TracVision®
BY KVH INDUSTRIES

TracVision R6DX Installation Guide

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KVH's Premier Satellite TV System for RVs

These instructions explain how to install the TracVision R6DX on an RV or motor coach. 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 technician install the TracVision R6DX system. To find a technician near you, please visit ***www.kvh.com/wheretogetservice***. If you purchased the product and decide to install it yourself, please see the enclosed warranty statement for warranty implications.

Related Documentation

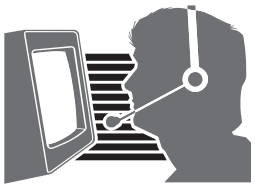
The following additional documents are provided with the TracVision R6DX system:

Document	Description
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:

Phone: +1 401 847-3327
E-mail: techs@kvh.com



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 *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.

- Phillips and flat-head screwdrivers
- 7/16" open-end wrench
- Silicone sealant, RTV, or equivalent
- Construction adhesive suitable for the roof
- Fasteners suitable for mounting the antenna to the roof
- 5/8" - diameter hole saw
- Augat IT1000 connector installation tool *(KVH part #19-0242)*
- Eight 1/4" fasteners (see "Mount the Interface Box" on page 10)
- Satellite TV receiver(s) for your desired service *(see Figure 2 for a list of validated receivers; for information on connecting different receiver models, contact KVH Technical Support at 401-847-3327)*

Figure 1: TracVision R6DX System Components

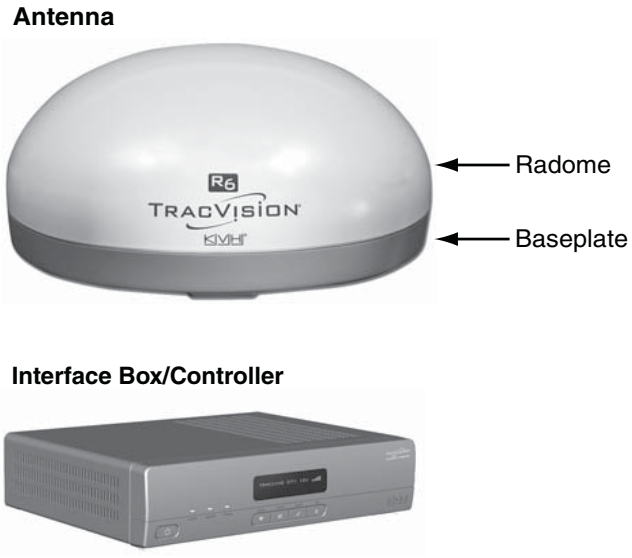


Figure 2: KVH-Validated Receivers

Standard-Definition Models		
DIRECTV	DISH Network	ExpressVu
D12 D11 D10	311	3100
High-Definition (HD) Models		
DIRECTV	DISH Network	ExpressVu
H21* H20*	211k 211	6100

* For compatibility with a Tri-Sat AutoSwitch, use model-manufacturer ID H21-200 or H20-600

2 Plan the Installation

Before you begin, consider the following installation guidelines:

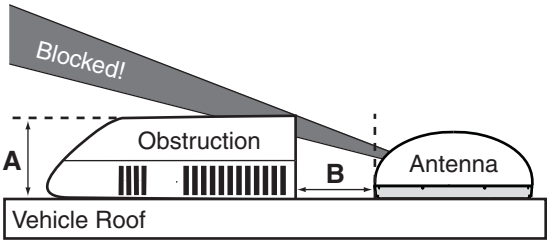
- Minimize blockage. The antenna requires a clear view of the southern sky to receive satellite TV. Using the guidelines in Figure 3 as a guide, mount the antenna a suitable distance away from obstructions on the roof, such as air conditioners.
- Ensure the mounting surface is flat and strong enough to support the antenna's weight (28 lbs).

IMPORTANT!

When placed on the mounting surface, all three mounting plates must lay flat against the roof (within 7/16") to avoid warping the base and damaging the antenna.

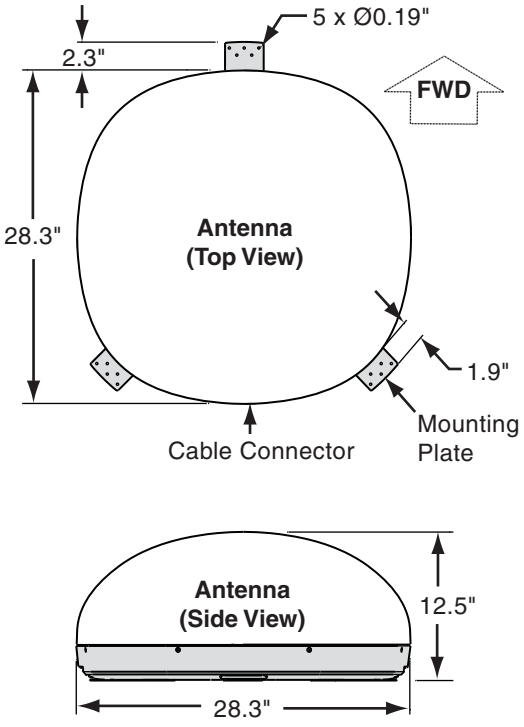
- Select an antenna mounting location on the centerline of the vehicle with the antenna's cable connector facing the rear of the vehicle (see Figure 4).
- Be sure to mount the antenna near enough to the interface box to allow you to connect the 28-ft. coax cable, while still maintaining sufficient slack in the cable. If you need to use a longer coax cable, use an RG6 (75 ohms) cable that does not exceed 80 feet in length.
- Once you've chosen a location for the antenna, identify a safe location nearby for the 5/8" cable access hole in the roof. Make sure you will not drill into any existing wires or aesthetic structures inside the vehicle.
- When choosing a location for the interface box and receiver(s), find a dry, well-ventilated area inside the vehicle away from any heat sources. Also be sure the front panel of the interface box will be easily accessible to the user.

