

Installation Instructions

INTRODUCTION

If you do not want to install the system yourself, you can have it installed by a professional. Call the DISH Installation Network™ at 1-800-799-7175 for information about installation in your area.

If you do intend to install the system yourself, this document provides installation procedures. The procedures are relatively simple, but do require **some** skill in construction-related tasks. Make sure to follow all warnings and cautions; they are provided for your safety.

An optional Installation Kit is available. This Kit includes some of the hardware required for most installations, an instructional videotape, and a guide that provides more detailed installation procedures. See “Optional Installation Kit” on page 3.

ATTENTION!



You should be somewhat familiar with construction related tasks, as the following installation instructions do not contain step-by-step procedures for mounting the satellite dish to a surface and drilling holes in the building for cable. The optional Installation Kit includes a guide that provides such detailed instructions. You may also choose to have a licensed professional do the installation.

WARNING!



It is very important that you carefully follow all local building and electrical codes (especially the latest revision of the **National Electrical Code**) and standard safety procedures for installing and working with this type of equipment. Improper procedures or installation can result in damage to the equipment or the building, and injury or death to you. If you are not sure about whether the installation follows these codes, contact a licensed building inspector or electrician in your area for assistance.

WARNING!



Take extreme care to avoid contacting any overhead power lines, lights, and power circuits while you are installing the satellite dish. Contact with any of these could prove fatal. Do not install the satellite dish near power lines.

WARNING VS. ATTENTION

You must remember certain safety issues during installation and use of this system. This Guide provides various procedures and instructions. Some of these procedures could result in injury or property damage if they are improperly performed. Other procedures require additional attention.

In this *Guide*, the following notes tell you when you need to pay attention to a safety or operational issue.



Designates a potential situation where the following may happen:

- ◆ Personal injury or death may occur.
- ◆ Equipment or property may be damaged.



Designates the following operational issues:

- ◆ Important operation or maintenance instructions follow.
- ◆ Additional attention is required.

FOR YOUR SAFETY



- ◆ Do not attempt to open the case of the receiver. There is risk of electrical shock, which may result in damage to the equipment and/or personal injury or death to you. There are no user-serviceable parts inside the receiver. Opening the receiver case or unauthorized modification will void the warranty.



- ◆ Do not use or install this receiver near water or in very moist conditions. The receiver may be damaged, and electrical shock or fire could occur.

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Correspondence regarding this *Guide* should be addressed directly to *EchoStar Technologies Corporation, Technical Publications, 90 Inverness Circle East, Englewood, Colorado 80112.*

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TABLE OF CONTENTS

Safety Instructions2
Unpacking and Checking the Contents3
Before you Start.....	3
Optional Installation Kit.....	3
Determining the Direction to the Satellite.....	.4
Finding the Azimuth and Elevation	4
Finding a Clear Line of Sight	5
Mounting Locations.....	6
Considerations for Signal Interference	6
General Instructions6
Assembling and Mounting the Satellite Dish8
Aligning the Mast.....	.8
Assembling the Satellite Dish	8
Aiming the Dish for the Strongest Signal	10
Grounding and Wiring the System.....	.12
Installing the Ground Block	12
Routing the Cable to the Ground Block	12
Routing the Cable to the Receiver	13
Connecting the Receiver to a Telephone Line.....	13
Basic Wiring Diagram	15
Ordering Your Programming	15
Installing an Additional Dish.....	.16
Assembling, Mounting, and Wiring the Dish	16
Installing the Multi-Dish Switch.....	16
Routing Cables to the Multi-Dish Switch	16
Routing Cables to the Receivers.....	16
Grounding the Multi-Dish System.....	17
Completing the Switch Setup	17
Multi-Dish Wiring Setup Diagrams	17
Checking the Multi-Dish Switch Setup	22

Installation Instructions

SAFETY INSTRUCTIONS

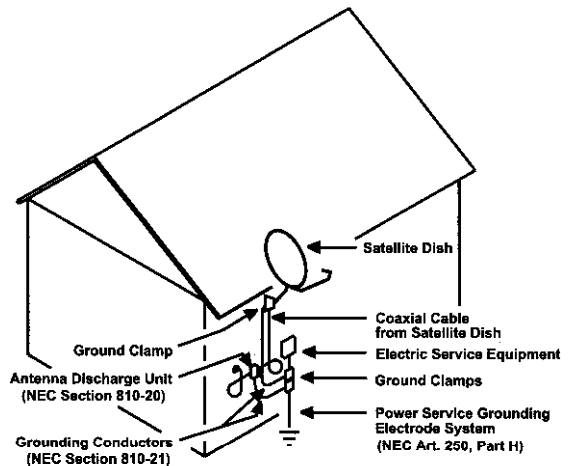


You should always follow these instructions to help ensure against injury to yourself and damage to the equipment.

