TRACVISION®
BY KVH INDUSTRIES

TracVision M9
Standard Configuration

TracVision M9 Installation Guide

TracVision® M9 Installation Guide

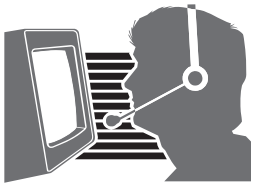
These instructions explain how to install the TracVision M9 satellite TV antenna system on a vessel. Complete instructions on how to use the system are provided in the User's Guide.

Installation Steps

Who Should Install the System?

To ensure a safe and effective installation, KVH recommends that a KVH-authorized marine technician install the TracVision antenna. KVH-authorized technicians have the tools and electronics expertise necessary to install the system. To find a technician near you, visit www.kvh.com/wheretogetservice.

Technical Support



If you need technical assistance, please contact KVH Technical Support:

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54-0418 Rev. D

1 Inspect Parts and Get Tools

Before you begin, follow these steps to make sure you have everything you need to complete the installation.

a. Unpack the box and ensure it contains everything shown on the Kitpack Contents List. Save the packaging for future use.

IMPORTANT!

Always lift the antenna by the baseplate and never by the radome or any portion of the internal antenna assembly (see Figure 1).

b. Carefully examine all of the supplied parts to ensure nothing was damaged in shipment.

c. Gather all of the tools and materials listed below. You will need these items to complete the installation.

- Flat-head and Phillips-head screwdrivers
- Electric drill and 1/2" (13 mm) and #29 drill bits
- 17 mm socket wrench
- 9/16" open-end wrench
- Light hammer and center punch
- Adhesive tape
- Scriber or pencil
- Wire strippers
- 15-amp quick-tripping circuit breaker
- RG-6 or RG-11 RF coax cable(s) with Snap-N-Seal® F-connectors for connecting the antenna to the receiver(s) (see Step 4e on page 6 to determine the number and type of cables required)
- Connector installation tool (Augat IT1000 - KVH part #19-0242 for RG-6 cable installations)
- Power cable for connecting vessel power to the MCU (see Figure 3)
- Satellite TV receiver(s) and TV(s)

Figure 1 TracVision M9 Antenna

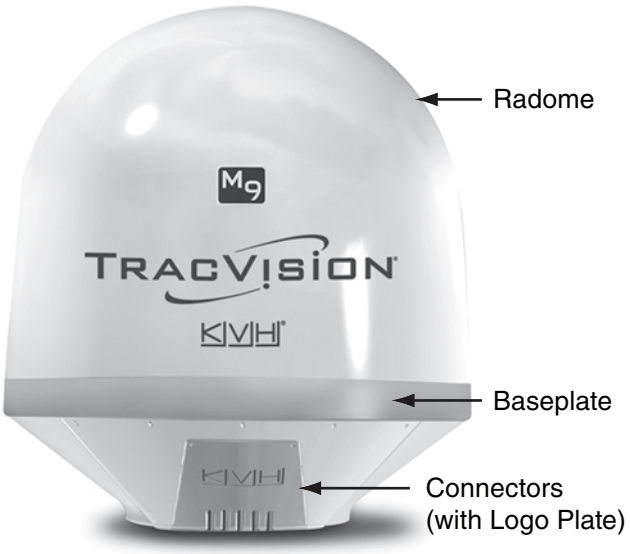


Figure 2 Master Control Unit (MCU)

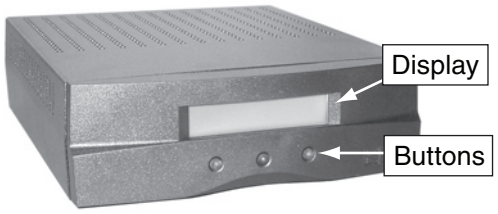


Figure 3 Power Cable Guidelines

Cable Length	Use Cable Gauge
< 40 ft (12 m)	12AWG (4mm^2)
40-70 ft (12-21 m)	10AWG (6mm^2)

2 Plan the Antenna Installation

Before you begin, consider the following antenna installation guidelines:

IMPORTANT!

Be sure to follow the guidelines below. Damage caused by an improper installation is not covered under KVH warranty.

- Minimize blockage. The antenna requires a clear view of the sky to receive satellite TV (see Figure 4). The fewer obstructions, the better the system will perform.
- Make sure the mounting surface is wide enough to accommodate the antenna's base (see Figure 5). Also make sure it is flat, level, strong enough to support the antenna's weight (85 lbs, 38.6 kg), and rigid enough to withstand vibration.
- Be sure to preserve enough free space outside the access hatch to allow a technician to remove the hatch and perform maintenance.
- Select a location that is as close as possible to the intersection of the vessel's fore-and-aft centerline and midships.
- Select a location that is not too high above the waterline. Limit the height above the waterline to less than 1/2 the vessel's length.
- Do not mount the antenna at the same level as the radar because the radar's energy might overload the antenna. Ideally, you should mount the antenna 4 ft (1.2 m) above the radar, and outside the beam path of the radar.
- Select a location that is at least 4 ft (1.2 m) away from any magnetized materials, large ferrous masses, cranes, engines, derricks, other antennas, devices with DC motors, electric winches, high-amperage cables, or battery banks. The antenna's internal compass sensor performs best in a benign magnetic environment.
- If you are mounting the antenna on a steel vessel, use an aluminum, brass, plastic, or wood platform (NOT steel or iron) to position the antenna at least 4 ft (1.2 m) above and 6 ft (1.8 m) away from the steel surface.

Figure 4 Blockage from Obstruction

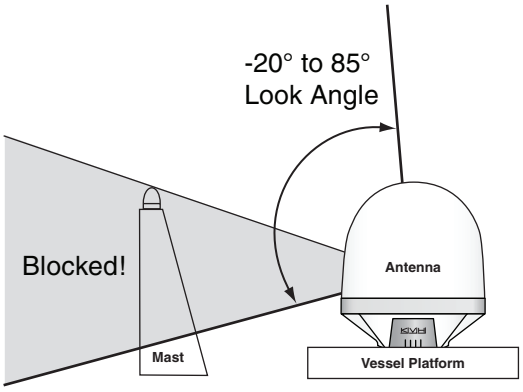
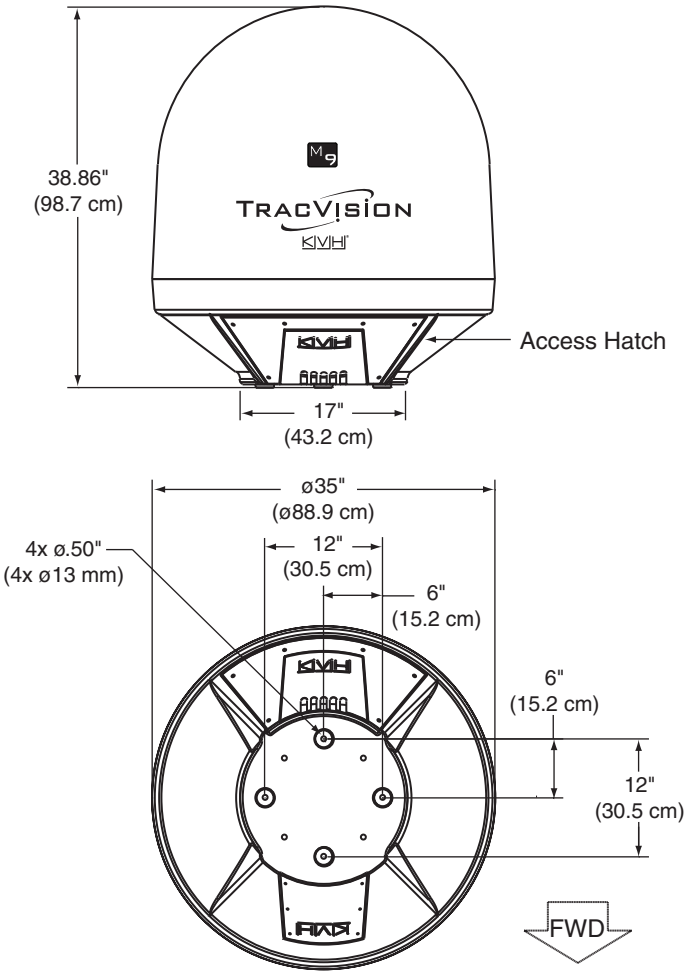


Figure 5 Antenna Dimensions



3 Plan the MCU Installation

Before you begin, consider the following MCU installation guidelines:

- Select an MCU mounting location in a dry, well-ventilated area belowdecks away from any heat sources or salt spray.
- Be sure the MCU's front panel will be easily accessible to the user. The owner will use the MCU's buttons to control the antenna.
- Be sure to leave enough room at the MCU's rear panel for connecting the cables and maintaining a service loop (see Figure 6 for MCU dimensions).
- Since the supplied data/power cable is 100 ft (30 m) long, the MCU should be located within 100 ft (30 m) of the antenna. Allow an adequate service loop, approximately 8" (20 cm) of slack, at each end of the cable for easy serviceability.
- The kitpack contains parts for mounting the MCU either to a horizontal surface (using Velcro) or to a vertical surface (using the supplied flush mount bracket).

Prepare the MCU Mounting Site (Flush Mount only)

NOTE: *Skip this step if you plan to mount the MCU to a horizontal surface instead.*

a. Using the MCU flush mounting template provided at the end of this manual, mark and cut out a hole in the mounting surface to accommodate the flush mount bracket (see Figure 7).

b. Using the same template, mark the locations for the four MCU mounting holes.

c. Using a #29 drill bit, drill a 0.136" (3.45 mm) hole at the four mounting hole locations. Later, you will mount the MCU using four #8 screws.

