TracVision® M7 Main PCB Replacement Instructions

The following instructions explain how to replace the main PCB in a TracVision M7.

Tools Required

- #1 Phillips screwdriver

- #2 Phillips screwdriver

- 3/8" nut driver or wrench

- PC with the latest version of the Flash Update Wizard installed

  TIP: *The Flash Update Wizard is available to KVH-authorized dealers through the KVH Partner Portal at* **www.kvh.com/ partners**.
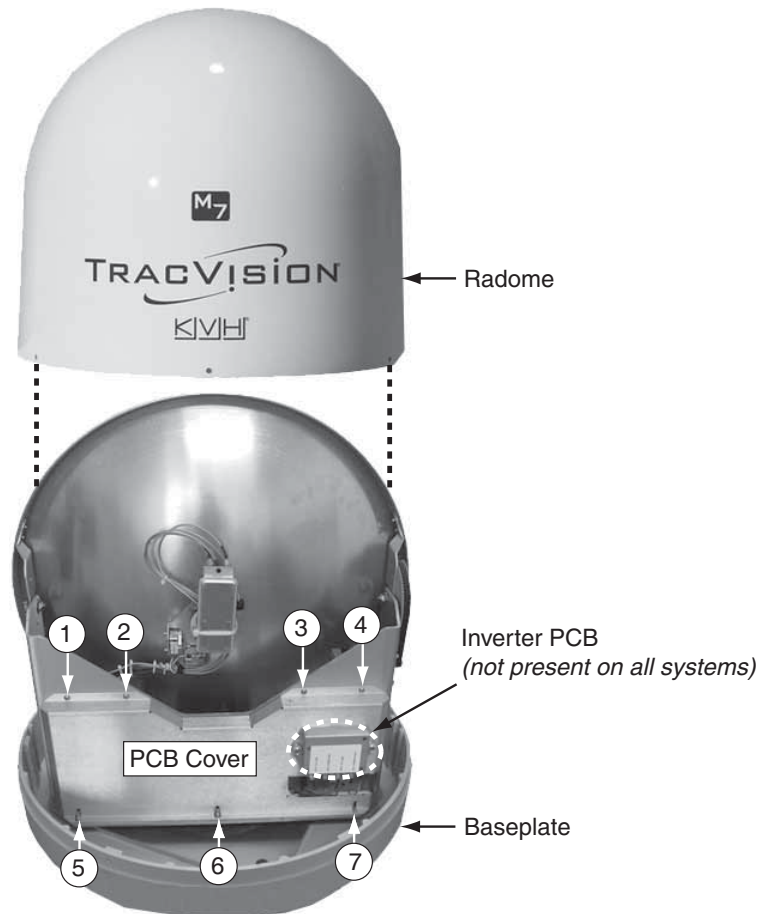
⚠	CAUTION
For your own safety, be sure to disconnect power from all wired components before performing this procedure.	

Step 1 - Replace the Main PCB

a. Using a #2 Phillips screwdriver, remove the six #10-32 screws securing the radome. Then remove the radome and set it aside in a safe place.

Figure 1 Radome Removal/PCB Cover Screws

b. Using a #2 Phillips screwdriver, remove the four screws securing the PCB cover at locations 1-4 (see *Figure 1*). Using a 3/8" nut driver or wrench, remove the three nuts and washers at locations 5-7.

c. Carefully position the cover to allow access to the PCB.

NOTE: Be sure to handle the cover carefully to avoid damaging or dislodging PCB components.

NOTE: The PCB module is static-sensitive. Ensure that you take the necessary grounding precautions before handling.

d. Examine the gyro connections to the PCB. If the gyro wires are connected as shown in **Figure 2** (an old version PCB is currently installed), discard the jumper cable connecting the small gyro PCB to the main PCB. Later, you will connect the elevation and azimuth gyro wires directly to the new PCB. The small gyro PCB is no longer necessary.