- ◆ Read **all** safety and operating instructions before you operate any receiver.
- ◆ Retain all safety and operating instructions for future reference.
- ◆ Heed all warnings on the receiver and in the safety and operating instructions.
- ◆ Follow all installation, operating, and use instructions.
- ◆ Unplug the receiver from the AC power outlet before cleaning. Use only a damp cloth for cleaning the exterior of the receiver.
- ◆ Do not use accessories or attachments not recommended by the receiver manufacturer, as they may cause hazards and will void the **warranty**.
- ◆ Do not operate **the** receiver in high-humidity areas, or expose it to water or moisture.
- ◆ Do not place the receiver on an unstable cart, stand, tripod, bracket, or table. **The** receiver may fall, causing serious personal injury and damage to the receiver.
- ◆ Do not block or cover slots and openings in the receiver. These are provided for ventilation and protection from overheating. Never place the receiver near or over a radiator or heat register. Do not place the receiver in an enclosure such as a cabinet without proper ventilation.
- ◆ Do not stack the receiver on top of or below other electronic devices.
- ◆ Operate the receiver using only the type of power source indicated on **the** marking label. Unplug the receiver power cord by gripping the power plug, not the cord.
- ◆ The receiver is equipped with either a ground-type or a polarized plug. This plug will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact an electrician to replace the obsolete outlet. Do not defeat the safety purpose of the ground-type or polarized plug.
- ◆ Route power supply cords so that they **are** not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where **they** exit from the unit.
- ◆ Do not overload wall outlets or extension cords, as **this** can result in a risk of fire or electrical shock. Never insert objects of any kind into the receiver through openings, as the objects may touch dangerous voltage points or short out parts. This could cause fire or electrical shock.
- ◆ Make sure that **the** outdoor parts of the antenna system are grounded in accordance with local, state, federal, and *National Electrical Code* (NEC) requirements. Pay special attention to NEC Sections 810 and 820. See the example shown in the diagram on the next page.
- ◆ Use an outlet that contains surge suppression and ground fault protection, or use a surge protection device. For added protection during a lightning storm, **or** when the receiver is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the lines between the receiver and the antenna. This will provide **some** protection against damage caused by lightning or power line surges.
- ◆ Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing the antenna, take extreme care to avoid touching such power lines or circuits, as contact with them can be fatal.
- ◆ Do not attempt to service **the** receiver yourself, as opening or removing covers (except for **the** Smart Card access cover on the front panel of some receivers) may expose you to dangerous voltage, and will void the warranty. Refer all servicing to authorized service personnel.
- ◆ Upon completion of any service or repair to the receiver, ask the service technician to perform safety checks to ensure **that** the receiver is in proper operating condition.

Installation Instructions

- ◆ Unplug the receiver from the wall outlet and refer servicing to authorized service personnel whenever any of the following occurs:
 - The power supply cord or plug is damaged;
 - Liquid has been spilled, or objects have fallen into the receiver;
 - The receiver has been exposed to rain or water;
 - The receiver has been dropped or the chassis has been damaged;
 - The receiver exhibits a distinct change in performance.
- ◆ When replacement parts **are** required, ensure that the service technician uses replacement parts specified by the receiver manufacturer. Unauthorized substitutions may damage the receiver or cause electrical shock or tire, and will void the warranty.



UNPACKING AND CHECKING THE CONTENTS

Unpack the contents carefully. Electronic devices can easily be damaged if bumped or handled roughly. Examine all parts for damage that may have occurred during shipment. If you **find** any damage, immediately call the location where the system was bought, or Customer Service, before continuing the installation.

Note: Keep the shipping materials, in case you ever need to return the parts

BEFORE YOU START

This manual provides procedures for installing a one dish system and for installing additional dishes. For additional dishes, you will need to install a multi-dish switch in place of the ground block. See “Installing an Additional Dish” on page 16.

Because you will make modifications to the location where you mount the satellite dish, you should be somewhat familiar with and able to safely perform the following procedures.

- ◆ You should be able to use a bubble level or plumb line to set both horizontal and vertical surfaces. This is especially critical for vertical surfaces.
- ◆ You should know how to drill holes in the mounting surface (wood, brick, cinder block, etc.).
- ◆ You should know how to drill holes and run cables through your building. This includes sealing the holes once the cable has been installed.