Figure 6 MCU Dimensions

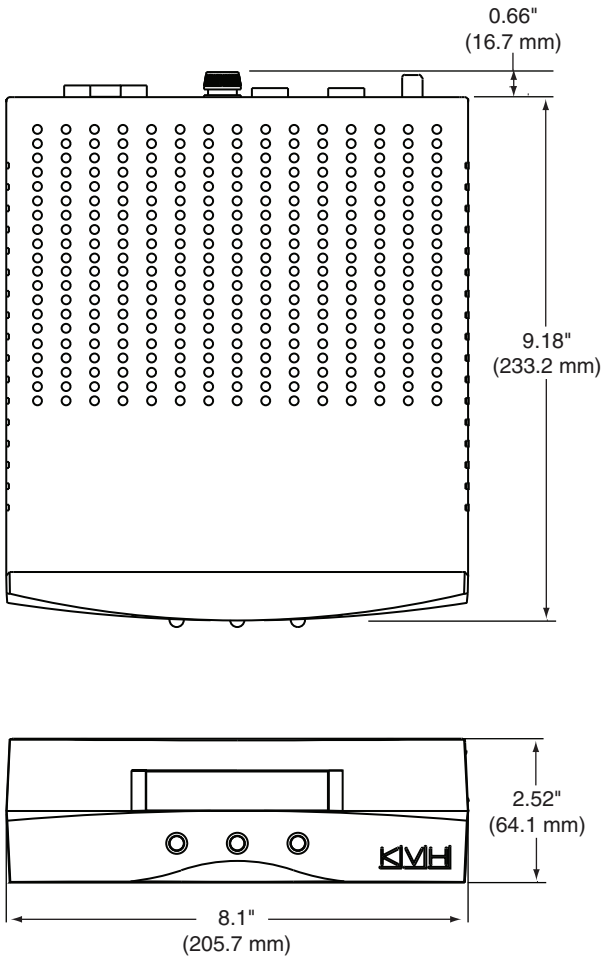
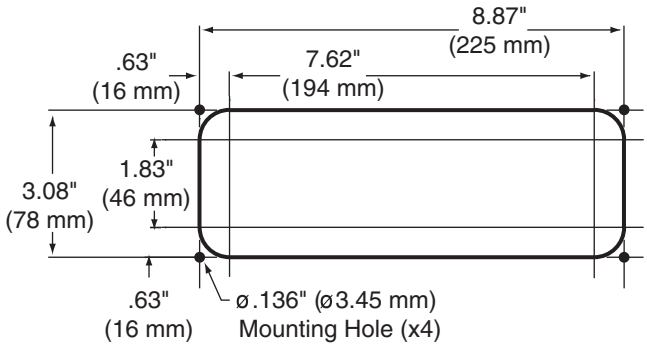


Figure 7 MCU Mounting Holes Layout



4 Prepare the Antenna Site

Once you have identified a suitable antenna mounting site, according to the guidelines provided in Step 2 on page 4, follow these steps to drill the mounting holes and cable access hole to prepare the site for installation.

a. Unfold the antenna mounting template (supplied in the Customer Welcome Kit) and place it onto the mounting surface. Make sure the "FWD" (forward) arrow points toward the bow and is parallel to the vessel's centerline (see Figure 8).

NOTE: *You don't need to mount the antenna exactly on the vessel's centerline, but the antenna's forward arrow must be parallel to it (the closer, the better).*

b. Use the template to mark the locations for the four mounting holes on the mounting surface.

c. Drill a 1/2" (13 mm) hole at the four mounting hole locations you marked in Step 4b. Later, you will insert four M10 bolts from below to secure the antenna to the mounting surface.

d. Mark a location for the cable access hole, either in the center of the antenna mounting hole pattern or in an area aft of the antenna. Later, you will route the data/power and RF cables through this hole and into the vessel.

IMPORTANT!

If you wish to route the cables through the bottom of the antenna's baseplate, rather than connecting at the side, you will need to modify the antenna's baseplate. See Appendix A on page 23 for details.

e. Drill the cable access hole in the location you marked in Step 4d. Be sure to size the hole appropriately to accommodate the data/power cable and all required RF cables (see Figure 9 and Figure 10 to determine the number and type of RF cables required). Smooth the edges of the hole to protect the cables.

Figure 8 Antenna Mounting Holes Layout

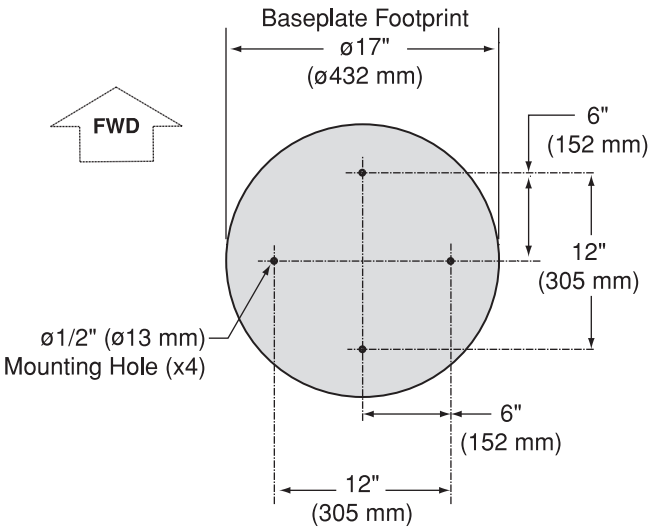


Figure 9 Number of RF Cables Required

Connecting to:	# RF Cables
Circular/Linear Sky Mexico Versions	
1 receiver	1
2 or more receivers	2*
Linear Quad LNB Version	
1 receiver	1
2 receivers	2
3 receivers	3
4 or more receivers	4**

* Multiswitch required for 3 or more receivers.
** Multiswitch required for 5 or more receivers.
See Appendix B on page 25 for details.

Figure 10 RF Cable Guidelines

Cable Length	Use Cable Type
≤ 75 ft (23 m)	RG-6
> 75 ft (23 m)	RG-11

5 Wire the Antenna

Follow these steps to connect the data/power and RF cables to the antenna.

IMPORTANT!

If you wish to route the cables through the bottom of the antenna's baseplate, rather than connecting at the side, see Appendix A on page 23 for supplemental instructions.

a. Route the data/power and RF cables belowdecks through the cable access hole. Leave an adequate service loop, approximately 8" (20 cm) of slack, in the cables for easy serviceability. Later, you will connect the data/power cable to the MCU and the RF cable(s) to the receiver(s).

b. Position the antenna in place over the mounting holes with the baseplate's connectors (see Figure 11) facing the stern.

c. Connect the data/power cable to the antenna (see Figure 12 and Figure 13); hand-tighten.

IMPORTANT!

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

d. Using a 9/16" wrench, connect the RF cable(s) to the antenna. If you need to connect only one RF cable, connect the cable to the antenna's RF1 connector (see Figure 13). Connect any additional RF cables to the RF2, RF3, and RF4 connectors.

TIP: *If you connect two or more RF cables, label both ends of each cable to match the connector. This will make it easier to identify the cables later.*

e. Place the rear logo plate over the cables, so each cable exits the proper opening (see Figure 14). Using six M4 screws, attach the logo plate to the baseplate.

Figure 11 Antenna Connectors

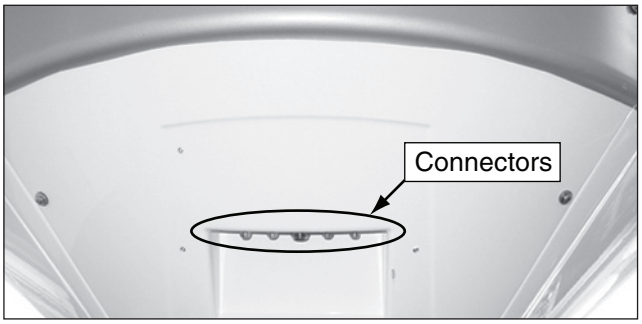


Figure 12 Data/power Cable Connections

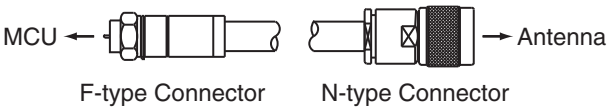


Figure 13 Antenna Baseplate Cable Connections

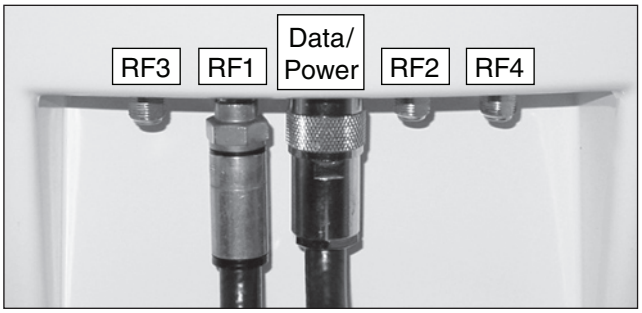
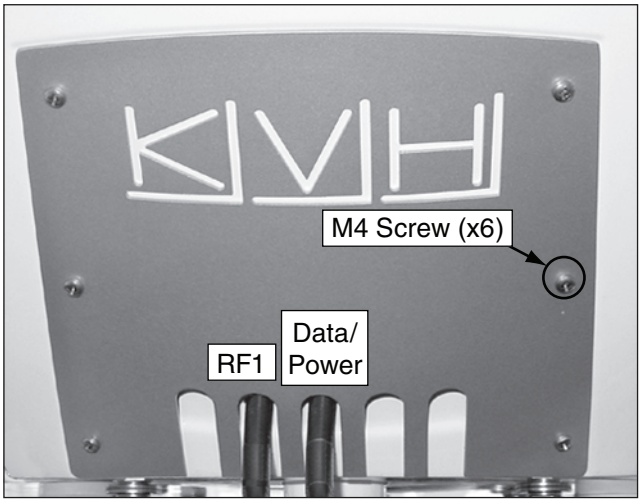


Figure 14 Rear Logo Plate Installed



6 Mount the Antenna

Follow these steps to mount the antenna to the mounting surface.

a. Place the antenna baseplate over the holes drilled in the mounting surface.

b. Make sure the four holes in the baseplate line up with the four holes in the mounting surface and the antenna's connectors face the stern.

c. 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 (see Figure 15).

IMPORTANT!

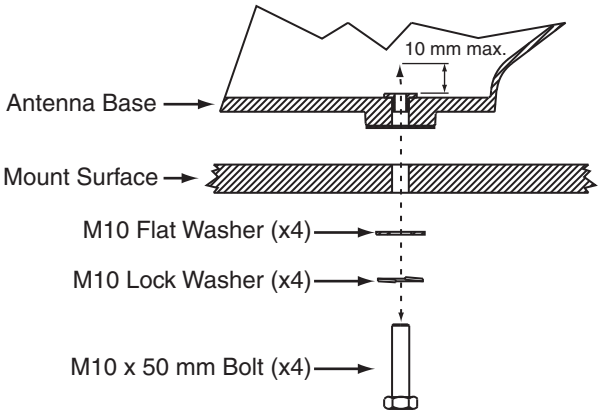
Be sure to use metric (not standard) bolts to avoid stripping the inserts. To prevent damage, do not extend the bolts further than 0.4" (10 mm) into the antenna's baseplate.

d. Tighten all four bolts until the four rubber feet are bottomed against the mounting surface.

