TracPhone® V7

24" (60 cm) Configuration

V7

TRACPHONE®

KVH®

Installation Guide

KVH Industries, Inc.

TracPhone V7 Installation Guide

KVH's Complete mini-VSAT Broadband℠ System

These instructions explain how to install the TracPhone V7 mini-VSAT Broadband satellite communications system. Instructions on how to use the system are provided in the *User's Guide*.
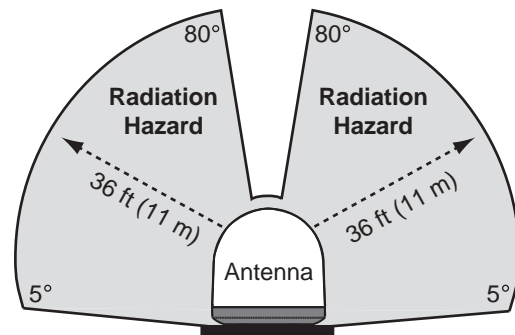
Installation Steps

CAUTION - RF Radiation Hazard

The antenna transmits radio frequency (RF) energy that is potentially harmful. Whenever the system is powered on, make sure everyone stays more than 36 feet (11 m) away from the antenna within its 5-80° elevation range. No hazard exists directly above the antenna and anywhere below the antenna's mounting plane.

80° 80°

Radiation Hazard   Radiation Hazard

36 ft (11 m)   36 ft (11 m)

Antenna

5°   5°

Who Should Install the System?

To ensure a safe and effective installation, only a KVH-certified technician should install the TracPhone system. KVH-certified 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

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

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

❶ 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 in Figure 1 and on the *Kitpack Content Lists*. 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).

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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) bit

- 3" (80 mm) hole saw

- Wire cutters

- Socket wrenches and extension

- 7/16" open-end wrench

- Light hammer and center punch

- Adhesive tape and scriber or pencil

- Wire strippers and terminal lug crimper

- Two RF coax cables (see Figure 18 on page 11 for type required)

- Connector installation tools

- Windows® 7, Vista™, or XP laptop with the latest version of TPV7 Flash Update Wizard installed (software available to technicians on the KVH Partner Portal)

NOTE: KVH offers an optional Access Controller kit for connecting both a TracPhone V7 and a Fleet or FleetBroadband antenna system to the onboard local area network (LAN). Supplemental instructions are provided in the kit (KVH part #01-0327).

Figure 1: TracPhone V7 System Components

Antenna

Radome

Baseplate

Control Unit

Modem

Ethernet Switch

Multimedia Terminal Adapter (MTA)

Remote Service & Support Module

❷ Plan the Antenna Installation

Before you begin, consider the following antenna installation guidelines:

- Minimize blockage. The antenna requires a clear view of the sky to transmit and receive satellite signals (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, strong enough to support the antenna's weight (60 lbs, 27.2 kg), and rigid enough to withstand heavy vibration.

- Select a location that is as close as possible to the intersection of the vessel's centerline and midships.

- Select a location that is well above any areas accessible to passengers and crew to reduce the risk of RF radiation exposure.

- 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, outside the beam path of the radar.

- Avoid placing the antenna near any other onboard antennas to prevent potential interference.
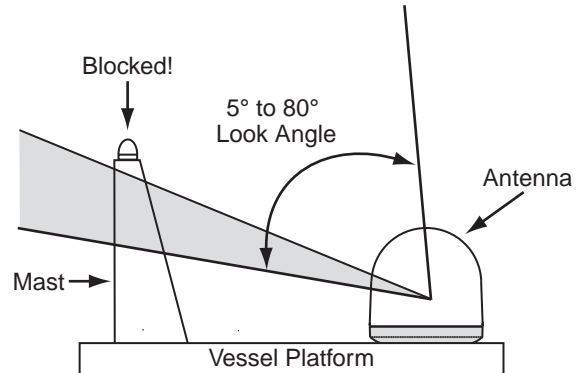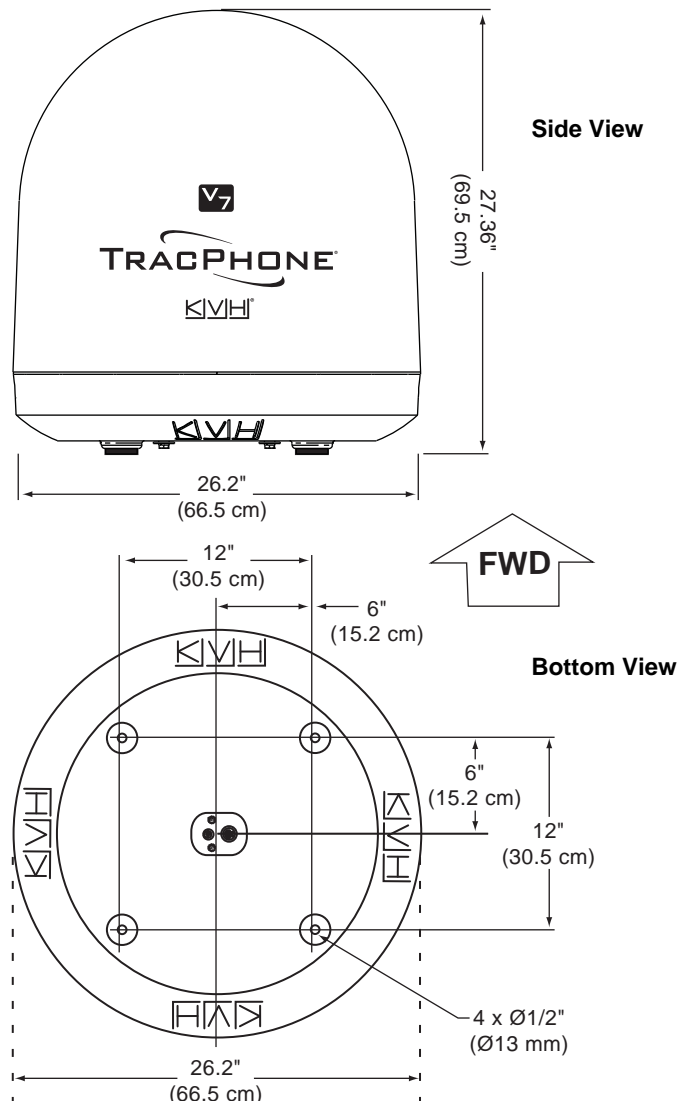
Figure 2: Blockage from Obstruction

Figure 3: Antenna Dimensions

Side View

27.36"
(69.5 cm)

26.2"
(66.5 cm)

FWD

Bottom View

12"
(30.5 cm)

6"
(15.2 cm)

6"
(15.2 cm)

12"
(30.5 cm)

4 x Ø1/2"
(Ø13 mm)

26.2"
(66.5 cm)

③ Plan the Belowdecks Installation

Before you begin, consider the following installation guidelines for the belowdecks units.

Control Unit and Modem

- Select a mounting location in a dry, well-ventilated area belowdecks away from any heat sources or salt spray.

- Be sure the front panels will be easily accessible to the user.

- Leave enough room at the rear panel to accommodate the connecting cables.

- You have several options for mounting the control unit and modem:

    Option 1 - Inside the optional case

    Option 2 - To a horizontal surface together using two L-brackets

    Option 3 - To a horizontal surface separately using four L-brackets

    NOTE: The control unit and modem are sized to fit a standard 19" (482.6 mm) equipment rack.

- To use the supplied data and power cables, the control unit must be located within 100 ft (30 m) of the antenna. However, you can order 150 ft (45 m) cables if a longer cable run is necessary (see Figure 18 on page 11).

Switch and MTA

- To use the supplied Ethernet cables, select a mounting location within 25 ft (7.5 m) of the modem (maximum length = 200 ft (60 m)).

- If you install a wireless access point *(supplied by customer)*, be sure the location provides adequate WiFi reception. Do not install it in an area surrounded by metal or near any electrical devices that emit RF noise.

Remote Service & Support Module

- To use the supplied serial data cable, select a mounting location within 25 ft (7.5 m) of the control unit (maximum length = 50 ft (15 m)).

- Be sure the location provides adequate GPRS cellular reception.

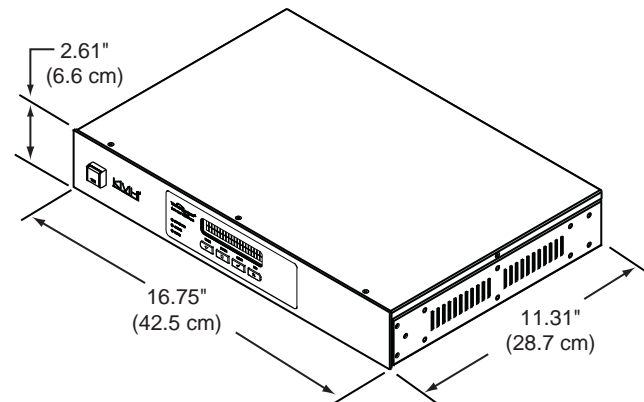Figure 4: Control Unit or Modem Dimensions (Identical)
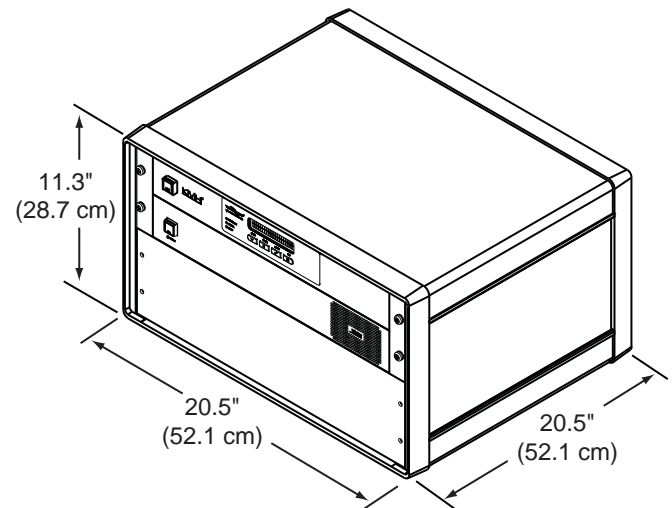

Figure 5: Case Dimensions

Figure 6: Dimensions of Ancillary Components

Component	Dimensions (W x D x H)
Switch	6.7" x 3.9" x 1.1" (17 cm x 9.9 cm x 2.8 cm)
MTA	4.6" x 5.12" x 1.18" (11.7 cm x 13 cm x 3 cm)
Remote Service & Support Module	5.12" x 3.54" x 1.5" (13 cm x 9 cm x 3.8 cm)

❹ Prepare the Belowdecks Units

If you plan to mount the control unit and modem inside the optional 19" (482.6 mm) case, follow these steps to assemble the case.

a. Remove the four M4 screws securing the rear cover to the case. Discard the rear cover.

b. Attach the top cover to the case using four M4 x 12 mm screws (see Figure 7). Attach the bottom cover and the two mounting brackets using four M4 x 16 mm screws.

c. Attach the four plastic feet to the bottom cover (see Figure 7).

d. At the front of the case, insert eight cage nuts into the following locations on the frame (four on each side) (see Figure 7): #2, #5, #8, and #11.

e. At the back of the case, insert four cage nuts into the following locations on the frame (two on each side): #1 and #3.

f. Remove the four #6-32 screws and washers securing the two retaining straps to the rear panel of the control unit. *Do not remove the bottom screws securing the straps to the modem.*

g. Attach the strain-relief bracket to the retaining straps and control unit using the screws and washers you removed in Step f (see Figure 8).

h. At the top 3U section of the case, insert the control unit/modem assembly and secure the front mounting brackets to the case using four M6 screws and washers (see Figure 9).

i. At the bottom 3U section of the case, attach the supplied blank panel using four M6 screws and washers (see Figure 9).

j. Secure the back of the control unit to the back of the case using the two supplied "Z" brackets. Attach the brackets to the case frame using four M6 screws and washers. Attach the brackets to the rear panel of the control unit using four #6-32 screws and washers (see Figure 9).

k. Once you have completed all system wiring, mount the case to the vessel using fasteners appropriate for the mounting surface.

