

TRACVISION[®]

BY KVH INDUSTRIES

TracVision M3/M2 Linear Configuration



TracVision M3/M2 Installation Guide

TracVision M3/M2 Installation Guide

Linear Configuration

These instructions explain how to install the TracVision M3/M2 satellite TV antenna system on a vessel. Complete instructions on how to use the system are provided in the *User's Guide*.

Installation Steps

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Who Should Install the System?

To ensure a safe and effective installation, KVH recommends that a KVH-authorized marine technician install the TracVision antenna. To find a technician near you, please visit www.kvh.com/wheretogetservice.

Related Documentation

The following additional documents are provided with the TracVision M3/M2 system:

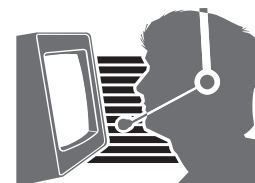
<u>Document</u>	<u>Description</u>
User's Guide	Operation, setup, and troubleshooting information
Product Registration Form	Details on registering the product with KVH
Warranty Statement	Warranty terms and conditions
Contents List	List of every part supplied in the kit

Technical Support

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

North/South America, Australia:
Phone: +1 401 847-3327
E-mail: techs@kvh.com
(Mon.-Fri., 9 am-6 pm ET, +5 GMT)
(Sat., 9 am-2 pm ET, +5 GMT)

Europe, Middle East, Asia:
Phone: +45 45 160 180
E-mail: support@kvh.dk
(Mon.-Thu., 8 am-4:30 pm, -1 GMT)
(Fri., 8 am-2 pm, -1 GMT)



1 Inspect Parts and Get Tools

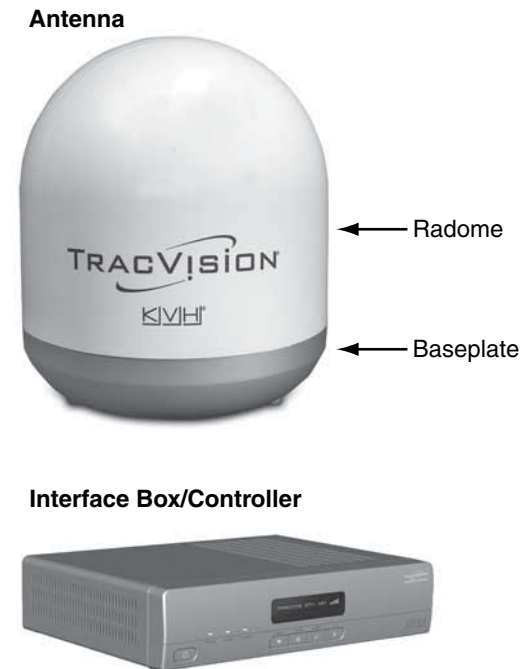
Before you begin, follow these steps to make sure you have everything you need to complete the installation.

IMPORTANT!

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

- a. Unpack the box and ensure it contains everything shown on the *Kitpack Contents List*. Save the packaging for future use.
- 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.
 - #2 Phillips screwdriver
 - 7/16" open-end wrench
 - 7/16" socket wrench
 - 1/2" socket or open-end wrench
 - Electric drill and 5/16" (8 mm) bit
 - Hole saw of desired diameter (for cable access hole, see [page 5](#))
 - Silicone sealant or equivalent
 - Adhesive tape
 - Light hammer
 - Center punch
 - Eight 1/4" fasteners (see "Mount the Interface Box" on page 11)
 - Satellite TV receiver

Figure 1: TracVision M3/M2 System Components



2 Plan the Installation

Before you begin, consider the following installation guidelines:

- Minimize blockage. The antenna requires a clear view of the sky to receive satellite TV (see Figure 2). 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 3). Also make sure it is flat, level (within $\pm 2^\circ$), strong enough to support the antenna's weight (18 lbs/8.2 kg), and rigid enough to withstand vibration.
- Custom mounting solutions, including struts and masts, are available from several third-party manufacturers. Contact your local KVH dealer or distributor for details.
- KVH recommends that you do not mount the antenna on the same level as the radar, because the radar's energy might overload the antenna.
- Be sure to mount the antenna near enough to the supplied interface box belowdecks to allow you to connect the 50-ft. (15 m) coaxial cable between the antenna and the interface box, while still maintaining sufficient slack in the cable.

IMPORTANT!

Do not shorten or extend the antenna cable. Since the cable carries data, power, and communications, the integrity of this cable and its connections is very important.

- When choosing a location for the interface box and receiver, find a dry, well-ventilated area belowdecks away from any heat sources or salt spray. Also be sure the interface box front panel will be easily accessible to the user.