Figure 3: Blockage from Obstruction



Obstruction Height (A)	Min. Distance from Antenna (B)
8"	8"
10"	13"
12"	19"
14"	24"
16"	30"

Figure 4: Antenna Dimensions



3 Remove the Restraints

At the bottom of the antenna, four shipping restraint screws prevent the internal antenna assembly from moving during shipment. Follow these steps to remove the restraints.

a. Carefully carry the antenna to the roof of the vehicle.

b. Using a Phillips screwdriver, remove the four 1/4"-20 screws on the bottom of the antenna at the locations shown in Figure 6. Save these shipping restraints for future use.

IMPORTANT!

Once you have removed the shipping restraints, keep the antenna level as much as possible and handle the antenna unit carefully. Improper handling might damage the unit.

Figure 5: Carrying the Antenna to the Roof

Figure 6: Shipping Restraint Locations (Bottom View)

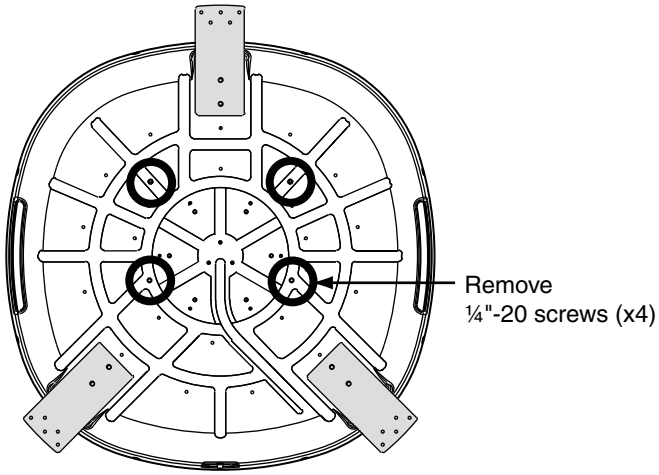
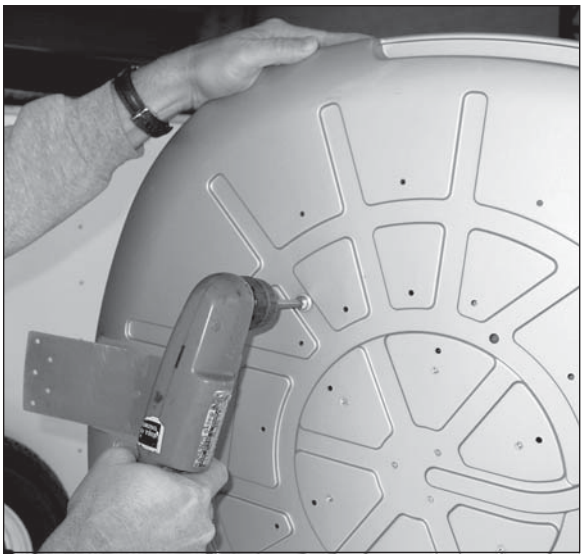


Figure 7: Removing the Shipping Restraints



4 Mount the Antenna

Follow these steps to mount the antenna to the roof.

a. Apply appropriate construction adhesive to the bottom of the antenna's three mounting plates across all of the holes.

b. At the mounting location you chose in Step 2 on page 4, place the antenna on the centerline of the roof so that the front mounting plate faces the front of the vehicle and the cable connector faces the rear of the vehicle (see Figure 8).

c. Attach the three antenna mounting plates to the roof using 15 fasteners appropriate for the roof's construction (see Figure 9).

IMPORTANT!

Due to the variation in RV roof construction, consult with the RV manufacturer to determine the safest fastening method.

d. Seal all fasteners with silicone sealant or equivalent.