Figure 2 Gyro Wires with Old PCB Version
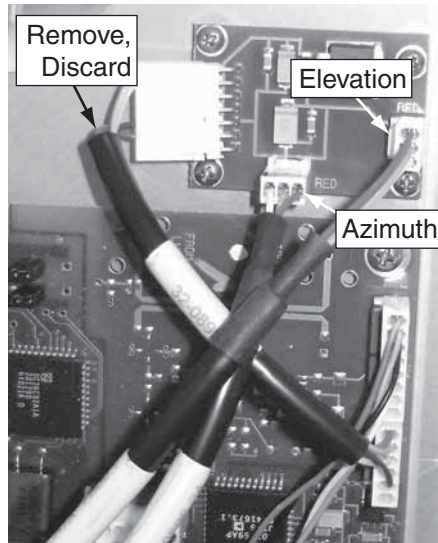
e. Label the eight Molex connectors as shown in **Figure 3**. This will prevent incorrect connections to the PCB later. (If you are replacing an old version PCB, as identified in the previous step, label the elevation and azimuth gyro connectors as shown in **Figure 2** then disconnect them from the small gyro PCB.)

Figure 3 Molex Wire Labels/PCB Screws
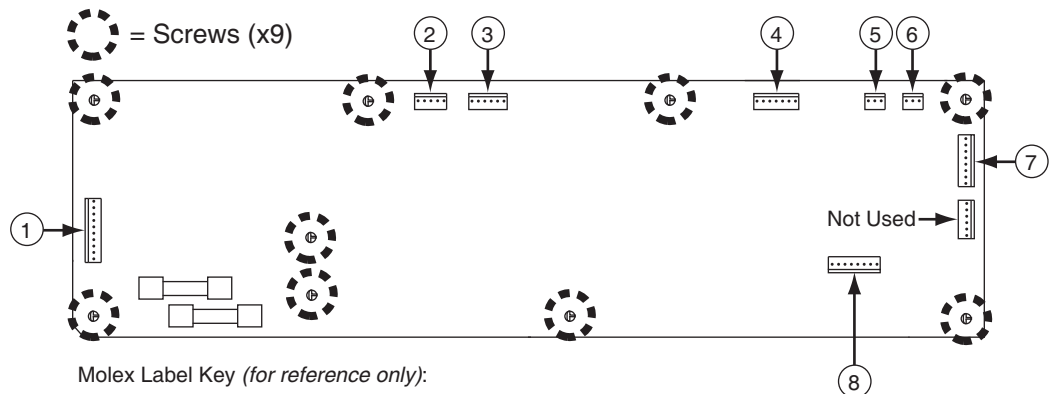
Molex Label Key *(for reference only)*:

① = Power/Data - 10 pins   ⑥ = Azimuth Gyro - 3 pins
② = Azimuth Motor - 5 pins   ⑦ = To RF PCB - 8 pins
③ = Elevation Motor - 6 pins   ⑧ = Limit Switches - 8 pins
④ = External Sensor - 7 pins
⑤ = Elevation Gyro - 3 pins

f. Disconnect the Molex connectors from the main PCB (see *Figure 3 on page 3*).

g. Using a #1 Phillips screwdriver, remove the nine screws securing the main PCB to the antenna frame (see *Figure 3 on page 3*).

h. Remove the faulty main PCB.

i. Reverse this process to install the replacement main PCB. (If you replaced an old version PCB, as identified in *Step 1d*, be sure to connect the azimuth and elevation wires to the new PCB as shown in *Figure 4*.) Then reinstall the radome and reconnect power to the TracVision system.

Figure 4 Gyro Connections from Old Version PCB to New Version PCB
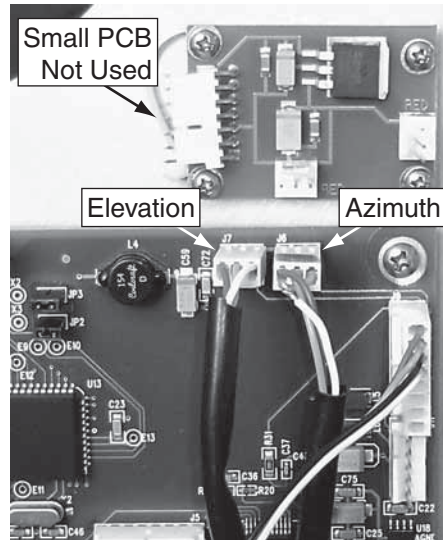
NOTE: Be sure to remove the labels you applied to the wires in Step 1e.

Step 2 - Configure the Antenna

The antenna now needs to be configured. The following instructions explain how to configure the antenna. This procedure requires a PC with the latest version of the KVH Flash Update Wizard installed.

a. Follow the instructions provided in the *TracVision M7 User's Guide* to connect a PC to the TracVision system.

b. Double-click the KVH Flash Update Wizard shortcut on your PC's desktop to start the Flash Update Wizard.