Figure 2: Blockage from Obstruction

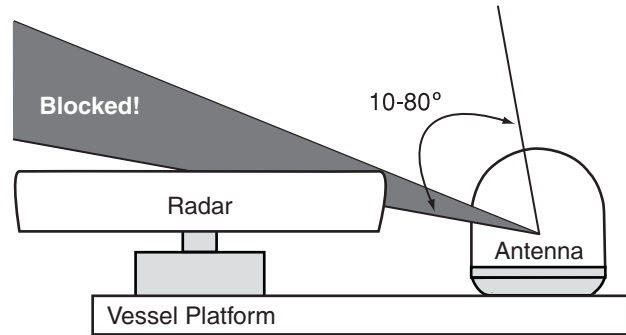
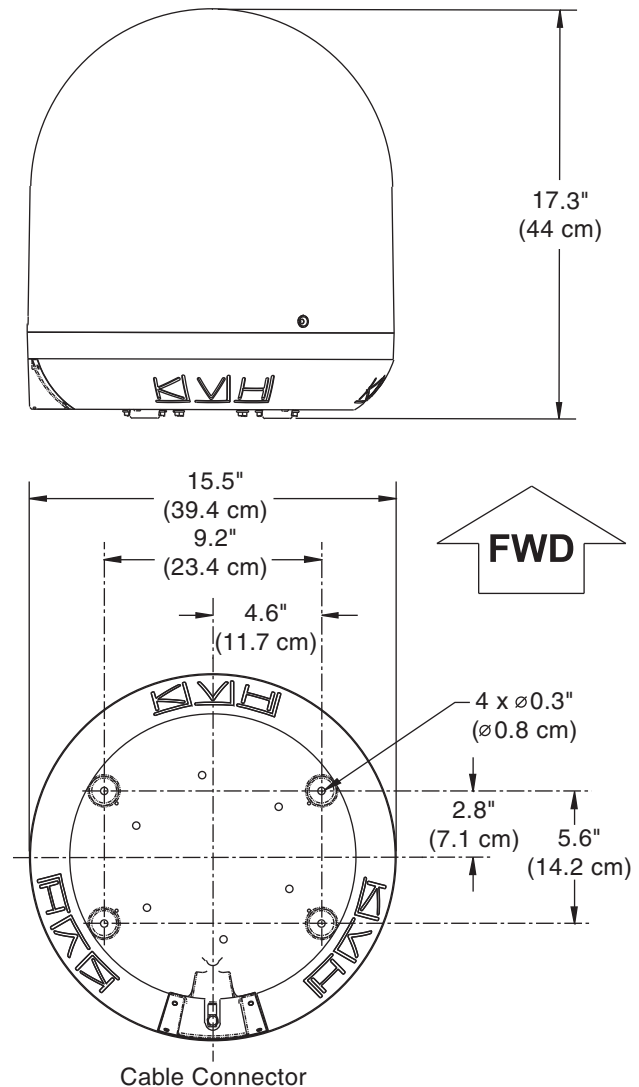


Figure 3: Antenna Dimensions



3 Prepare the Mounting Site

Once you have identified a suitable antenna mounting site, according to the guidelines provided on [page 4](#), follow these steps to prepare the mounting 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 4). *You don’t need to mount the antenna exactly on the centerline (the closer, the better), but the antenna’s forward arrow must be parallel to it.*

IMPORTANT!

Be sure the mounting surface is flat and level. Use a separate mounting plate, if necessary.

- b. Using the template, mark the locations for the four mounting holes.
- c. Drill a 5/16" (8 mm) hole at the four mounting hole locations you marked in Step b (see Figure 5). Later, you will insert four 1/4"-20 bolts through these holes 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 antenna cable through this hole and into the vessel.
- e. Using a hole saw, drill the cable access hole in the location you marked in Step d. Be sure to size the hole appropriately to maintain a cable bend radius of at least 3" (75 mm). If the hole location is in the center of the antenna mounting hole pattern, the diameter of the cable access hole must not exceed 3.5" (88 mm). Smooth the edges of the hole to protect the cable.
- f. Clean and dry the antenna mounting surface.
- g. Peel off the paper backing from the supplied foam seal to expose the adhesive. Then press the foam seal down firmly onto the mounting surface, centered between the antenna mounting holes (see Figure 6).