Figure 8: Antenna Orientation

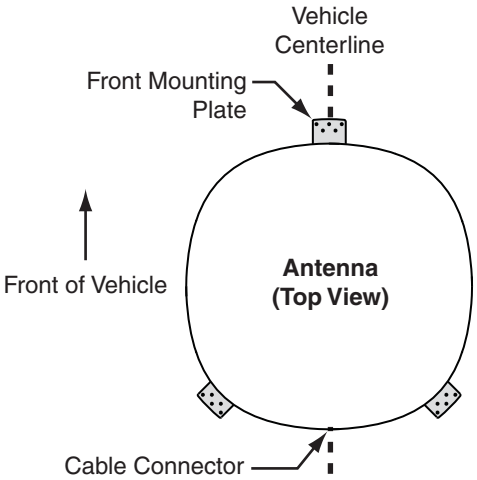


Figure 9: Attaching the Mounting Plates

5 Wire the Antenna

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

a. At the location you chose in Step 2 on page 4, use a 5/8" hole saw to cut out a cable access hole in the vehicle's roof. Smooth the edges of the hole to protect the cable.

b. Connect the RG6 antenna cable (the end with the rubber sealing boot) to the antenna. Hand-tighten, then tighten with a 7/16" wrench for 1/4 turn (see Figure 10).

c. Slide the rubber sealing boot up the cable until it covers the connector. This boot will help protect the connector from the elements.

d. Route the other end of the antenna cable down through the roof access hole and into the vehicle. Later, you will connect this end of the cable to the interface box.

IMPORTANT!

Do not kink the cable. Maintain a bend radius of at least 3 inches.

e. Leave an adequate service loop - approximately 8" of slack - in the antenna cable for easy serviceability.

f. Seal the cable access hole with a liberal amount of silicone sealant (or equivalent) to protect against leakage.

g. Install the clamshell ventilator over the cable access hole. The clamshell's opening should face the rear of the vehicle. Secure in place with appropriate fasteners (see Figure 11).

Figure 10: Connecting the Antenna Cable

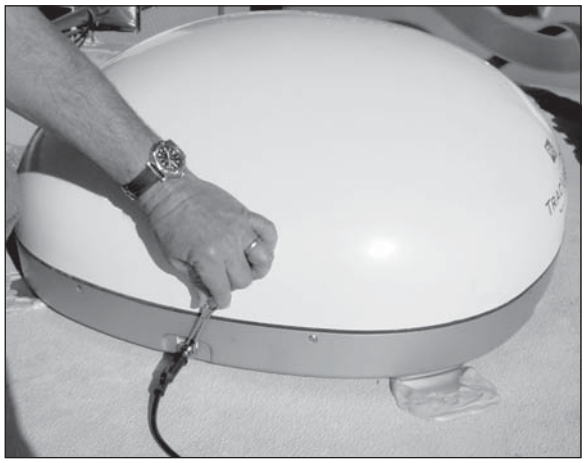


Figure 11: Mounting the Clamshell Ventilator

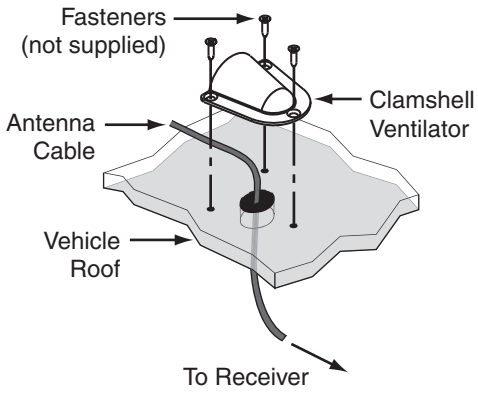


Figure 12: Antenna Installed

6 Wire the Interface Box

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

IMPORTANT!

Terminate all RF coaxial cables, including the antenna cable, with Snap-N-Seal® F-connectors using an Augat IT1000 tool. Low-quality connectors will degrade system performance and KVH's warranty does not cover repairs resulting from the use of such connectors.

a. Connect the antenna cable (A) to the "To KVH Antenna" jack on the interface box (see Figure 13).

TIP: *If you have a Tri-Sat AutoSwitch for DIRECTV Ku-band Tri-Sat service, follow the receiver wiring instructions provided in the Tri-Sat AutoSwitch kit.*

b. Connect an RF coaxial cable (B) from the "Unstacked Output" jack on the interface box to the "Satellite In" jack on the receiver. This receiver will control satellite selection.

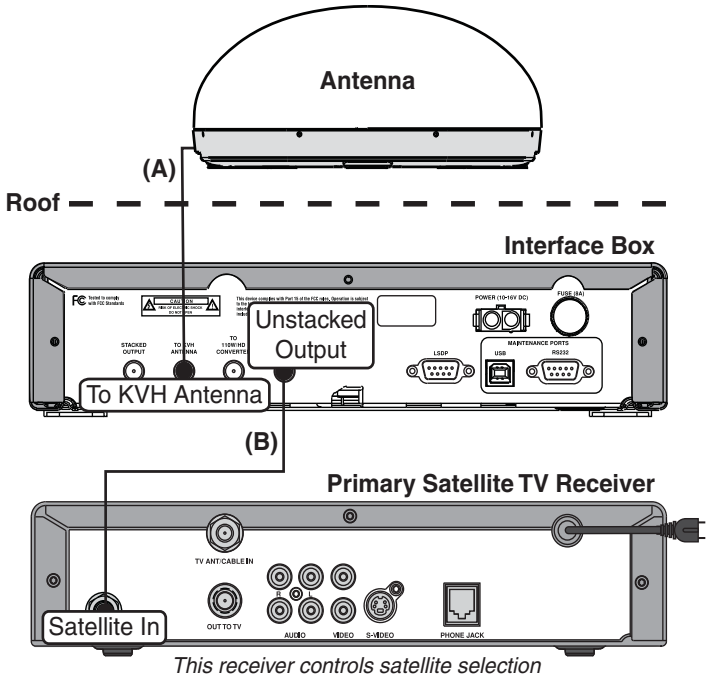
c. Connect the receiver to the customer's television. Follow the instructions in the receiver's manual.