OPTIONAL INSTALLATION KIT

The Installation Kit is an optional product that contains some of the hardware and materials required for most installations of the system. To buy the Installation Kit, call DISH Network*” Sales at 1-800-333-3474.

Note: This kit does not include tools, nor does it include all the materials you may need for a particular installation. You may need additional materials, sold separately. If you find that you do not have the tools and **skills** for a certain procedure, call a professional, such as a satellite television dealer or an electrician, for assistance. For professional installation, call the DISH Installation Network*“ at 1-800-799-7 175.

Installation Instructions

DETERMINING THE DIRECTION TO THE SATELLITE

To help you decide where to mount the dish, you must determine at which satellite you would like to aim and then determine the direction to that satellite from your **location**. You must have a clear line of sight from the dish location to the satellite. You must have a compass and have the satellite receiver temporarily connected to a TV, as explained below. Use the following procedure to find the best location for the dish, while keeping in mind the considerations discussed in “Mounting Locations” on page 6.

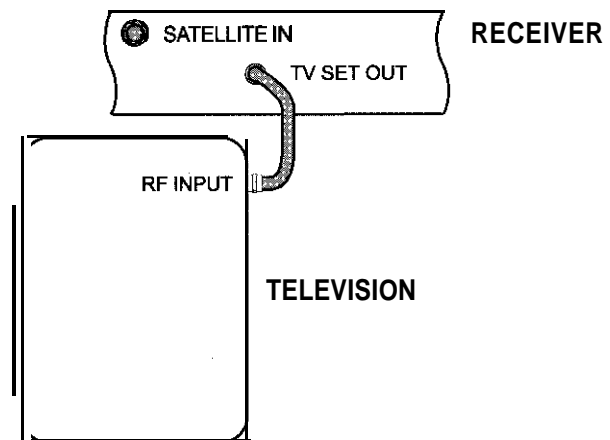
FINDING THE AZIMUTH AND ELEVATION

When determining the general location of a satellite, you need to find the azimuth (the south, southeast, or southwest direction to the satellite) and elevation (the angle up to the satellite) from your location. Temporarily connect the receiver to a television, using the receiver back panel **TV Set Out** connection.

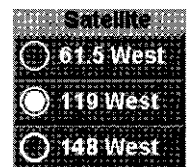
1. Make sure that the remote control batteries are fresh, and are installed properly. If applicable, make sure that the remote control is in **SAT** mode, in order to control the satellite receiver. For information on doing these procedures, see the User **Guide** that came with the system.
2. Upon turning on your television and receiver, if you are not already on the **Point Dish** screen, do the following to get there or follow the instructions in the User **Guide** that came with the system. Press the remote control **Menu** button to display the **Main Menu**.
3. Select the System Setup option to display the **System Setup** menu.
4. Select the Installation option to display the **Installation and Setup** menu.
5. Select the **Point Dish/Signal** option.

On the **Point Dish and Signal Strength** menu, use the **Up/Down/Left/Right arrow** buttons to move the highlight to the Satellite field and choose the satellite at which you would like to aim.

Note: This diagram shows the receiver temporarily connected to the television. For permanent wiring setups, see the User Guide that came with the system.



Note: Some receivers do not display the **Satellite** field (as shown). If the **Satellite** field is not displayed, the azimuth and elevation angles which are determined when you enter your zip code will be for aiming at the satellite at 119°. The satellite at 119° is the *primary* satellite and provides the majority of main stream programming. Unless you want only special interest programming (foreign and educational channels), you should aim at the satellite at 119°.



Specific information describing the channels offered from each of the satellite locations can be found on the **Channel Directory** that came with your system.

Installation Instructions

- Use the **Up/Down/Left/Right** arrow buttons to move the highlight to the ZIP Code field. Use the number pad buttons to enter each digit of your ZIP code in the ZIP Code field. Note: You can also use the remote control Up or Down arrow button to increase or decrease, respectively, the highlighted digit in the ZIP Code field.
- When you enter the last digit of your ZIP code, the receiver displays the azimuth and elevation angles on the menu. Write down these numbers - you will use them in the next section.

Azimuth: _____

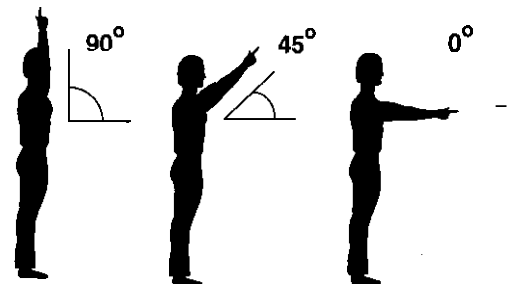
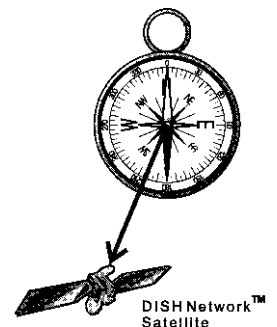
Elevation: _____

NOTE: If you want to aim at a satellite other than the one at 119” and you do not see the **Satellite** field, get the appropriate azimuth and elevation angles by consulting our home page at <http://www.dishnetwork.com> or calling Customer Service at 1-800-333-3474.

