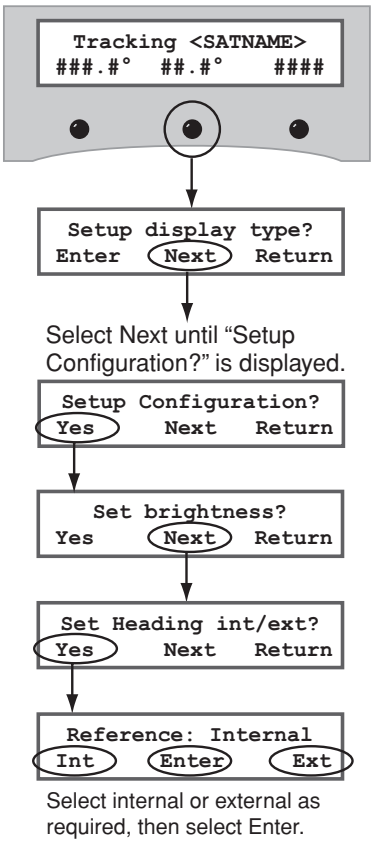


Setting the Heading Reference Source

You can set the heading reference source to internal (default) or external. When internal heading data is selected, the system receives heading data from the GyroTrac's sensor. You can also select external heading data if an external compass is connected to the system.

Use the flowchart in *Figure A-4* to modify the heading reference source, or if you wish to restore the original heading reference source.

Figure A-4 Setting the Heading Reference Source



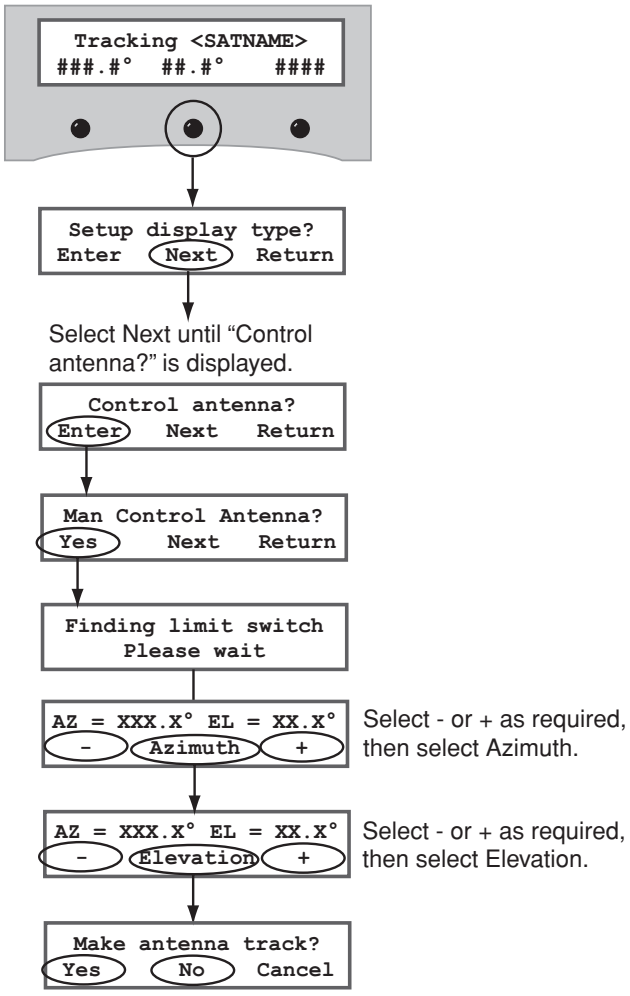
Manually Controlling the Antenna

Use the flowchart in ***Figure A-5*** if you wish to control the antenna manually.

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

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

Figure A-5 Manually Controlling the Antenna



Updating Satellite Frequency Data

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

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

You will need to enter the following information:

- Symbol rate
- FEC code

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

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

IMPORTANT!

The vessel must remain stationary throughout this procedure.

1. Set your satellite receiver to signal meter mode. Refer to your selected receiver's user manual for details.

   IMPORTANT!

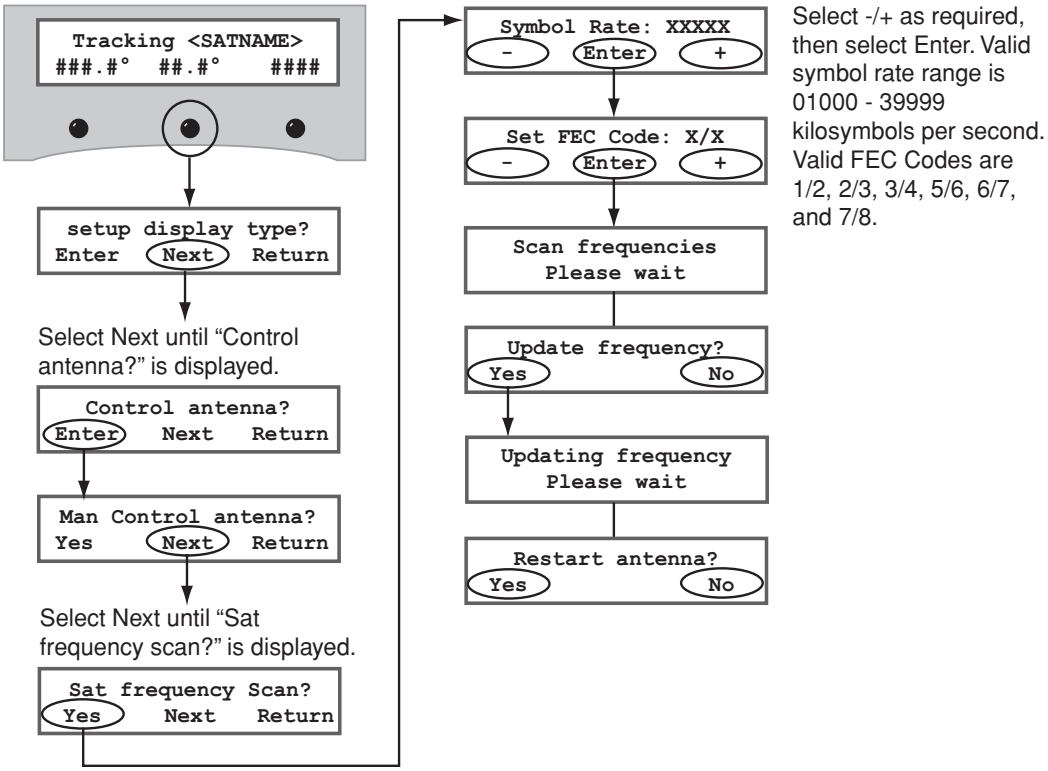
   Ensure that the TV signal meter indicates that you have a strong signal.

2. If the system is unable to locate the selected satellite, you can manually point the antenna. Refer to ***"Manually Controlling the Antenna" on page 59*** for details.
3. Using the receiver, select the desired polarization and band. Refer to your selected receiver's user manual for details.

4. Use the flowchart in *Figure A-6* to scan the frequency data of the selected satellite.

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

Figure A-6 Scanning Frequency Data



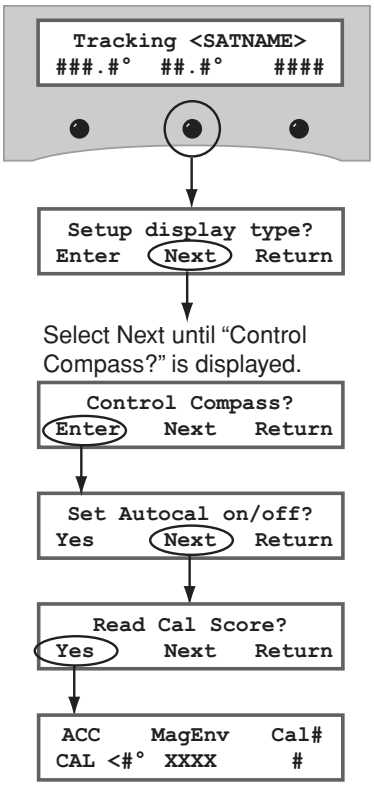
Displaying the Calibration Score

Use the flowchart in *Figure A-7* to display the calibration score. For information on interpreting the calibration score, see *"Interpreting the Calibration Score" on page 73*.