d. If you need to connect an additional receiver, connect the receiver to the "Stacked Output" jack on the interface box through an in-line destacker (see Figure 14). Two destacker models are available from KVH:

# of Additional Receivers	Destacker Model
1	Single-output (KVH part #19-0347)
2	Dual-output (KVH part #19-0410)

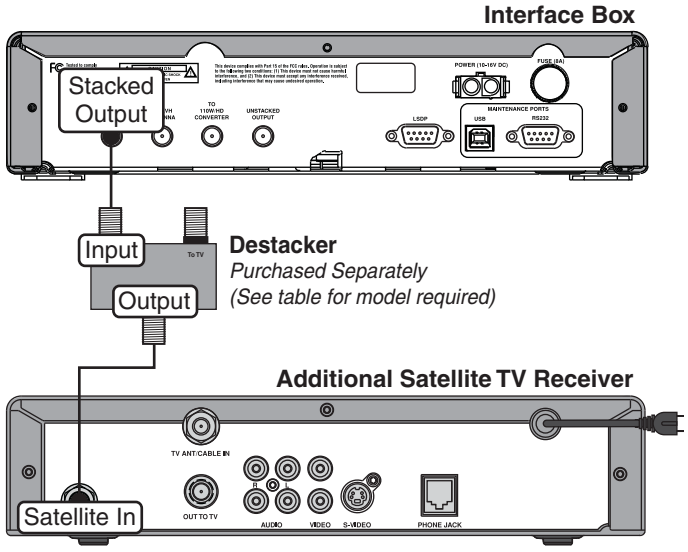
The destacker converts the stacked signal from the interface box into an unstacked signal, which receivers are configured to decode.

Figure 13: Wiring the Interface Box



This receiver controls satellite selection

Figure 14: Connecting an Additional Receiver



7 Connect Power

The interface box requires 10-16 VDC power input supporting 60 watts *(5 amps @ 12VDC).* Follow these steps to connect power to the interface box.

> **CAUTION**
>
> For your own safety, shut down vehicle power before you connect the wires.

a. Before you connect the power wires, turn off vehicle power and test the circuit to ensure no power is present.

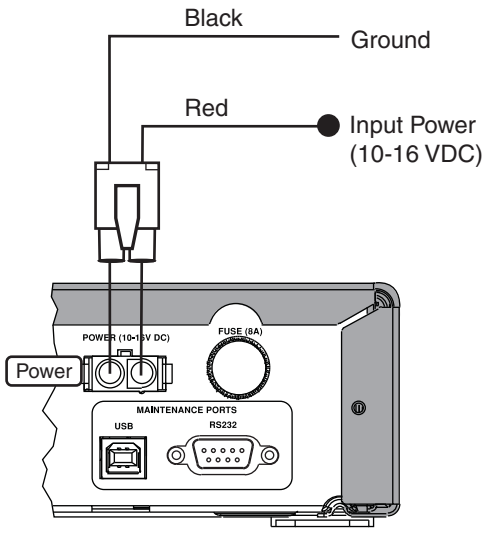
b. Connect the individual power wires to a dedicated 12 VDC circuit. Connect the negative (black) wire to ground (power return), and connect the positive (red) wire to clean +12 VDC vehicle power.

NOTE: *If vehicle power fluctuates or is noisy, KVH recommends that you use an AC/DC power supply (KVH part #72-0206-01) to provide stable 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 15).

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

Figure 15: Interface Box Power Wiring



8 Mount the Interface Box

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

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 16).

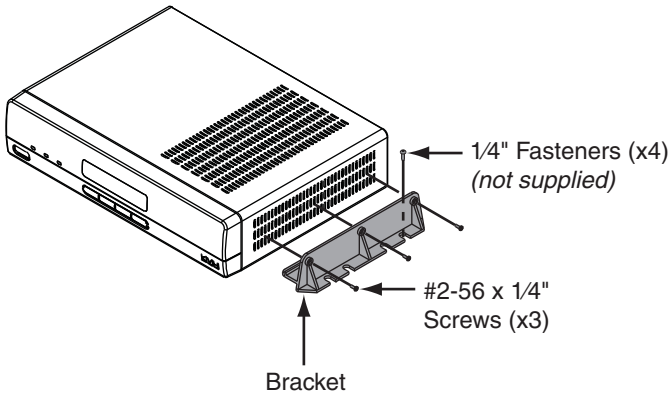
IMPORTANT!