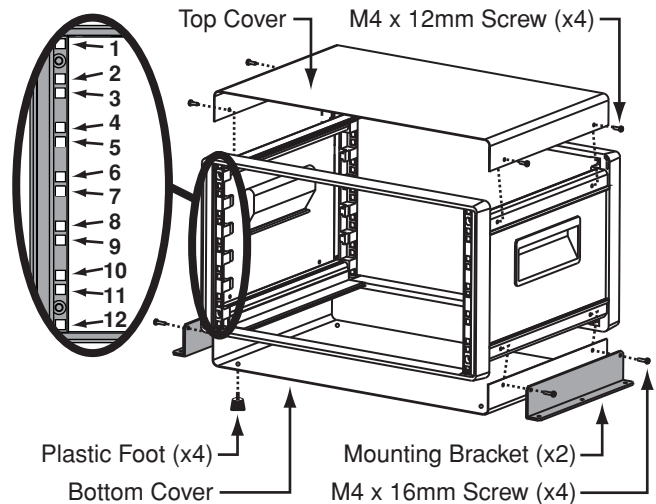## Option 1 - Mounting in the Case

Figure 7: Assembling the Case

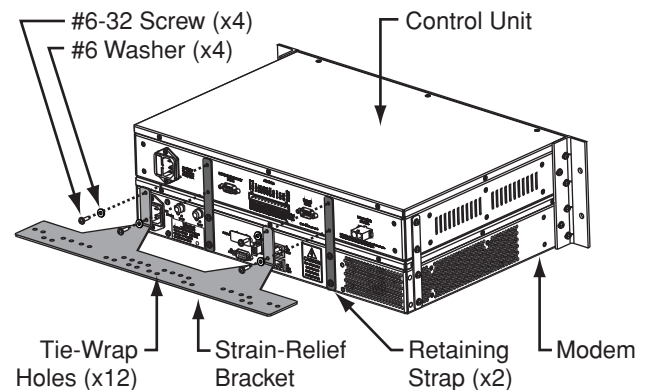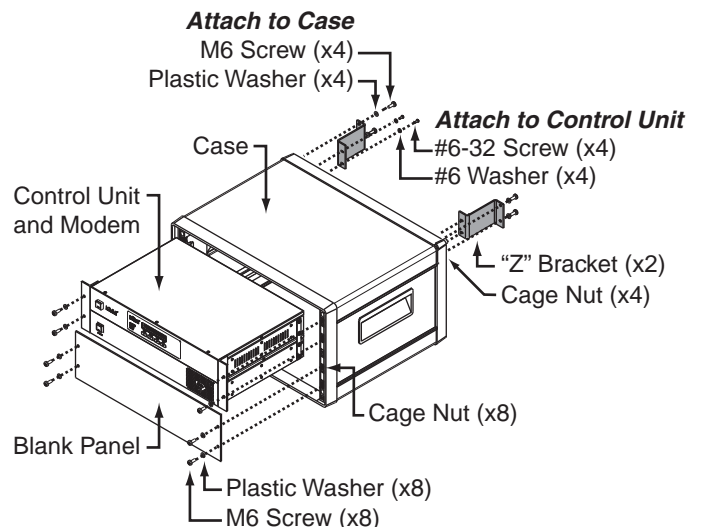Figure 8: Attaching the Strain-Relief Bracket

Figure 9: Securing the Control Unit/Modem in the Case

④ Prepare the Belowdecks Units

If you plan to mount the control unit and modem together as an assembly, without using the optional case or an equipment rack, follow these steps to attach the strain-relief bracket and "L" mounting brackets.

a. Remove the four #6-32 screws and washers securing the two retaining straps to the rear panel of the control unit. *Do not remove the bottom screws securing the straps to the modem.*

b. Attach the strain-relief bracket to the retaining straps and control unit using the screws and washers you removed in Step a (see Figure 10).

c. Attach two of the supplied "L" mounting brackets to the sides of the control unit or modem using four #6-32 screws and washers (see Figure 11). You can attach the brackets to either the top of the control unit or the bottom of the modem, depending on your desired mounting location.

d. Once you have completed all system wiring, mount the modem/control unit assembly to the vessel using fasteners appropriate for the mounting surface.

Option 2 - Mounting Units Together
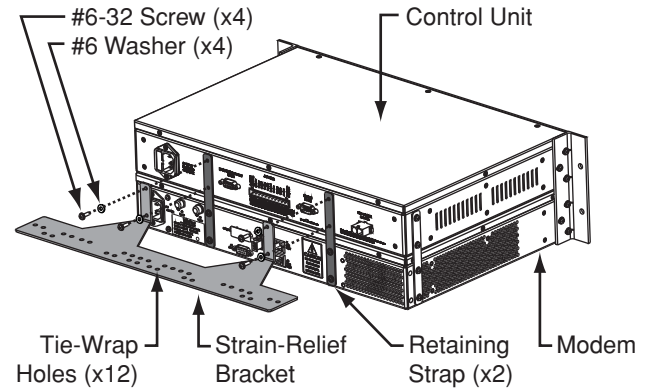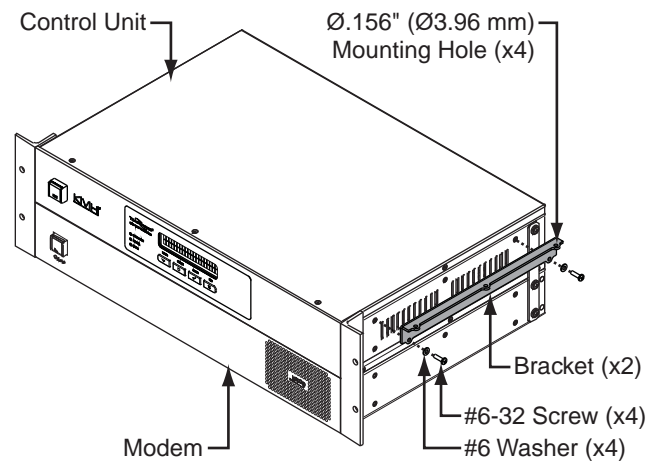
Figure 10: Attaching the Strain-Relief Bracket

Figure 11: Attaching the Mounting Brackets

➍ Prepare the Belowdecks Units

If you plan to mount the control unit and modem separately, follow these steps to detach the control unit from the modem, attach the strain-relief brackets, and attach the "L" mounting brackets.

a. Remove the 28 #6-32 screws and washers securing the two rack-mount brackets and four metal retaining straps to the control unit and modem (see Figure 12). Remove the brackets and straps.

b. Attach a strain-relief bracket to the back of the control unit using four of the screws and washers you removed in Step a (see Figure 13).

c. Attach a second strain-relief bracket to the back of the modem using four of the screws and washers you removed in Step a (see Figure 14).

d. Attach two of the supplied "L" brackets to the sides of the control unit using four #6-32 screws and washers (see Figure 11 on page 7). You can attach the brackets at either the top or bottom of the control unit, depending on your desired mounting location.

e. Attach the two other supplied "L" brackets to the sides of the modem using four #6-32 screws and washers (see Figure 11 on page 7). You can attach the brackets at either the top or bottom of the modem, depending on your desired mounting location.

f. Once you have completed all system wiring, mount the control unit and modem to the vessel using fasteners appropriate for the mounting surface.

Option 3 - Mounting Units Separately
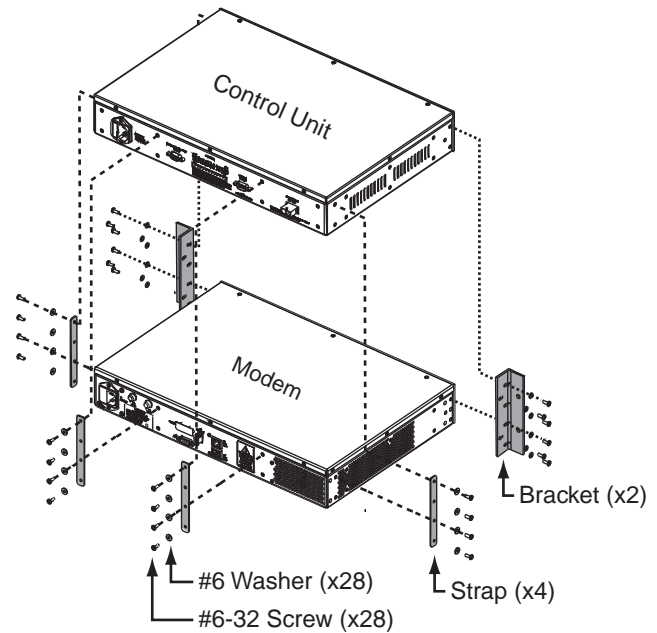
Figure 12: Detaching the Control Unit from the Modem

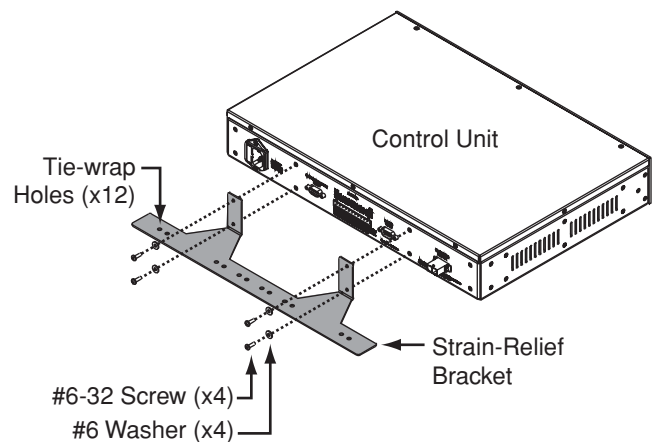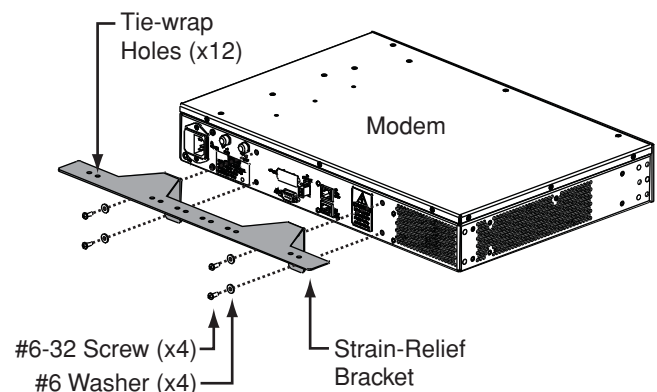Figure 13: Attaching the Bracket to the Control Unit

Figure 14: Attaching the Bracket to the Modem

5 Prepare the Antenna Site

Once you have identified a suitable antenna mounting site, according to the guidelines provided in Step 2, 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 15).