IMPORTANT!

If the system is currently configured to use an external compass, you must set the TracVision system to use an internal heading reference before performing this procedure. See *"Setting the Heading Reference Source" on page 58* for more information.

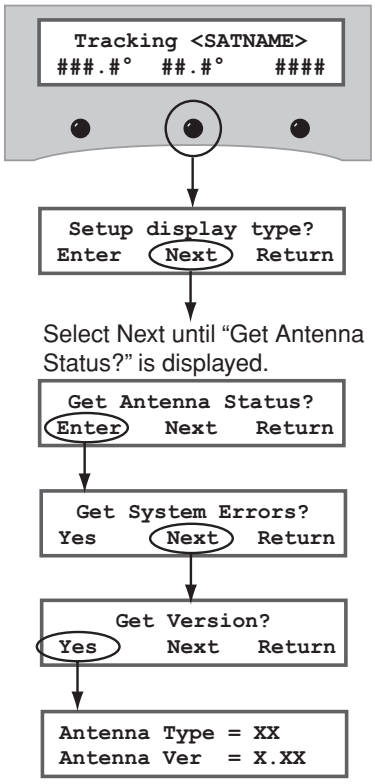
Figure A-7 Displaying the Calibration Score



Displaying the Antenna Software Version

Use the flowchart in *Figure A-8* if you wish to display antenna software version.

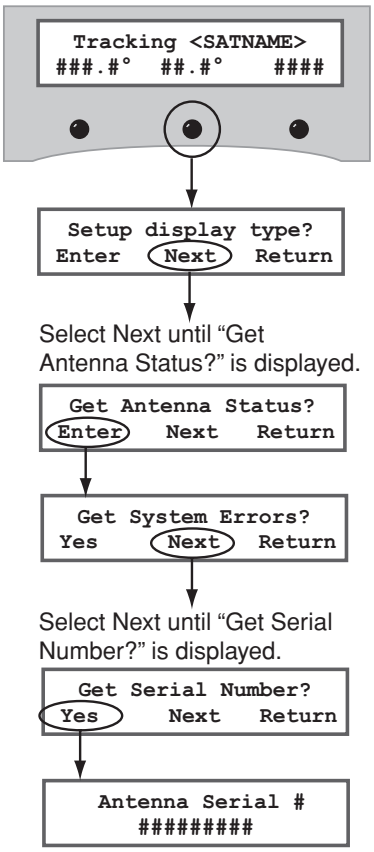
Figure A-8 Displaying Antenna Software Version



Displaying the Antenna Serial Number

Use the flowchart in *Figure A-9* if you wish to display antenna serial number.

Figure A-9 Displaying Antenna Serial Number



Other Advanced Settings

Not all ADCU menu options are used in this configuration. The following menu options are not used:

- Default Display Box
- Set TV Com On/Off
- Get Bit Error Rate
- Get Thres/Sig level
- Get System Errors

Appendix B Recalibration

This appendix explains how to recalibrate the system and set gyro offset values. This information should only be utilized by KVH-authorized technicians.

Contents

B

Recalibrating the System

During installation, the TracVision M5/M7 should have been properly calibrated. However, if the GyroTrac sensor is moved or if additional equipment is installed or removed near the GyroTrac sensor, KVH recommends recalibrating the system. The following sections explain how to recalibrate the system.

To perform this procedure, you will need to perform the following:

- Clear the existing calibration score
- Turn on autocalibration
- Recalibrate the system
- Verify the calibration score
- Turn off autocalibration

IMPORTANT!

If the system is currently configured to use an external compass, you must set the TracVision system to use an internal heading reference before performing this procedure. See *"Setting the Heading Reference Source 58" on page 51* for more information.

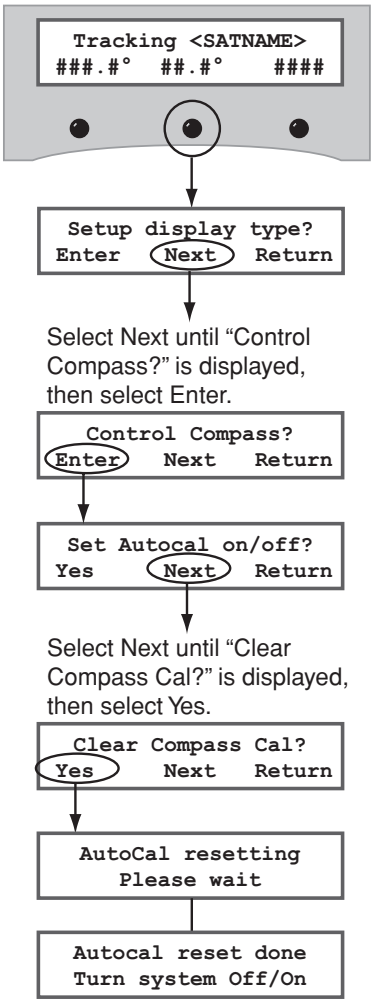
Clear the Existing Calibration Score

The following instructions explain how to clear the existing calibration score. Use the flowchart in *Figure B-1 on page 70* to clear the existing calibration score.

NOTE: *If the "System Halted Power System Off/On" message is displayed during this procedure, turn the system Off. Wait 10 seconds, then turn the system On. Be sure to allow the system to initialize before restarting the procedure.*

NOTE: *Be sure to turn the system Off after completing this procedure. Wait 10 seconds, then turn the system On.*

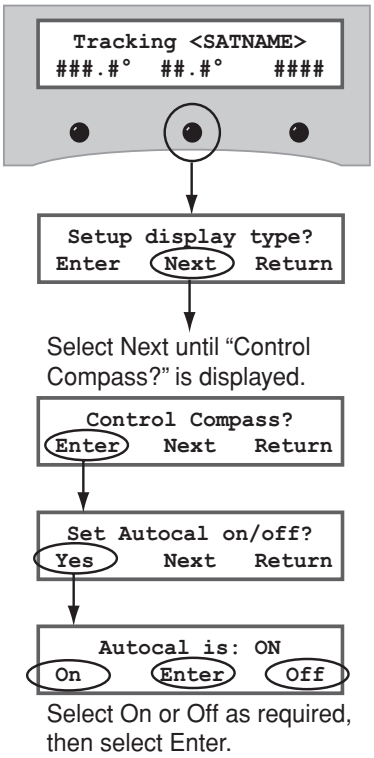
Figure B-1 Clearing the Existing Calibration Score



Set Autocalibration to On

Use the flowchart in *Figure B-2* to turn On autocalibration.