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 16: Interface Box Mounting



9 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 receiver.

c. Press the power switch on the front of the interface box to apply power to the TracVision system (see Figure 17).

d. Wait while the antenna searches the sky for the satellite. Within a few minutes, all three status lights on the front of the interface box should be lit green (see Figure 17).

NOTE: *If all three status lights are not lit green, refer to the User's Guide for troubleshooting information.*

e. Verify that the "System Needs Setup" screen is displayed on the interface box (see Figure 18).

f. Using the buttons on the interface box front panel (see Figure 19), follow the steps in the next section to set up the TracVision system for the customer's service provider:

Option 1 - DIRECTV *(see page 12)*

Option 2 - DISH Network *(see page 13)*

Option 3 - ExpressVu *(see page 14)*

NOTE: *If you do not see an operating mode on the following pages that tracks your desired set of satellites, you can select up to five satellites in Manual mode instead. Refer to the User's Guide for details.*

Figure 17: Interface Box Power Switch and Status Lights

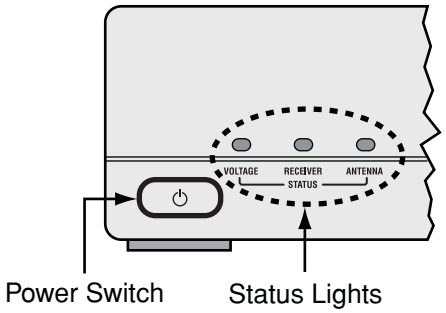


Figure 18: "System Needs Setup" Screen

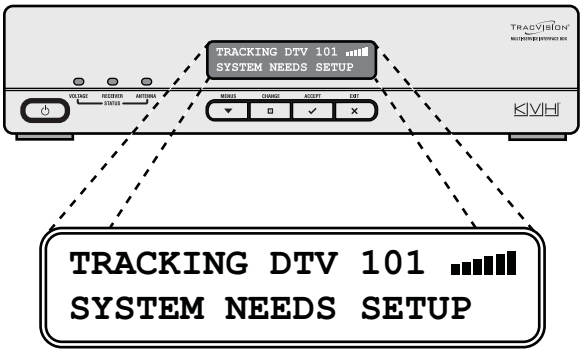
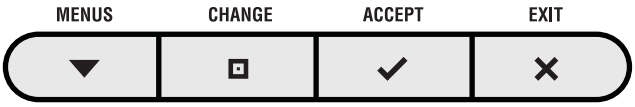


Figure 19: Interface Box Buttons



10 Set Up the System

Option 1 - DIRECTV

Follow these steps and refer to the flowchart in Figure 20 to set up the system for DIRECTV.

a. Press any button on the interface box front panel.

b. At "Service= DIRECTV?," press ACCEPT.

c. At "Mode= Tri-Sat Auto," press CHANGE until the display shows the desired mode. Then press ACCEPT.

You may select any one of the following DIRECTV modes:

Mode	Satellites Tracked
Tri-Sat Auto	101, 110, and 119
Tri-Sat Pairs *(Not used)*	101, 110, and 119
Dual-Sat	101 and 119

Tri-Sat Auto

Select this mode if you have a Tri-Sat AutoSwitch installed for DIRECTV Tri-Sat service. Refer to the instructions that came with the kit for additional setup details.

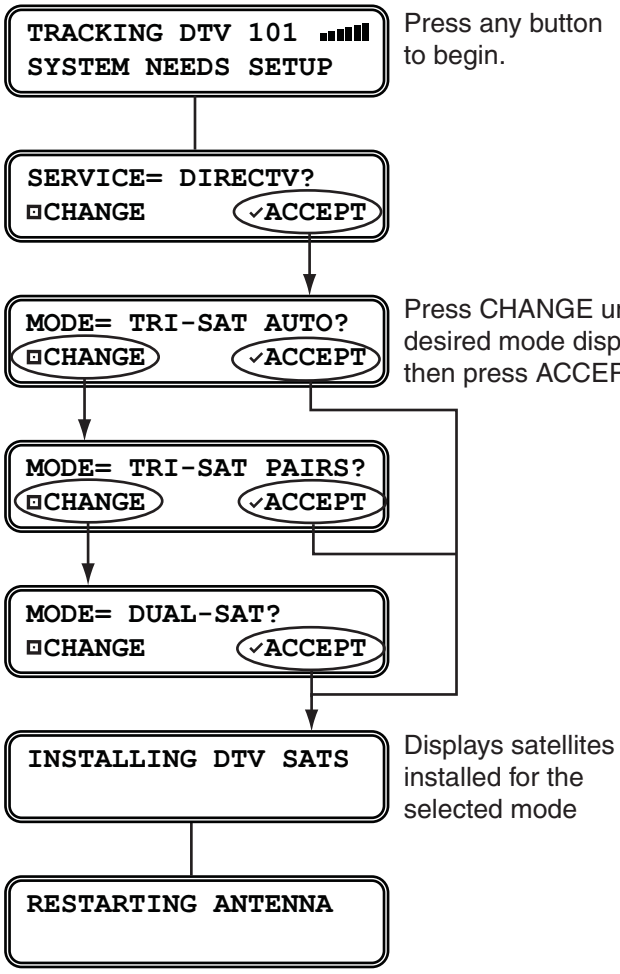
Tri-Sat Pairs

Do not use for a new installation. This mode is only provided for compatibility with older DIRECTV HDTV configurations that included an HDTV converter instead of a Tri-Sat AutoSwitch.