   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.

b. Using a light hammer and center punch, mark the locations for the four mounting holes and cable access hole on the mounting surface in the locations indicated on the template.

c. Drill a 1/2" (13 mm) hole at the four mounting hole locations you marked in Step b. Later, you will insert four 3/8"-16 bolts through these holes to secure the antenna to the mounting surface.

d. Cut out the 3" (80 mm) cable access hole in the location you marked in Step b. Smooth the edges of the hole to protect the cables. Later, you will route the data, power, and RF cables through this hole and into the vessel.

e. Clean and dry the antenna mounting surface.

f. 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, ensuring the hole in the foam seal aligns with the cable access hole in the mounting surface (see Figure 15).

   NOTE: Apply the foam seal to the vessel mounting surface, not to the antenna's baseplate. You will have difficulty connecting the cables to the antenna if the foam seal is attached to the baseplate.

Figure 15: Antenna Mounting Holes Layout

FWD

Ø3" (Ø80 mm)
Cable Access Hole

Foam Seal

12"
(305 mm)

12"
(305 mm)

Ø1/2" (Ø13 mm)
Mounting Hole (x4)
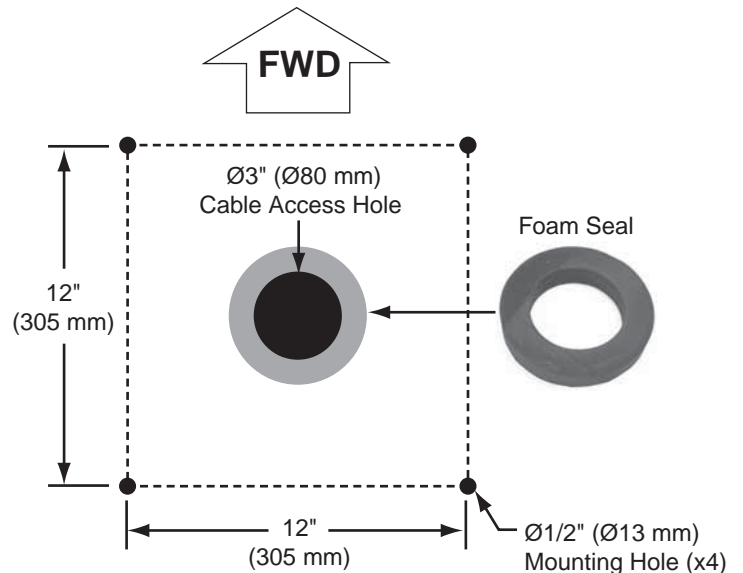
⑥ Remove the Restraints

Inside the antenna, several shipping restraints prevent the antenna assembly from moving during shipment. Follow these steps to remove the first set of shipping restraints.

a. Remove the six #10-32 Phillips 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. Using a 9/16" socket with 6" extension, remove the four 3/8" bolts, two brackets, and two washers securing the antenna to the shipping pallet (see Figure 17).

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.

NOTE: *You will remove the tie-wrap and wire shipping restraints after you mount the antenna.*
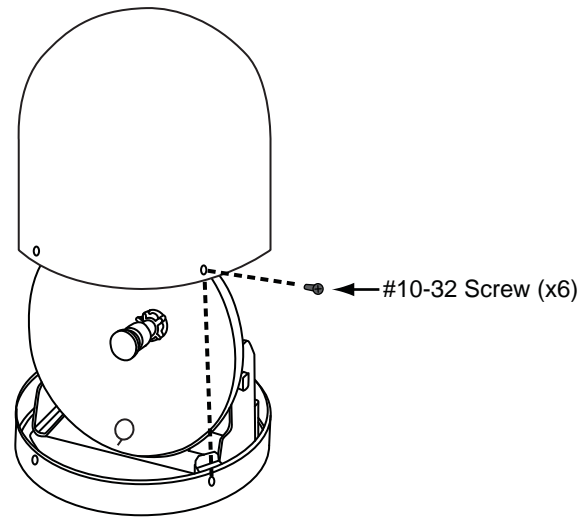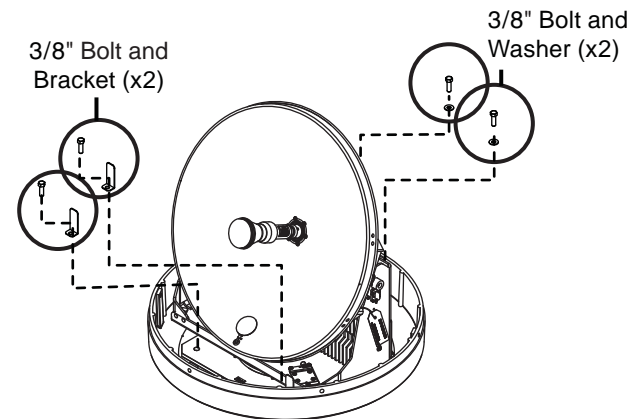
Figure 16: Removing the Radome

#10-32 Screw (x6)

Figure 17: Shipping Restraints

3/8" Bolt and Washer (x2)

3/8" Bolt and Bracket (x2)

➐ Wire the Antenna

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

a. In addition to the data and power cables, you will need to connect two 75Ω RF coax cables from the antenna to the belowdecks equipment. Use the guidelines in Figure 18 to determine the type of RF cables required.

> **IMPORTANT!**
>
> Terminate RF cables with the proper type "F" connectors (see Figure 18). Instructions for terminating LMR-400-75 cable are provided in Appendix B on page 28.

b. **Label both ends** of the two RF cables. Label one cable "TX," and label the other "RX."

c. Route the data, power, and RF cables belowdecks through the 3" (80 mm) 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 and power cables to the control unit and the RF cables to the modem.

d. Connect the data cable to the "Data" jack on the bottom of the antenna (see Figure 19). Hand-tighten until the connector locks in place; do not use excessive force.

e. Connect the power cable to the "Power" jack on the bottom of the antenna. Hand-tighten until the connector locks in place; do not use excessive force.

f. Connect the RF cable labeled "TX" to the "MTx" jack on the bottom of the antenna. Hand-tighten, then tighten with a 7/16" wrench for 1/4 turn to ensure an electrical and weather-proof connection.

g. Connect the RF cable labeled "RX" to the "MRx" jack on the bottom of the antenna. Hand-tighten, then tighten with a 7/16" wrench for 1/4 turn.

Figure 18: RF Cable Requirements*

15-50 ft (5-15 m) Cable Run
Cable: RG-11 Connector: SNS11AS Installation Tools: CST596711 and L3011B
51-100 ft (16-30 m) Cable Run
Cable: LMR-400-75 Connector: EZ-400-FMH-75 Installation Tools: TK-400EZ-75
101-150 ft (31-45 m) Cable Run
Cable: LMR-600-75 Connector: EZ-600-FMH-75 Installation Tools: TK-600EZ

* For alternate cable options, see the Application Notes section of the KVH Partner Portal (technicians only).

NOTE: RG-11 connectors/tools are manufactured by Thomas & Betts. LMR-400-75 and LMR-600-75 cables/ connectors/tools are manufactured by Times Microwave.

NOTE: Optional 150 ft (45 m) data and power cables: Data cable KVH part #32-0921-0150 Power cable KVH part #32-0924-0150

Figure 19: Connectors on Bottom of Antenna
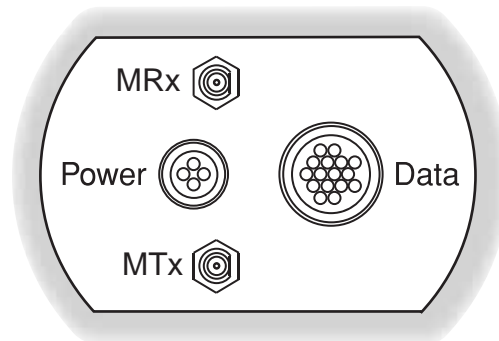
⑧ Mount the Antenna

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 forward arrow inside the baseplate points toward the bow and is parallel to the vessel's centerline (see Figure 20).

c. Make sure the four holes in the baseplate line up with the four holes in the mounting surface.

> **IMPORTANT!**
>
> You will need to rotate the antenna assembly by hand to see all four mounting holes. Rotate the antenna assembly slowly. If it hits a mechanical stop with excessive force, the limit switch might become damaged.

d. At each of the four baseplate mounting holes, place a 3/8" flat washer on a 3/8"-16 bolt and insert the bolt into the hole from above (see Figure 21).

e. Secure each mounting bolt to the mounting surface using a 3/8" shoulder washer, a 3/8" flat washer, a 3/8" lock washer, and a 3/8"-16 hex nut from below. Tighten all four bolts until the four rubber feet on the baseplate are bottomed against the mounting surface and the foam seal is fully compressed. KVH recommends that you tighten the nuts to between 12 and 16 ft-lbs (16.2 and 21.7 N-m) of torque.

f. Using wire cutters, cut and remove the shipping restraint securing the reflector to the antenna frame (see Figure 22).

g. Cut and remove the tie-wrap shipping restraint securing the antenna's LNB to the back of the reflector (see Figure 22).

h. Reinstall the radome onto the antenna. Secure in place with the six #10-32 screws you removed in Step 6a (see Figure 16 on page 10).

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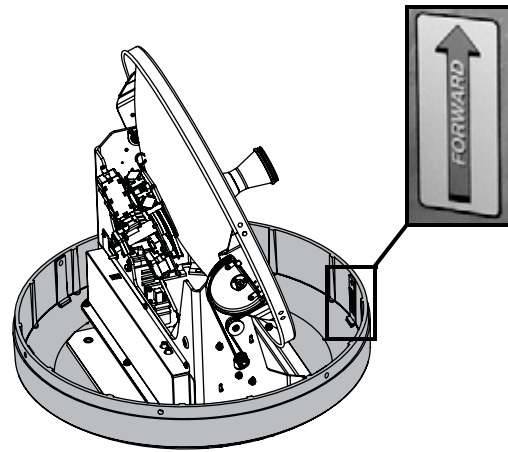

Figure 20: Forward Arrow in Antenna Baseplate

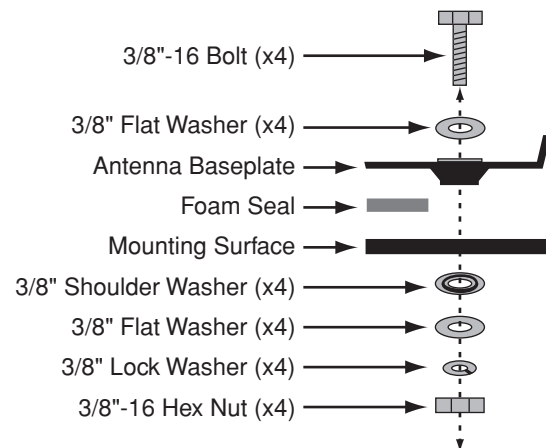Figure 21: Mounting the Antenna (Side View)
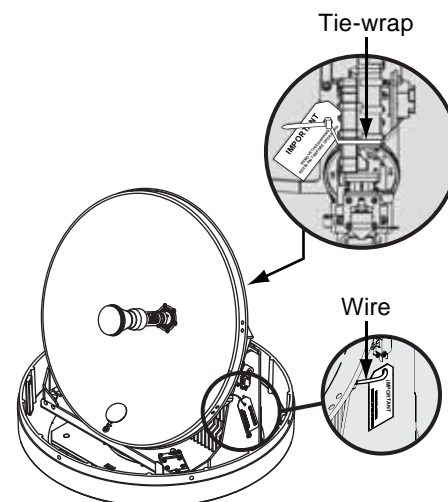
3/8"-16 Bolt (x4)
3/8" Flat Washer (x4)
Antenna Baseplate
Foam Seal
Mounting Surface
3/8" Shoulder Washer (x4)
3/8" Flat Washer (x4)
3/8" Lock Washer (x4)
3/8"-16 Hex Nut (x4)

Figure 22: Shipping Restraints

Tie-wrap

Wire

9 Wire the Belowdecks Units

Wire the Antenna Cables

Follow these steps to connect the antenna to the control unit and the modem.