IMPORTANT!

Do not block the four small drain holes in the bottom of the antenna. These drain holes ensure that any moisture within the antenna will be able to escape.

Figure 15 Mounting the Antenna (side view)



7 Remove the Restraints

Inside the antenna, three heavy-duty tie-wraps prevent the antenna assembly from moving during shipment. Follow these steps to remove these shipping restraints.

a. Remove the eight #10-32 Phillips-head screws securing the radome to the baseplate (see Figure 16). Carefully lift the radome straight up until clear of the antenna assembly and set it aside in a safe place.

TIP: *If you keep the radome topside, secure it with a lanyard to prevent it from falling overboard.*

b. Unfasten the two tie-wraps securing the reflector to the antenna frame (see Figure 17). To unfasten the tie-wraps, release the tab with a flat-head screwdriver.

c. Unfasten the tie-wrap securing the antenna frame to the sensor bracket (see Figure 18).

d. Save the tie-wraps for future use; the customer will need to reinstall them if he/she needs to relocate or reship the antenna.

e. Reinstall the radome onto the antenna. Secure in place with the eight #10-32 screws you removed in Step 7a.

f. Install a protective plastic screw cap (supplied in the kitpack) over each radome screw.

Figure 16 Removing the Radome

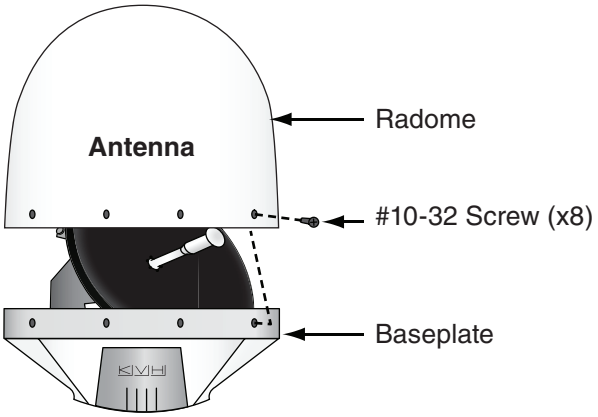


Figure 17 Locations of Shipping Restraints

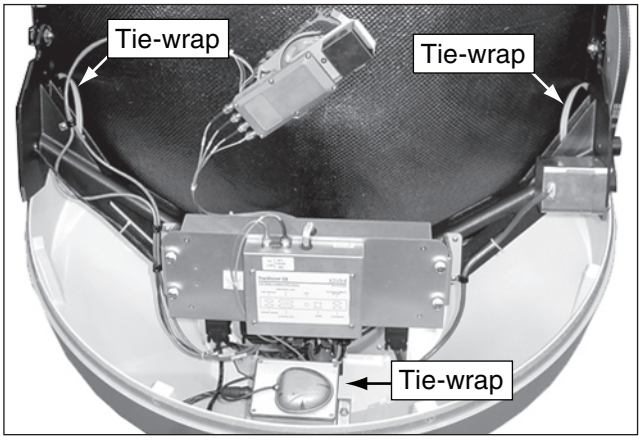
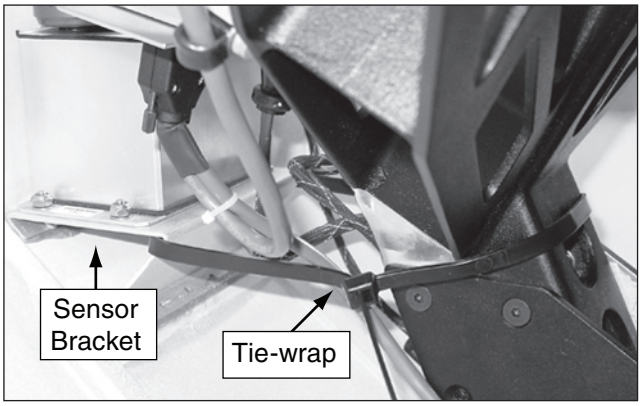


Figure 18 Close-up of Antenna Frame Shipping Restraint



8 Wire the Receiver(s) and MCU

Circular/Sky Mexico Version Only

Follow these steps to connect the MCU and one or two receivers**.**

IMPORTANT!

If you wish to connect three or more receivers to the antenna, see Appendix B on page 25.

a. Connect the data/power cable from the antenna to the "Output to Antenna" jack on the MCU (see Figure 19). Do not overtighten the connection; finger-tight is sufficient.

b. Connect the RF1 cable from the antenna to the grounding block, as shown in Figure 19. Label this grounding block connector "RF1."

c. If you are connecting two receivers, connect the RF2 cable from the antenna to the grounding block, as shown in Figure 19. Label this grounding block connector "RF2."

d. Attach the supplied ground wire to either ground screw on the grounding block. Connect the other end of the wire to a suitable vessel AC ground.

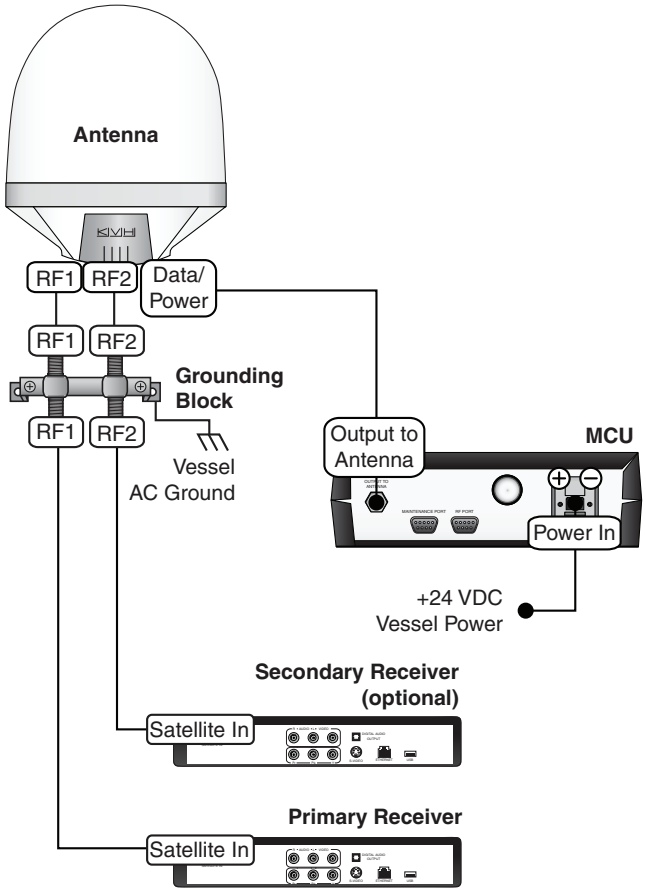
e. Using the two supplied #6 screws, mount the grounding block inside the vessel.

f. Connect an RF cable from the "RF1" connector on the grounding block to the "Satellite In" connector on the primary receiver. The primary receiver controls satellite selection if the antenna is set up for automatic switching.

g. If you are connecting two receivers, connect an RF cable from the "RF2" connector on the grounding block to the "Satellite In" connector on the secondary receiver.

h. Connect the receiver(s) to the customer's television(s). Follow the instructions in the receiver's manual.

Figure 19 Wiring Diagram - Circular/Sky Mexico Version



8 Continued Wire the Receiver(s) and MCU

Linear Quad Version Only

Follow these steps to connect the MCU and up to four receivers.

IMPORTANT!

If you wish to connect three or more receivers to the antenna, see Appendix B on page 25.

a. Connect the data/power cable from the antenna to the "Output to Antenna" jack on the MCU (see Figure 20). Do not overtighten the connection; finger-tight is sufficient.

b. Connect the RF1 cable from the antenna to the "Satellite In" connector on the primary receiver. The primary receiver controls satellite selection if the antenna is set up for automatic switching.

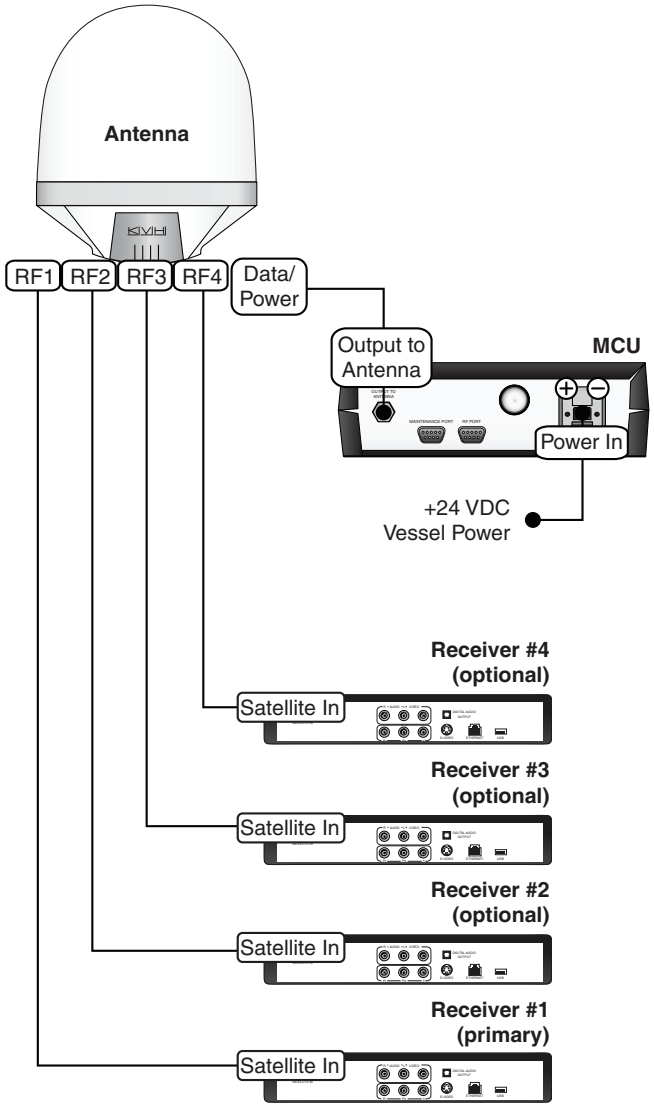
c. If you are connecting two, three, or four receivers, connect RF cables to the "Satellite In" connectors on these receivers.