Figure 4: Antenna Mounting Holes Layout

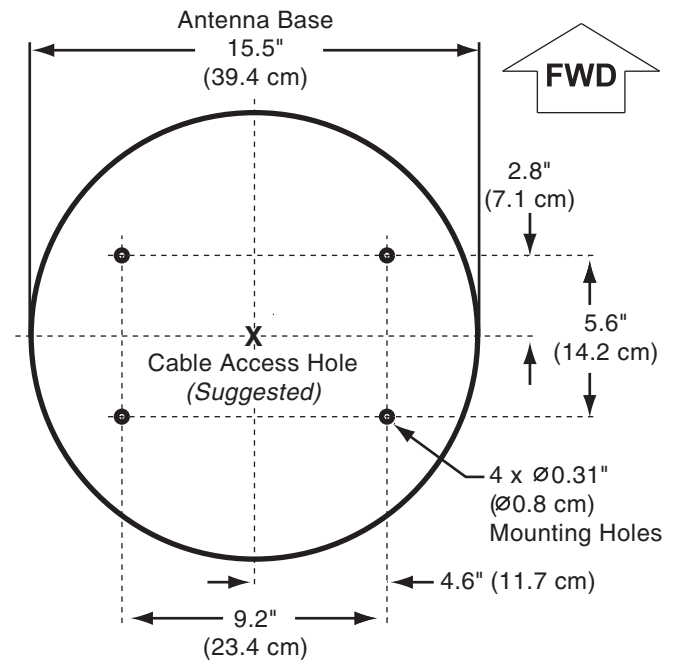


Figure 5: Drilling Antenna Mounting Holes

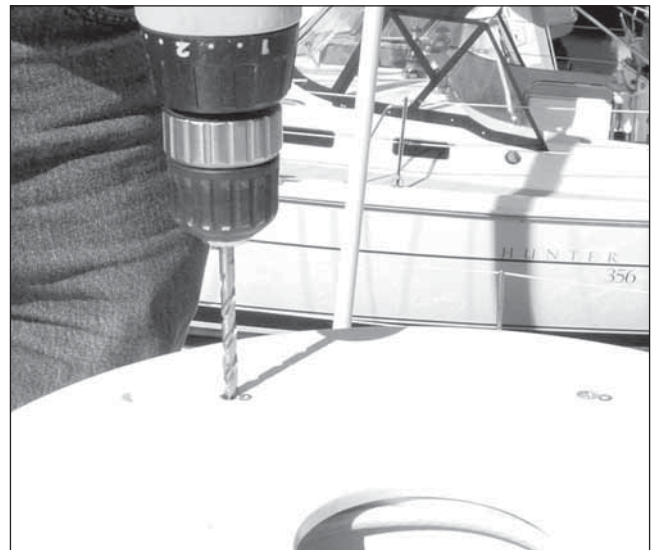
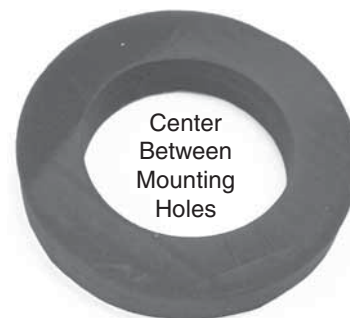


Figure 6: Foam Seal



4

Wire the Antenna

Follow these steps to connect the antenna cable to the antenna.

- a. Using the supplied 3 mm Allen hex key, remove the connector cover from the antenna's base (see Figure 7). Save the cover and the four M4 cap screws for later use.
- b. Route the antenna cable belowdecks through the cable access hole. Be sure to keep the end of the cable with the rubber sealing boot at the antenna site.
- c. If you are routing the cable underneath the antenna, attach the right-angle connector to the antenna end of the cable. Hand-tighten, then tighten with a 7/16" wrench for 1/4 turn to ensure an electrical and weather-proof connection. Then place the supplied right-angle rubber boot extension onto the end of the cable (see Figure 8).
- d. Connect the cable to the antenna. Hand-tighten, then tighten with a 7/16" wrench for 1/4 turn (see Figure 9).
- e. If you are using a right-angle connector, slide the right-angle rubber boot extension up the cable until it covers the right-angle connector.
- f. Slide the rubber boot up the cable until it covers the connector. If you are using a right-angle connector, be sure the boot mates with the extension (see Figure 10). This boot will help protect the connector from the elements.
- g. Reattach the cover over the connector, as shown in Figure 10. Secure in place with the M4 cap screws you removed in Step a. The cover must be attached before you mount the antenna.
- h. Leave an adequate service loop, approximately 8" (20 cm) of slack, in the antenna cable for easy serviceability.
- i. Weatherproof and seal the cable access hole as required.

IMPORTANT!

Be sure to seal the cable access hole to prevent water from leaking into the vessel.

Figure 7: Removing the Connector Cover

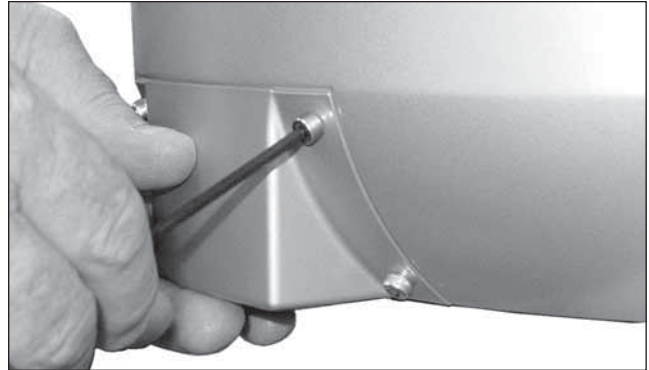


Figure 8: Rubber Boot Extension for Right-Angle Connector

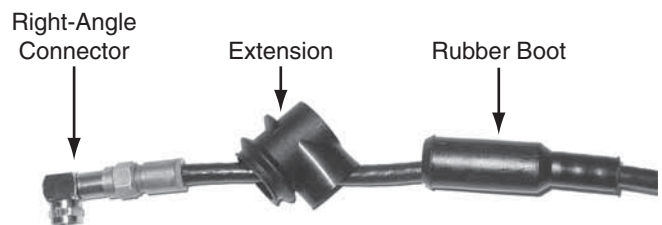
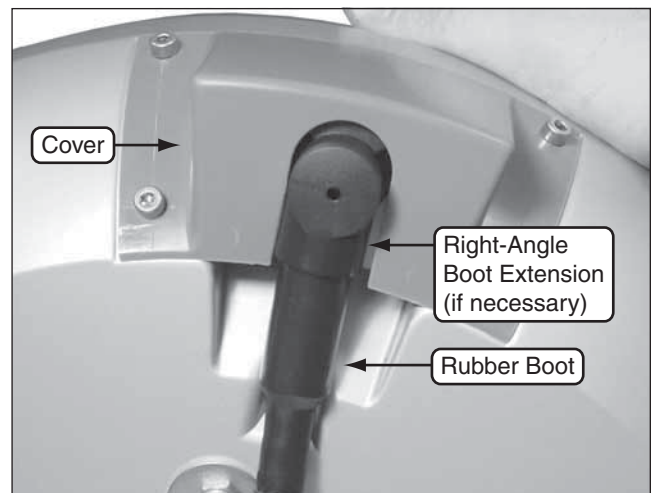


Figure 9: Connecting the Antenna Cable



Figure 10: Protecting the Cable Connection



5 Remove the Shipping Restraint

Follow these steps to remove the shipping restraint, which prevents the internal antenna assembly from moving during shipment. The antenna will not work with this restraint still in place.