FINDING A CLEAR LINE OF SIGHT

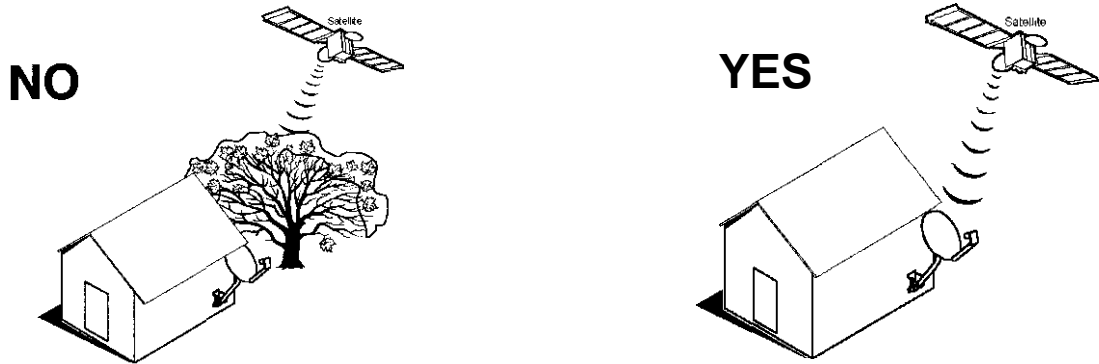
“Finding a clear line of sight” means finding a location for the satellite dish with a clear view of the satellite, a view not blocked by trees, buildings, or anything else. Make sure that trees are not likely to grow up or out into the line of sight. Also, consider seasonal changes. A location that is clear in winter may be blocked by leaves in spring and summer.

- Take a compass and the azimuth and elevation angles to the location for the satellite dish. Make sure the compass is at least a foot away from other metal objects, and that there are no magnetic objects or electronic devices nearby. Holding the compass so the needle can swing freely, turn the compass until the dark end of the compass needle is aligned on the N. This points to magnetic North. The compass face is divide! into 360 degrees. North is zero degrees (0°), East is 90° , South is 180° , and West is 270°
- On the compass, find your azimuth angle. Turn to face this direction, while taming the compass to keep the dark end of the needle over the N. You are now facing in the direction to the satellite. Find a landmark, or lay a stick or board on the ground that lines up in that direction.
- Use the elevation angle to find out how high the satellite is in the sky from your location. Vertical is 90° , horizontal is 0° , and halfway in between is 45° . Stand close to where you plan to mount the satellite dish and face in the direction that you marked for the direction to the satellite. Use your arm to estimate the elevation angle in the sky. You are now pointing to the general location of the satellite.
- Note whether anything blocks the line of sight to the satellite. Leave a fairly wide margin for adjustment, since you have not yet aimed the dish exactly.



Installation Instructions

Note: If you mount the dish on a structure that has an eave or overhang, make sure that the eave or overhang does not block the line of sight between the dish and the satellite. If something does block the line of sight, you must find a new mounting location, **or** remove the obstacle, if possible. Also, make sure that you can get to the dish to remove snow, ice, and other debris if necessary.



5. If **necessary**, repeat steps 1 through 4 until you have found the best location for the satellite dish. The best location must provide a sturdy support for the dish and must have a clear line of sight. It should also be easily accessible. Mark the spot and the direction to the satellite.

MOUNTING LOCATIONS

When you survey your property for appropriate locations for the satellite dish, keep in mind that you can mount the satellite dish in a variety of ways: on brick, on solid siding, on wood, on a roof, or on a metal pole. Because installing the satellite dish may involve drilling into the wall or roof of your building, or digging a hole and using cement, you should be very confident of the location before beginning installation. Errors can be expensive and time-consuming.

CONSIDERATIONS FOR SIGNAL INTERFERENCE

The satellite dish can withstand most kinds of weather. However, extremely strong winds could damage the surface where the satellite dish is mounted. A strong wind can cause the satellite dish to exert several hundred pounds of pressure on the mounting surface, so the surface **must** be stable and strong. Such a mounting surface also helps ensure against movement of the satellite dish, which would interrupt signal reception.

