



The DBS-4500 / *Land Version*

In-Motion Satellite Television System

Installation Instructions

Includes:

– 100 Series Antennas



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APPENDIX A –DATRON SATELLITE SYSTEM RECEIVER COMPATIBILITY MATRIX

1. Welcome

Congratulations on your selection of CruiseTV? , Datron's DBS-4500 In-Motion Satellite Television System. The DBS-4500 is the most advanced in-motion, state-of-the-art, automated satellite system available. This manual is provided to help you plan and complete the installation of the satellite system. These step-by-step instructions are organized in sequential order for your convenience. Read through the entire manual once before you attempt to install the Datron DBS-4500 In-Motion Satellite Television System. If you have any questions or require technical support, please contact Datron, at 800-287-5052.

This manual contains instructions for installing the DBS-4500 Land Version.

1.1 Satellite Receiver Selection

The DBS-4500 model is compatible with satellite receivers equipped with a low speed data port on the rear of the receiver. Check to see that your receiver has this port before proceeding with the installation. See Appendix A for a compatibility list. "Advanced" design receivers also provide a RF remote control feature which allows the receiver to be hidden. This is recommended for many installations.

2. Installation Overview

The DBS-4500 In-Motion Satellite System may take several hours to install. Be sure to give yourself plenty of time to complete the installation. To perform the installation of the satellite system you will need:

- ? Power drill
- ? Two drill bits, sizes 3/16" and 3/4"
- ? Two wrenches or sockets 7/16"
- ? Wrench or socket 1/4"
- ? Roof sealant *
- ? Bubble level
- ? Tape measure
- ? Pencil
- ? Wire stripper
- ? Slotted and Phillips screw drivers
- ? Terminal/lug crimpers
- ? Cable/wire cutters

2.1 Optional Items

- ? Flat 1/4" ID flat washers, as needed for shims
- ? Tie wraps
- ? Cable Clamps
- ? Sharp knife or razor
- ? Volt meter

The Datron DBS-4500 In-Motion Satellite Television System comes with most of the required installation hardware. Additional 1/4 inch flat washers may be required for shimming the antenna to get it level.

*Contact your dealer or the manufacturer of your RV for the recommended type of sealant that is compatible with the vehicle roof.

2.2 Antenna Carton Contents

| Description | Datron Part Number |
|--|--------------------|
| 1 Antenna Assembly | 130144-101 |
| 1 Installation Instruction Manual | M-01334 |
| 1 User's Guide | M-01335 |
| 2 Coaxial Cables (35 ft.) – terminated on both ends | 43180-35 |
| 1 Multi-conductor antenna control cable (35 ft.) – terminated on one end | 43148-35 |
| 1 Satellite Receiver Control cable (5 ft.) | 43149-1 |
| 1 ACU Power Interface Kit, including switch and switch bezel plate | 130228-101 |
| 1 Stainless steel cable cover | 850 |
| 8 Lag Bolts (1/4 x 1 1/4") | 42704-2 |
| 8 Flat washers (1/4" ID) | 42215-0257 |
| 8 Lock washers (1/4" ID) | 42216-0257 |

2.3 Installation Accessories

For special installations, Datron has the following accessories to the installation kit which are sold separately. Please contact our customer service department for more information at 800-287-5052.

| Description | Datron Part Number |
|---|--------------------|
| Coaxial Cable terminated (15 ft.) | 43180-15 |
| Coaxial Cable terminated (25 ft.) | 43180-25 |
| Coaxial Cable terminated (35 ft.) | 43180-35 |
| Satellite Receiver Interface Cable (3 ft.) | 42718-003 |
| Satellite Receiver Interface Cable (6 ft.) | 42718-006 |
| Satellite Receiver Interface Cable (10 ft.) | 42718-010 |
| Satellite Receiver Interface Cable (15 ft.) | 42718-015 |
| Satellite Receiver Interface Cable (20 ft.) | 42718-020 |
| 120 VAC Input 12 VDC Power Supply | PSA-124P |

2.4 Selecting the Antenna Location

Before beginning installation, park the vehicle on a level surface. This will facilitate correct leveling of the antenna. This is extremely important and will affect the performance of the system. Determine where the satellite receiver will be located inside the vehicle. Keep this location in mind as you look for a place to install the antenna on the roof. The cable run should be as short as possible.

Use the following suggestions to ease the installation:

Select a suitable location on the top of the vehicle where the antenna assembly is to be mounted. Remember to keep in mind the location of the inside equipment. The antenna assembly requires a 35" diameter space for installation. It is important that no tall structures (other antennas, luggage racks, etc.) be located near the antenna as they may interfere with the antenna's line of sight to the satellite. Using a tape measure, verify the location you have chosen provides the necessary diameter for antenna installation.

Place the antenna system on the roof of the vehicle in the location where it will be mounted. You are now ready to begin attaching the DBS-4500 In-Motion Satellite Antenna System to the vehicle.