NOTE: A system wiring diagram is provided in Appendix A on page 27.

a. First dress the data and power cables from the antenna. Strip back the insulation of each wire approximately 1/4" (6 mm) and gently twist each wire to ensure a good electrical connection.

b. Find the terminal strip connector in the kitpack. Connect the antenna data cable to the terminal strip connector as shown in Figure 23.

> **IMPORTANT!**
>
> The diagram refers to wires by **body color/ stripe color**. For example, "Brown/White" means the brown wire with the white stripe.

c. Connect the power cable from the antenna to the terminal strip connector as shown in Figure 23.

d. Plug the terminal strip connector into the rear panel of the control unit (see Figure 24).

e. Connect the RF coax cable labeled "RX" (connected to the antenna's MRx jack) to the "Rx RF" jack on the back of the modem (see Figure 25).

f. Connect the RF coax cable labeled "TX" (connected to the antenna's MTx jack) to the "Tx RF" jack on the back of the modem.

> **IMPORTANT!**
>
> Be sure to terminate RF cables properly with type "F" connectors.

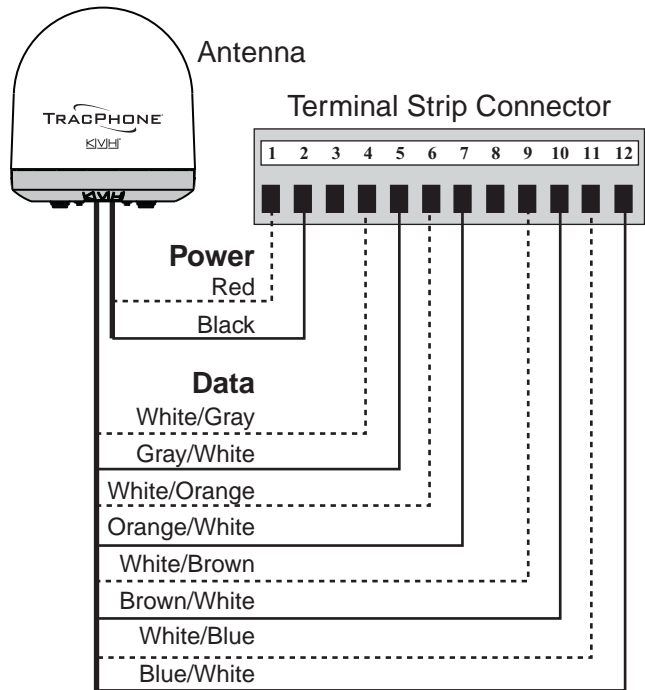Figure 23: Antenna Power and Data Wiring
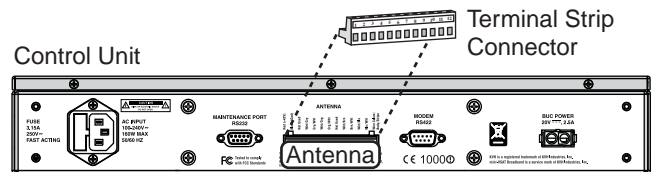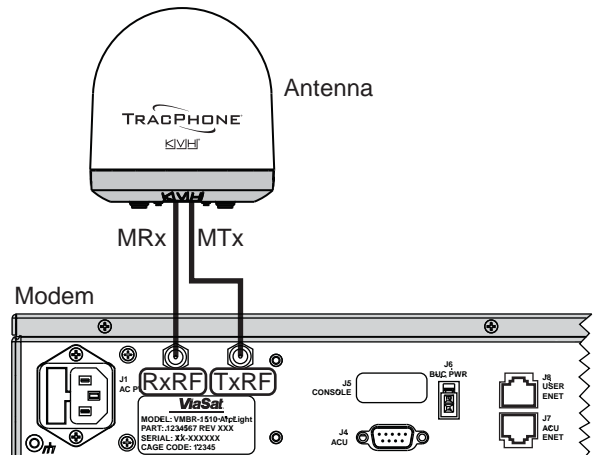
Figure 24: Antenna Power and Data Wiring

Figure 25: Antenna RF Transmit and Receive Wiring

Wire the Control Unit to the Modem

Follow these steps to connect the control unit to the modem.

a. Connect a serial data cable from the "Modem" jack on the control unit to the "ACU" jack on the modem (see Figure 26).

b. Connect the BUC power cable from the "BUC Power" jack on the control unit to the "BUC Pwr" jack on the modem.
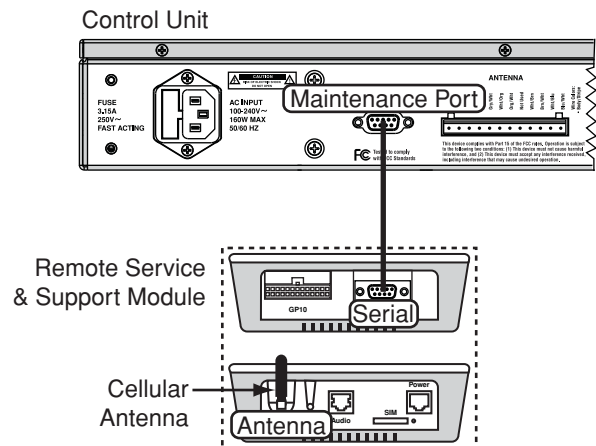
Wire the Remote Service Module

Follow these steps to connect the remote service & support module to the control unit.

a. Connect a serial data cable from the "Maintenance Port" jack on the control unit to the "Serial" jack on the remote service & support module. (see Figure 27).

b. Make sure the cellular antenna is connected to the "Antenna" jack on the remote service & support module.
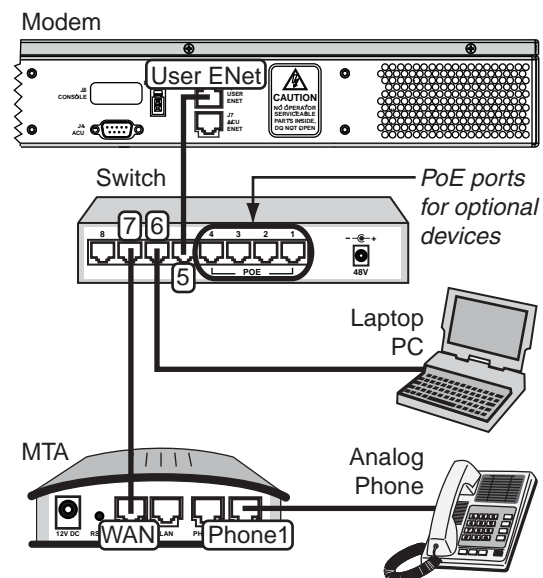
Wire the Switch and MTA

Follow these steps to connect all LAN devices.

a. Connect the supplied straight-through Ethernet cable from the "User ENet" jack on the modem to any port on the switch (see Figure 28).

b. Connect a second straight-through Ethernet cable from any port on the switch to the "WAN" jack on the MTA.

c. Connect the customer's analog (not digital) phone(s), fax machine, and/or PABX to the desired RJ-11 "Phone" jack(s) on the MTA. Each jack is linked to a unique phone line.

NOTE: If the customer requires an enterprise-grade fax solution, install KVH's optional UCH-250 Fax Server (KVH part #19-0520).

d. For a wired Ethernet network, connect the customer's computer(s) to any port(s) on the switch. For a wireless network, connect an access point (customer-supplied) to the switch *(ports 1-4 support IEEE 802.3af devices).*

Figure 26: Modem Data and BUC Power Wiring

Figure 27: Remote Service & Support Module Wiring

Figure 28: Switch and MTA Wiring

NOTE: The Ethernet and VoIP equipment supplied with the system might differ from those shown in this diagram.

⑩ Connect Power

Follow these steps to connect power to the TracPhone V7 system.

TIP: To ensure a stable power level, KVH recommends that you use an uninterruptible power supply (UPS) to power the system.

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 cables.

b. Be sure the vessel is properly grounded in accordance with marine standards.

c. Connect the control unit and modem to the supplied AC power strip (see Figure 29). Use the special adapter cables provided in the kitpack.

IMPORTANT!

Do not cut off the ground pin from the control unit and modem power cable plugs, and do not use a 3-prong to 2-prong adapter.

d. Connect the appropriate power cord (US or European) to the power strip.

e. Connect the supplied AC/DC adapters to the MTA, switch, and remote service & support module. Then plug the adapter cables into the vessel's AC power supply.

f. Strain-relieve all wires at the back of the control unit and modem by securing them to the attached strain-relief bracket(s) using the tie-wraps supplied in the kitpack. Be sure to leave enough slack in the cables for easy serviceability.

g. Plug the power strip into the vessel's 115 or 230 VAC power supply.

IMPORTANT!

Double-check all of your wiring before continuing. If wiring is incomplete or incorrect, electronics may become damaged when you apply power.

Figure 29: Power Wiring

15
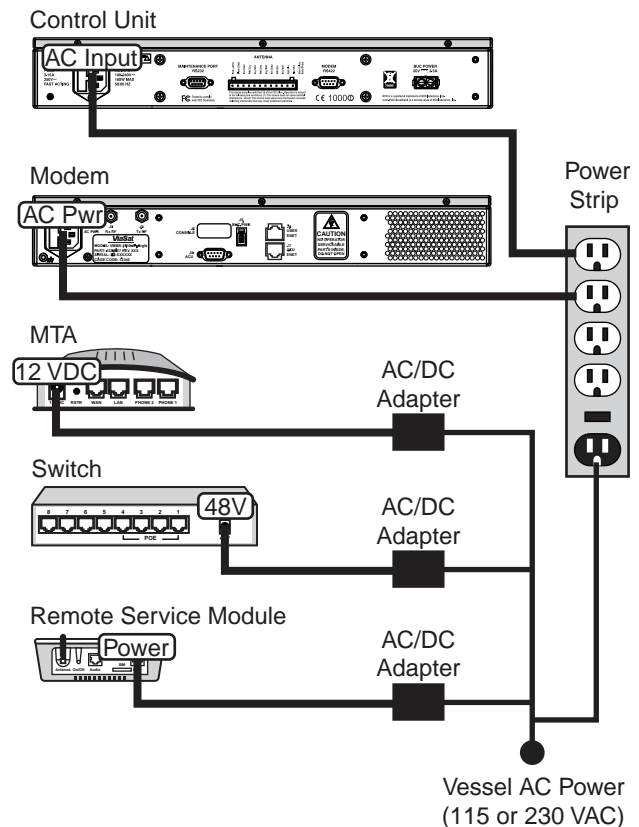
⓫ Configure the Computer(s)

Follow these steps to configure the user's computer(s) for a wired connection to the TracPhone V7. Once you have set up and tested a wired connection, you can configure a wireless connection *(wireless access point not supplied)*.