Dual-Sat

Select this mode for DIRECTV service if you do not have a Tri-Sat AutoSwitch installed.

Figure 20: DIRECTV Setup



10 Set Up the System

Option 2 - DISH Network

Follow these steps and refer to the flowchart in Figure 21 to set up the system for DISH Network.

a. Press any button on the interface box front panel.

b. At "Service= DIRECTV?," press CHANGE until the display shows "Service= DISH." Then press ACCEPT.

c. At "Mode= DISH 1000/129," press CHANGE until the display shows the desired mode. Then press ACCEPT.

You may select any one of the following DISH Network modes:

Mode	Satellites Tracked
DISH 1000/129	119, 110, and 129
DISH 1000/61	119, 110, and 61
DISH 500	119 and 110

DISH 1000/129 or DISH 1000/61

Select one of these modes for DISH Network's three-satellite service (DISH 1000). Use the map in Figure 22 to help determine the appropriate DISH 1000 mode for your geographic area.

DISH 500

Select this mode if you wish to receive programming from the 119 and 110 satellites for DISH 500 service.

d. Follow the instructions in Step 11 on page 15 to set up your receiver(s).

Figure 21: DISH Network Setup

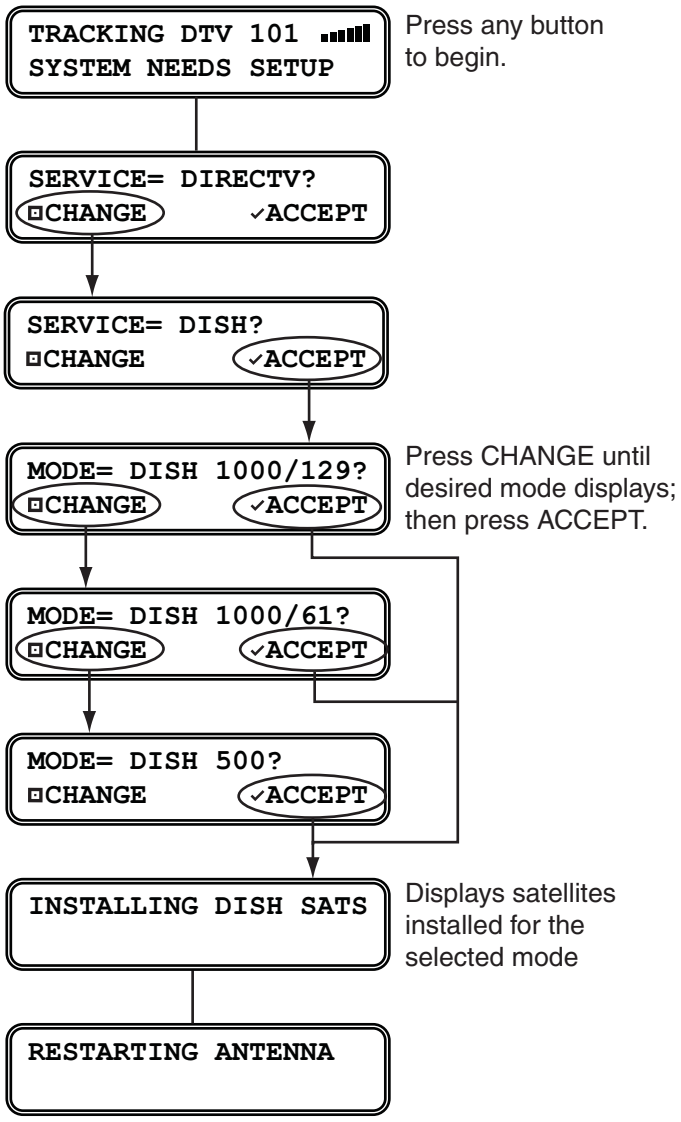


Figure 22: Recommended Areas for DISH 1000 Satellites

10 Set Up the System

Option 3 - ExpressVu

Follow these steps and refer to the flowchart in Figure 23 to set up the system for ExpressVu.

a. Press any button on the interface box front panel.

b. At "Service= DIRECTV?," press CHANGE until the display shows "Service= ExpressVu." Then press ACCEPT.

c. At "Mode= Dual-Sat," press CHANGE until the display shows the desired mode. Then press ACCEPT.