- a. Remove the three #10-32 screws securing the radome to the antenna.
- b. Carefully lift the radome straight up until clear of the antenna assembly and set it aside in a safe place (see Figure 11).

NOTE: Due to the snug fit, some contact between the radome's sealing gasket and the antenna mechanism is normal.

- c. Using a 7/16" socket wrench, remove the shipping restraint bolt, washer, and spacer securing the antenna assembly to the base (see Figure 12 and Figure 13). Save the restraint for future use.
- d. Position the antenna onto the mounting surface. The antenna's base should rest squarely atop the foam seal.

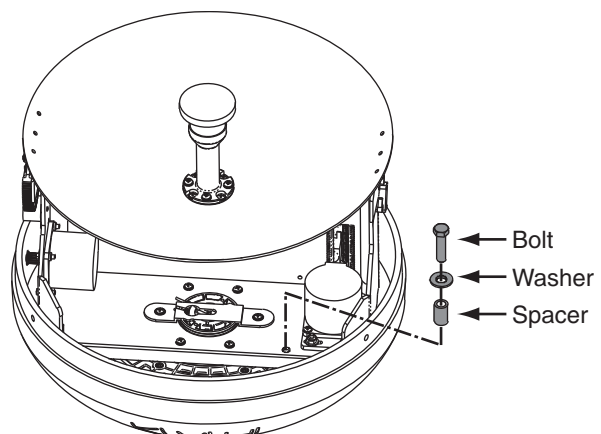
Figure 11: Removing the Radome



Figure 12: Removing the Shipping Restraint



Figure 13: Shipping Restraint Hardware



6 Mount the Antenna

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

- a. Align the four holes in the antenna's baseplate with the four holes in the mounting surface. Ensure the "Forward" arrow inside the baseplate points toward the bow and is parallel to the vessel's centerline (see Figure 14).

IMPORTANT!

Be sure to insert the mounting bolts from above and use the supplied hardware for a secure installation.

- b. Secure the antenna's baseplate to the mounting surface using four 1/4"-20 bolts, 5/8" washers, 1" washers, and lock nuts, as shown in Figure 15 and Figure 16.
- c. Tighten the bolts until the foam seal is compressed and the antenna's four rubber feet are bottomed against the mounting surface.
- d. Reinstall the antenna's radome to protect the antenna while you're working belowdecks. While pressing the radome down onto the base, secure the radome to the base using the three #10-32 screws you removed earlier. Later, you will remove the radome again to set the LNB skew angle.

Figure 14: "Forward" Arrow

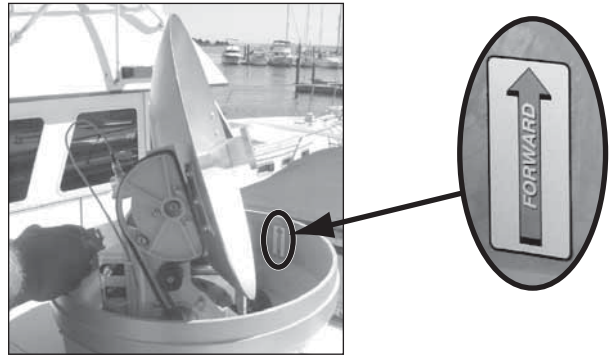


Figure 15: Tightening the Mounting Bolts from Above

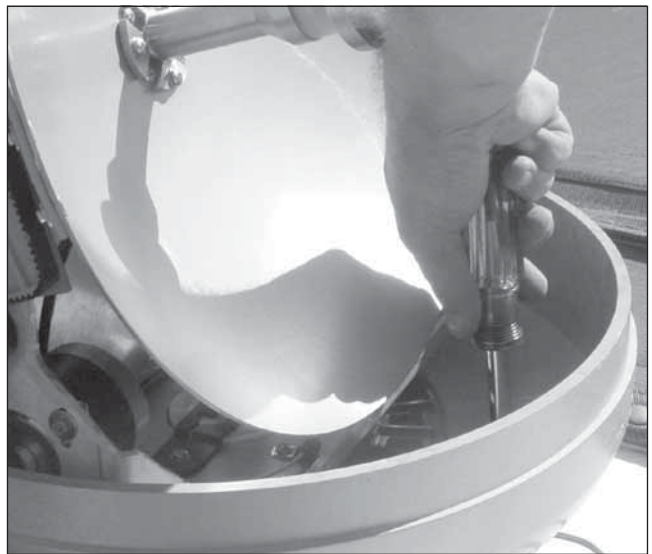
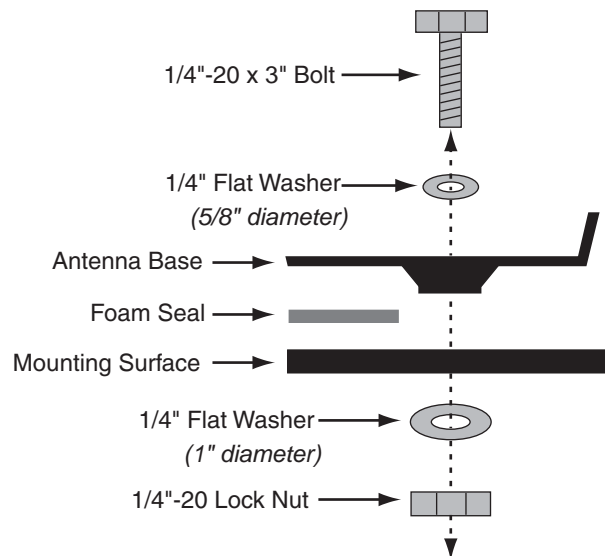


Figure 16: Mounting Hardware



7 Wire the Interface Box

Follow these steps to connect the antenna cable and receiver to the interface box.