In general, the stronger the signal you maintain, the better your chance of uninterrupted reception during periods of snow, rain, and heavy cloud cover. If you live in an area where snowfall is heavy, you should mount the satellite dish in a place where you can reach it easily to remove snow or ice as it could also cause signal loss.

Some radar detectors give off a strong enough signal to cause interference with satellite reception. If radar detectors are in the **vicinity**, see if they can be removed or turned off. If not, try locating the dish using the house to block the offending radar detector. A metal screen could also be used between the interfering signal and the antenna.

GENERAL INSTRUCTIONS

- ◆ Assemble the satellite dish in a safe location before climbing up to the mounting location. Use caution when climbing, and when working at the mounting location.
- ◆ Install the satellite dish only on a solid surface or solid foundation material. If you install it on the side of a building, make sure that the center bolts are attached directly to a building stud or other solid material. Use the appropriate drilling and attachment hardware for the type of surface.

Installation Instructions

- ◆ Make sure you have determined the best location for the satellite dish before drilling the holes in the building or setting up the mounting pole. Make sure that you can route the cable from the location into the building. If you install a mounting pole, make sure that you can route the cable overhead, or underground to the building.
- ◆ Before drilling any holes in the building, make sure there are no wires or pipes in the area of the holes. Before digging any holes in the ground, contact the local utility and telephone companies for help in locating underground utility or telephone lines.
- ◆ *All* installations should conform to the local building and electrical codes. If you are not sure, contact a licensed building inspector or electrician in your area to assist you. Be aware that community covenants, if any, may have additional requirements. Also, check your homeowner's insurance policy for any restrictions or exceptions that may apply.
- ◆ Choose a location that is easily accessible in most weather conditions. You may need to clean snow or debris off the satellite dish.
- ◆ Place the satellite dish as close to the receiver as possible. Do not use more than 100 feet of RG-6 cable between the receiver and the satellite dish without a line amplifier to boost the satellite signal. Otherwise, the system is more likely to lose the signal, especially during periods of rain, snow, or heavy cloud cover. If the setup requires over 100 feet of cable, you should consider having the system professionally installed.
- ◆ Consider seasonal changes. The location may appear clear in the winter, but spring and summer leaves could block the signal to the satellite dish.
- ◆ If you use a ladder, follow the safety instructions provided by the manufacturer. Use only a fiberglass ladder, to avoid the risk of electrical shock if the ladder were to contact any overhead power lines, lights, or power circuits.
- ◆ As you work, be aware of your surroundings. Take adequate precautions to avoid injury to yourself or damage to buildings, structures, or equipment.
- ◆ Never install the satellite dish near power lines.
- ◆ Do not install the satellite dish where it can be jostled, bumped, or blocked by people, animals, or vehicles.
- ◆ Do not install the satellite dish where it is exposed to high winds. Do not try to install the satellite dish in windy or **stormy** weather, particularly if there is a chance of lightning.
- ◆ Do not attempt to fasten the satellite dish to the mortar between bricks or cinder blocks.
- ◆ Do not mount the satellite dish on vinyl or aluminum siding. These materials are structurally too weak to securely hold the satellite dish, even with a building stud underneath.
- ◆ Do not mount the satellite dish downwind of a chimney or furnace vent. Ashes and dirt could collect on the dish and LNBF, possibly causing damage and poor reception. If practical, locate the dish so that it faces away from the vent.
- ◆ Do not install the satellite dish on stucco or imitation masonry unless the base material is solid.
- ◆ Do not mount the satellite dish on composite materials such as strand, chip, fiber, or particle board unless the fastener attaches securely to a wall stud, rafter, or other foundation material beneath the surface.
- ◆ Do not mount the satellite dish on a railing, on a tile roof, or in a tree.
- ◆ Do not mount the satellite dish on a chimney that is not structurally sound. Wind causes the dish to vibrate, and these vibrations can damage an unsound chimney. Install the dish on a chimney only if there is no other suitable mounting location.