Figure B-2 Autocalibration Setting

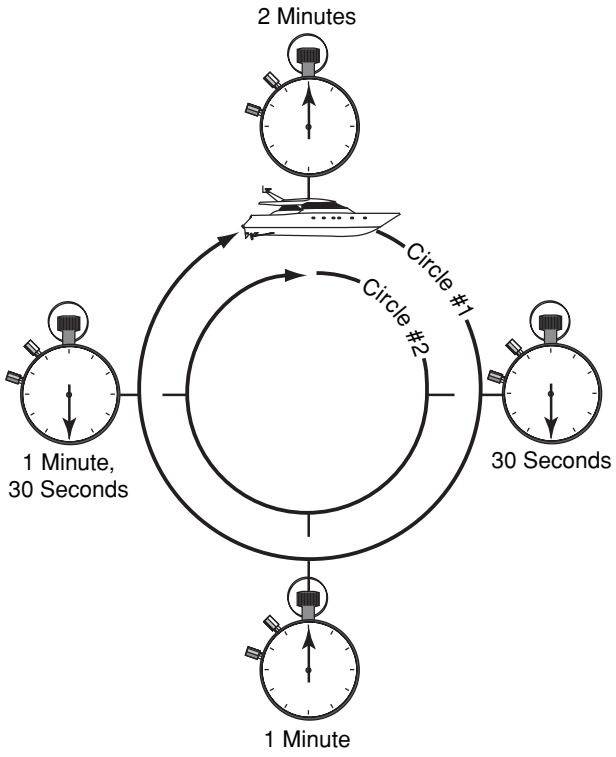


Recalibrate the System

1. Select a calm day and a clear area. Excessive pitching and rolling can distort calibration data.
2. Apply power to the TracVision system.
3. Write down your approximate heading. You will use this information later in this procedure.
4. Steer the vessel at a slow, steady pace through two full circles that take at least two minutes each to complete. Use the heading information that you recorded earlier to confirm that you completed each full circle (see *Figure B-3 on page 72*).

   TIP: *The circles do not have to be perfectly round, but ensure that you have turned 360° for each circle.*

Figure B-3 Timing Calibration Circles

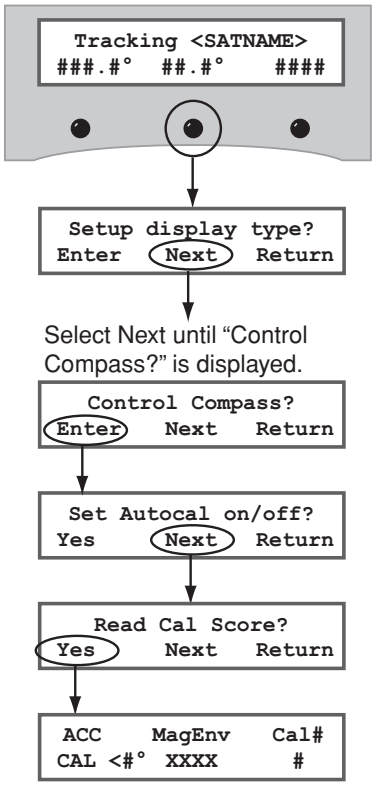


Verify the Calibration Score

This section explains how to interpret the calibration score display. Be sure to verify that the calibration yielded acceptable results. If the calibration did not yield acceptable results, you will need to restart recalibration.

Use the flowchart in *Figure B-4 on page 73* to display the calibration score. For information on interpreting the calibration score, see *"Interpreting the Calibration Score" on page 73*.

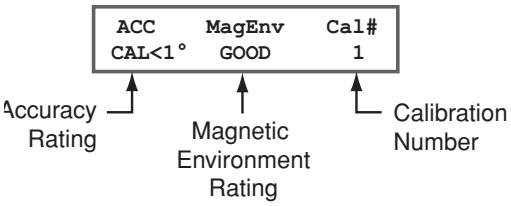
Figure B-4 Displaying the Calibration Score



Interpreting the Calibration Score

Each calibration results in a calibration score that is stored in the system's memory. The calibration score contains an accuracy score, a magnetic environment rating, and the number of calibrations performed.

Figure B-5 Calibration Score Screen



Accuracy Score

The accuracy score indicates the degree of accuracy the GyroTrac will provide based on the quality of the last calibration. *Figure B-6* lists the five possible accuracy score levels.

Figure B-6 Accuracy Rating Levels

Accuracy Score	Accuracy
<1°	Better than 1°
<2°	Better than 2°
<4°	Better than 4°
<8°	Better than 8°
BAD CAL	Recalibrate

Magnetic Environment

The magnetic environment rating (GOOD, POOR, BAD) indicates the quality of the installation location. If the quality is POOR or BAD, the GyroTrac Sensor should be moved to a more favorable magnetic environment and recalibration should be restarted.

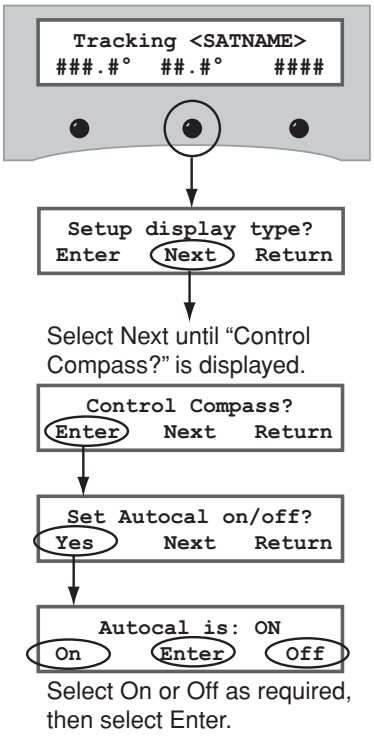
Calibration Number

The calibration number indicates the number of times the sensor has been calibrated. This is primarily used to verify that a new calibration has been accepted by the system.

Set Autocalibration to Off

Use the flowchart in *Figure B-7* to turn Off autocalibration setting.

Figure B-7 Autocalibration Setting



Setting the Sensor Offset Values

The GyroTrac sensor must be mounted as close to level in pitch and roll as possible, with its long axis parallel to the vessel's centerline. If the GyroTrac sensor was not mounted according to the guidelines in the *TracVision M5/M7 Installation Guide*, you need to adjust the sensor offset values to compensate for variances when pitch, roll, and azimuth references cannot be met.

TIP: *The maximum offset values for pitch and roll are ±45°; the maximum offset value for azimuth is ±180°.*

NOTE: *Pitch, roll, and yaw settings are determined by the GyroTrac sensor, not external hardware.*

IMPORTANT!

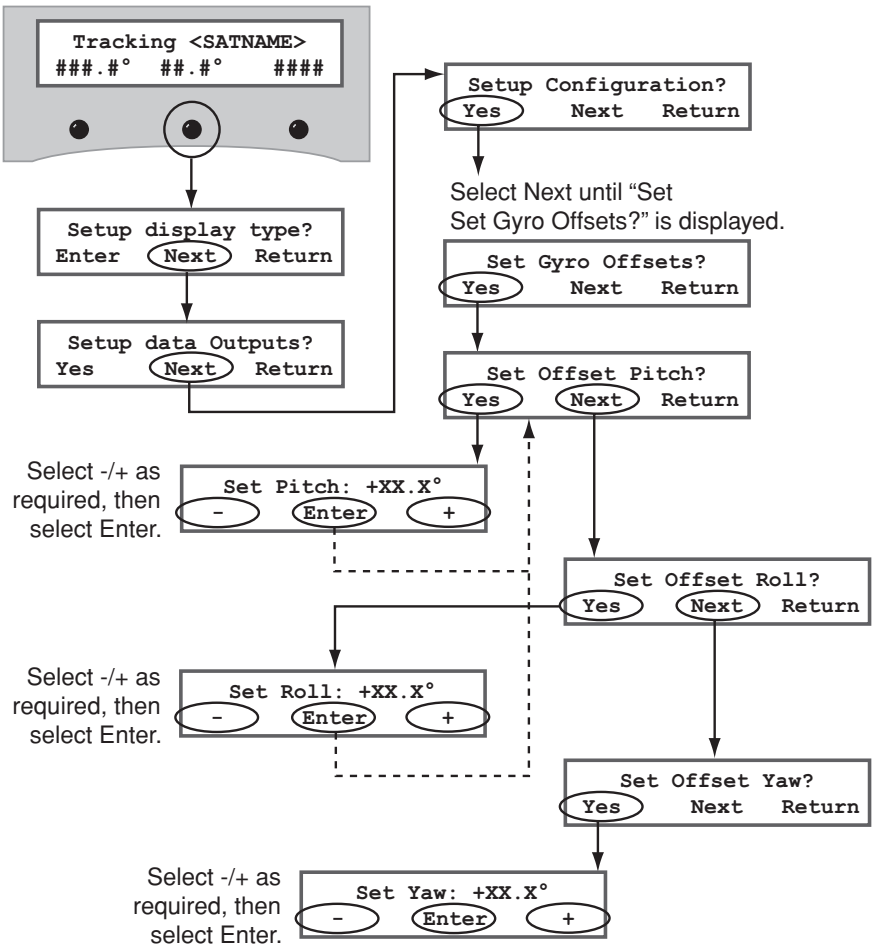
This procedure must be performed while the vessel is docked or in still water.