IMPORTANT!

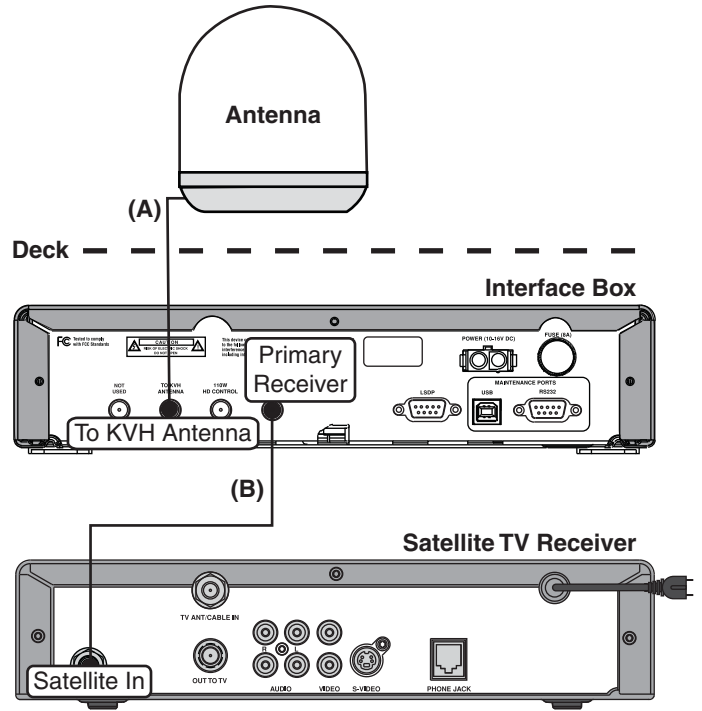
Do not shorten or extend the antenna cable. Since the cable carries data, power, and communications, the integrity of this cable and its connections is very important.

IMPORTANT!

Be sure to route cables within the vessel appropriately to avoid damage. For example, do not route any cables through wet areas (bilges) or near hot exhaust pipes. Also be sure you do not kink the cable; maintain a bend radius of at least 3" (75 mm).


- a. Connect the antenna cable (A) to the “To KVH Antenna” jack on the interface box (see Figure 17).
- b. Connect an RF coaxial cable (B) from the “Primary Receiver” jack on the interface box to the “Satellite In” jack on the receiver.
- c. Connect the receiver to the customer’s television. Follow the instructions in the receiver’s manual.

Figure 17: Wiring the Interface Box



8 Connect Power

The interface box requires 10-16 VDC power input supporting 50 watts (*4.2 amps @ 12 VDC*). Follow these steps to connect power to the interface box.

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

- a. Before you connect the power wires, turn off vessel power and test the circuit to ensure no power is present.
- b. Connect the individual power wires to a dedicated 10-amp or 15-amp circuit breaker. Connect the negative (black) wire to ground (power return), and connect the positive (red) wire to +12 VDC vessel power.

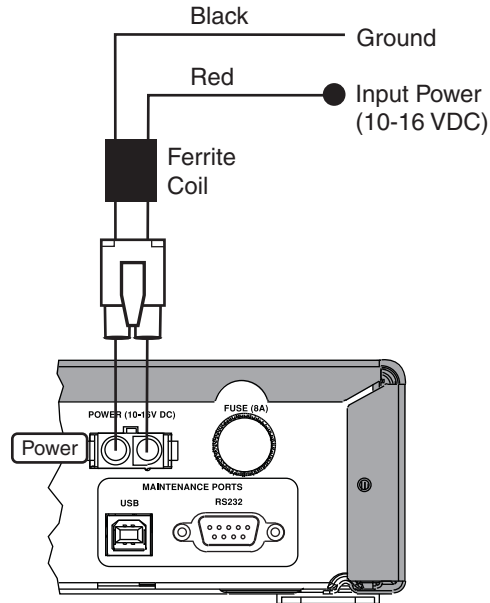
NOTE: As an alternative, you may use an AC/DC power supply (KVH part #72-0206-01) to supply power to the interface box.

- c. Plug the other end of the wires into the “Power” jack on the rear panel of the interface box (see Figure 18).

NOTE: Do not remove the small ferrite coil that is clamped onto the power wires. This coil suppresses EMI (electromagnetic interference) from the interface box.

- d. Connect power to the receiver. Follow the instructions in the receiver’s manual.

Figure 18: Interface Box Power Wiring



9 Mount the Interface Box

Once all cables are connected, follow these steps to install the interface box inside the vessel.

- a. Attach the two mounting brackets to the sides of the unit using three #2-56 screws. Simply screw these fasteners into the vent slots (see Figure 19).