> **IMPORTANT!**
>
> Establishing a wireless connection onboard a steel vessel might require a special WAP and advanced networking expertise.

> **IMPORTANT!**
>
> When setting up a wireless network, apply security settings, such as encryption, to protect the network from outside intrusion.

NOTE: The computer must have a network interface card installed and all cabling must be 100 Mbps fast Ethernet UTP CAT-5 with RJ45 connectors.

Windows 7 or Vista

a. Turn on the networked computer.

b. From the Windows Control Panel, navigate to the **Network and Sharing Center**. *You can find the control panel either through the Start menu or "My Computer."*

c. At the Network and Sharing Center window, double-click the **Local Area Connection** link (Windows 7) or **View Status** link (Windows Vista) for the Ethernet connection you are using for TracPhone V7.

d. At the Local Area Connection Status window, click **Properties**. *This screen only displays if the computer is currently connected to a network.*

e. At the Local Area Connection Properties window, select the **Networking** tab. Then select **Internet Protocol Version 4** and click **Properties** (see Figure 30).

f. At the Internet Protocol Properties window, select **Obtain an IP address automatically** and **Obtain DNS server address automatically** (see Figure 31). Then click **OK**.

g. At the Local Area Connection Properties window, click **OK**.

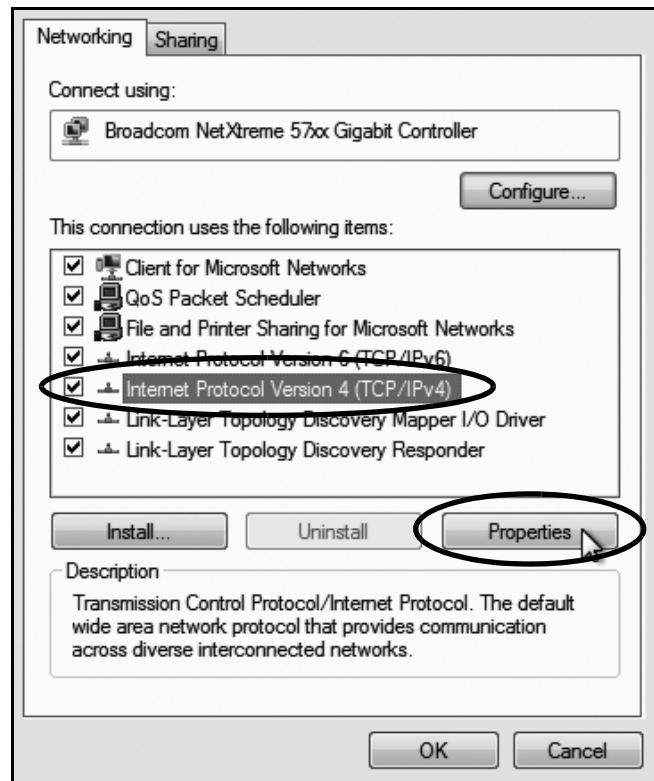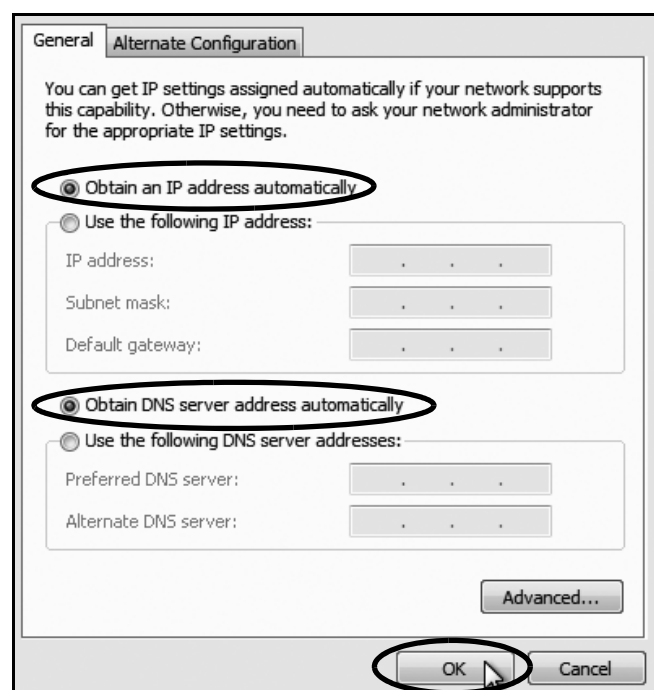Figure 30: Windows 7/Vista - Local Area Connection Properties

Figure 31: Windows 7/Vista - Internet Protocol Properties

Windows XP

a. Turn on the networked computer.

b. At the Windows Contol Panel, double-click **Network Connections**. *You can find the control panel either through the Start menu or "My Computer."*

c. At the Network Connections window, double-click the **Local Area Connection** icon for the Ethernet connection you are using for TracPhone V7.

d. At the Local Area Connection Status window, select the **General** tab. Then click **Properties**. *This screen only displays if the computer is currently connected to a network.*

e. At the Local Area Connection Properties window, select the **General** tab. Then select **Internet Protocol (TCP/IP)** and click **Properties** (see Figure 32).

f. At the Internet Protocol (TCP/IP) Properties window, select the **General** tab. Then select **Obtain an IP address automatically** and **Obtain DNS server address automatically** (see Figure 33). Then click **OK**.

g. At the Local Area Connection Properties window, click **OK**.

h. Restart the computer.

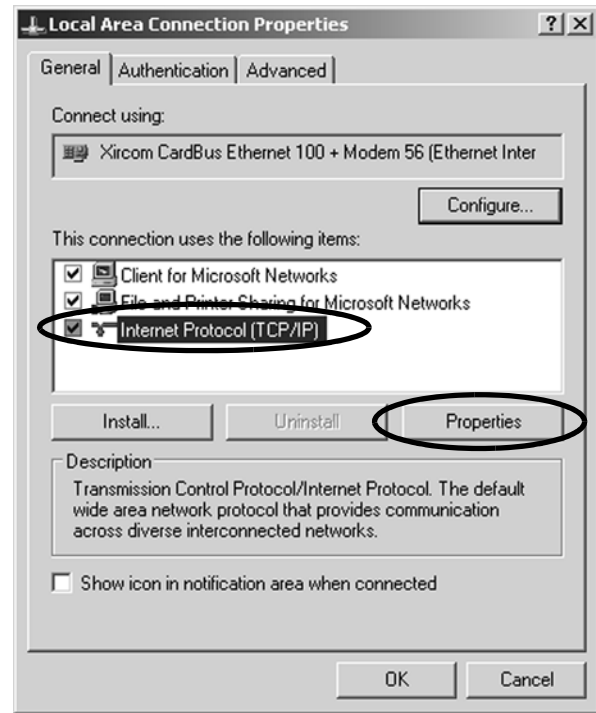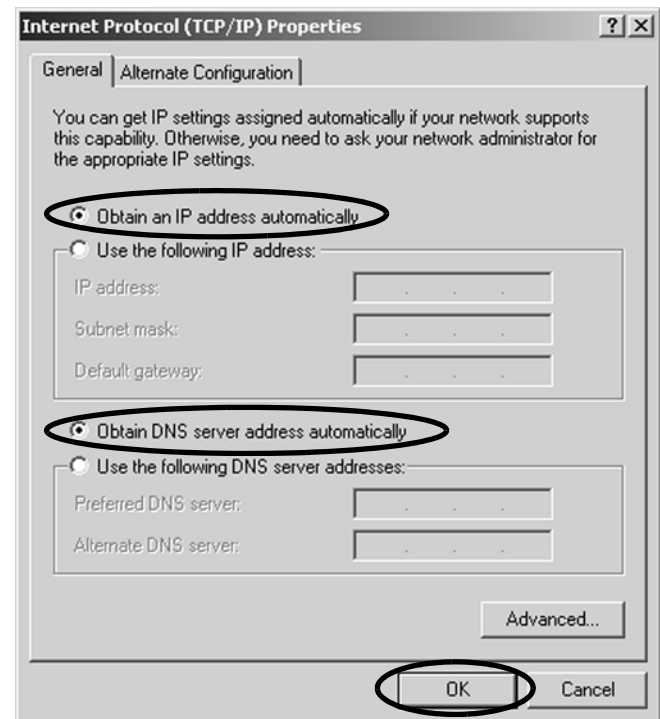Figure 32: Windows XP - Local Area Connection Properties

Figure 33: Windows XP - Internet Protocol (TCP/IP) Properties

⑪ Continued Configure the Computer(s)

Macintosh OS X

a. Turn on the networked computer.

b. At System Preferences, click the **Network** icon.

c. At the Network window (see Figure 34), select the following:

   • Show: **Built-in Ethernet**

   • Configure: **Using DHCP**

   • Leave all text boxes blank

d. Network: Click **Apply Now**.

e. Restart the computer.

Figure 34: Macintosh OS X - Network Preferences

12 Turn On the System

Follow these steps to turn on the TracPhone V7 system for the first time.

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

b. Apply vessel power to the TracPhone system, including the switch, MTA, and remote service & support module.

c. Turn on the power switch on the front of the the modem (see Figure 35). The button's light should illuminate green.

d. Turn on the power switch on the front of the control unit (see Figure 35). The button's light should illuminate green.

e. Wait 5 minutes for system startup.

f. Verify that the status lights on the control unit and modem (see Figure 36) exhibit the following conditions:

- **Control Unit**: Lit green

- **Antenna**: Lit or flashing green

- **Modem**: Lit or flashing green

- **Status**: Any condition except off

If any of these lights exhibit a different condition, refer to the Troubleshooting section of the *User's Guide*.

g. Verify that the status lights on the MTA and switch indicate a normal condition. Refer to the MTA and switch manuals for details.
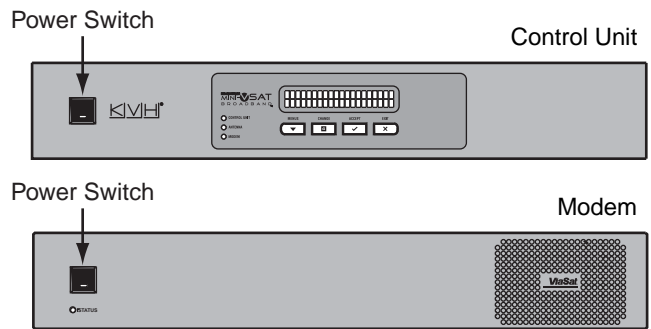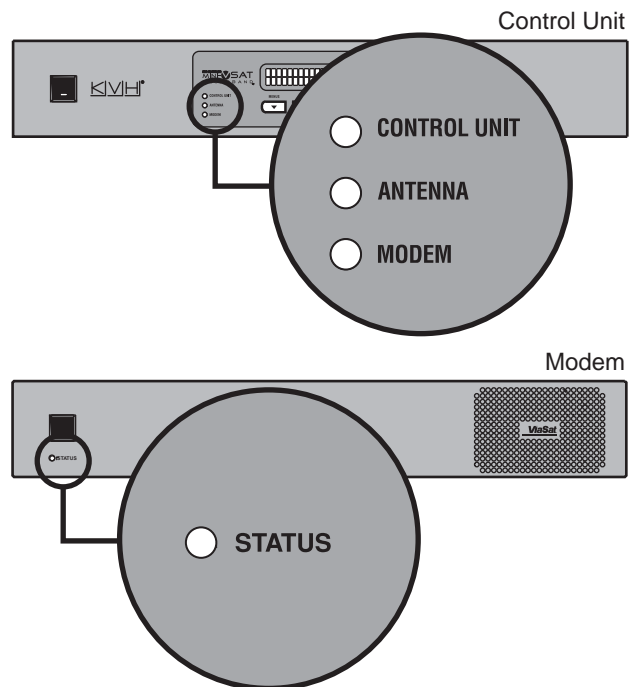
Figure 35: Power Switches

Figure 36: Status Lights

⓭ Update the System Software

Follow these steps to ensure the latest software is installed in the TracPhone V7 system.

a. At the control unit, press MENUS until the display shows "ANTENNA STATUS" (see Figure 37). Then press ACCEPT.

b. Press MENUS until the display shows "ANTENNA MAIN BOARD." Note the reported software (SW) version.

c. Press MENUS to view the software versions for the RF board, AZ/EL motor, skew motor, and control unit. Note all of these versions.

d. Compare the software versions you just noted on the control unit with the latest versions listed in the TPV7 Flash Update Wizard's Release Notes.