You may select any one of the following ExpressVu modes:

Mode	Satellites Tracked
Dual-Sat	91 and 82
Single-Sat	91

Dual-Sat

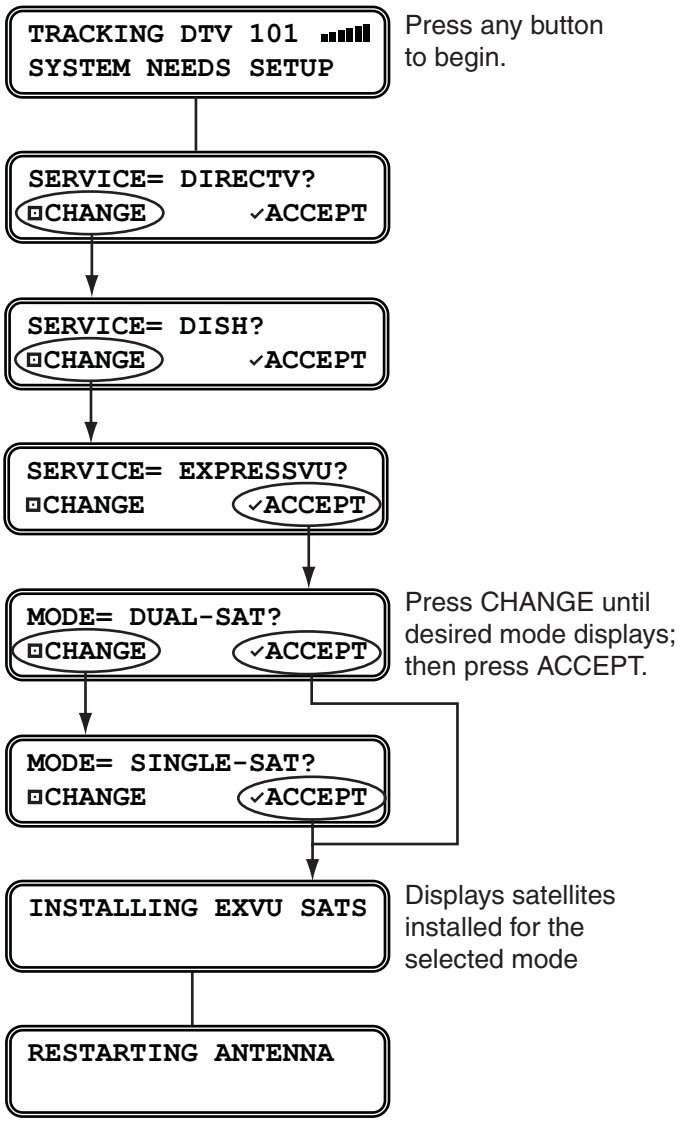
Select this mode if you wish to receive ExpressVu programming from the 91 and 82 satellites.

Single-Sat

Select this mode if you wish to receive ExpressVu programming from just the 91 satellite.

d. Follow the instructions in Step 11 on page 15 to set up your receiver(s).

Figure 23: ExpressVu Setup



11 Run Check Switch Tests

DISH or ExpressVu Only

If you set up the system for DISH Network or ExpressVu, follow these steps to run the receiver's Check Switch test as required.

Primary Receiver - 2 Check Switch Tests

Follow these steps to run two Check Switch tests on the primary receiver, which is connected to the "Unstacked Output" jack on the interface box. This receiver will control satellite selection.

NOTE: *The first Check Switch test finds the satellites; the second Check Switch test configures the receiver for those satellites.*

a. Park the vehicle in a blockage-free area. Ensure the antenna has an unobstructed view of the sky.

b. Apply power to the TV and receiver. (If the antenna is turned off, turn it back on and wait a few minutes for startup.)

c. Using the receiver remote, go to the "Point Dish/Signal Strength" screen (press MENU, 6, 1, 1 on most models).

d. Choose **Check Switch**, then press SELECT.

e. Choose **Test**, then press SELECT.

f. Wait at least 15 minutes before proceeding to allow the antenna to find all of the satellites. Disregard any messages on the TV; they do not correctly indicate when the antenna is ready for the next Check Switch test.

g. After waiting 15 minutes, repeat Steps d-f to run a second Check Switch test.

h. Refer to the tables in Figure 24 and verify the values displayed on your TV match those required for your selected satellite TV service.

If your values match, exit the menu and allow the receiver to download the program guide.

If your values do not match, follow the steps on the next page to reset the system before retrying this procedure.

Figure 24: Expected Check Switch Results

DISH 1000/129 Results

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

DISH 1000/61 Results

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

DISH 500 Results

Input	**1**	**1**	**2**	**2**
Satellite	119	119	110	110
Polarity	Odd	Even	Odd	Even
Status	Reception Verified			
Switch	SW42			

ExpressVu Results*

Input	**1**	**1**	**2**	**2**
Satellite	91	91	82	82
Polarity	Odd	Even	Odd	Even
Status	Reception Verified			
Switch	SW21			

* If you selected ExpressVu Single-Sat mode, the TV will show an error message instead. This is normal for Single-Sat mode.