IMPORTANT!

Be sure all receivers are grounded. If the receiver has a 2-prong power plug, run a ground wire from the receiver's chassis to a suitable ground point. If a potential exists between AC and DC grounds, connect the wire to the MCU's DC return instead.

d. Connect the receiver(s) to the customer's television(s). Follow the instructions in the receiver's manual.

Figure 20 Wiring Diagram - Linear Quad Version



9 Connect Power

Follow these steps to connect power to the MCU. The MCU supplies power to the antenna.

a. Before you begin, disconnect vessel power.

> **CAUTION**
>
> For your own safety, disconnect vessel power and make sure the circuit is dead before you connect any power wires.

b. Connect a power cable to 24 VDC (2.5 amps continuous) vessel power (for power cable specifications, see Figure 3 on page 3). Power supplied to the antenna **MUST NOT** fall below 18 VDC or exceed 30 VDC.

NOTE: *If a 24 VDC power supply is not available, install an AC/DC converter that supplies 24 VDC (KVH part #19-0488 or equivalent).*

c. KVH recommends you install a 15-amp circuit breaker between power and the MCU. The MCU does not have an on/off switch.

d. Install the ferrite coil, supplied in the kitpack, onto your vessel power cable (close to the MCU) to help reduce conducted emissions. Make two loops in the cable and clamp the coil around the loops (see Figure 21). This ferrite coil must be installed to comply with the CE standard.

e. Find the plastic power plug supplied in the kitpack (see Figure 22). Insert your vessel power wires into the plug's power (+) and ground (-) terminals. Tighten the plug's terminal screws to secure the wires in place.

f. Plug the plastic power plug into the "Power In" jack on the MCU (see Figure 23). Secure in place with the two retaining screws.

Figure 21 Ferrite Coil Clamped onto Power Cable

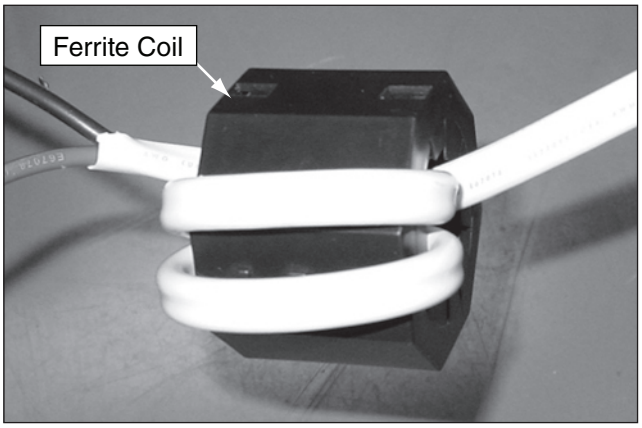


Figure 22 Power Plug

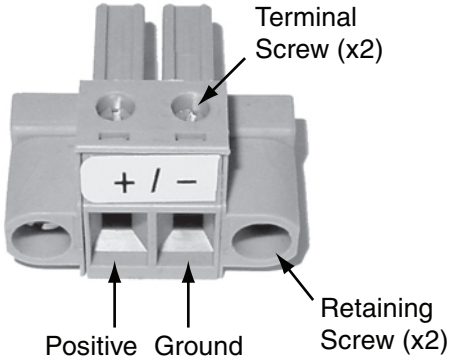
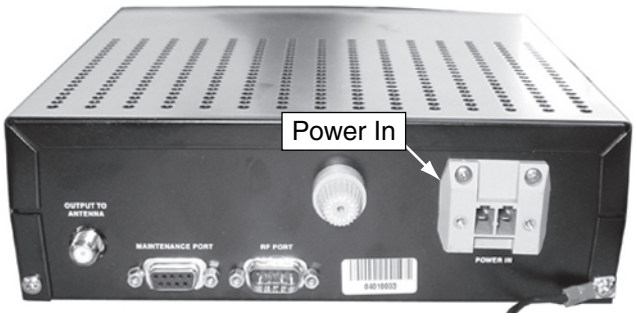


Figure 23 MCU Power Connection



10 Mount the MCU

In Step 3 on page 5, you identified a suitable MCU mounting location. Now follow these steps to mount the MCU using one of the following options:

Option 1 - Velcro mount to a horizontal surface

Option 2 - Flush mount to a vertical surface

Option 1 - Velcro Mount

a. Clean the bottom of the MCU and the mounting surface using a mild detergent.

b. Peel the backing from the four supplied Velcro fabric squares and stick them to the bottom corners of the MCU (see Figure 24).

c. Position the four Velcro hook disks onto the mounting surface. Drill screw holes for the disks and secure in place with #4-24 screws.

d. Press the MCU firmly into place so the fabric's loop material engages the hook disks.

Option 2 - Flush Mount

a. At the two holes in the bottom of the MCU, place a #6 flat washer on a #6-32 screw and insert the screw from below (see Figure 25). Do not tighten the screws yet.

b. Slide the flush mount bracket backward onto the MCU until the two notches in the bracket engage the screws at the bottom of the MCU.

c. Tighten the screws to secure the bracket to the MCU.

d. In Step 3 on page 5, you cut out the mounting hole in the mounting surface. Insert the MCU and bracket assembly into this mounting hole and secure in place with four #8 screws and washers (see Figure 26).

Figure 24 Velcro Mounting

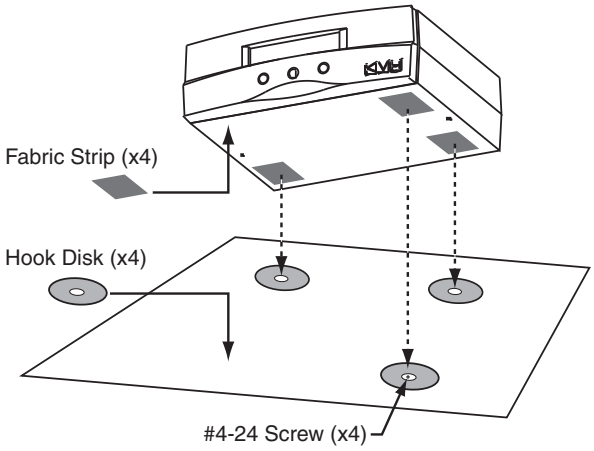


Figure 25 Flush Mount Bracket

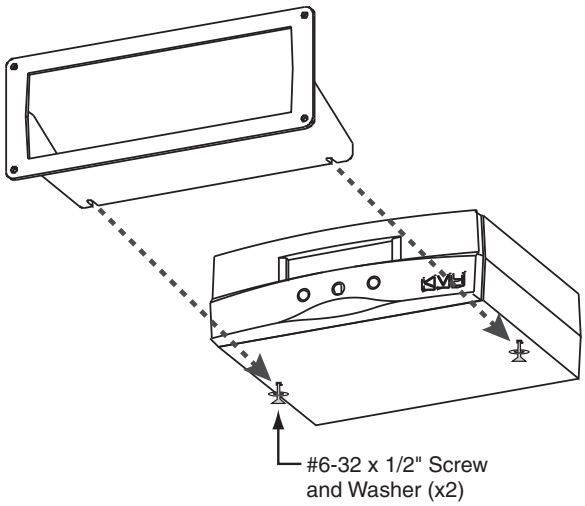
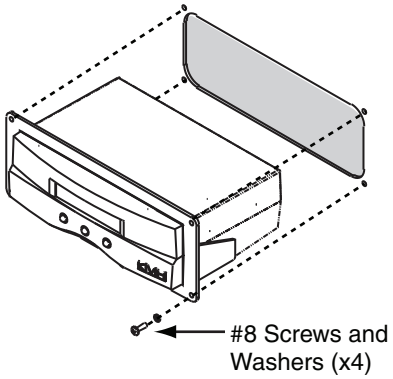


Figure 26 Flush Mounting the MCU to a Vertical Surface



11 Select Satellites

Follow these steps to turn on the system and select satellites for tracking.

a. Ensure the antenna has a clear, unobstructed view of the sky.

b. Apply power to the receiver(s), TV(s), and MCU. Wait two minutes for system startup.

c. Press the center MENU button on the MCU to access the Install Satellite menu (see Figure 27).

d. At "Install Satellite?", press YES.

e. Now you need to set the MCU to track the satellites of your choice. You can select from preset satellite groups of three satellites, or you can choose up to three satellites from over 70 satellites in the satellite library. Please refer to "Setting the MCU to Track Satellites" in the TracVision M9 User's Guide for complete information.

NOTE: *DISH 1000 customers with the DISH 129 satellite installed must have a multiswitch installed to enable manual switching, or a Master Receiver Selector (MRS) (KVH Part #72-0412) to enable automatic (or manual) switching. The MRS also allows you to select which receiver is the master receiver.*

f. Linear Versions - Set up the receiver(s) for the same satellites, and in the same order, as the antenna. "Sat. A" is the first satellite you selected for tracking; "Sat. B" is the second; "Sat. C" is the third (see Figure 28).

Figure 27 Install Satellite Menu

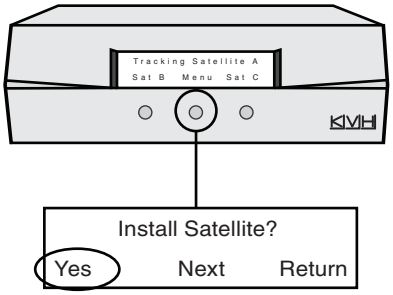


Figure 28 Linear Receiver Settings

Antenna	Receiver	DiSEqC
Sat. A	Alternative 1 or A	DiSEqC 1
Sat. B	Alternative 2 or B	DiSEqC 2
Sat. C	Alternative 3 or C	DiSEqC 3

12 Calibrate the Internal Sensor

The antenna's internal compass sensor is calibrated at the factory for a perfect-world environment. However, hard and soft iron effects on your vessel can distort the magnetic field around the antenna, causing errors in the sensor's reported heading. To compensate for these magnetic distortions, follow these steps to calibrate the internal sensor.