IMPORTANT!

To set pitch, roll, and yaw properly, initially enter zeros for all measurements. Choose the Pitch, Roll, and Yaw display from the Main menu and record over those numbers. Reverse the value of the Pitch and Roll (positive becomes negative, negative becomes positive). Return to the Gyro Offset menu and enter the recorded numbers.

Use the flowchart in ***Figure B-8 on page 77*** to modify the sensor offset setting, or if you wish to restore the original sensor offset setting.

Figure B-8 Setting Sensor Offset Values



Appendix C Programming User-defined Satellites

This appendix explains how to program a user-defined satellite(s) into the antenna, if necessary. The TracVision M5/M7 includes a library of common satellites that you can choose from. However, if the satellite(s) you wish to track is not listed, follow the instructions in this appendix to program your desired satellite(s).

Contents

C

Connecting a PC to the Maintenance Port

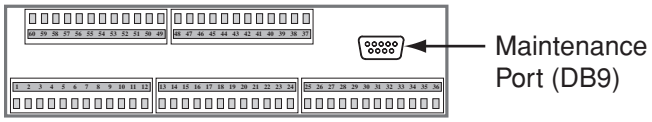
To program your user-defined satellite(s), you first need to connect a PC with Windows HyperTerminal and a straight serial data cable.

TIP: *If you are a KVH-authorized technician, you can use the KVH Flash Update Wizard instead of HyperTerminal. Enter commands in the wizard's "Antenna Comms" window. You do not need to flash the antenna to enter commands.*

1. Remove operating power from the ADCU.

2. Connect one end of a straight serial data cable to the maintenance port (DB9 connector) located on the back of the ADCU. Connect the other end of the data cable to the serial port on your PC.

Figure C-1 Maintenance Port on Back of ADCU

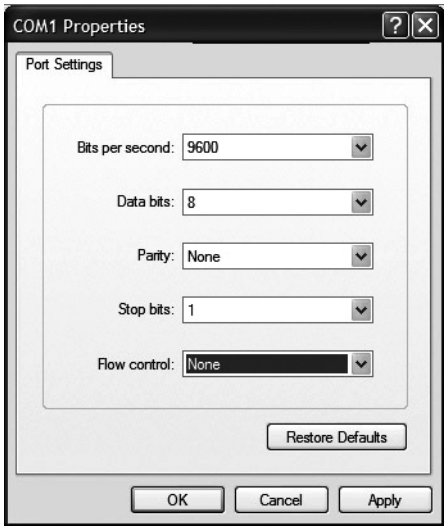


TIP: *If your computer does not have a DB9 serial COM port, you can use the following USB-to-RS232 adapters: IO Gear Part # GUC232A (visit* ***www.iogear.com****) or Belkin Part # F5U109 (visit* ***www.belkin.com****).*

3. Open HyperTerminal and establish the following settings:

   - Bits per second: 9600
   - Data bits: 8
   - Parity: None
   - Stop Bits:1
   - Flow Control: None

Figure C-2 HyperTerminal Settings



TIP: *To view characters on the screen as you type, set up HyperTerminal to echo typed characters. Select "Properties" from the File menu; select "ASCII Setup" at the Settings tab; then select "Echo typed characters locally" at the ASCII Setup window.*

4. Apply operating power to the ADCU.

Programming Your User-defined Satellite(s)

To configure a user-defined satellite, you will need to program the following satellite information into the antenna:

- Satellite name
- Satellite longitudinal position
- Transponder information for all applicable combinations of polarization/band:
  - Frequency
  - Symbol rate
  - FEC code
  - Network ID
  - Decoder type

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

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

1. Connect a PC to the maintenance port, as described in *"Connecting a PC to the Maintenance Port" on page 81*. Then type the following commands in the HyperTerminal window.

2. Type **HALT** then press Enter.

3. Type the following **SATCONFIG** command then press Enter:

SATCONFIG,*X*,*A*,*B*,*C*,*D*

Field	Description
X	User-defined satellite stored in antenna library (User1 = User-defined Satellite 1 or User2 = User-defined Satellite 2)
A	Longitude (0-180)
B	E (East) or W (West)
C	Decoding type (2 = DSS, 3 = DVB)
D	Polarization (L = linear) (C = circular)

4. Type **@DEBUGON** then press Enter.

5. Type the following **@SATCONFIG** command then press Enter:

@SATCONFIG,*X*,*E*,*F*,*G*,*H*,*I*,*J*,*K*

Field	Description
X	User-defined satellite stored in antenna library (User1 = User-defined Satellite 1 or User2 = User-defined Satellite 2)
E	Frequency, MHz (00000 or 10700-12750)
F	Symbol rate, kilosymbols per second (10000-45000)
G	FEC code (12, 23, 34, 56, 67, or 78)
H	Network ID, hexadecimal (0x####)
I	Polarization (V = vertical; H = horizontal; R = right; L = left)
J	LNB down conversion frequency (U = USA [11250 MHz]; L = low [9750 MHz]; H = high [10600 MHz]; G = Latin America [10500 MHz]; S = Sinosat [11300 MHz])
K	Decoding type (2 = DSS, 3 = DVB)

6a. (Linear systems only) - Repeat Step 5 for each polarization/band:

- Vertical High
- Horizontal High
- Vertical Low
- Horizontal Low

6b. (Circular systems only) - Repeat Step 5 for each polarization:

- Right
- Left

If your selected satellite does not have information for one or more of these transponder categories, you can enter the following defaults instead:

Transponder Data	Default Value
Frequency	00000
Symbol rate	27500
FEC code	Same value as other transponders with valid data
Network ID	0x0000

7. Type **ZAP** then press Enter. The antenna restarts. Wait one minute for system startup.

8. Follow the steps in *"Setting the ADCU to Track Different Satellites" on page 24* to select your new user-defined satellite(s) for tracking. Be sure use the following installation names for your user-defined satellite(s):

Satellite	Installation Name
User-defined Satellite 1	USER1
User-defined Satellite 2	USER2

Example - Linear Satellite

The following is an example of programming the fictional "YOURSAT 7" as the USER1 user-defined satellite.

YOURSAT 7 at 7°W, DVB decoder, linear polarization

Transponder Data	Value
Horizontal High	
Frequency	11.966 GHz
Symbol rate	27500
FEC code	3/4
Network ID	2048 (dec) = 0x0800
Vertical High	
Frequency	11.823 GHz
Symbol rate	27500
FEC code	3/4
Network ID	2048 (dec) = 0x0800
Vertical Low	
No data listed	
Horizontal Low	
No data listed	

Based on the above information, you would enter the following commands into the HyperTerminal window:

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

Example - Circular Satellite

The following is an example of programming the fictional "YOURSAT 122" as the USER2 user-defined satellite.