3. Specifications

3.1 Mechanical

| | |
|-----------------------|--|
| Antenna (Elliptical) | 12" X 24" |
| Operating Temperature | 0°F - 125°F |
| Operating Wind Level | No Limit |
| Radome Height | 15.0" |
| Radome Diameter | 33.0" |
| Antenna Movement | 22° to 66° Elevation, 720° Azimuth |
| Weight on Roof | 35 lbs. |
| Mounting Footprint | 34.5" Circle |

3.2 Electrical

| | |
|-------------------|---------------------------|
| Operating Voltage | 12 VDC nominal |
| Operating Current | 2.0 amps DC nominal |
| | 3.0 amps DC maximum |

4. Step-By-Step Installation Instructions

The DBS-4500 is designed to install quickly and easily. As can be seen in Figure 4-1, there are only four “Plug & Play” connectors, J1 through J4, to connect for full implementation of the DBS-4500 antenna system. Only connection of J1 and J3 are necessary for most installations. Therefore, it is not necessary to remove the radome cover to install this system. **CAUTION:** *Follow these installation instructions exactly to ensure a trouble free installation. An incomplete or incorrect installation could result in a voided warranty. To avoid warranty problems, use only Datron authorized installers to complete this installation.*

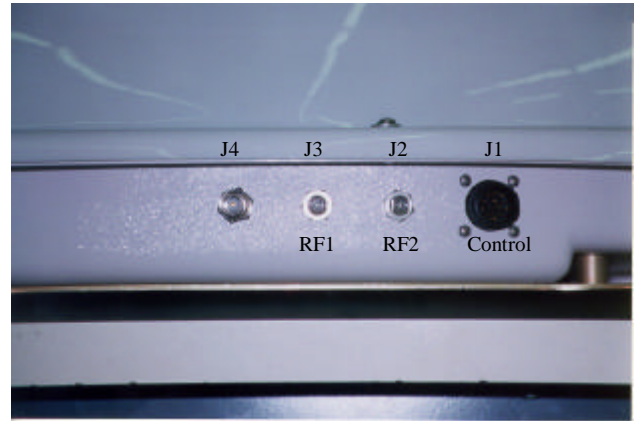


Figure 4-1

4.1 Antenna Mounting Instructions

Step 1 Locate the antenna on the centerline, or crown of the vehicle. Position control cable and RF cables to best serve your cabling need (see Figure 4-2).



Figure 4-2

NOTE: Orientation of the antenna is **not** critical. Positioning the antenna connectors toward the rear of the vehicle will reduce wind resistance.

Step 2 Using the antenna base as a template. Match-drill a minimum of two (2) mounting holes in each mounting pad (see Figure 4-3). Use a 3/16” diameter drill bit and drill to a depth of 3/4-inches.



Figure 4-3

- Step 3** Using a bubble level, check the level at each of the four antenna mounting feet. The center of the antenna should be $\frac{1}{4}$ " to $\frac{1}{2}$ " above the crown of the vehicle roof. A smaller gap, or no gap, can cause wind noise and/or vibration. Shim underneath the mounting pads with $\frac{1}{4}$ " ID washers and/or spacers as required.
- Step 4** Remove the antenna and clean drill chips and debris from mounting surface.
- Step 5** Apply sealant to the bottom of the four (4) mounting pads if no shimming is required.
- Step 6** Fill each hole drilled into the roof with sealant. Be sure to use sealant that is compatible with the roof type. Contact the vehicle manufacturer for information on compatibility with roof materials.
- Step 7** Place the antenna system over the mounting holes that were just drilled
- Step 8** Re-install spacers and shims and check that the system is still level, if not, readjust shims.
- Step 9** Install the eight (8) lag screws and/or installer supplied rivets. Longer lag screws may be required if substantial shimming is needed for leveling. The lag screws should penetrate approximately $\frac{3}{4}$ ". (See Figure 4-4.)



Figure 4-4

- Step 10** Check that the antenna is still level, adjust if necessary.

CAUTION: MAKE SURE THAT RADOME BASE HAS NOT BEEN TORQUED OR DEFORMED BY THE INSTALLATION TO THE VEHICLE. IF THE RADOME BASE IS DEFORMED, OPERATION OF THE ANTENNA PEDESTAL WILL BE ADVERSELY AFFECTED.

- Step 11** Apply more sealant at each bolt and/or rivet head to prevent leakage through the mounting holes (See Figure 4-5).



Figure 4-5

- Step 12** After the hardware has been tightened, generously weatherproof the hardware and penetration points with sealant. Do not attempt to seal around the entire radome base.

- Step 13** **IMPORTANT!** Cut and remove the shipping tie that locks the antenna in place for shipping (see Figure 4-6). Failure to remove this tie may result in damage to the antenna motors and drive electronics.