TIP: You do not need to flash the antenna; you will simply type commands in the Flash Update Wizard's "TracVision Antenna Comms" window. Be sure to click the "TracVision Antenna Comms" window to select it before typing.

c. Type **HALT** then press Enter.

d. Type **DEBUGON** then press Enter.

e. Type **=TVM7** then press Enter.

f. The antenna will restart. Wait one minute for system startup.

g. Type **HALT** then press Enter.

h. Type **DEBUGON** then press Enter.

i. Type **=LSTEST** then press Enter

j. Type **=CALGYRO** then press Enter. If a "Scale factor out of range - bad gyro" message appears, contact KVH Technical Support.

k. The antenna will restart. Wait one minute for system startup.

l. Type **HALT** then press Enter.

**m.** Type the following **GPS** command then press Enter.

GPS,*XX,D,YYY,Z*

Field	Description
XX	Your latitude (0-90)
D	S (South) or N (North)
YYY	Your longitude (0-180)
Z	E (East) or W (West)

The antenna will use this data to speed up satellite acquisition. You can find your latitude and longitude from one of the following sources:

• GPS (Global Positioning System)

• *Figure 5 on page 7* and *Figure 6 on page 8* contain position grids and tables, providing you with approximate latitude and longitude values for North America and Europe.

n. Follow the instructions provided in the *TracVision M7 User's Guide* to set up the TracVision system to track your selected satellites.

o. Type **ZAP** then press Enter. The antenna will restart. Wait one minute for system startup.

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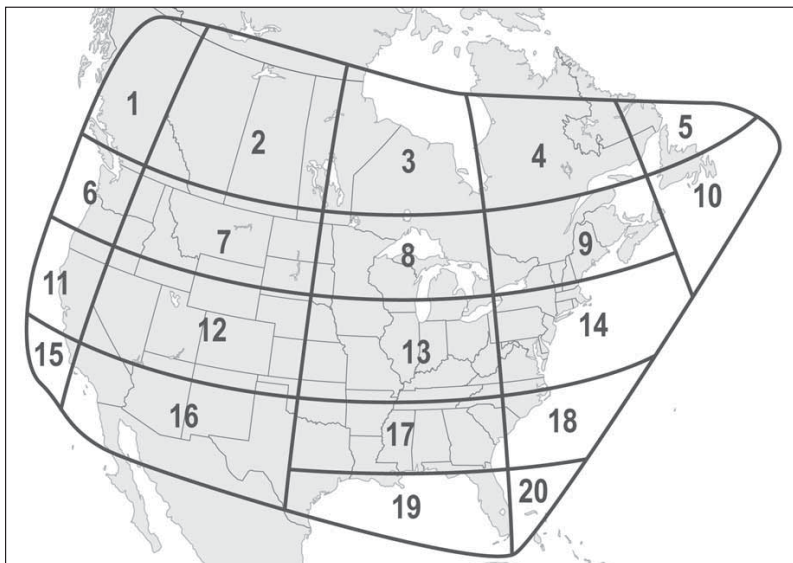
Grid #	Latitude	Longitude
1	55° N	125° W
2	55° N	110° W
3	55° N	90° W
4	55° N	70° W
5	55° N	55° W
6	45° N	125° W
7	45° N	110° W
8	45° N	90° W
9	45° N	70° W
10	45° N	50° W
11	40° N	125° W
12	40° N	110° W
13	40° N	90° W
14	40° N	70° W
15	32° N	125° W
16	32° N	110° W
17	32° N	90° W
18	32° N	75° W
19	27°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

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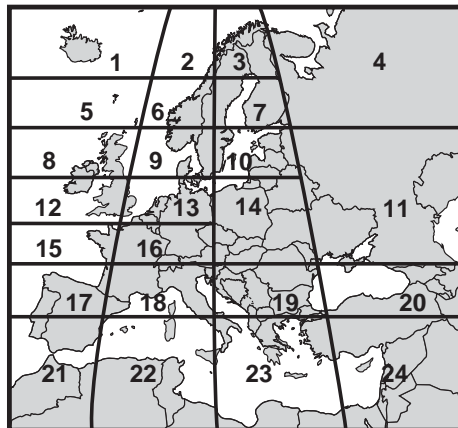
Grid #	Latitude	Longitude
1	67° N	7° W
2	67° N	7° E
3	67° N	22° E
4	65° N	45° E
5	63° N	7° W
6	63° N	7° E
7	63° N	22° E
8	57° N	7° W
9	57° N	7° E
10	57° N	22° E
11	55° N	40° E
12	53° N	7° W
13	53° N	7° E
14	50° N	22° E
15	47° N	7° W
16	47° N	7° E
17	43° N	7° W
18	43° N	7° E
19	43° N	22° E
20	43° N	37°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