   NOTE: Before using the TPV7 Flash Update Wizard, be sure to check for updates to ensure it has all of the latest software files (Internet access required).

e. Use the TPV7 Flash Update Wizard to update any older versions of software in the TracPhone V7 system. Refer to the Wizard's Help menu for complete details (see Figure 38).

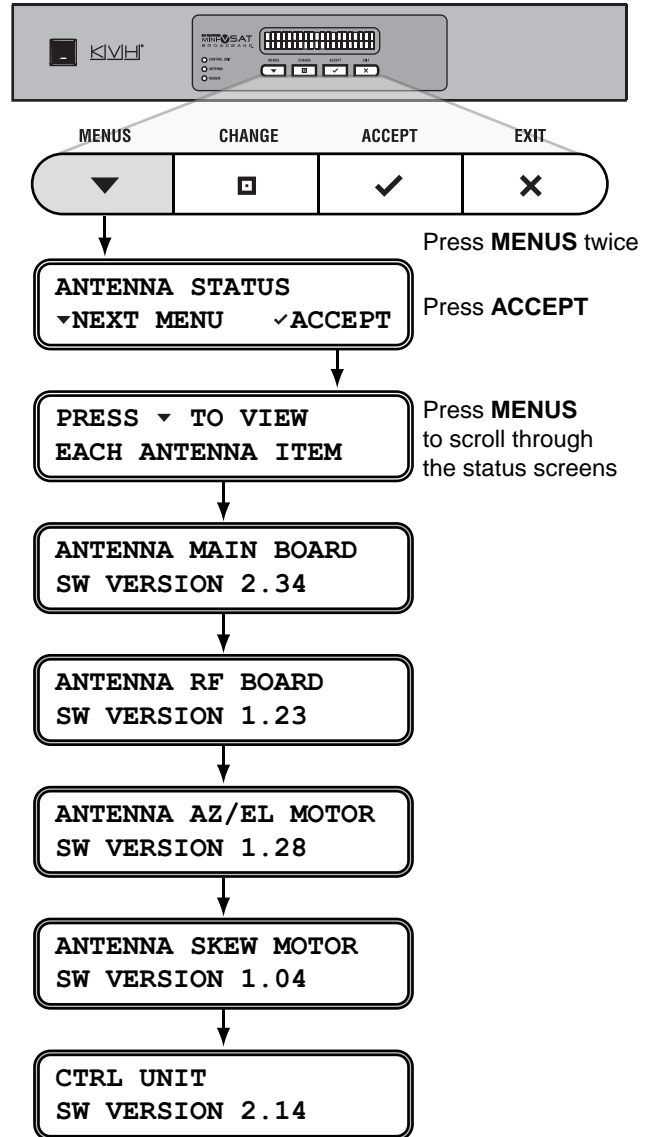Figure 37: Software Versions Displayed on the Control Unit

Press **MENUS** twice

ANTENNA STATUS
▼NEXT MENU   ✓ACCEPT

Press **ACCEPT**

PRESS ▼ TO VIEW
EACH ANTENNA ITEM

Press **MENUS** to scroll through the status screens

ANTENNA MAIN BOARD
SW VERSION 2.34

ANTENNA RF BOARD
SW VERSION 1.23

ANTENNA AZ/EL MOTOR
SW VERSION 1.28

ANTENNA SKEW MOTOR
SW VERSION 1.04

CTRL UNIT
SW VERSION 2.14

Figure 38: TPV7 Flash Update Wizard Help Menu

⓮ Set Up RF Hazard Zones

To prevent exposure to RF energy, which may be harmful to people who stand within 36 feet (11 meters) of the antenna, you can configure up to two RF radiation hazard zones for areas where crew and/or passengers frequent (see Figure 39). The system will disable the transmitter whenever the antenna is pointing within one of these zones.

Follow these steps to set up an RF hazard zone.

a. Determine the necessary azimuth range for the RF hazard zone(s). You will need to enter, in clockwise order, beginning and ending azimuths (>4° apart) **relative to the antenna's forward arrow**, which should be pointing toward the bow (see Figure 40).

b. At the control unit, press MENUS until the display shows "CONFIGURATION." Then press ACCEPT.

c. Press MENUS until the display shows "SET HAZARD ZONE."

d. Press CHANGE until the display shows "SET HAZARD ZONE = YES." Then press ACCEPT.

e. At "ZONE 1," press CHANGE. A cursor appears under the first number in the azimuth range for RF hazard zone #1.

f. Press CHANGE until the number is set to the first digit of the beginning azimuth for the first hazard zone. *Enter a zero if the azimuth value is less than 100°.*

g. Press ACCEPT. The cursor moves to the next number.

h. Repeat steps f and g to set the remaining digits of the desired RF radiation hazard zone. Then press ACCEPT.

i. At "Zone 2," repeat steps e-h to set the range for the second RF hazard zone, if desired.

j. At "XMT IN ZONES," verify that the display shows "XMT IN ZONES = NO." Then press MENUS.

k. Press EXIT to exit the menu.

NOTE: *For more details, refer to the Configuration section of the User's Guide.*

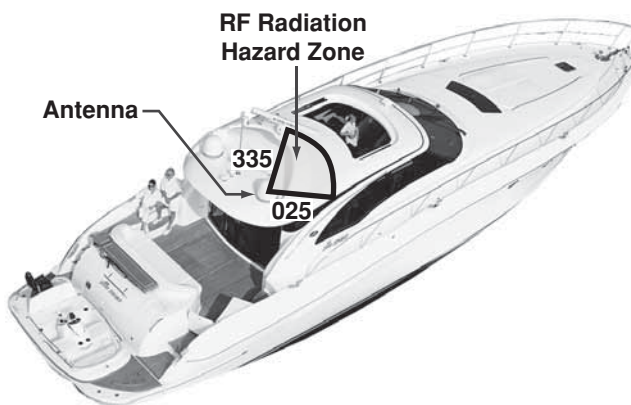Figure 39: Example of an RF Radiation Hazard Zone

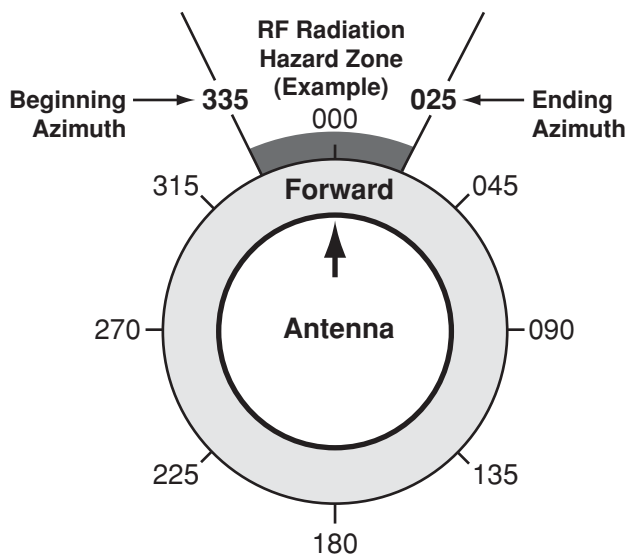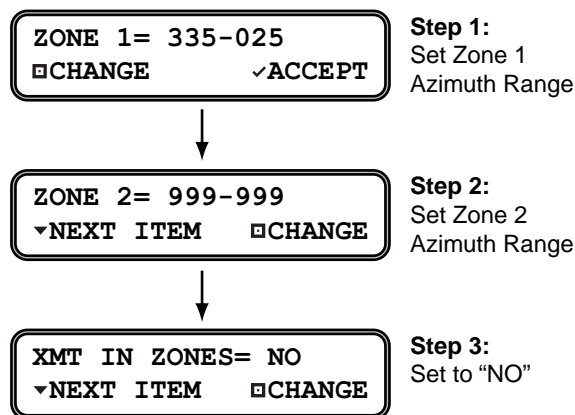Figure 40: Azimuths Relative to Antenna's Forward Arrow

Figure 41: Setup Process for RF Hazard Zones

```
ZONE 1= 335-025
□CHANGE      ✓ACCEPT
```
Step 1:
Set Zone 1
Azimuth Range

```
ZONE 2= 999-999
▾NEXT ITEM    □CHANGE
```
Step 2:
Set Zone 2
Azimuth Range

```
XMT IN ZONES= NO
▾NEXT ITEM    □CHANGE
```
Step 3:
Set to "NO"

⓯ Test the System

Now that you have installed the system, you can test the system to verify it is ready for customer delivery. Follow these steps to test the system for proper operation.

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

b. With the TracPhone system powered on, restart the networked computer(s).

c. Verify that the antenna is tracking the service satellite and the modem is connected to the mini-VSAT Broadband service, as indicated by the control unit screen shown in Figure 42. If an error appears, refer to the Troubleshooting section of the *User's Guide*.

IMPORTANT!

Once the system is online, do not turn it off for 30 minutes to allow the modem to download the latest configuration files via the satellite. If the modem is unable to connect, you may upload the files manually via the modem's web interface. Details are available to technicians on the KVH Partner Portal.

---

d. If the customer has activated the TracPhone system for mini-VSAT Broadband service, verify that the system can access the Internet by entering any common website address (URL) into the browser.

e. If the customer has activated the TracPhone system, also verify that you can place a voice call. First make sure the MTA's "VOIP" light is lit (see Figure 43). Then, using any telephone connected to the MTA, place a call to someone on a terrestrial or cellular network and ask that person to call you back at the customer's number.

f. Even if the customer has not yet activated the TracPhone system for mini-VSAT Broadband service, you can still check the modem's communications to the land-based hub. Open the web browser on any networked computer and enter the following address to access the Welcome page: **http://208.83.165.11/mbbtest**. Verify that the Welcome page appears in the browser (see Figure 44).