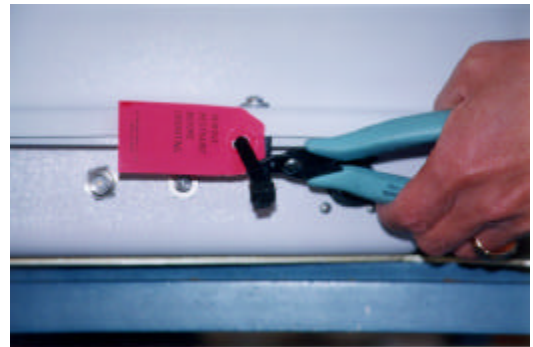


Figure 4-6

4.2 Connecting the Cables

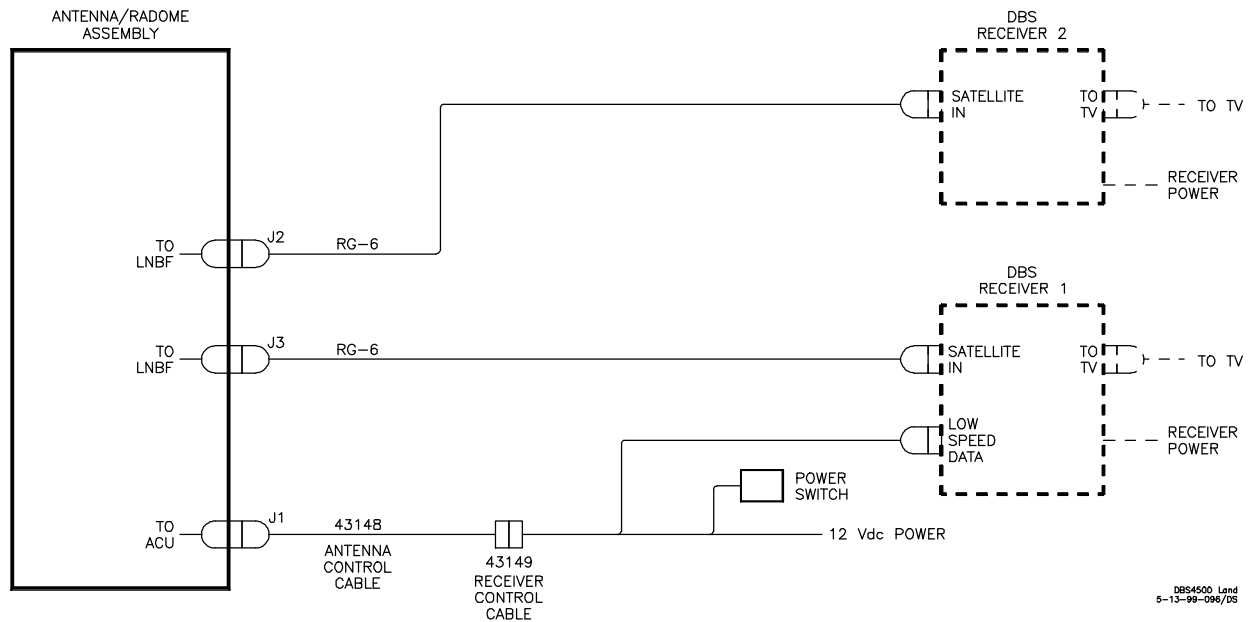


Figure 4-7. Cable Diagram

Step 1 Attach the Antenna Control cable circular connector to the antenna. Be sure to rotate the plug clockwise until the connector is completely seated. Connect the two RF cables, RF1 and RF2 and slide weather bolt over the connections. (See Figure 4-1.)

IMPORTANT! IN SINGLE COAX INSTALLATIONS USE J3 NOT J2. FAILURE TO DO SO WILL RESULT IN ERROR MESSAGE “CODE 10: LNBFV” ON SCREEN.

Step 2 Route the RF coax cable and the antenna control cable down through the roof to the receiver. A 3/4-inch hole must be drilled in order to pass the cables down through the roof.

Step 3 After the cables are routed, pot the cables with silicone sealant, around the hole. (See Figure 4-8.) Extreme care must be taken in sealing the cable entry point into the vehicle in order to prevent leaks.

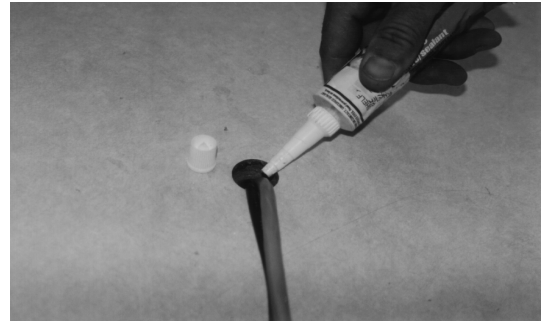


Figure 4-8

Step 4 Place the stainless steel cable cover over the opening where the cables go through the roof. Match drill through the three mounting holes and use either #8 x 1/4" sheet metal screws or rivets to fasten cable cover to roof. Seal around mounting flange before fastening. (See Figure 4-9.)