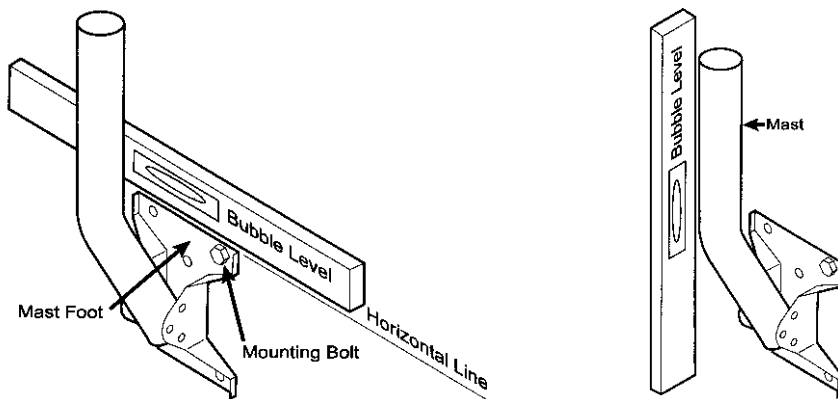
Installation Instructions

ASSEMBLING AND MOUNTING THE SATELLITE DISH

ALIGNING THE MAST

Before you secure the mounting foot to the location you have chosen, you need to use a bubble level or plumb line to make sure that the top edge of the mounting foot is level. If the mounting surface is horizontal, there is no top edge of the mounting foot. You also need to use the bubble level to make sure the top part of the mast is vertical. If the mast is not absolutely vertical, the elevation angle that the receiver provides for your location will be inaccurate. This will make it difficult or impossible for you to aim the dish for the strongest signal.

The first diagram below shows how to make sure that the top edge of the mounting foot is level. The diagram on the right shows how to make sure the top part of the mast is vertical (be sure to check at least two adjacent sides). When you are sure the foot is level and the mast is vertical, tighten the bolts.



ASSEMBLING THE SATELLITE DISH

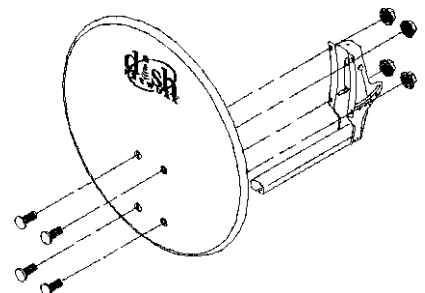


Assemble the satellite dish in a safe location **before** climbing up to the mounting location. Use caution when climbing, and when working at the mounting location.



Before you install the dish mount, you should make sure that you can route the cable from the mounting location into your building, drilling holes where necessary, to the receiver.

1. Place the dish on the support arm. Align the **flathead** bolt holes in the dish with the bolt holes on the dish support arm.
2. Insert each **flathead** bolt into one of the holes, and secure it by threading a lock nut onto the bolt on the back side. Tighten the bolts so that they **are** snug.

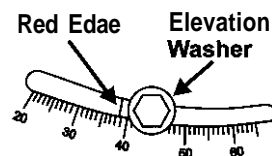
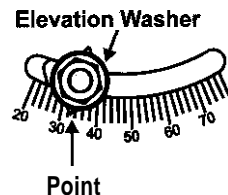


Installation Instructions

3. Tilt the support bracket to the elevation of the satellite.

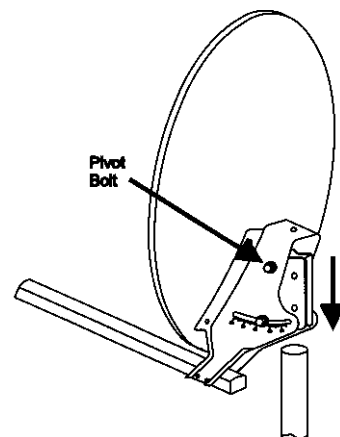
- ◆ If you have the bracket where the washer has points on it, align the elevation marks with the washer points.
- ◆ If you have the bracket where the red edge of the mast shows through the curved slot, align the red edge with the required elevation mark.

Note: Trust the elevation scale. You cannot set the elevation by aiming the dish or the LNBF support arm directly at the satellite.



4. Slide the mast clamp down onto the mast. Make sure that the pivot bolt rests on the top of the mast.

You may have either one or two coaxial cables to attach to the LNBF, depending on which type of LNBF you bought: single-output to support one receiver, or dual-output to support two or more receivers. If you have to attach two cables to the LNBF, the following steps, 5 through 13, apply to both cables. Use only RG-6 coaxial cables with weather proof "F" connectors. Do not use cable TV cables or cables from other satellite TV systems. These cables may cause signal loss. Also, do not use previously-installed cable runs. Such cable runs may include signal splitters of which you are not aware, which would prevent the system from operating properly.

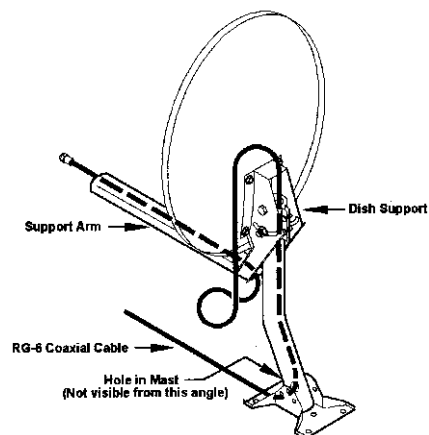


5. Thread the coaxial cable into the hole in the mast near the mast foot, up inside the mast, and out from the top of the mast. Note: Do not kink or pinch the cable.