Turn On Autocalibration

Follow these steps to turn on the system's Autocalibration function. The Autocalibration function will allow the sensor to calibrate itself automatically.

a. Press the center MENU button on the MCU to access the onscreen menu (see Figure 29).

b. At "Install Satellite?", press NEXT until the display shows "Operations Mode?" Then press YES.

c. At "Get Antenna Status?", press NEXT until the display shows "Control Compass?" Then press YES.

d. At "Set Autocal on/off?", press YES.

e. At "Autocal is: OFF", press ON.

f. At "Autocal is: ON", press RETURN.

Run the Autocalibration Function

Follow these steps to steer the vessel through a complete circle to ensure the Autocalibration function effectively calibrates the sensor.

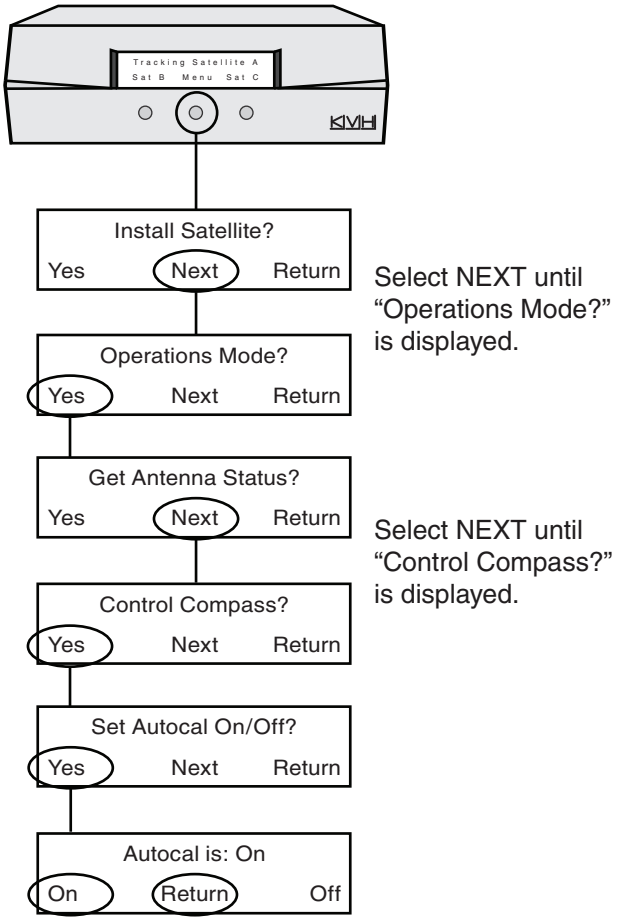
NOTE: *If the antenna is installed on a large vessel, such as a tanker or cargo ship, you may omit this step. Simply leave the Autocalibration function set to ON.*

a. Select a calm day and navigate the vessel to a clear area. Excessive pitching and rolling can distort calibration data.

b. Apply power to the TracVision system.

c. Just before you begin, note the vessel's heading.

Figure 29 Turning On Autocalibration at the MCU



12 Continued Calibrate the Internal Sensor

d. Steer the vessel at a slow, steady speed through a complete circle that takes at least two minutes to complete (see Figure 30). Use the heading you noted in Step c to confirm when you have completed a full circle.

Check the Calibration Score

Once you have completed the circle, follow these steps to check the calibration "score."

a. Press the center MENU button on the MCU to access the onscreen menu.

b. At "Install Satellite?", press NEXT until the display shows "Operations Mode?" Then press YES.

c. At "Get Antenna Status?", press NEXT until the display shows "Control Compass?" Then press YES.

d. At "Set Autocal on/off?", press NEXT until the display shows "Get Cal Score?" Then press YES.

e. The display shows the score for the calibration you performed (see Figure 31).

f. **If Accuracy = "BAD CAL":** Recalibrate the sensor by navigating through an additional circle. Repeat until you achieve a suitable accuracy rating.

g. **If Mag. Environment = "POOR" or "BAD":** Check the area around the antenna for materials that might cause magnetic interference. Relocate the materials, if possible, or relocate the antenna to a more favorable magnetic environment (see Step 2 on page 4 for details). Then clear the calibration score (see Appendix C on page 29) and recalibrate the sensor.

h. Press any button. The display returns to the "Get Cal score?" screen.

i. Press RETURN until you exit the menu.

NOTE: *The Autocalibration function turns off automatically once the system achieves a good calibration score.*

Figure 30 Running Autocalibration

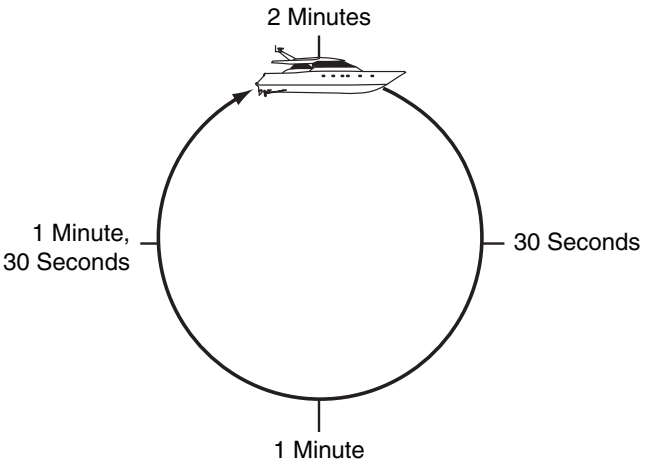


Figure 31 Calibration Score Example

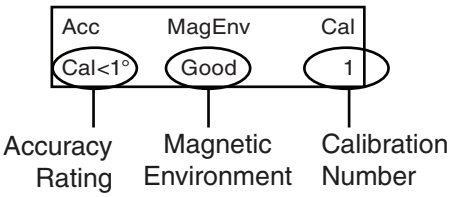


Figure 32 Calibration Details

Data Field	Description
Accuracy Rating	Degree of accuracy the sensor will provide (CAL<1° = within 1°)
Magnetic Environment	Quality of the antenna's installation site (Good, Poor, or Bad)
Calibration Number	Number of times the sensor was calibrated

13 Run Two Check Switch Tests

Dish Network or Bell TV Only

If you set up the TracVision M9 system for DISH Network or Bell TV service, follow the steps below to run the receiver's Check Switch test twice.

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

a. Dock the vessel in a blockage-free area in calm water.

b. Ensure the receiver you wish to configure is connected to the TracVision system's RF1 cable.

c. Turn on the TV and receiver.

d. Apply power to the TracVision system then wait two minutes for system startup.

e. Using the receiver's remote, go to the "point Dish/Signal Strength" screen (press MENU, 6, 1, 1 on most models).

f. Choose Check Switch, then press SELECT.

g. Choose Test, then press SELECT.

h. Wait at least 15 minutes before proceeding.

IMPORTANT!

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

i. After waiting 15 minutes, repeat Steps e through g to run a second Check Switch test.

j. Verify the values on your TV match those required for your satellite service and configuration. Refer to the figures at right for details. If your values do not match, turn off the antenna, then turn it back on and repeat Steps d through g.

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

Figure 33 DISH 1000/129 Check Switch Results

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

Figure 34 DISH 1000/61 Check Switch Results

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

Figure 35 DISH 500 Check Switch Results

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

Figure 36 Bell TV Check Switch Results

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

14 Educate the Customer

The installation process is complete!

Before you depart the vessel, test the system to verify the antenna works properly. Then give the Customer Welcome Kit to the customer and explain how to use the system. Also be sure the customer understands the following:

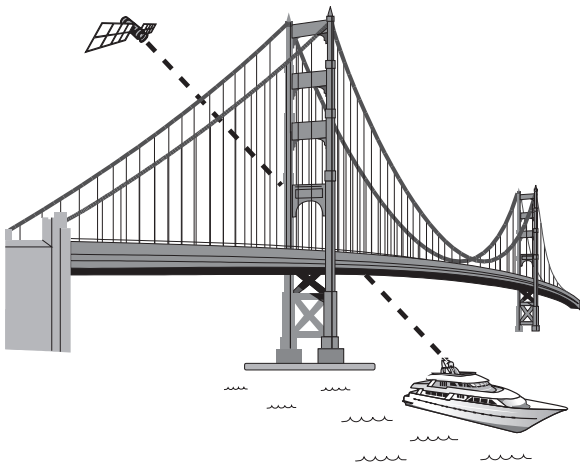
- Keep the radome installed on the antenna at all times. The radome protects the antenna's moving parts from wind, rain, and debris.

WARNING

It is dangerous to watch TV while piloting a vessel. The TracVision system is intended as a passenger entertainment product only.

- The antenna must have a clear view of the sky to receive satellite TV. Common causes of blockage include trees, buildings, bridges, and onboard equipment (see Figure 37).
- Heavy rain or snow may temporarily interrupt reception.
- Clean the antenna regularly. Dirt buildup on the radome can affect reception.
- The vessel must be located within the selected satellite's coverage area to receive its satellite TV signals. To view satellite coverage maps, visit www.kvh.com/footprint.
- Please register the system with KVH. The registration process is quick, easy, online, and ensures the best possible service from KVH. Visit www.kvh.com/register or refer to the Product Registration Form for details.

Figure 37 Example of Satellite Blockage



Appendices

This section provides supplemental instructions for special or advanced configurations. It also provides system wiring diagrams and a mounting template for the belowdecks equipment.

Contents

A Bottom Cable Entry Kit

If you wish to route the system cables through the bottom of the antenna's baseplate, rather than connect the cables at the side of the baseplate, follow these steps to modify the antenna for bottom cable entry. Figure 38 shows the relevant parts of the antenna baseplate; refer to this figure throughout the procedure.

Remove the Radome and Restraints

1. Perform Steps 7a through 7d on page 9 to remove the antenna's radome and shipping restraints. You will need to rotate the antenna assembly by hand to access various parts of the baseplate.

IMPORTANT!

Once you have removed the restraints, handle the antenna very carefully. With the restraints removed, the internal antenna assembly rotates freely and, if not handled properly, can damage the limit switch.

Relocate the Cable PCB

1. Remove the tie-wrap securing the cable PCB (printed circuit board) wires to the baseplate access hatch (see Figure 39).
2. Remove the five #4-40 screws, washers, and nuts securing the cable PCB to the access hatch (see Figure 39).
3. Attach the cable PCB to the alternate cable PCB bracket (see Figure 40) using the five #4-40 screws and washers supplied in the kitpack. Apply a small amount of Loctite threadlocker to the screw threads before securing.