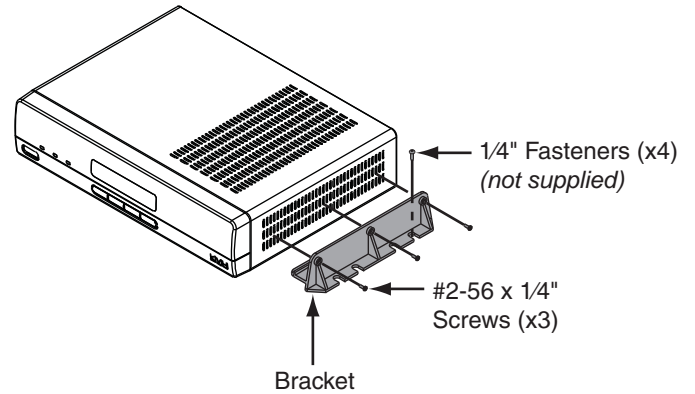
IMPORTANT!

To avoid overheating, do not block the upper vents of the interface box.

- b. Secure the brackets to the mounting surface using appropriate 1/4" fasteners (not supplied).

NOTE: Be sure to leave enough slack in the connecting cables (service loop) for easy serviceability.

Figure 19: Interface Box Mounting



10 Turn On the System

Follow these steps to turn on the system for the first time.

- a. Ensure the antenna has a clear, unobstructed view of the sky.
- b. Apply power to the TV and the receiver.
- c. Press the power switch on the front of the interface box to apply power to the TracVision system (see Figure 20).
- d. Wait one minute for system startup.
- e. Verify that the VOLTAGE and RECEIVER status lights on the interface box are lit green. Verify that the ANTENNA status light is either lit green or flashing green (see Figure 20). If not, refer to the *User's Guide* for troubleshooting information.
- f. Verify that the “System Needs Setup” screen is displayed on the interface box (see Figure 21).
- g. Using the buttons on the interface box front panel (see Figure 22), follow the steps in the next sections to set up the TracVision system for the customer’s location and desired satellites.

Figure 20: Interface Box Power Switch and Status Lights

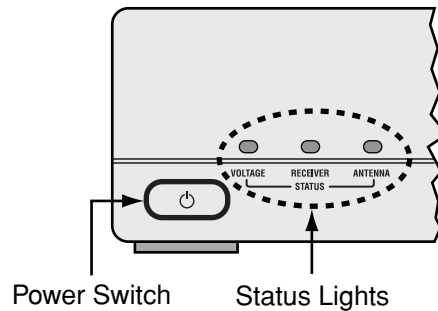


Figure 21: “System Needs Setup” Screen

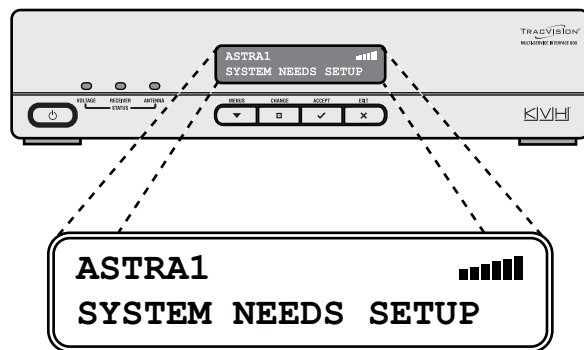
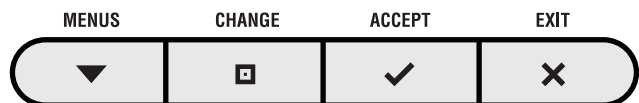


Figure 22: Interface Box Buttons



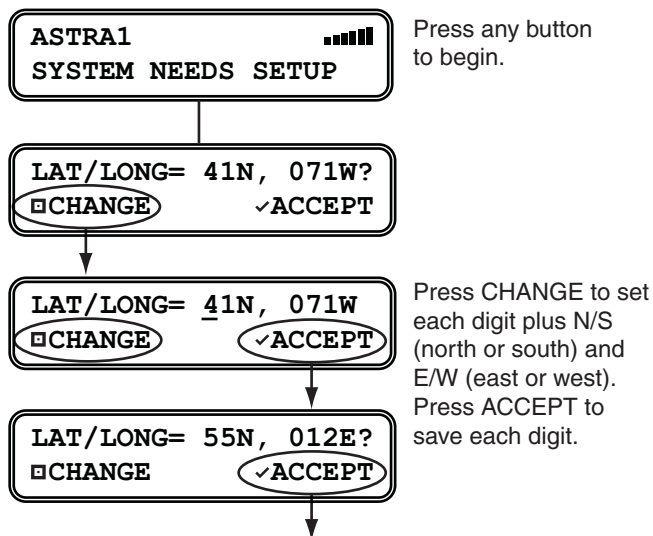
11 Enter Your Latitude & Longitude

Follow these steps and refer to the flowchart in Figure 23 to enter your vessel's latitude and longitude into the system. The antenna will use this position information to calculate the proper LNB skew setting for your position and speed up satellite acquisition.

If you are located in Europe and don't know your latitude and longitude, you can use the approximate latitude/longitude for your region shown in Figure 24. For example, if you are located in Antibes, France (region #18), you would enter 43° N latitude and 7° E longitude.