YOURSAT 122 at 122°W, DVB decoder, circular polarization

Transponder Data	Value
Right	
Frequency	12.225 GHz
Symbol rate	20000
FEC code	5/6
Network ID	4100 (dec) = 0x1004
Left	
Frequency	12.456 GHz
Symbol rate	20000
FEC code	5/6
Network ID	4100 (dec) = 0x1004

Based on the above information, you would enter the following commands into the HyperTerminal window:

```
HALT
SATCONFIG,USER2,122,W,3,C
@DEBUGON
@SATCONFIG,B,99,12225,20000,56,0x1004,R,U,3
@SATCONFIG,B,99,12456,20000,56,0x1004,L,U,3
ZAP
```

Appendix D TracVision M5 Wiring Diagrams

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

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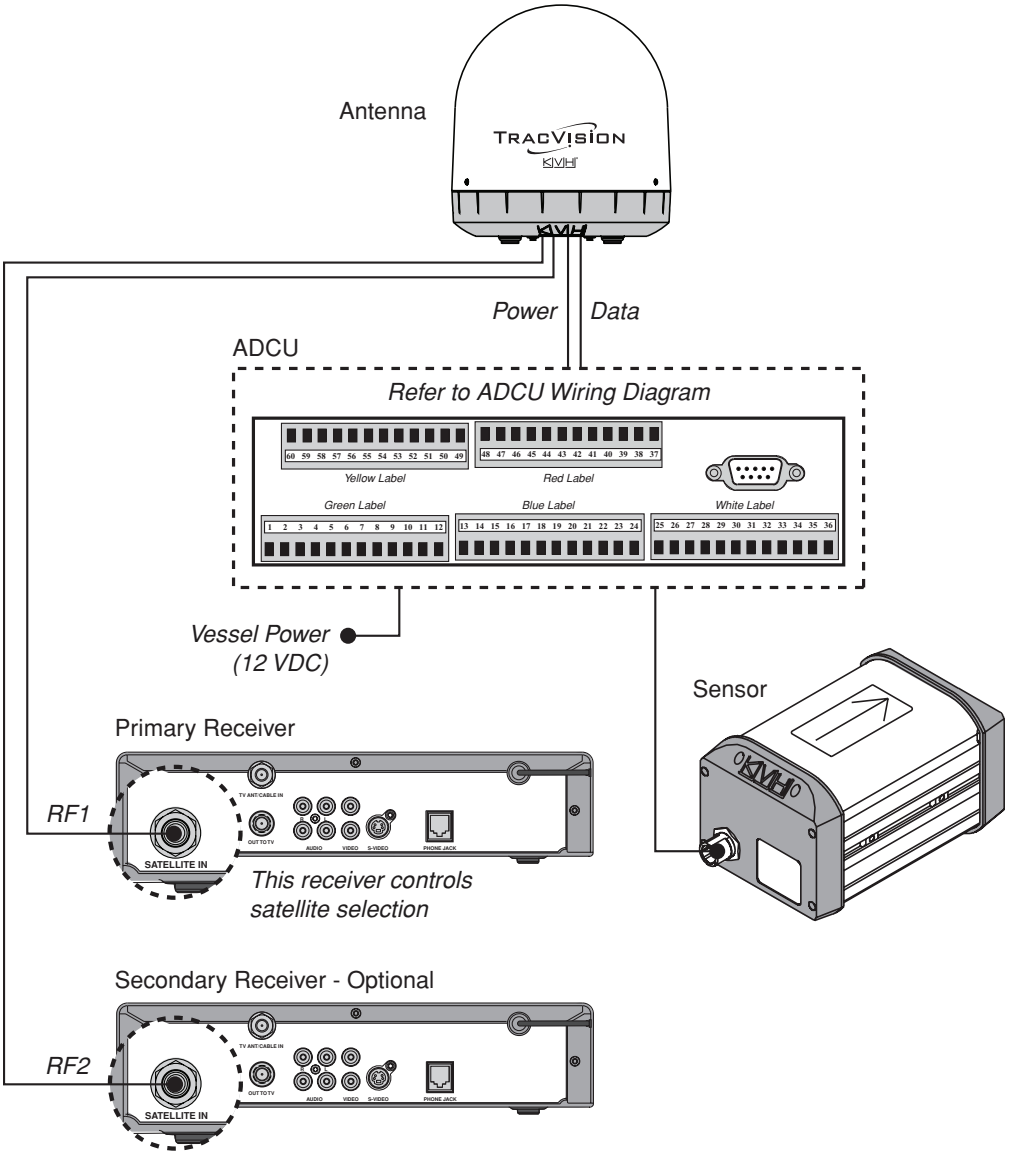
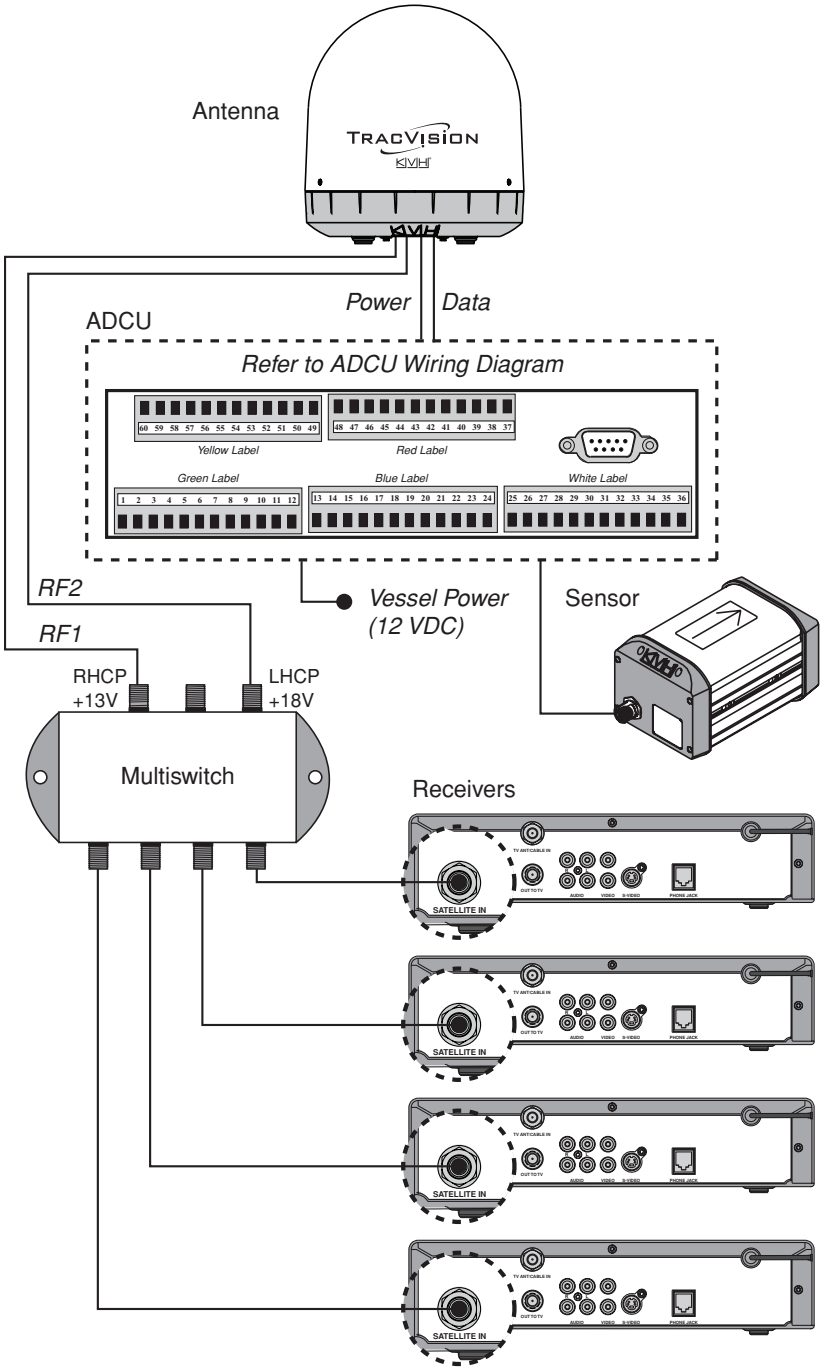
TracVision M5 Wiring Diagram for One or Two Receivers