Figure 42: Good Service Connection Indicated on Control Unit LCD


```
ONLINE
TRACKING 22.0W
```
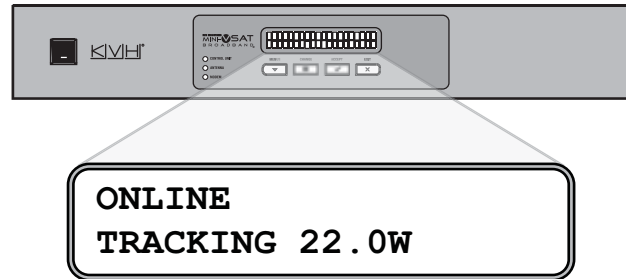
NOTE: Satellites will vary depending on your location.

Figure 43: MTA Status Lights

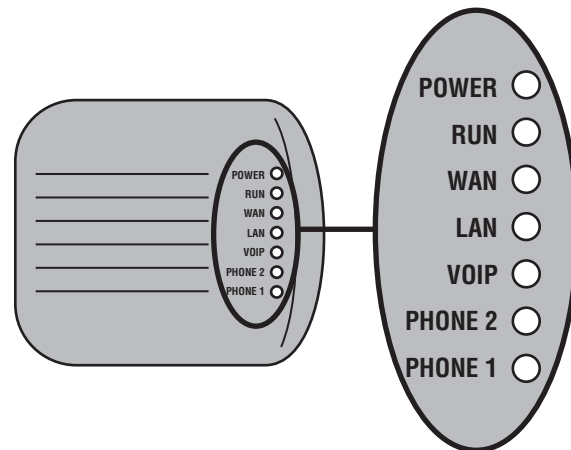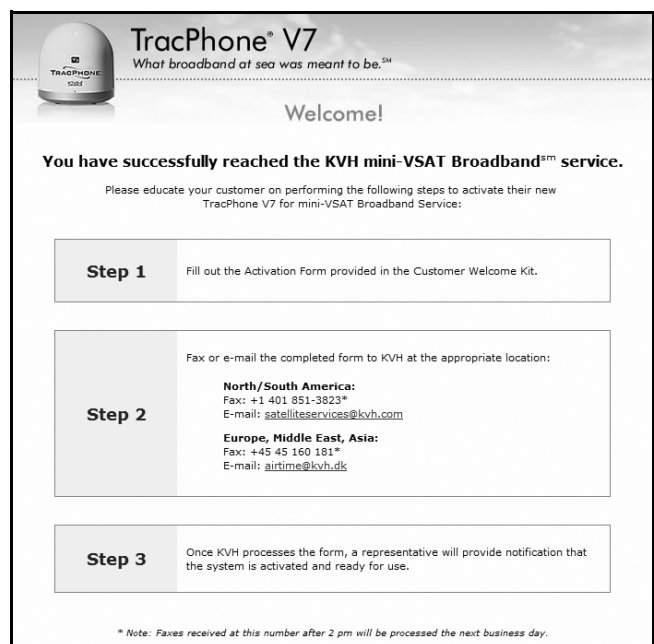Figure 44: Welcome Page for Testing

**g.** Open the web browser on any wired (not wireless) networked computer and enter the following address to access the modem's web interface: **http://192.168.0.1**

h. Under "Forward Link" on the General Status page, make sure **Eb/No is at least 2 dB** (see Figure 45).

NOTE: Refer to the User's Guide for details about the other status information that is available on this web page.

Figure 45: General Status Page Via Modem Web Interface
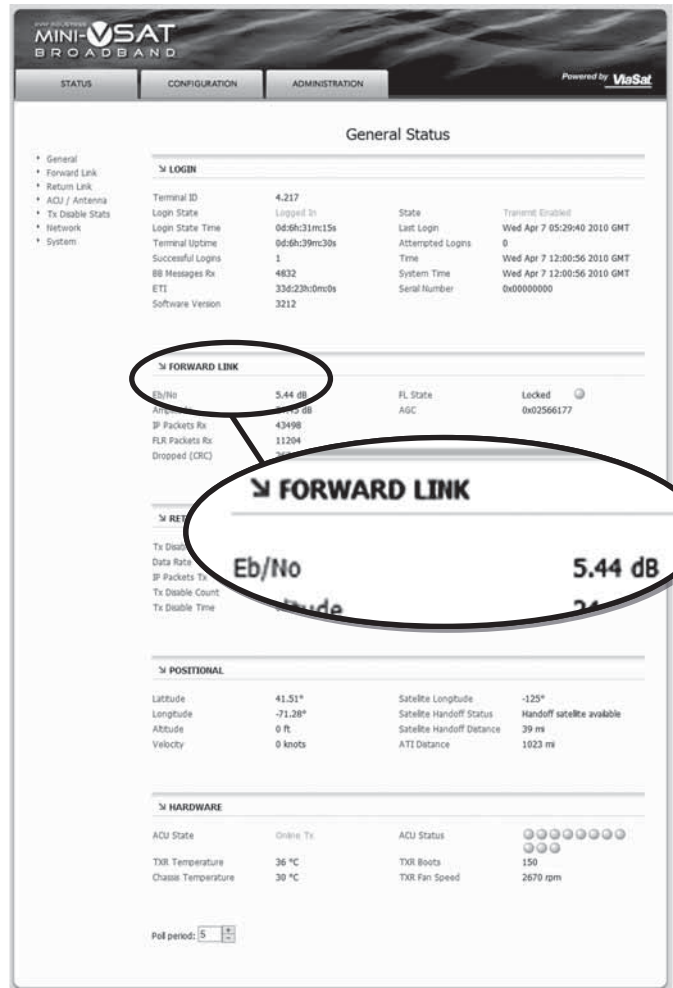
16 Educate the Customer

The installation is complete! Before you leave the vessel, enter the system serial numbers on the first page of the *User's Guide*, give the Welcome Kit to the customer, and review the following with the customer:

- Advertised data speeds and reasons why speeds may decrease at times (refer to Section 15 of the End User Agreement)

- Voice service and all associated long-distance charges (refer to the Airtime Rate Sheet)

- Fair Access Policy: streaming video and peer-to-peer file sharing are prohibited (refer to Sections 44-45 of the End User Agreement)

Also explain how to use the system and be sure the customer understands the following:

- **The antenna transmits RF energy that is potentially harmful.** Whenever the system is powered on, make sure everyone stays more than 36 feet (11 meters) away from the antenna within its 5-80° look angle (see Figure 47). No hazard exists directly above the antenna and anywhere below the antenna's mounting plane.

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

- The antenna must have a clear view of the sky to communicate via satellite. Common causes of blockage include masts, trees, buildings, and bridges (see Figure 48).

- Clean the antenna regularly. Dirt buildup on the radome can affect communications. Heavy rain or snow may also temporarily interrupt communications.

- The vessel must be located within the coverage area of the satellite. To view a coverage map, visit ***www.kvh.com/footprint***.

- The system must be activated for mini-VSAT Broadband service. For activation details, refer to the Activation Checklist located in the Welcome Kit or on the web at ***www.kvh.com/mvbservice***.

Figure 46: Customer Welcome Kit

Figure 47: Safe Distance to Avoid Risk of RF Radiation Exposure
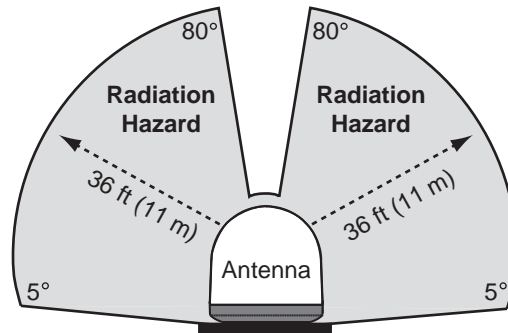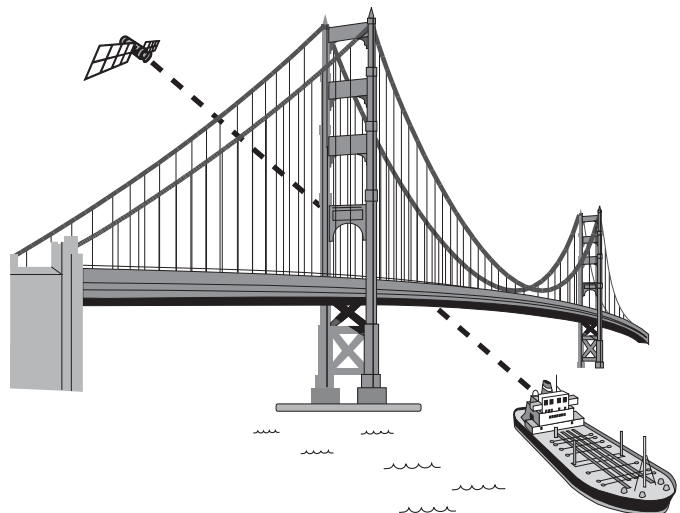

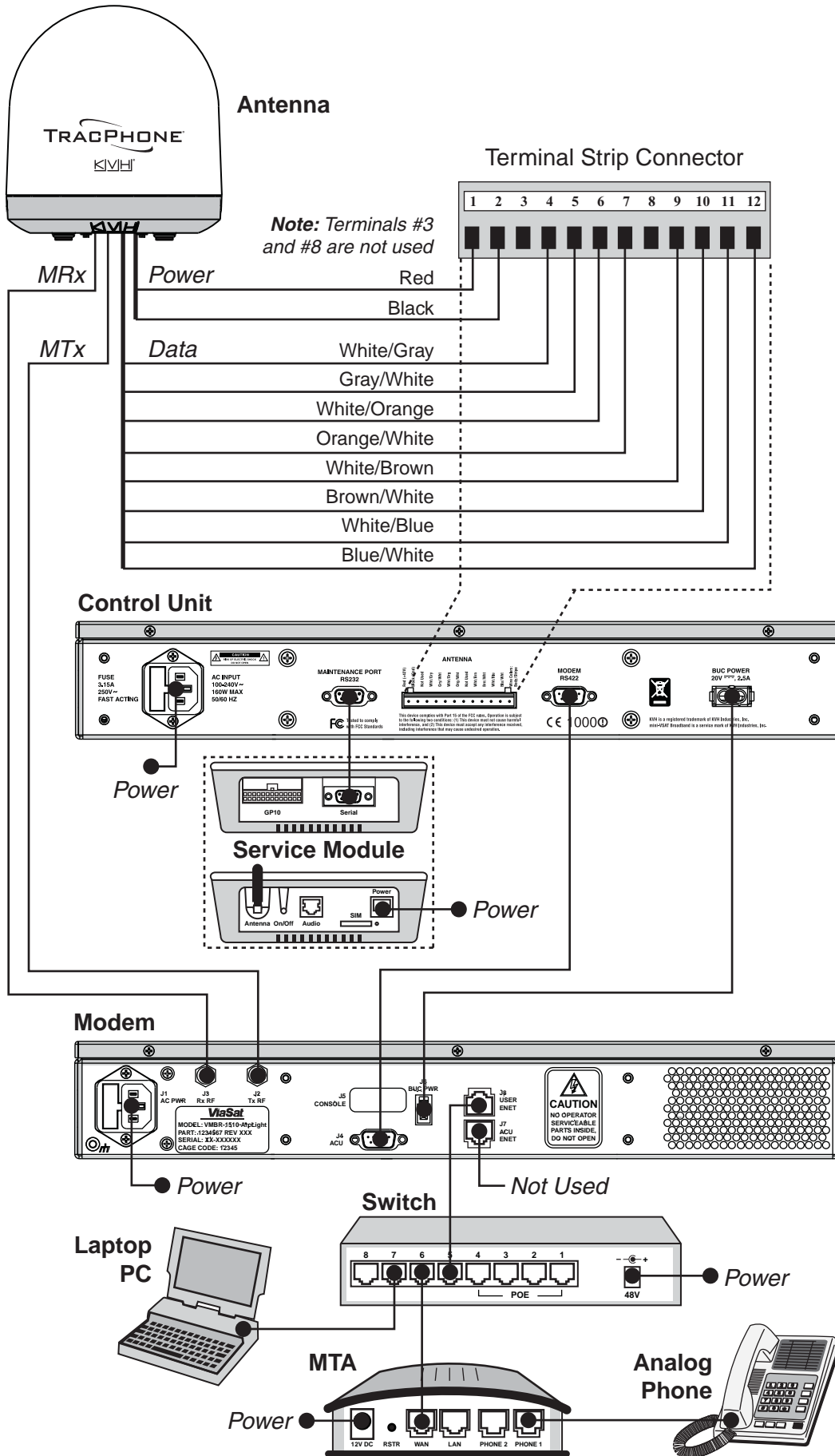Figure 48: Example of Satellite Blockage

Appendices

This section provides a system wiring diagram and supplemental instructions for terminating an LMR-400-75 cable.