11 Continued Run Check Switch Tests

DISH or ExpressVu Only

Resetting the System Before Retrying the Primary Receiver Check Switch Procedure

If the receiver Check Switch results displayed on the TV do not match the expected values shown in Figure 24 on page 15, follow these steps and refer to the flowchart in Figure 25 to reset and reconfigure the system.

a. On the interface box, press MENUS until the display shows "Diagnostics= No."

b. Press CHANGE until the display shows "Diagnostics = Yes." Then press ACCEPT.

c. At "System Reset= No," press CHANGE until the display shows "System Reset = Yes." Then press ACCEPT.

d. At "Reset to Factory?," press ACCEPT.

e. Wait a few minutes for the system to reset to its factory conditions.

f. When the display shows "System Needs Setup," repeat the setup procedure on page 13 (DISH) or page 14 (ExpressVu) for the desired mode.

g. Be sure the vehicle is parked in a blockage-free area. Make certain the antenna has a clear, unobstructed view of the sky.

h. Repeat the Check Switch steps on page 15.

Additional Receiver(s) - 1 Check Switch Test

If you connected multiple receivers to the system, follow these steps to run a Check Switch test on each additional receiver (one at a time). *When you are done, reconnect the receivers as before.*

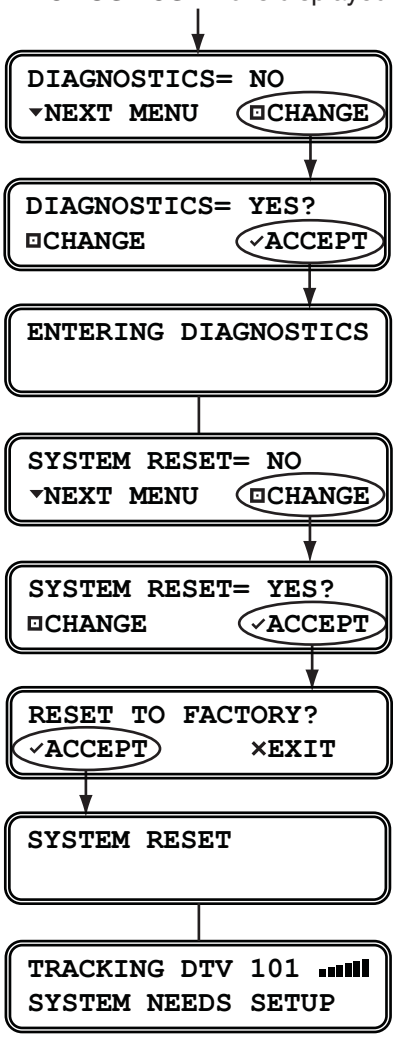
a. Temporarily disconnect the primary receiver from the "Unstacked Output" jack.

b. Connect the additional receiver to the "Unstacked Output" jack.

c. Perform Steps a-e on page 15 to run a single Check Switch test on the receiver.

d. Wait 15 minutes, then verify the values on the TV match the values shown in Figure 24 on page 15. If your values do not match, try running another Check Switch test.

Figure 25: Factory Reset



12 Educate the Customer

The installation process is complete! Before you leave the vehicle, test the system to verify the antenna works properly. 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.

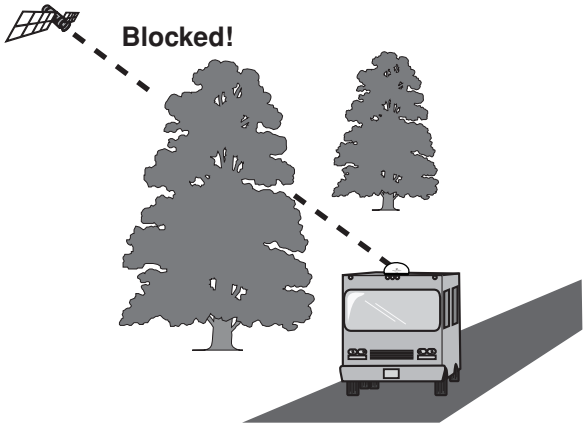
> **WARNING**
>
> It is dangerous to watch TV while driving a vehicle. While the vehicle is in motion, the system is intended for passenger use only.

- The receiver must be activated before it can receive satellite TV programming. Refer to Figure 26 for activation details.
- The antenna must have a clear view of the southern sky to receive satellite TV. Common causes of blockage include trees, buildings, bridges, overpasses, and mountains (see Figure 27). The TracVision system will not work inside a garage. Heavy rain or snow might also temporarily interrupt reception.
- To ensure optimum reception, keep DewShield™ set to AUTO. The DewShield electronic dew elimination system prevents dew from forming on the antenna (moisture weakens satellite signals).
- Clean the antenna regularly. Dirt buildup on the radome can affect satellite TV reception.
- **(DISH 1000 only)** You may need to change the operating mode when traveling between regions (see page 13 for details).
- 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 vehicle must be located within the selected satellite's coverage area. To view satellite coverage maps, visit: *www.kvh.com/footprint*.

Figure 26: Receiver Activation

Service:	Call to Activate:
DIRECTV	1-866-551-8004 (24 hours, 7 days a week)
DISH	1-866-399-8509 (Mon.-Fri., 8:30am - 5pm ET)
ExpressVu	1-888-SKY-DISH (24 hours, 7 days a week)

Figure 27: Blockage Example



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