Circular Version Only

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



***NOTE:** This configuration requires an active (powered) multiswitch, such as Channel Master model 6314IFD. You can purchase this multiswitch from KVH (KVH P/N 19-0123). Be sure to terminate all unused output connectors with 75 ohm DC blocks (Channel Master model #7184 or equivalent). This configuration also requires using the ADCU to switch between satellites.*

Appendix E TracVision M7 Wiring Diagrams

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

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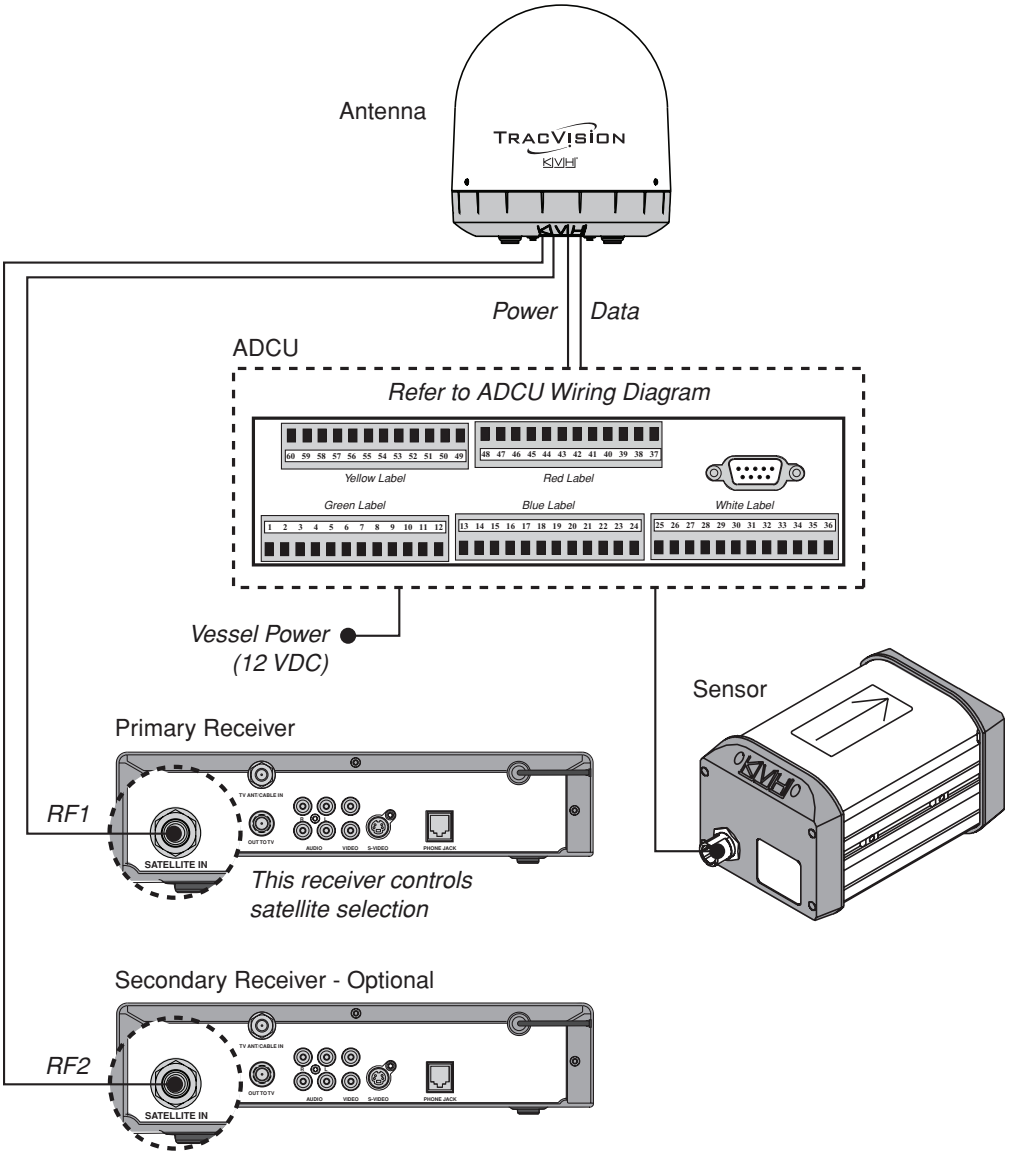
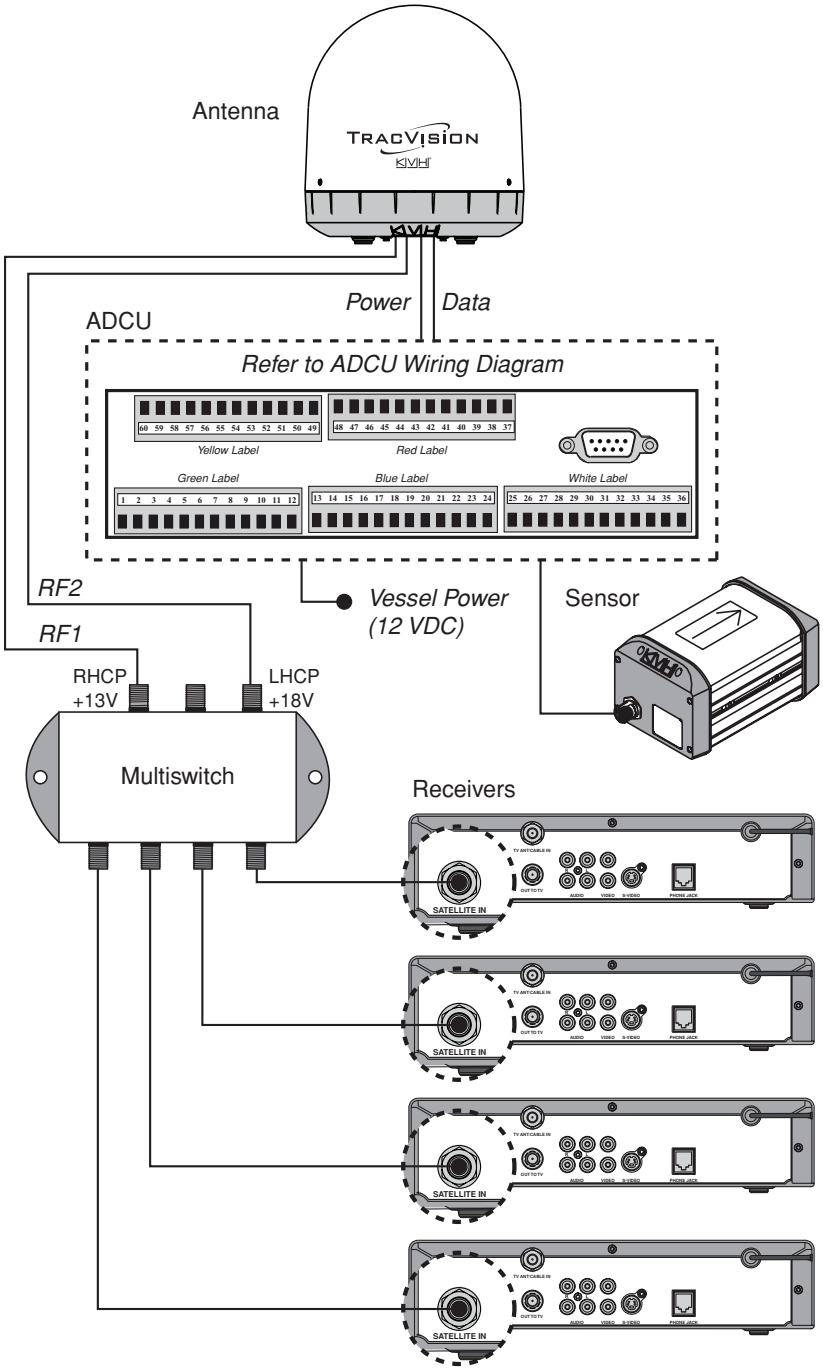
TracVision M7 Wiring Diagram for One or Two Receivers