Figure 4-9

Step 5 Once the cover is fastened down, fill the cavity where the cable goes in completely with silicone sealant. (See Figure 4-10.)

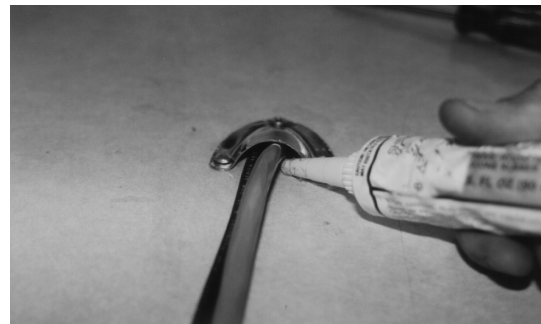


Figure 4-10

Step 6 Make sure to tie the cables down to the roof of the vehicle near the entry point. This is to ensure that the cables do not move around during operation or become an obstacle to trip on, thus breaking the seal.

You should now be finished on the roof. Once again, check to see that:

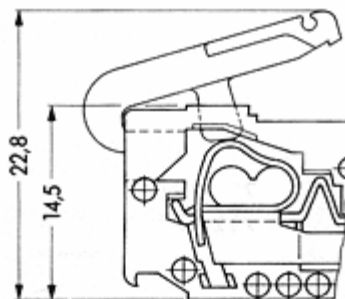
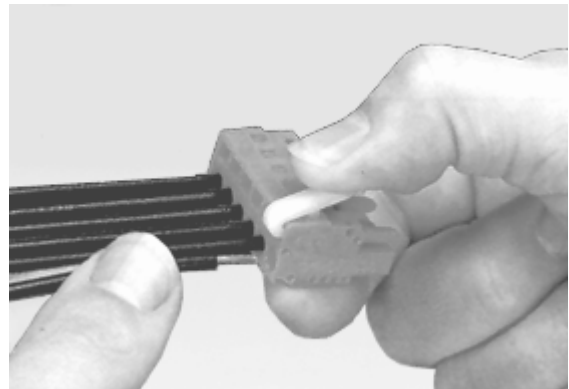
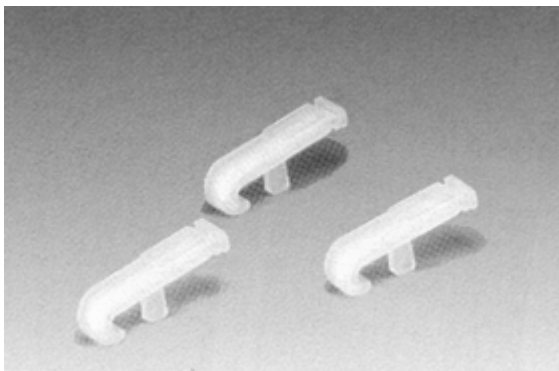
- ? All holes in the roof are sealed
- ? All loose wires are tied down
- ? The antenna is level
- ? Shipping strap has been removed

4.3 Antenna Connections Inside Vehicle

Once the antenna control cable has been connected and properly sealed and tied down on the roof of the vehicle, it is time to attach the Antenna Control cable to the gray “Wago” connector that is part of the Receiver Control cable. Please refer to Figures 4-11 while reading these instructions.

Plug the Receiver Control cable into the satellite receiver using the 9-pin connector and wire the power connections as shown in Figure 4-11. This cable will plug into the low speed data port. Make sure the Antenna Control cable is long enough to reach the gray “Wago” end of the Receiver Control cable.

The Control cable will connect to the Receiver Control cable as shown in Figure 4-11. Measure the Control cable and cut any excess length, then strip back the jacket 3 inches, use caution to avoid nicking the individual wires. Strip ¼-in. of insulation from each of the individual six Control Cable wires color-coded red, black, orange, white, green, and blue. Insert each wire into the appropriate terminal, using a plastic insertion tool, Wago P/N 231-131, included or small screwdriver. It is not necessary to tin the bare wire leads. The gray “Wago” connector has two mounting ears and may be mounted in any location that is convenient. Make sure the connection is on the wire and not on the wire insulation. Cut off the silver colored shield wire, it is not used.