Figure 38 Interior Baseplate (Antenna Not Shown)

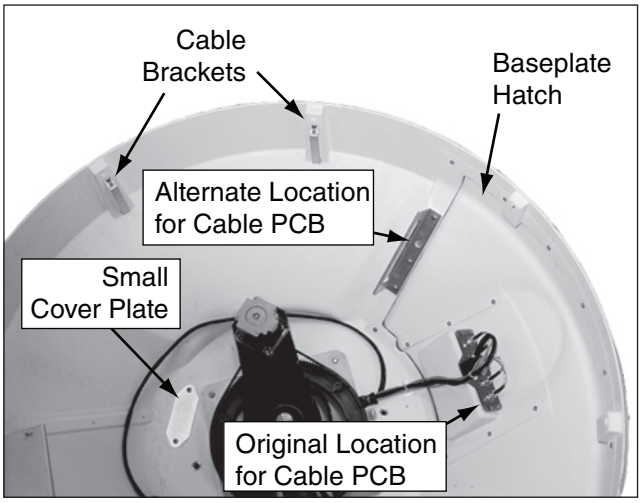


Figure 39 Cable PCB in Original Location

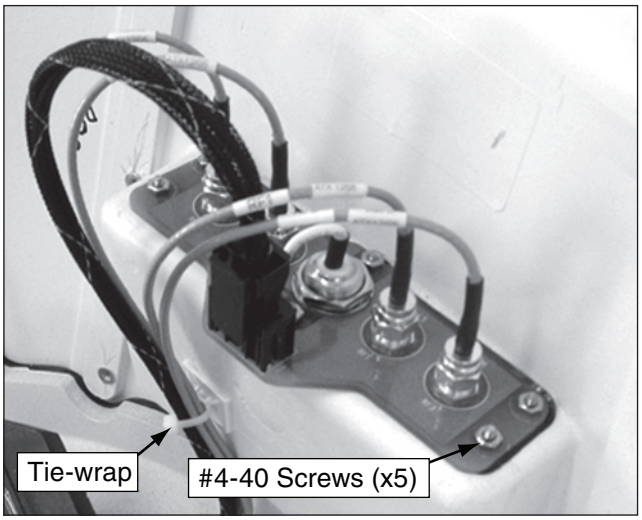
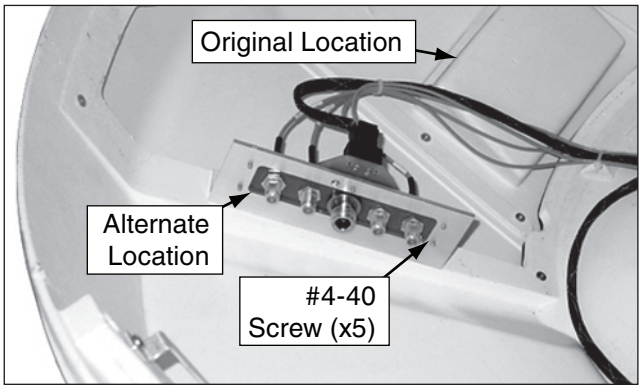


Figure 40 Cable PCB in Alternate Location



Seal the Original Cable PCB Location

1. Peel off the paper backing from the large cover plate gasket supplied in the kitpack. Attach the gasket to the supplied cover plate, making sure all holes are aligned. Also make sure all of the holes will align with the holes at the original PCB location, gasket side facing down.
2. Position the large cover plate and gasket (gasket side facing down) over the original cable PCB location. Secure in place with the five #4-40 screws and washers you removed earlier. Apply a small amount of Loctite threadlocker to the screw threads before securing (see Figure 41).

Prepare the Bottom Cable Access Hole

1. Remove the two M4 screws from the small cover plate and gasket inside the antenna baseplate. Remove the small cover plate and gasket (see Figure 42).
2. Peel off the paper backing from the rubber seal and carefully attach the rubber seal to the underside of the baseplate, ensuring a good seal around the rim of the bottom cable access hole (see Figure 43).

Figure 41 Large Cover Plate and Gasket

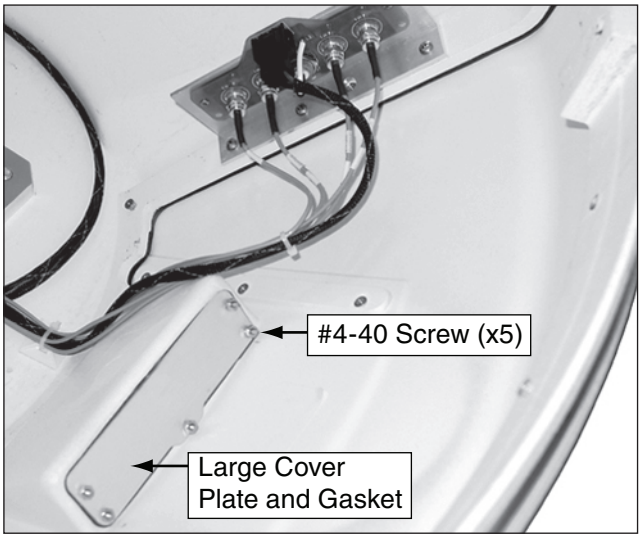


Figure 42 Small Cover Plate and Gasket

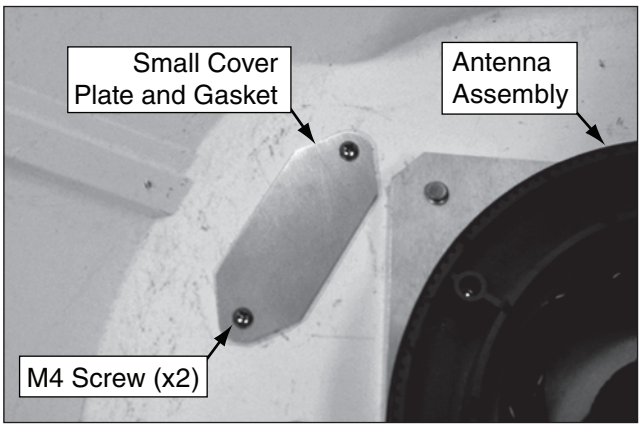
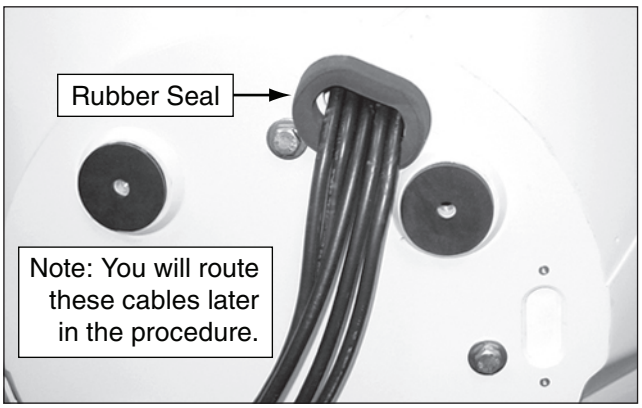


Figure 43 Rubber Seal on Underside of Baseplate



Route and Secure the Cables

1. Remove the four M4 screws securing the cable brackets to the inside rim of the baseplate (see Figure 44). Remove and save the cable brackets.

2. Route the data/power (F-type connector end) (see Figure 45) and RF cables belowdecks through the cable access hole. Leave an adequate service loop, approximately 8" (20 cm) of slack, in the cables for easy serviceability. Later, you will connect the data/power cable to the MCU and the RF cable(s) to the receiver(s).

3. Route the N-type connector end of the data/power cable (see Figure 45) through the baseplate's bottom cable access hole. Connect the data/power cable to the center connector on the cable PCB (see Figure 46).

> ***IMPORTANT!***
>
> Be sure to properly align the data/power cable with the PCB connector before tightening. Connecting the cable at an angle may damage the cable's center tines.

4. Route the RF cable(s) through the baseplate's bottom cable access hole. Using a 9/16" wrench, connect the RF cable(s) to the cable PCB (see Figure 46). If you need to connect only one RF cable, connect the cable to the RF1 connector. Connect any additional RF cables to the RF2, RF3, and RF4 connectors. See Figure 9 on page 6 to determine the number of RF cables required.

TIP: *If you connect two or more RF cables, label both ends of each cable to match the connector. This will make it easier to identify the cables later.*

Figure 44 Cable Brackets on Inside Rim of Baseplate

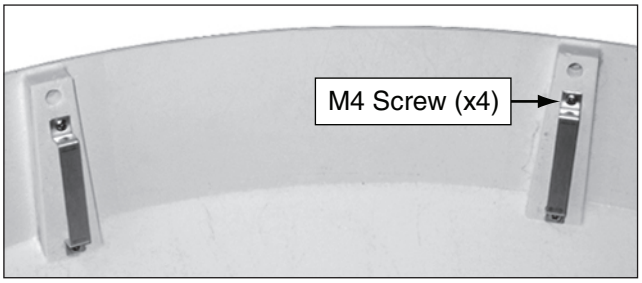


Figure 45 Data/Power Cable Connections

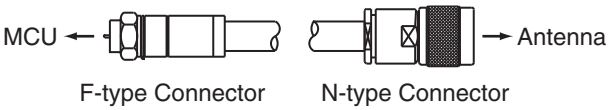
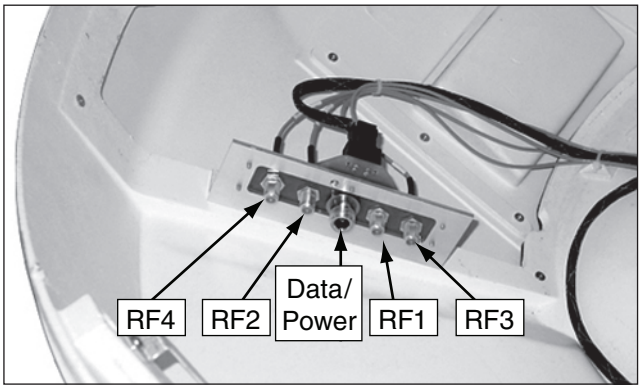


Figure 46 Cable Connections on PCB



5. Secure the data/power and RF cables to the inside rim of the baseplate, using the two cable brackets. Secure the brackets in place using the four M4 screws you removed earlier (see Figure 47).

6. Attach the supplied cable exit shroud over the cable access hole inside the baseplate, using the two M4 screws you removed earlier from the cover plate (see Figure 48).