Contents

A Wiring Diagram

Antenna

Terminal Strip Connector

1	2	3	4	5	6	7	8	9	10	11	12

Note: Terminals #3 and #8 are not used

MRx *Power* Red

Black

MTx *Data* White/Gray

Gray/White

White/Orange

Orange/White

White/Brown

Brown/White

White/Blue

Blue/White

Control Unit

FUSE
3.15A
250V~
FAST ACTING

AC INPUT
100~240V~
160W MAX
50/60 HZ

MAINTENANCE PORT
RS232

ANTENNA

MODEM
RS422

BUC POWER
20V 2.5A

Power

GP10   Serial

Service Module

Antenna On/Off Audio   SIM   Power

Power

Modem

J1
AC PWR   J3
Rx RF   J2
Tx RF   J5
CONSOLE   BUC PWR   J8
USER
ENET   CAUTION
NO OPERATOR
SERVICEABLE
PARTS INSIDE.
DO NOT OPEN

ViaSat
MODEL: VMBR-1510-AtpLight
PART: 1234567 REV XXX
SERIAL: XX-XXXXXX
CAGE CODE: 12345

J4
ACU   J7
ACU
ENET

Power   *Not Used*

Switch

**Laptop
PC**

8	7	6	5	4	3	2	1

POE

48V   *Power*

MTA   **Analog
Phone**

Power   12V DC RSTR WAN LAN PHONE 2 PHONE 1

These instructions explain how to terminate an LMR-400-75 RF cable with an EZ-400-FMH-75 "F" connector using the tools from the TK-400EZ-75 tool kit. For more detailed instructions, refer to the Times Microwave website (*www.timesmicrowave.com*).

1. Using the CCT-01 cutting tool, cut the cable evenly (see Figure 49).

2. Since cutting the cable can deform the end, gently round the end of the cable using a pair of needle-nose pliers (see Figure 50). Also make sure the center conductor is centered within the cable.

3. Place the heat shrink sleeve and metal ferrule onto the cable (see Figure 51).

4. Insert the end of the cable into the #1 end of the ST-400EZ stripping tool (see Figure 52). Then rotate the tool clockwise around the cable until the tool turns easily. The end of the cable should now be stripped to expose the center conductor.

Figure 49: Cutting the Cable

Figure 50: Reshaping the Cable
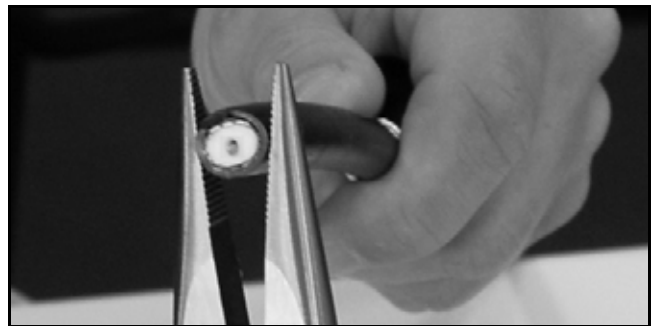
Figure 51: Placing the Heat Shrink Tubing and Ferrule

Figure 52: Stripping the End to Expose the Center Conductor

5. Using a utility knife, carefully remove any residual plastic from the center conductor, if necessary (see Figure 53).

6. Insert the end of the cable into the #2 end of the ST-400EZ stripping tool (see Figure 54). Then rotate the tool clockwise around the cable until the tool turns easily. This removes the cable jacket from the end of the cable, exposing the braid and dielectric (see Figure 55).

7. Using the DBT-02 tool, deburr and chamfer the center conductor (see Figure 56). Avoid nicking the aluminum tape covering the dielectric.

Figure 53: Removing Plastic Residue
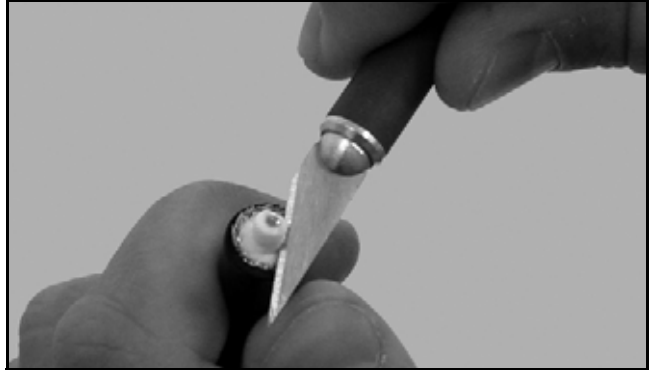
Figure 54: Stripping the Cable Jacket
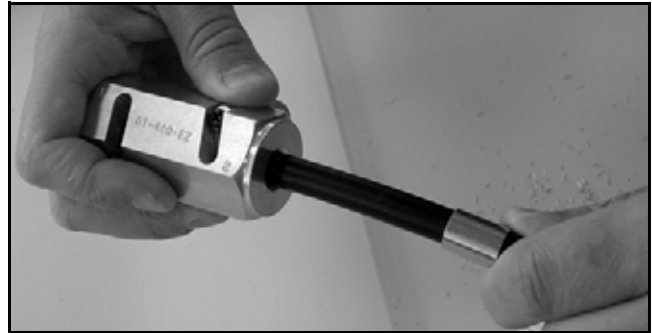
Figure 55: Cable Stripped, Exposing Dielectric

Figure 56: Deburring the Center Conductor

8. Gently flare the braid with your fingers (see Figure 57).

9. Insert the end of the cable into the connector body until the dielectric is firmly seated inside the connector (see Figure 58). Be sure all braid wires remain on the outside of the connector.

10. Trim any excess braid (see Figure 59), if necessary. The braid should assemble flush to within 1/16" (1.6 mm) of the connector shoulder.

11. Slide the ferrule over the braid until it is flush against the connector shoulder (see Figure 60).

Figure 57: Flaring the Braid

Figure 58: Pushing On the Connector
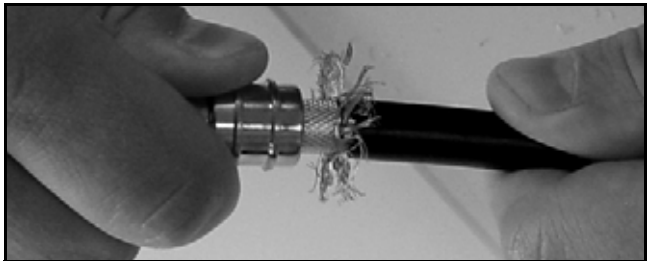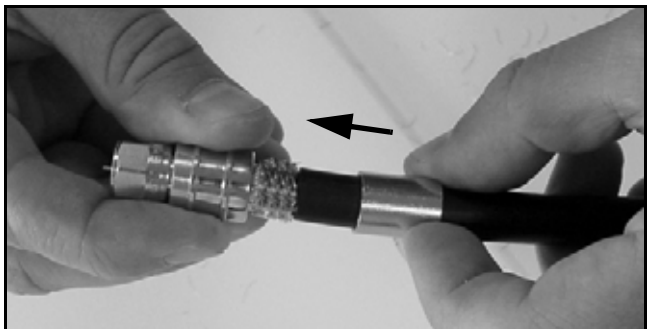
Figure 59: Trimming the Braid
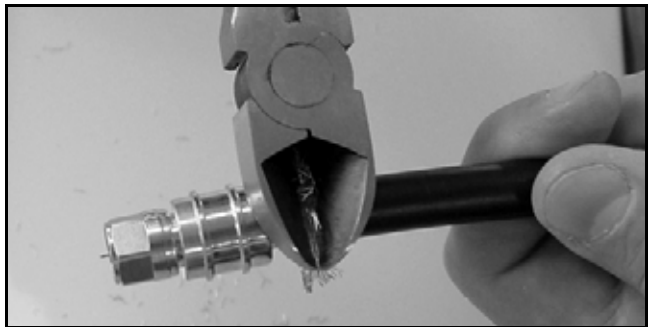
Figure 60: Sliding the Ferrule Over the Braid

12. Using an appropriate crimp tool (either the CT-400/300 or the HX-4 with Y1719 dies), crimp the ferrule in place (see Figure 61). Crimp as close to the connector body as possible.

13. Crimp the ferrule again, but further back from the connector. However, be careful not to crimp the cable jacket.

14. Slide the heat shrink sleeve over the connector body and heat it to compress it into place (see Figure 62). When you are done, the heat shrink should extend from the rear of the connector to the cable jacket. This forms a weather-tight seal.

15. Using a multimeter or similar device, check the continuity of the cable.

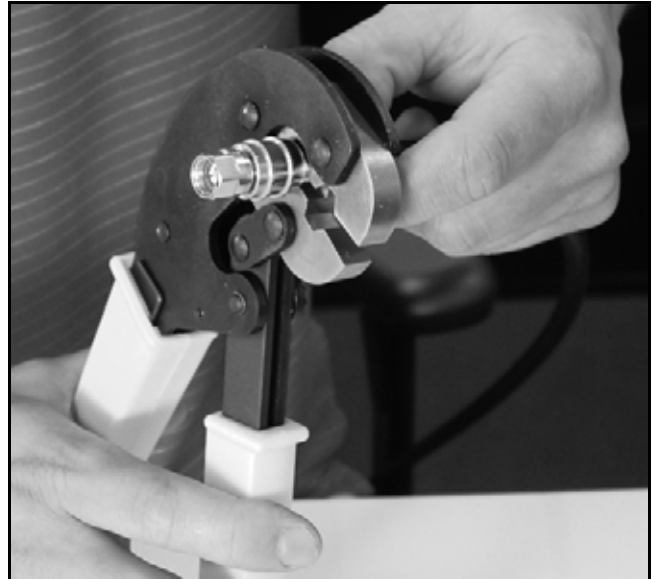Figure 61: Crimping the Ferrule onto the Cable

Figure 62: Applying the Heat Shrink Tubing