Wiring Aid Tool

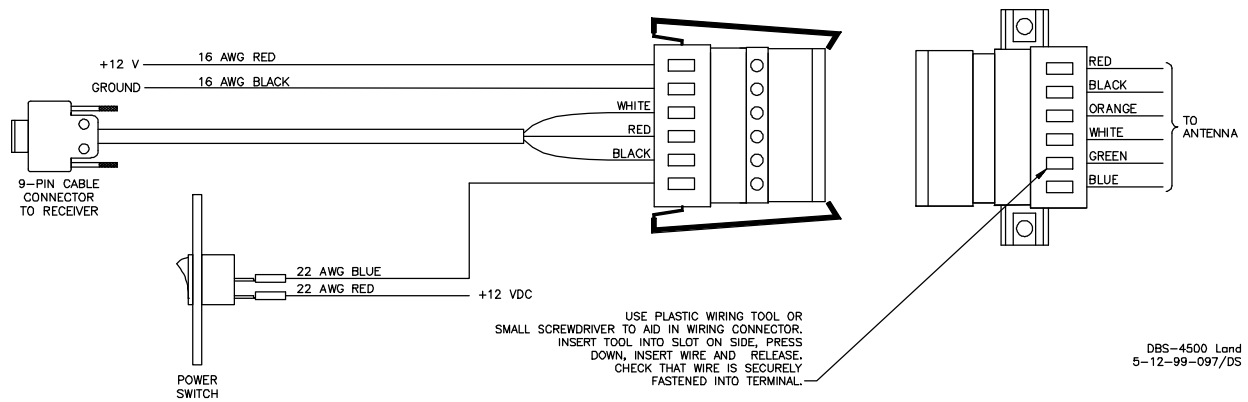


Figure 4-11. ACU Power Connection Wiring

4.4 ACU Power Connection

Refer once again to Figure 4-11. As shown in this drawing there are two 16 gage wires, one red and one black, these wires will connect to a 12-volt DC power source. The red 16-gauge wire will connect to positive 12 volts and the black 16-gauge wire will connect to ground. It is not necessary to install a fuse in-line with this connection, the DBS-4500 electronics is designed with an integrated resetable fuse. Do not apply power at this time.

NOTE: *It is extremely important that the 12 Volt DC supply to the DBS-4500 antenna system is a clean, continuous source, that does not fluctuate. To insure a proper power source, Datron recommends the use of an AC to DC power supply rated for a minimum of 4 amps at 12 volts. If you do not have a source for this supply, contact Datron and ask for part number PSA-124P.*

4.5 Installing the Antenna Power Switch

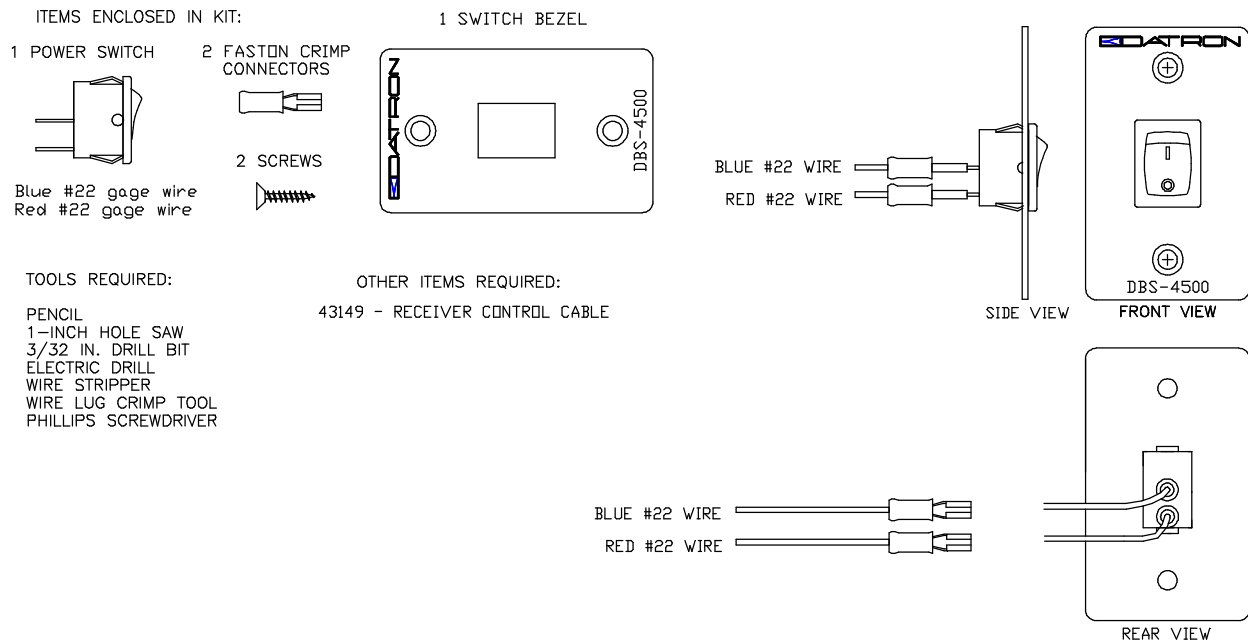


Figure 4-12

- Step 1** Determine the desired switch location and hold the switch bezel in that location to be sure that the switch assembly will fit. Also verify access and clearance behind the panel.
- Step 2** Using the switch bezel as a template, mark the locations of the 2 screw holes and the center rectangular opening. Drill the two mounting holes where marked using a 3/32-inch drill bit.
- Step 3** Using a hole saw; cut a 1-inch hole in the center of the rectangular pattern that was marked in step 2.
- Step 4** Feed the red and blue 22 gage wires from the inside of the vehicle panel, through the 1-inch hole, so that 8 inches of wire extends through to the outside of the panel. Crimp a faston connector onto the extended blue and red wire wires.
- Step 5** Snap the switch into the bezel from the front side as shown in “front view” of Figure 4-12. Note that the vertical white line on the rocker switch should be located towards the top of the switch plate. Then push the faston connectors onto the switch terminals as shown in diagram “side view.”
- Step 6** Install the switch assembly into the panel and fasten using the 2 screws supplied.