Replace the Logo Plate

1. Attach the supplied blank logo plate using six M4 screws (see Figure 49).

2. Discard the old logo plate, or save it in case you need to change the cable routing in the future.

3. The baseplate conversion process is complete! Complete the remaining system installation steps starting with Step 6 on page 8.

Figure 47 Cables Secured by Brackets

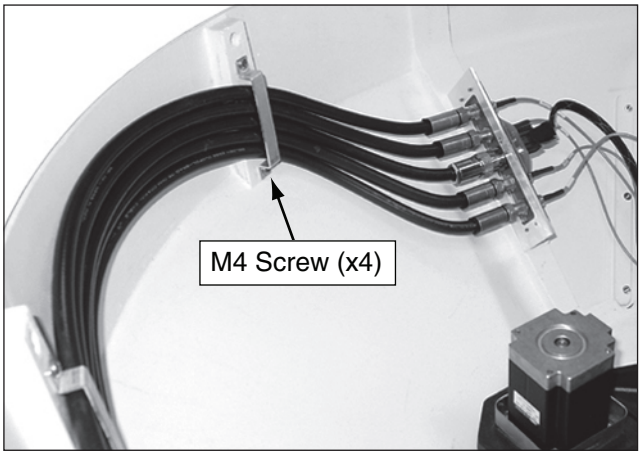


Figure 48 Cable Exit Shroud Installed Over Cables

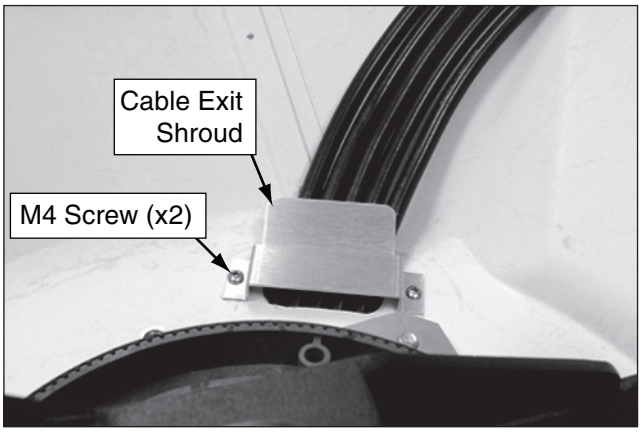
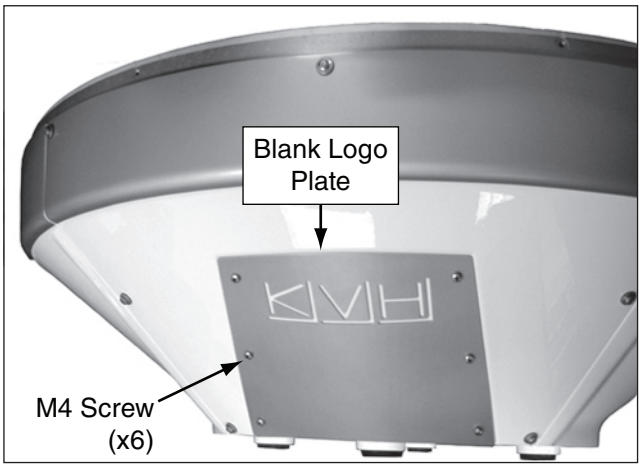


Figure 49 Blank Logo Plate (No Cable Slots)



B Connecting Additional Receivers

Appendix

This appendix explains how to connect additional receivers to the TracVision M9 system.

Antenna Version	See
Circular	Below
Linear Quad	Page 26
Linear Sky Mexico	Page 27

Circular Version Only

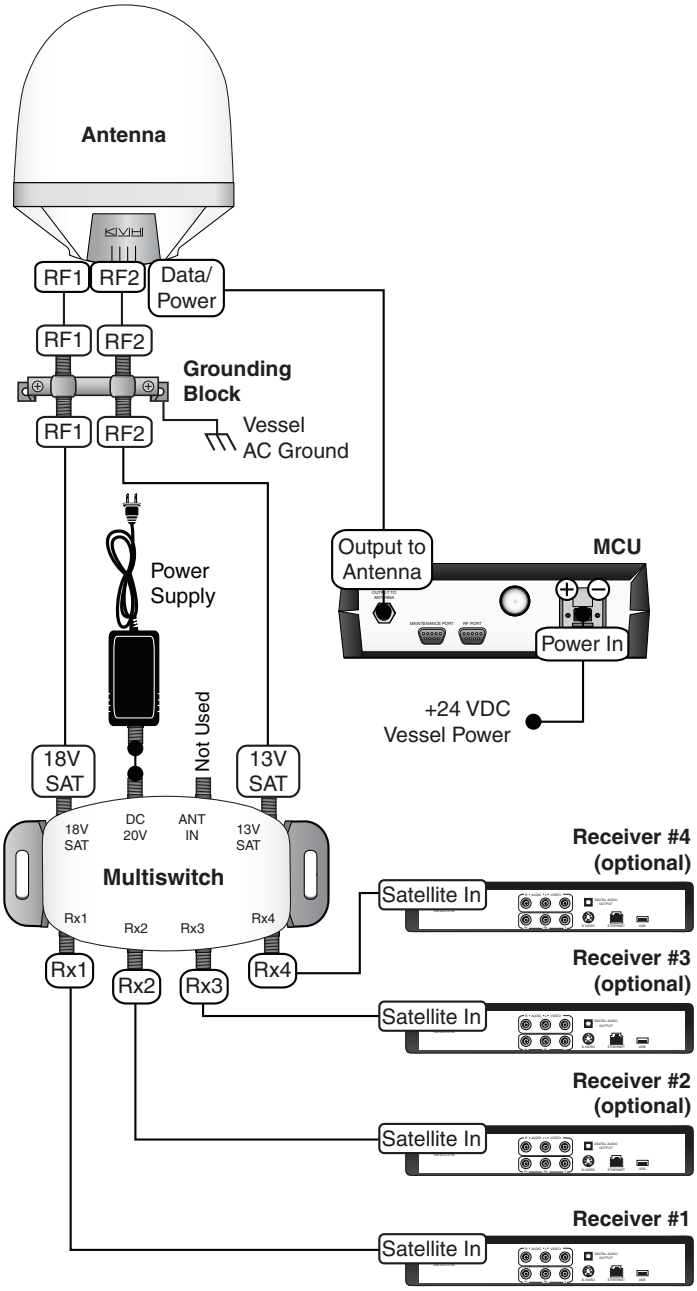
Use the wiring diagram in Figure 50 if you wish to connect three or four receivers to the TracVision M9 system. If you wish to connect five or more receivers, please refer to the TracVision M9 User's Guide.

IMPORTANT!

Multiswitches block a receiver's 22 KHz tone needed to switch satellites automatically. Therefore, the customer will need to manually switch satellites using the buttons on the MCU.

NOTE: *You can purchase an Eagle Aspen active multiswitch, shown in Figure 50, from KVH (order part #72-0310).*

Figure 50 Antenna Wiring - Antenna with Circular Dual LNB



B Continued Connecting Additional Receivers

Linear Quad Version Only

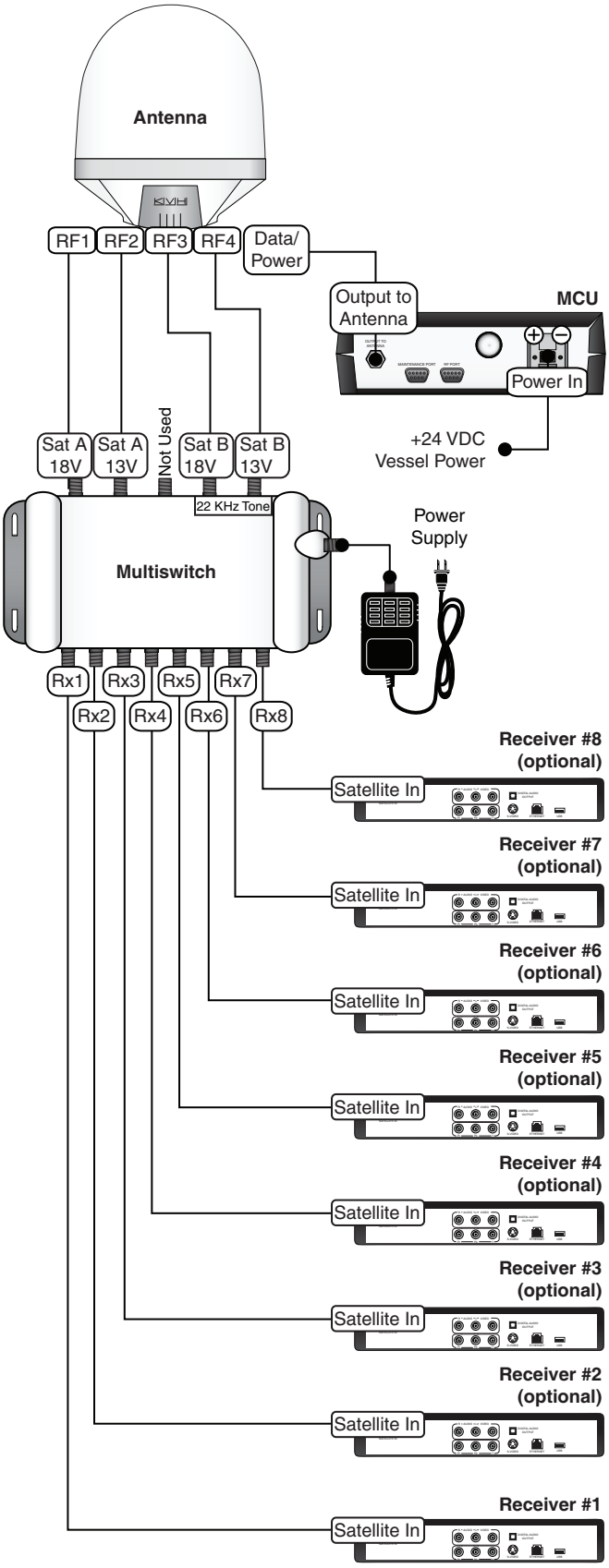
Use the wiring diagram in Figure 51 if you wish to connect up to eight receivers to the TracVision M9 system.

IMPORTANT!

Be sure all receivers are grounded. If the receiver has a 2-prong power plug, run a ground wire from the receiver's chassis to a suitable ground point. If a potential exists between AC and DC grounds, connect the wire to the MCU's DC return instead.