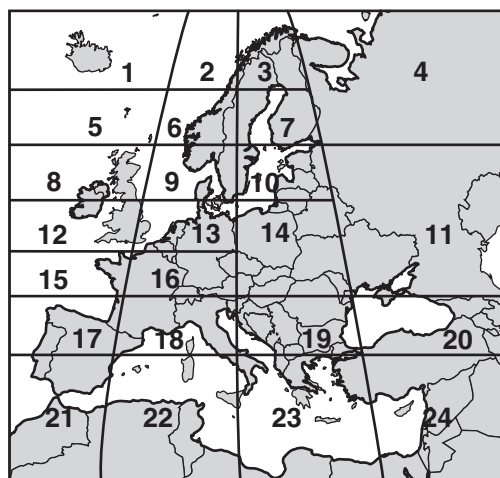
- Press any button on the interface box front panel.
- At "Lat/Long= 41N, 071W?," press CHANGE. A cursor appears under the first number in the displayed latitude.
- Press CHANGE until the number is set to the first digit of your vessel's current latitude. Then press ACCEPT. The cursor moves to the next number.
- Repeat Step c to set the remaining digits (plus North/South and East/West directions) of your latitude and longitude. Once you have set the entire position, the cursor disappears from the display.
- Press ACCEPT to confirm your selection.

Figure 23: Latitude/Longitude Setting



Continued on the next page.

Figure 24: Latitude/Longitude Data for Europe



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

12 Select Satellites

Follow these steps and refer to the flowchart in Figure 25 to set up the antenna for the customer's desired satellites. You may choose up to four satellites from the following list:

- Arabsat, 26° E
- Nilesat, 7° W
- Astra 1, 19.2° E
- Optus D1, 160° E
- Astra 2N, 28.2° E
- Optus C1, 156° E
- Astra 2S, 28.2° E
- Pas 9, 58° W
- Eutelsat W3A, 7° E
- Sirius, 5° E
- Hispasat, 30° E
- Thor, 0.8° W
- Hotbird, 13° E
- Turksat 1C, 42° E
- Hotbird WB, 13° E

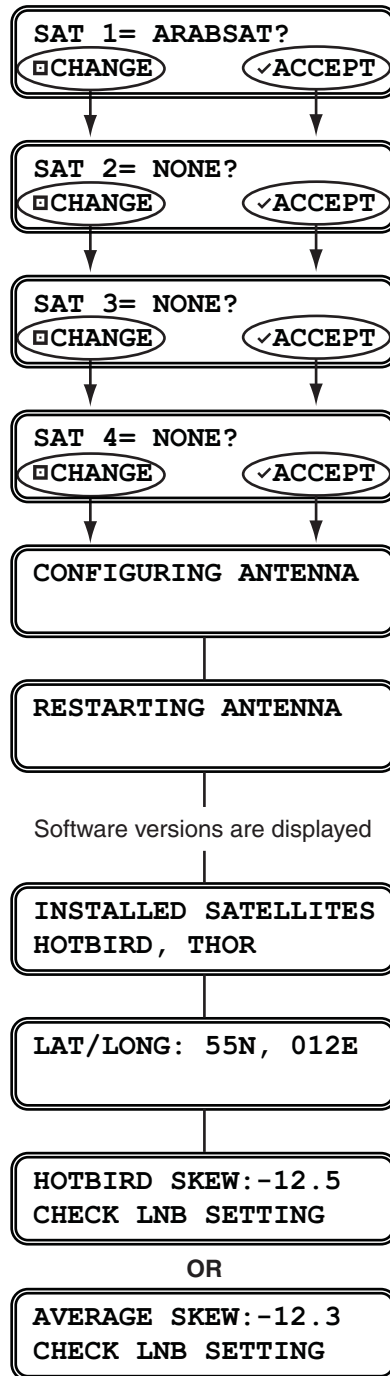
NOTE: If the desired satellite is not listed above, you can set up a special user-defined satellite. Refer to the User's Guide for details.

- a. At "Sat 1= Arabsat?," press CHANGE until the display shows the first (primary) satellite you wish to set up in the antenna. Then press ACCEPT.

NOTE: The display might show additional satellites not listed above. However, the TracVision system supports only those satellites specified above.

- b. Repeat Step a to choose the remaining desired satellites. If you don't need to set up four satellites, choose NONE instead.
- c. Pay close attention to the interface box display while the antenna restarts. The display will show the recommended LNB skew angle for your selected satellite(s) and position. You will need this skew angle to complete the next step.
- d. Set up your satellite TV receiver for the same satellites you set up in the antenna. Refer to your receiver's manual for details. Be sure to set them up in the same order. For example, set up SAT 1 (or A) in the receiver to the same satellite as SAT 1 in the antenna, and set up SAT 2 (or B) in the receiver to the same satellite as SAT 2 in the antenna.

Figure 25: Satellite Selection



Press CHANGE until the desired primary satellite is displayed. Then press ACCEPT.

Choose up to 3 additional satellites. Choose NONE when you are finished.

Your chosen satellites are displayed.

Your latitude & longitude are displayed.

The recommended skew angle is displayed. If you chose multiple satellites, the average skew is displayed.

13 Set the LNB Skew Angle

Follow these steps to set the antenna's LNB to the skew angle you noted in the previous step.

- a. Turn off and unplug your satellite TV receiver.
- b. Press the power switch on the front of the interface box to disconnect power from the TracVision system. Make sure the VOLTAGE status light goes out.