- Step 7** Connect the 22 gage red wire to any positive 12 volt power source and connect the blue wire to the Receiver control connector as shown in Figure 4-11.

NOTE: *Do not apply to power until all connections are made and verified.*

4.6 Connecting the Antenna System to a DIRECTV Compatible Satellite Receiver

- Step 1** Connect the coax cable from the satellite antenna to the receiver jack marked SATELLITE IN.
- Step 2** Connect the second coax cable to a second receiver if present.
- Step 3** Consult the receiver's Operating Instruction Manual for power requirements and instructions for connecting the satellite receiver to the television and other audio/video components.

NOTE: When using an inverter to power the satellite receiver it is recommended that it should be rated, at a minimum of twice the power rating of the receiver. For example: a receiver rated at 23-Watts would need at least a 46-Watt inverter. An inverter is available through any commercial electronics store.

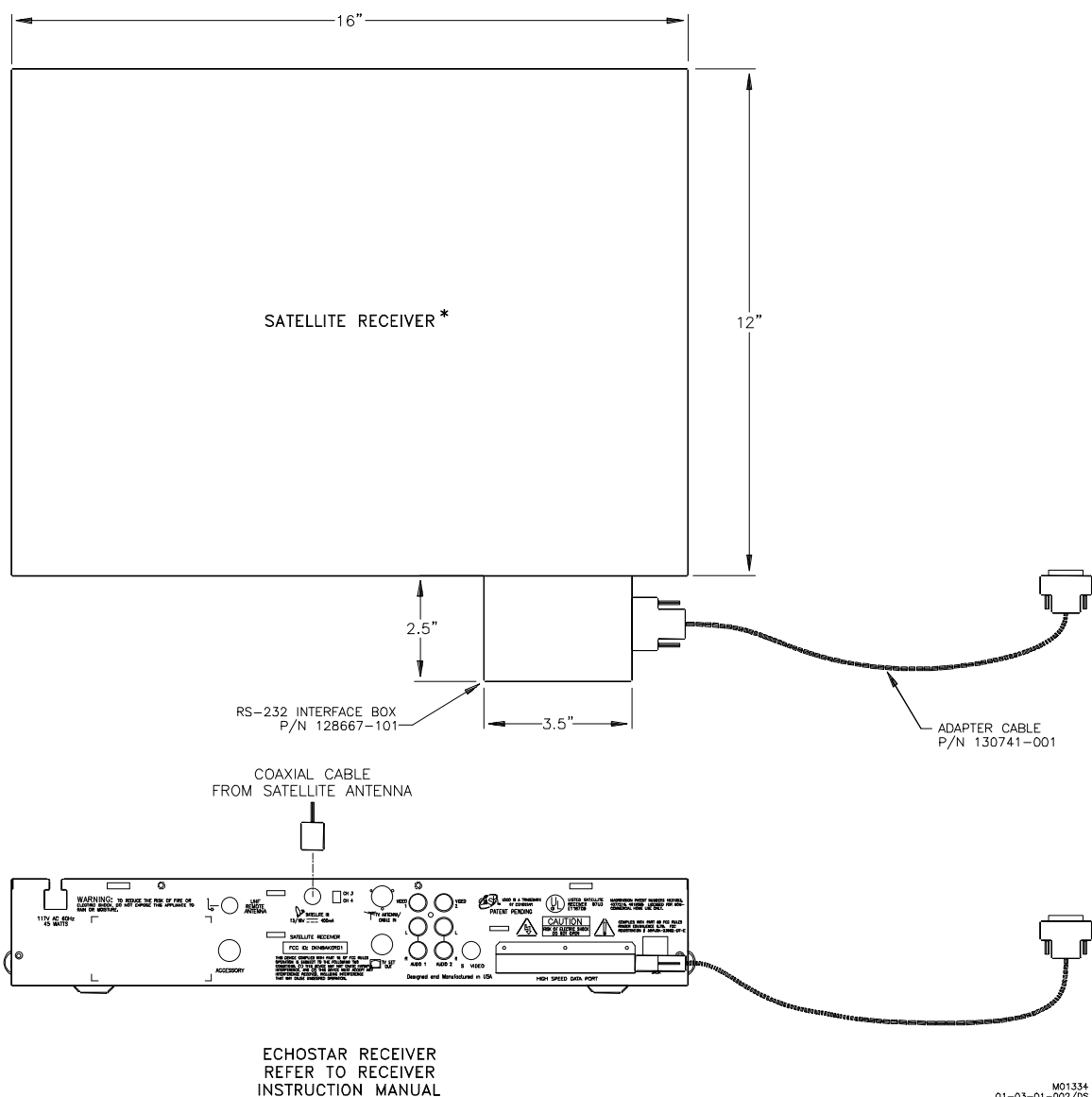
- Step 4** Power on the receiver and video monitor. The video monitor should display the message "Searching for Satellite". If this message is not displayed check the RF and video connections from the receiver to the video monitor. Consult the receiver's operating instruction manual for troubleshooting information. Once the proper connection to the video monitor has been established, it is time to power on the Datron DBS-4500 by actuating the power switch. After approximately 30 seconds, the video monitor should display now display the message "INIT REV XXXX" where XXXX is an alpha-numerical software revision code. The DBS-4500 has been designed to display several error codes if a problem is detected with the system installation. As list of error codes can be found in Table 1 and Table 2.