NOTE: *You can purchase a Terk BMS-58 active multiswitch, shown in Figure 51, from KVH (order part #19-0573).*

Figure 51 Antenna Wiring - Antenna with Linear Quad LNB



Linear Sky Mexico Version Only

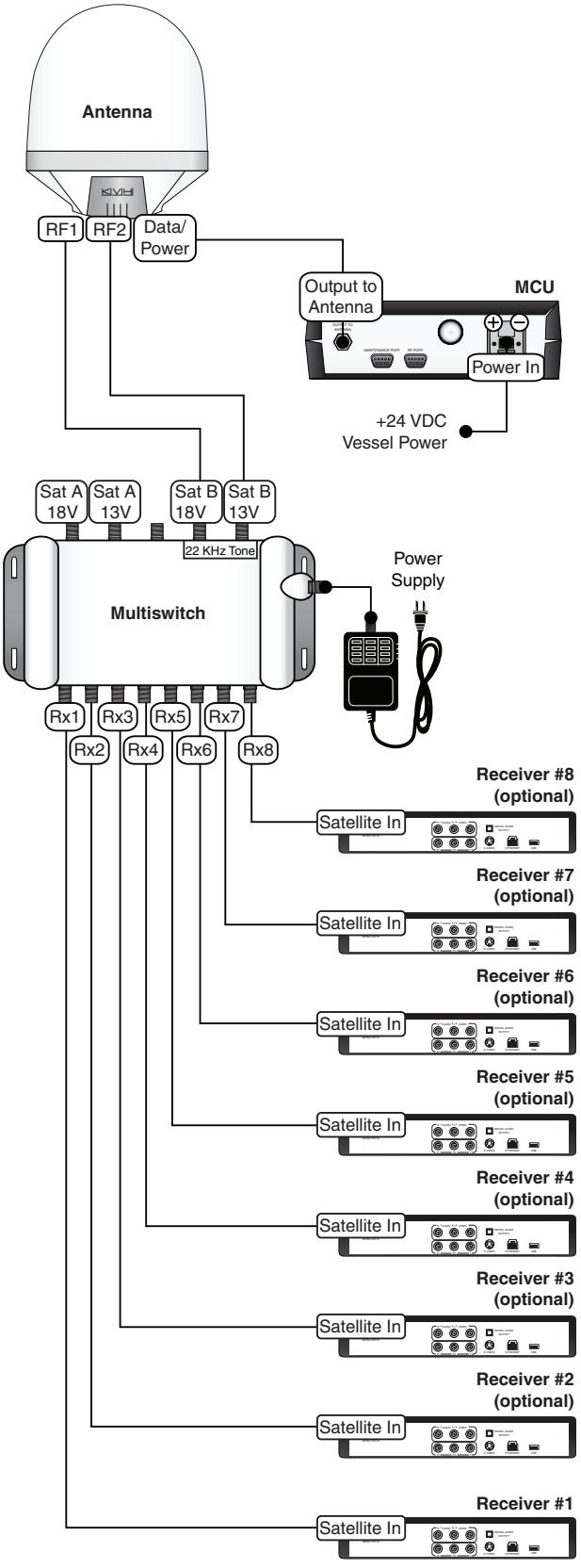
Use the wiring diagram in Figure 52 if you wish to connect up to eight receivers to the TracVision M9 system.

IMPORTANT!

Be sure all receivers are grounded. If the receiver has a 2-prong power plug, run a ground wire from the receiver's chassis to a suitable ground point. If a potential exists between AC and DC grounds, connect the wire to the MCU's DC return instead.

NOTE: *You can purchase a Terk BMS-58 active multiswitch, shown in Figure 52, from KVH (order part #19-0573).*

Figure 52 Wiring Diagram - Linear Sky Mexico Version



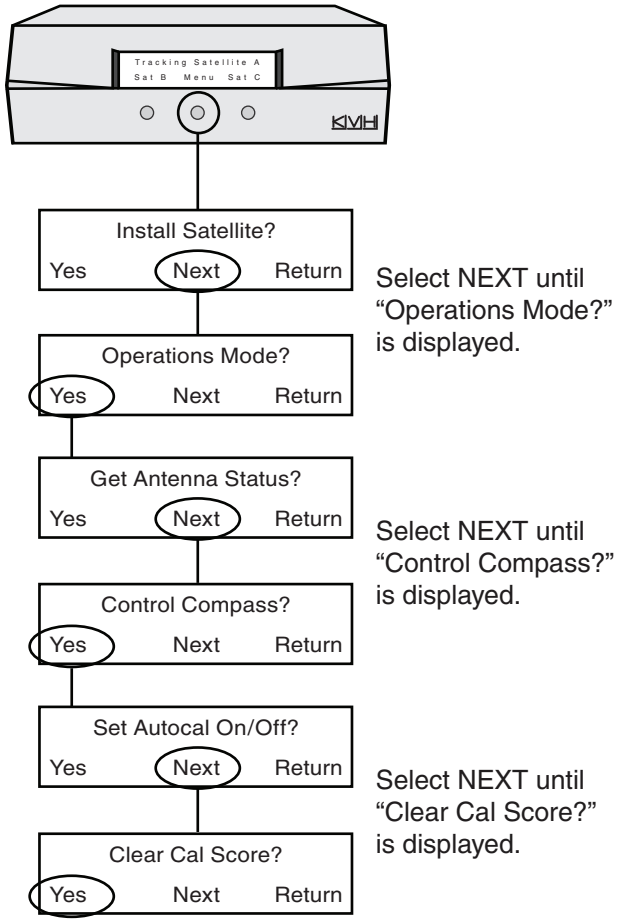
C Clearing the Calibration Score

If you needed to relocate magnetic materials near the antenna, or you relocated the antenna itself, follow these steps to clear the calibration score. You need to clear the system's stored calibration data before you can calibrate the internal sensor for a different magnetic environment.

1. Press the center MENU button on the MCU to access the onscreen menu (see Figure 53).
2. At "Install Satellite?", press NEXT until the display shows "Operations Mode?" Then press YES.
3. At "Get Antenna Status?", press NEXT until the display shows "Control Compass?" Then press YES.
4. At "Set Autocal on/off?", press NEXT until the display shows "Clear Cal Score?" Then press YES.
5. Wait a few seconds while the Autocalibration function resets.
6. When the display shows "Cal Score Cleared", turn off the TracVision system.
7. Wait 10 seconds, then turn on the TracVision system.

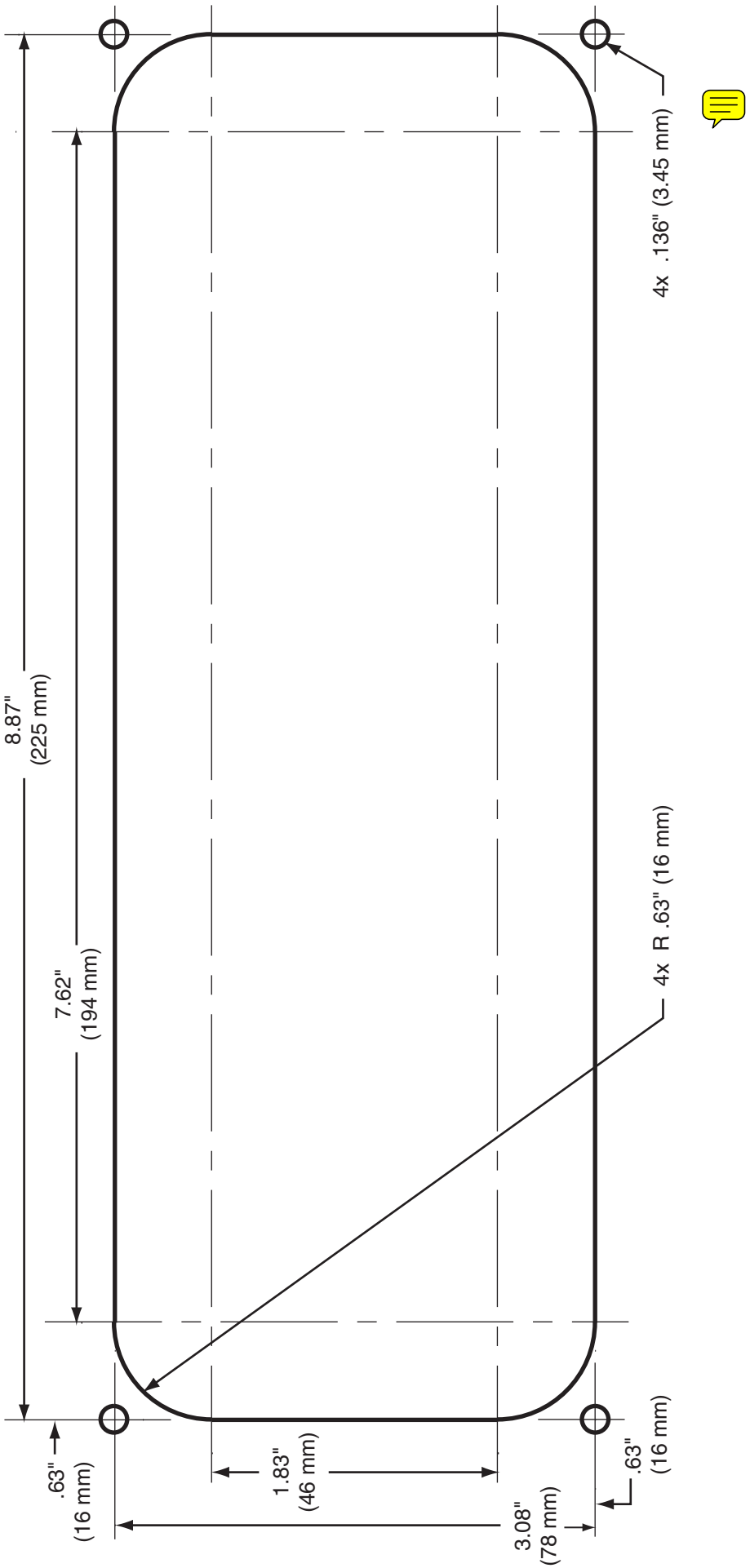
You can now calibrate the sensor for the new magnetic environment. See Step 12 on page 15 for calibration instructions.

Figure 53 Clearing the Calibration Score



D

MCU Flush Mounting Template



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