Step 3 - Check the RF PCB Software Version

You might need to update the software in the TracVision system's RF PCB, depending on its software version. The following instructions explain how to check the currently installed RF PCB software version.

a. Type **HALT** then press Enter.

b. Type **@VER** then press Enter. The antenna's RF PCB software version will appear in the "TracVision Antenna Comms" window. Be sure to record the software version for later use.

c. Type **ZAP** then press Enter.

d. Click the Flash Update Wizard's "View Release Notes" button. Then click the "Flash File Log" link within the Release Notes. Ensure that your RF PCB software version matches the version listed for your TracVision model.

e. **If your software version matches the software version listed in the Release Notes,** the procedure is complete! Be sure to return the old main PCB to KVH.

NOTE: *Before returning the main PCB, be sure to obtain an RMA number from KVH Technical Support and write the number clearly on the outside of the box. Shipments received without an RMA number will be returned to you at your expense.*

If your software version *does not* match the software version listed in the Release Notes, proceed to .

Step 4 - Flash the RF PCB (if required)

The RF PCB now needs to be updated, or "flashed" to ensure compatibility with the new main PCB. Flashing also allows the antenna to use the most current satellite configuration data available. Flashing instructions vary according to specific TracVision M7 configurations. Refer to the section appropriate for your specific TracVision M7 configuration.

NOTE: Only flash the RF PCB if your software version does not match the software version listed in the Release Notes (see "Step 3 - Check the RF PCB Software Version" on page 9).

Switchplate Configuration

To flash the RF PCB, you will need a special DB9 (female) to RJ22 (male) flash cable. This cable is available from KVH (*KVH Part # 32-0728*).

a. Connect the DB9 end of the flash cable to your PC.

b. Connect the RJ22 end of the flash cable to the TracVision antenna's RF port, located on the back of the switchplate.

Figure 7 RF Port on Back of TracVision Switchplate
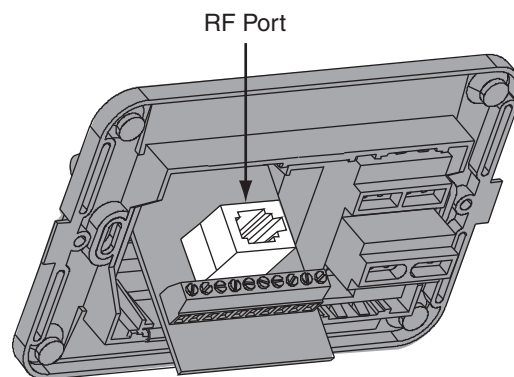
RF Port

c. Follow the Flash Update Wizard's onscreen instructions to flash the RF board.

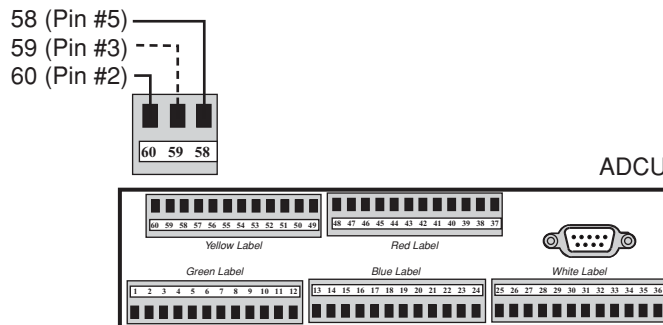The procedure is complete! Be sure to return the old main PCB to KVH.

NOTE: Before returning the main PCB, be sure to obtain an RMA number from KVH Technical Support and write the number clearly on the outside of the box. Shipments received without an RMA number will be returned to you at your expense.

GyroTrac Configuration

To flash the RF PCB, you will need a special RF flash cable (*KVH Part # 32-0618-15).* If you do not have a special RF flash cable, you can make one from a DB9 male-to-female serial data cable. You will use the three wires connected to the male end's following DB9 pins: 2, 3, and 5.

a. Connect the DB9 end of the flash cable to your PC.

b. Connect the RF flash cable wires to the ADCU terminal, as shown in **Figure 8**.