4.7 Connecting the Antenna to an EchoStar Compatible Receiver

In order to use the DBS-4500 CruiseTV with an EchoStar compatible receiver, it is necessary to obtain an Echo Star upgrade kit, Datron P/N 130742-101. This kit consists of an RS-232 interface box P/N 128667-101 and an adapter cable P/N 130741-001.

4.7.1 Installation

Remove the communication port cover from the EchoStar receiver, (see the compatibility matrix in Appendix A, at the end of this manual for a list of compatible receivers), install the RS-232 interface box and attach the mounting screws. Next attach the adapter cable to the conversion box via the 9-pin connector. Attach the remaining end of the adapter cable to the DBS-4500 serial 9 pin connector (see Figure 4-11). Installation is now complete. CruiseTV will automatically identify the EchoStar receiver at power up.



* NOTE: Satellite receiver not included in EchoStar upgrade kit.

This concludes the installation of the DBS-4500 In-Motion Satellite Television System. The following troubleshooting section will assist in detecting any problems with the installation of this system. For more detailed information on the operation of CruiseTV by Datron, consult the User's Guide P/N M-01335. To locate the authorized dealer nearest you, contact Datron/Transco Inc. Customer Service Department at (800) 287-5052.

5. Troubleshooting

Error conditions are described in Table 1 and possible solutions are indicated for each symptom. If you have trouble and cannot resolve it with this guide, contact your Datron dealer or Datron/Transco Inc. at 1-800-287-5052.

| Table 1. Error Conditions and Solutions | | | |
|---|---|--|---|
| Symptom | Indication | Cause | Possible Solution |
| Does not acquire | No screen display | Switch not turned on Battery dead Power not connected to battery Antenna not connected Bad switch Monitor not turned on Receiver not turned on | Turn on switch Recharge/replace battery Connect power to battery Connect missing/loose cable Replace switch Turn on/plug in monitor Turn on/plug in receiver |
| | "INIT-REV XXXX" does not display on monitor | ACU not connected Receiver not connected | Connect missing/loose cable Connect missing/loose cable |
| | "INIT-REV XXXX" continuously displayed on monitor | Excessive motion | Normal operation; reduce vehicle motion |
| | "Searching for Satellite" continuously displayed on monitor | View is obstructed Antenna coax not connected Radome covered with debris Initialized during excessive motion Radome covered with dew | Move vehicle to new location Connect all cables Clean radome Stop motion during initialization Spray radome with hose, or Wipe excess moisture from radome, or Drive vehicle to remove moisture coating |

| Table 1. Error Conditions and Solutions | | | |
|---|--|---|--|
| Symptom | Indication | Cause | Possible Solution |
| Picture drops out | Momentary freeze frame | View obstructed Large vehicular motion | Normal operation |
| | Continuous freeze frame | Receiver malfunction | Turn receiver off and on |
| | Picture pixeling | View obstructed Large vehicular motion | Normal operation |
| | “Searching for satellite” displayed on monitor | Long time view obstruction Very large vehicular motion | Normal operation; picture should return within three minutes Reboot system |
| | “Repositioning” displayed on monitor | Vehicle turned past limits | Normal operation; picture should return within 30 seconds |
| | “INIT-REV XXXX” displayed | Re-acquisition not successful | Normal operation; picture should return within three (3) minutes |
| | “Cal. Required” displayed on monitor | Displays when reset if performed | Calibration performed by turning power off and on every 10 seconds, five times |

5.1 Failure Messages

Failure messages are described in Table 2. If any of these messages are displayed contact your nearest Authorized Service Center or call Datron directly at (800) 287-5052.