CAUTION

Disconnect power from the antenna before you remove the radome. The antenna has moving parts that can cause injury.

- c. Remove the three #10-32 screws securing the radome to the antenna. Carefully remove the radome and set it aside in a safe place.
- d. Locate the LNB on the back of the antenna's reflector (see Figure 26).
- e. Loosen the two wing screws securing the LNB to the choke feed (see Figure 27).
- f. Adjust the LNB, clockwise or counter-clockwise, until the skew arrow on the LNB points to the correct skew angle on the choke feed.

IMPORTANT!

Make sure the LNB is fully inserted into the choke feed. The shaft of the LNB must be seated properly against the feed tube to ensure optimum performance.

- g. Tighten the wing screws to secure the LNB in place.
- h. Reinstall the antenna's radome. The radome's "TracVision" labels should face fore and aft (see Figure 28). While pressing the radome down onto the base, secure the radome to the base using the three #10-32 screws you removed earlier.
- i. Install a protective plastic screw cap (supplied in the kit) over each radome screw.

Figure 26: Location of LNB on Back of Antenna Reflector

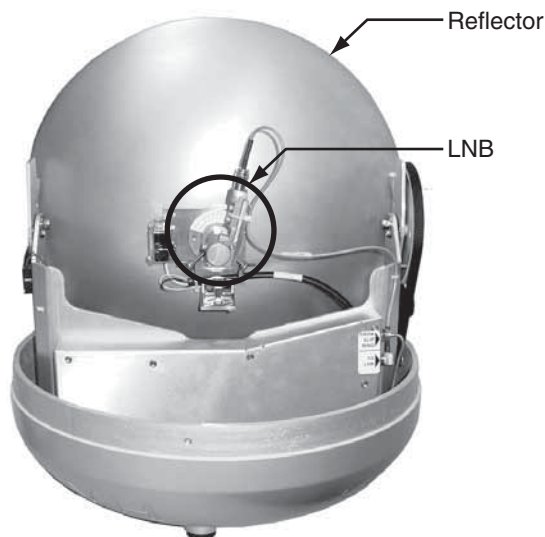


Figure 27: LNB Skew Angle Adjustment

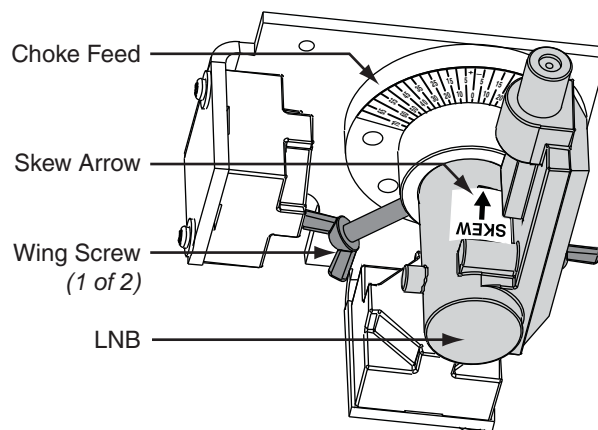



Figure 28: Radome Labels Facing Fore and Aft



14 Educate the Customer

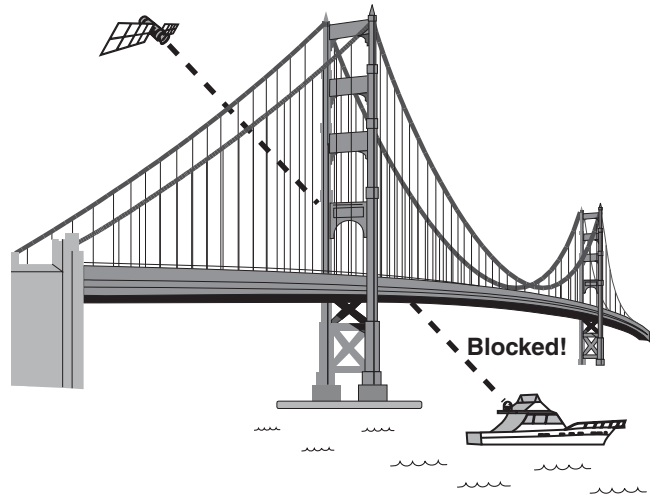
Before you leave the vessel, test the system to verify proper operation. Then give the Customer Welcome Kit and all manuals to the customer and explain how to use the system. Also be sure the customer understands the following:

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

	CAUTION
In the unlikely event that you need to remove the radome, remove power from the antenna first because the antenna's moving parts can cause injury.	

- The antenna must have a clear view of the sky to receive satellite TV. Common causes of blockage include trees, buildings, bridges, and equipment on the vessel itself (see Figure 29). Heavy rain or snow might also temporarily interrupt reception.
- Clean the antenna regularly. Dirt buildup can affect satellite TV reception.
- The antenna's LNB must be set to the correct skew angle for your location and selected satellite(s) to optimize reception. Therefore, you might need to adjust the skew when you travel to a different region or change your setup. Refer to the *User's Guide* for details.
- **(TracVision M2 only)** The TracVision M2 is designed for use while at anchor only. It will acquire and track the satellite while the vessel is moored, either at dock or at anchor, but not while underway.
- 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.
- The vessel must be located within the selected satellite's coverage area. To view satellite coverage maps, visit: www.kvh.com/footprint.
- Refer to the *User's Guide* for complete operation and troubleshooting information.

Figure 29: Blockage Example





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