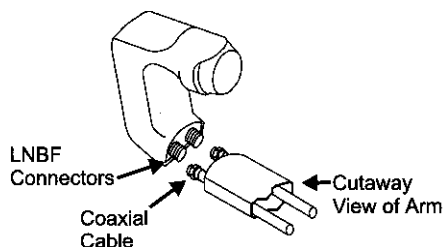
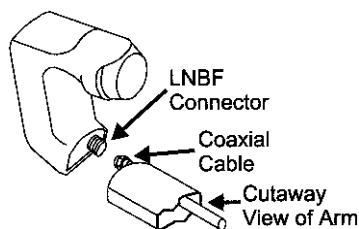
6. Bring the cable around in a gentle curve up and over the outside of the dish support, to the lower end of the support arm.

7. Thread the cable in through the lower end of the arm, inside the arm, and out from the upper end of the arm.

8. Adjust the cable so that there are about 2 inches of cable out the end of the arm. **Note:** Leave some slack in the cable. **This** will help you if you ever need to remove the LNBF.



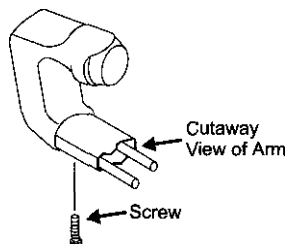
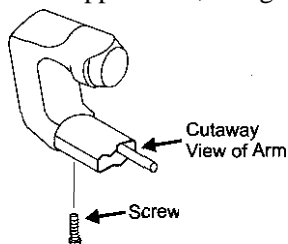
9. Attach the LNBF to the coaxial cable(s).



Installation Instructions

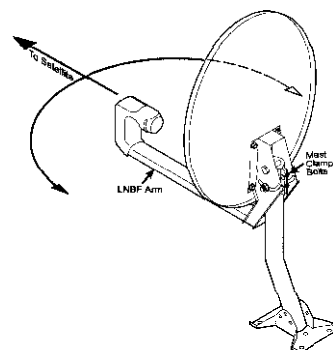
10. Fit the LNBF into the support arm, sliding it in until it is inserted firmly. You may have to adjust the cable, pulling it back gently through the support arm, but leaving some slack.

11. Attach the LNBF to the support arm, using the LNBF screw.



12. Pull the cable loop up into the top of the mast. If the package includes a cable clip, secure the cable loop to the back edge of the dish using the cable clip. This will provide a service loop in the cable if you ever need to remove the LNBF.

13. Turn the dish mount on the mast to align the LNBF support arm in the direction of the satellite. Tighten the mast clamp bolts so that the clamp is snug, but can still be moved back and forth.



AIMING THE DISH FOR THE STRONGEST SIGNAL

This procedure explains how to fine tune the aim of the dish and lock the signal strength. If not already on the **Point Dish screen**, do the following to get there or follow the instructions in the User *Guide* that came with the system.

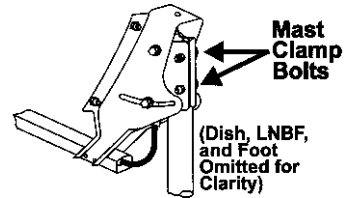
1. Connect the receiver to the satellite dish. To do this, connect a coaxial cable from the receiver back panel **Satellite In** connection to the LNBF on the satellite dish.
2. Press the remote control **Menu** button to display the **Main Menu**.
3. **Select the System Setup** option to display the **System Setup** menu.
4. **Select the Installation** option to display the **Installation and Setup** menu.
5. Select the **Point Dish/Signal** option.
6. Look at the **Signal Strength** bar.



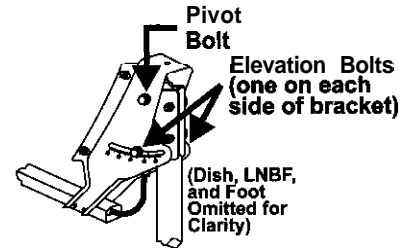
- ◆ If it is *red* and displays “Unlocked” or “Not Locked” you may be aiming the dish at the satellite but without a strong enough signal for a picture. The signal tone will be beeping. Go to the next step.
- ◆ If it is *red* and displays the words “Wrong Satellite” you may be aiming the dish at the wrong satellite. The signal tone will be beeping. Check which satellite you selected and either select a different one or re-aim.
- ◆ If it is *yellow* and displays the words “Wrong Satellite” you are aiming the dish at an **EchoStar** satellite but not the one you selected. Check which satellite you selected and either select a different one or re-aim.
- ◆ If it is *green* and displays the word “Locked,” you are aiming at the satellite you selected and have a strong enough signal. The signal tone will be steady. It rises as the signal gets stronger, and lowers as the signal strength drops.