| Table 2. Failure Messages | | |
|--------------------------------------|--|--|
| Failure Messages Displayed on Screen | Reason for Message Display | Possible Solution |
| CODE: 01 AZ & EL | Both AZ and EL index switches/motors failed. | Contact nearest Authorized Service Center or call Datron at (800) 287-5052 |
| CODE: 02 AZIDX | AZ index switch/motor failed. | |
| CODE: 03 ELIDX | EL index switch/motor failed. | |
| CODE: 04 A2D | Fault in the analog-to-digital converter. | |
| CODE: 05 XRATE | X gyro rate sensor failed. | |
| CODE: 06 YRATE | Y gyro rate sensor failed. | |
| CODE: 07 ZRATE | Z gyro rate sensor failed. | |
| CODE: 08 PLEV | Pitch level sensor failed. | |

| Table 2. Failure Messages | | |
|--------------------------------------|--|--|
| Failure Messages Displayed on Screen | Reason for Message Display | Possible Solution |
| CODE: 09 RLEVL | Roll level sensor failed. | Contact nearest Authorized Service Center or call Datron at (800) 287-5052 |
| CODE: 10 LNBFV | Failure of the R-hand/L-hand polarity of the LNBF. | ? Repair or replace coax ? Check receiver voltage to LNBF |

6. Warranty

Datron/Transco Inc. (DTi) warrants this product to be free from defects in material and workmanship for two (2) years' parts and one (1) year labor. Proof of purchase in the form of a bill of sale or invoice indicating the product installation date must be presented to obtain warranty service.

Datron/Transco Inc. liability hereunder is limited to cost of parts for two (2) years and labor costs for one (1) year to replace or repair, at its discretion, any part or parts determined to be defective in material or workmanship. Parts manufactured other than by Datron/Transco Inc. are warranted separately by the applicable parts manufacturer.

This warranty does not cover cosmetic damage of a non-functional nature or damage due to acts of God (including but not limited to lightning, windstorm, hail). This warranty also does not cover damage caused by improper voltage regulation. This warranty does not apply if the product has been improperly installed or subjected to misuse, neglect, or accidental damage.

This warranty is invalid if the factory-applied serial number has been altered or removed from the product.

Repair or replacement as provided under this warranty is the exclusive remedy of the consumer. Datron/Transco Inc. shall not be liable for any incidental or consequential damages for breach of any expressed or implied warranty of this product. In no event will Datron/Transco Inc. liability, if any, exceed the purchase price paid for the product. **THERE ARE NO WARRANTIES EXPRESSED OR IMPLIED EXCEPT AS STATED HEREIN.**

To locate the authorized dealer nearest you, contact Datron/Transco Inc. Customer Service Department at: **1-800-287-5052**.

Appendix A
Datron Satellite System
Receiver Compatibility Matrix



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Datron Satellite System Receiver Compatibility Matrix

| Brand Receiver | DBS-4500-100 Series DIRECTV/DISH Compatible |
|-----------------------|--|
| SONY | |
| SAT-B1 | Not Compatible |
| SAT-B2 | Not Compatible |
| SAT-B3 | OK - DIRECTV |
| SAT-A1 | OK - DIRECTV |
| SAT-A2 | OK - DIRECTV |
| SAT-A3 | OK - DIRECTV |
| SAT-A4 | OK - DIRECTV |
| SAT-A50 | OK - DIRECTV (6) |
| RCA | |
| DRD122RW | Not Compatible |
| DRD102RW | Not Compatible |
| DRD203RW | Not Compatible |
| DRD303RA | Not Compatible |
| DRD403RA | OK - DIRECTV (5) |
| DRD703RA | OK - DIRECTV (5) |
| DRD505RB | OK - DIRECTV (5) |
| DRD523RB | OK - DIRECTV (5) |
| DRD515RB | OK - DIRECTV (5) |
| DRD203RB | OK - DIRECTV (5) |
| HNS | |
| HIRD-A33 | OK - DIRECTV (5) |
| ECHOSTAR | |
| ISD2350 | OK - DISH (4) |
| ISD4000 | OK - DISH (4) |
| ISD5000 | OK - DISH (4) |
| ISD3350 | OK - DISH (4) |
| ISD4500 | OK - DISH (4) |
| All Others | Not Compatible |



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Datron Satellite System Receiver Compatibility Matrix

NOTES:

3 HNS Receivers: Requires special ACU/Satellite Receiver Interface Cable - Datron Part Number: 128649-006

4 ECHOSTAR Receivers: Reference Technical Bulletin #11

Echostar Receivers requires special interface cable:

DBS-4500-100 Datron Part Number: 130742-101

5 FOR OPTIMUM PERFORMANCE OF THE DBS-4000 AND DBS-4500 "CRUISE TV" IT IS SUGGESTED THAT THE SONY SAT-A1, SAT-A2, SAT-A3 or SAT-A4 RECEIVERS BE USED.

6 Compatible with software revision D or above.

**ADDITIONAL
NOTES:**

No models of the Uniden receivers are compatible with Datron products.

Hitachi and Toshiba receiver compatibility pending

Call Datron Datron Technical Support 1-800-287-5052 if you have questions regarding this data.