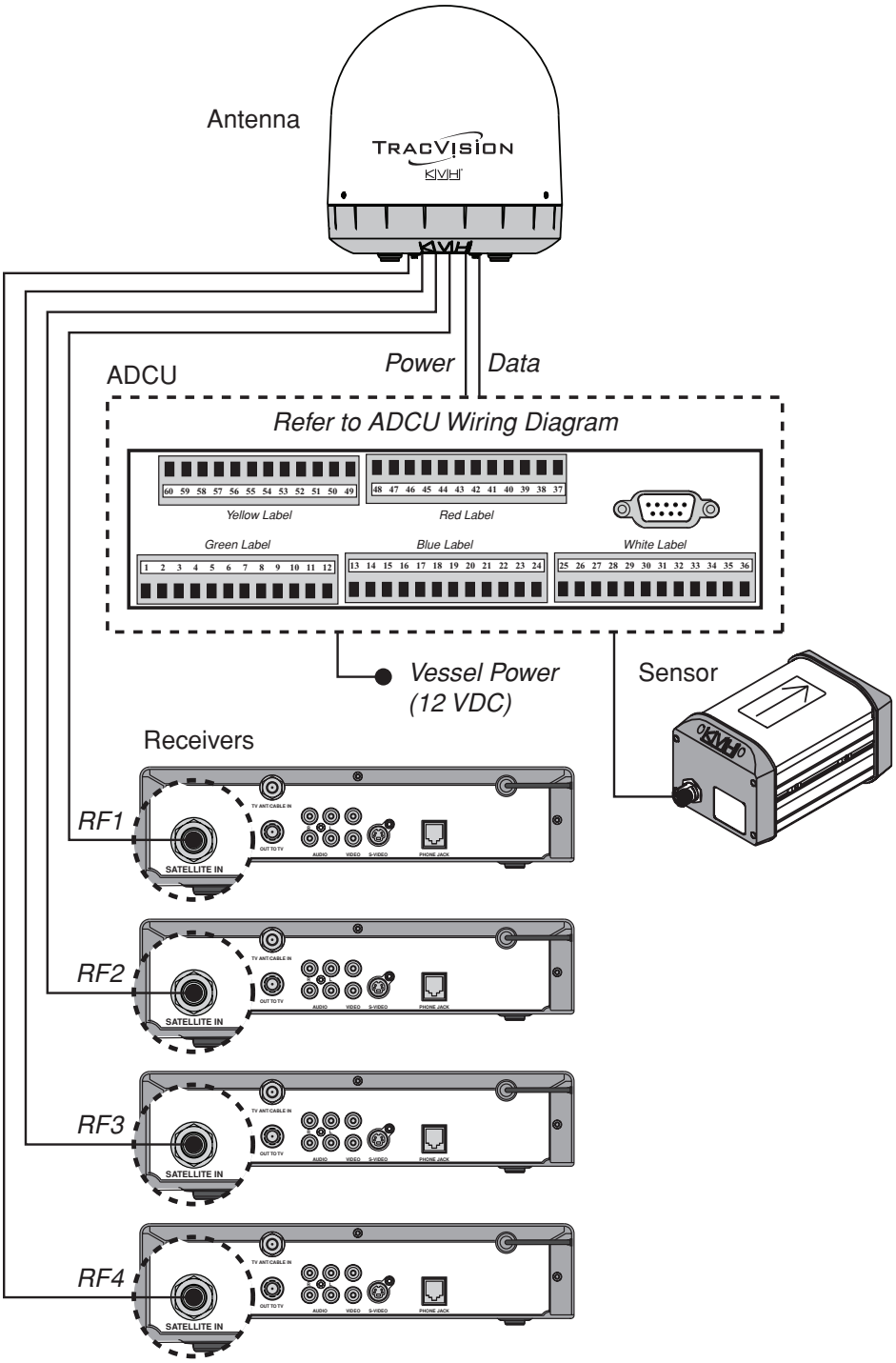
Circular Version Only

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



***NOTE:** This configuration requires an active (powered) multiswitch, such as Channel Master model 6314IFD. You can purchase this multiswitch from KVH (KVH P/N 19-0123). Be sure to terminate all unused output connectors with 75 ohm DC blocks (Channel Master model #7184 or equivalent). This configuration also requires using the ADCU to switch between satellites.*

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



NOTE: *If you wish to connect more than four receivers, you will need to install an active (powered) multiswitch, such as Spaun model 5602NF. You can purchase this multiswitch from KVH (KVH P/N 19-0413). Be sure to terminate all unused output connectors with 75 ohm DC blocks (Channel Master model #7184 or equivalent). The installation of a multiswitch also requires using the ADCU to switch between satellites.*

Appendix F
ADCU Wiring Diagrams

This appendix provides ADCU wiring diagrams for both required and optional equipment. For installation instructions, refer to the *TracVision M5/M7 Installation Guide*.