Figure 8 RF Port on Back of ADCU

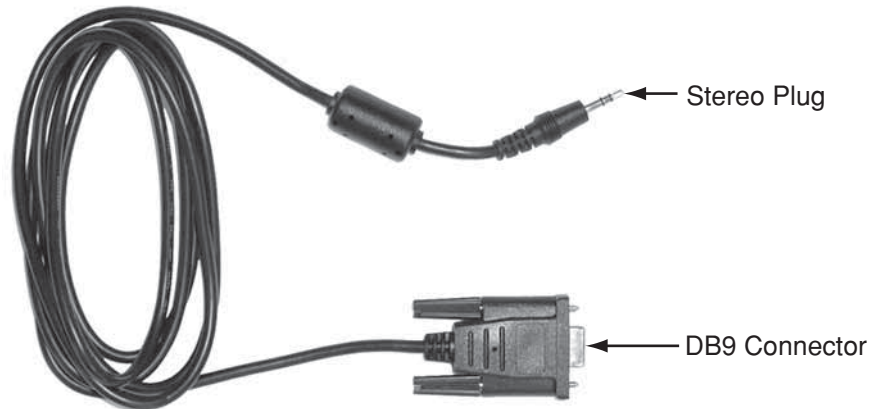c. Follow the Flash Update Wizard's onscreen instructions to flash the RF board.

The procedure is complete! Be sure to return the old main PCB to KVH.

NOTE: Before returning the main PCB, be sure to obtain an RMA number from KVH Technical Support and write the number clearly on the outside of the box. Shipments received without an RMA number will be returned to you at your expense.

MCP (MultiSat Control Panel) Configuration

To flash the RF PCB, you need the special flash adapter cable supplied with the MCP. This cable is available from KVH (*KVH Part # 32-0807).*
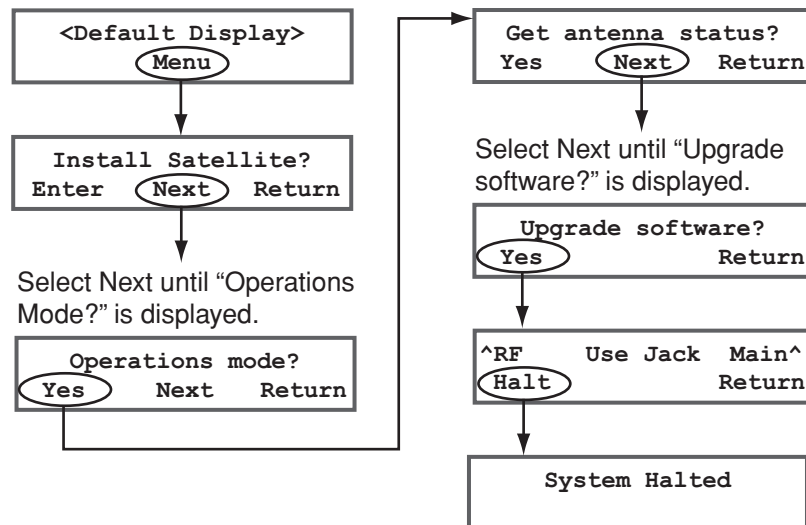
Figure 9 Flash Adapter Cable

Prepare the MCP

Before you can flash the RF PCB, you must prepare the MCP for flashing.

Using the MCP buttons, perform the procedure shown in *Figure 10*.
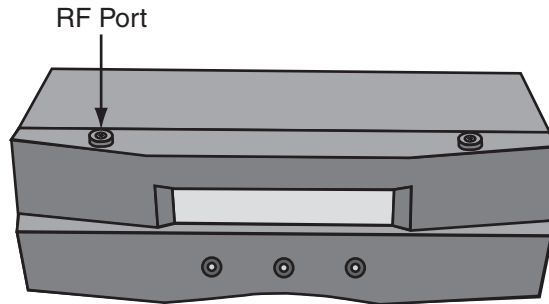
Figure 10 Flashing Preparation

Flash the RF PCB

a. Connect the DB9 end of the flash adapter cable to your PC.

b. Connect the stereo plug end of the flash adapter cable to the RF port on top of the MCP.

Figure 11 RF Port on Top of MCP

RF Port

c. Follow the Flash Update Wizard's onscreen instructions to flash the RF board.

The procedure is complete! Be sure to return the faulty main PCB to KVH.

NOTE: Before returning the main PCB, be sure to obtain an RMA number from KVH Technical Support and write the number clearly on the outside of the box. Shipments received without an RMA number will be returned to you at your expense.