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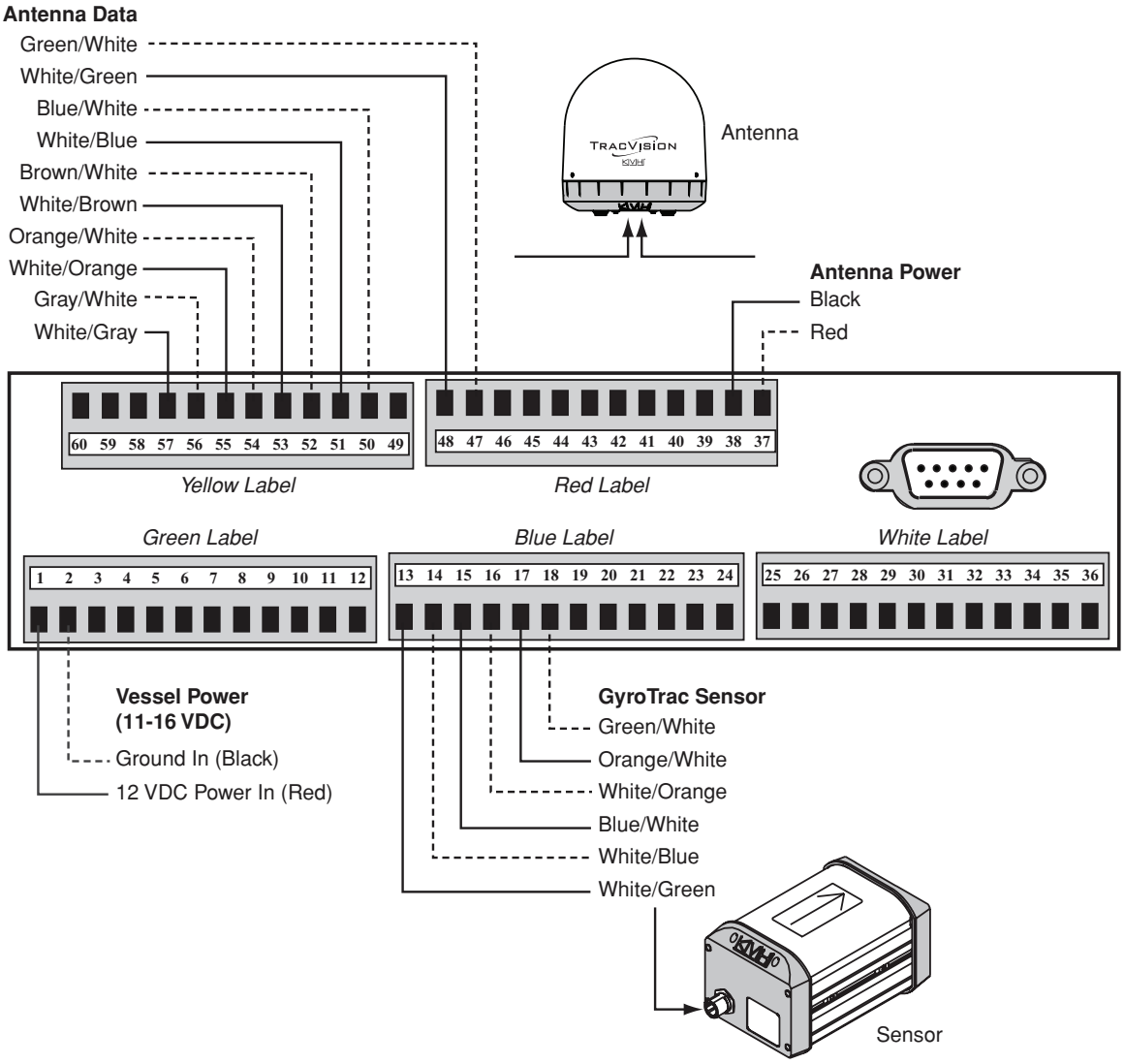
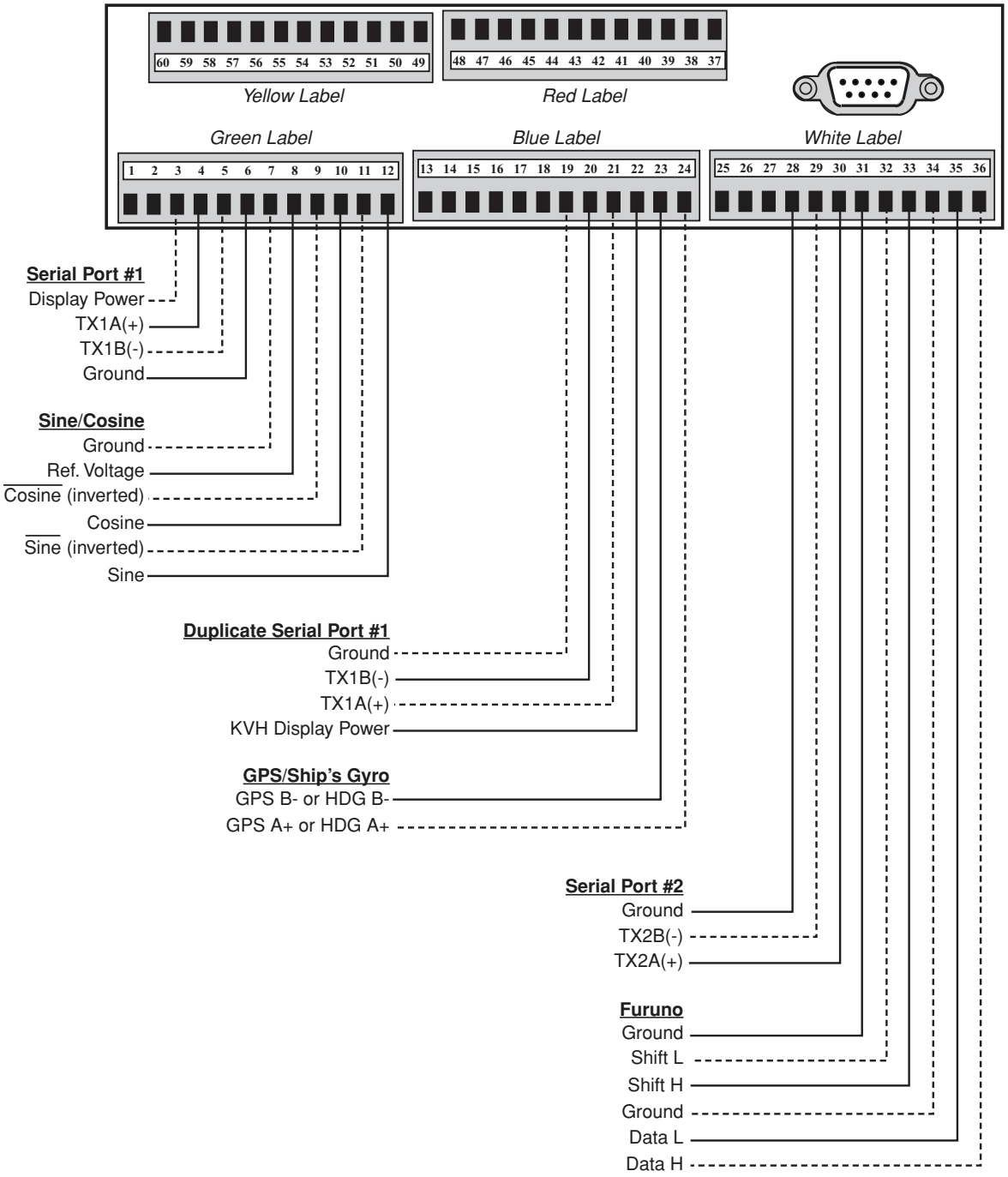
ADCU Wiring Diagram (Required)



ADCU Wiring Diagram (Optional Equipment)



Appendix G
Position Grids

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

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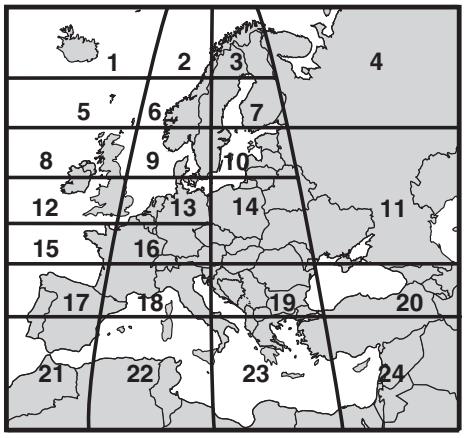
G

European Position Grid

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

Figure G-1 Approximate Latitude and Longitude

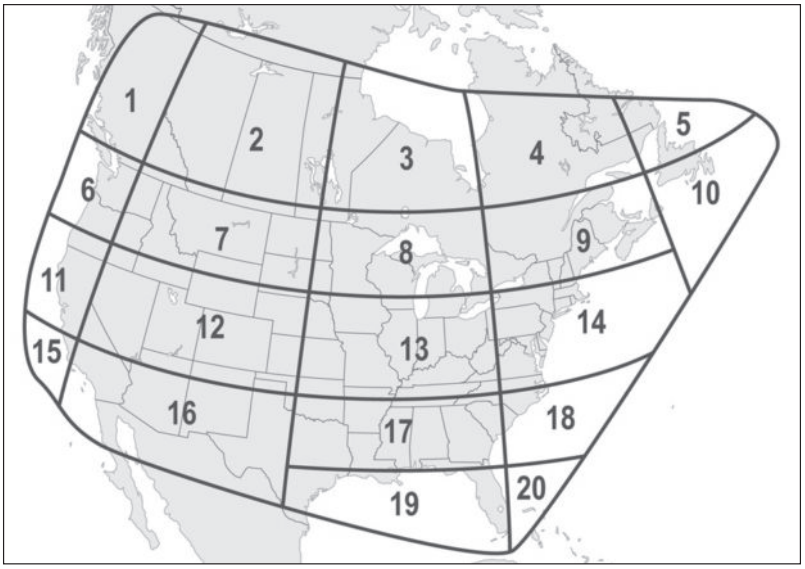


Grid #	Latitude	Longitude
1	67° N	7° W
2	67° N	7° E
3	67° N	22° E
4	65° N	45° E
5	63° N	7° W
6	63° N	7° E
7	63° N	22° E
8	57° N	7° W
9	57° N	7° E
10	57° N	22° E
11	55° N	40° E
12	53° N	7° W
13	53° N	7° E
14	50° N	22° E
15	47° N	7° W
16	47° N	7° E
17	43° N	7° W
18	43° N	7° E
19	43° N	22° E
20	43° N	37°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

North American Position Grid

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

Figure G-2 Approximate Latitude and Longitude



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

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