Installation Instructions

7. Loosen the mast clamp bolts just enough to be able to move the support bracket. Slowly move the satellite dish from side to side until you find the strongest signal. Tighten the mast clamp bolts just enough so the dish cannot be moved from side to side.



8. Loosen the elevation bolts and pivot bolt just enough to be able to move the support bracket. Slowly move the satellite dish up and down until you find the strongest signal. Tighten the elevation bolts and pivot bolt just enough so the dish cannot be moved up and down.



9. Repeat steps 7 and 8 until the Signal Strength bar is green, displays the word "Locked," and indicates the strongest possible signal.

Avoid placing yourself directly in front of the satellite dish while aiming it, as your body may block much or all of the satellite signal.

If practical, try to keep the TV in view while aiming the satellite dish. You can also turn up the sound volume, in order to use the signal tone to determine when you have aimed the dish for the maximum signal strength. If this is not practical, having an assistant may be helpful. One person can aim the dish while the other watches the signal strength and/or listens to the signal tone.

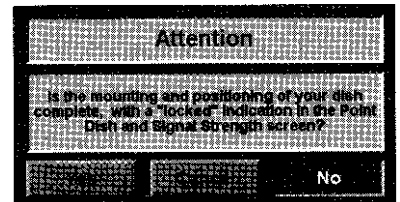
Typically, once you obtain a clear picture on the TV, a stronger signal will not noticeably affect the picture quality. However, keep trying to aim the satellite dish for the strongest possible signal. The stronger the signal, the better your chance of uninterrupted reception during periods of rain, snow, or heavy cloud cover.

Move the dish slowly from side to side, or slowly up and down, but not both at the same time. Loosen the bolts before each movement, and tighten them again before the next movement.

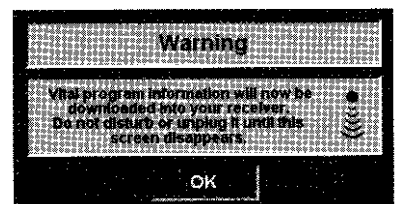
10. When the Signal Strength bar is green, displays the word "Locked," and indicates the strongest possible signal, tighten all the bolts to prevent movement of the satellite dish.

11. Mark the final locations on the mast and mounting bracket with a permanent marker. This assists you later if you have to realign the dish because of movement due to wind or weather. Do not scratch the painted surfaces to mark them. This will cause rusting.

Press the remote control View button to exit the Point Dish and Signal Strength menu. The receiver displays an Attention message asking whether the installation is complete. Use the Up/Down/Left/Right arrow buttons to move the highlight to the Yes option. Press the Select button.



12. The receiver displays a Warning message about the "download" of information to the receiver. Press the remote control Select button. Then, follow the direction in the message. Do not disturb or unplug the receiver during the download. Note: During the download, neither the remote control Power button or the receiver front panel Power button will be able to turn the receiver off.

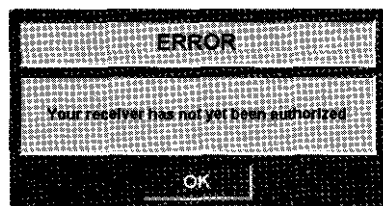


Installation Instructions

13. When the download is complete, the receiver briefly displays an Attention: Acquiring satellite signal message. Then, the receiver should display the Preview Channel, which tells you about available programs, channels, and services. This indicates that you have properly aimed the satellite dish.



14. If you tune the receiver to a channel other than the Preview Channel, the receiver displays an Error message. This indicates that the receiver has not yet been authorized to receive programming. You must call Customer Service to order your programming.



GROUNDING AND WIRING THE SYSTEM

The following guidelines apply to all grounding systems. As with any such installed devices, the satellite dish and the coaxial cable(s) should be grounded in accordance with the latest revision of the National *Electrical Code (NEC)* and all local electrical codes to provide some protection against damage caused by lightning strikes and other electrical discharges. Even lightning strikes several miles away can generate enough electricity in the air to damage the system. Article 820-40 of the NEC provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

The importance of proper grounding cannot be overemphasized. It will minimize the potential for damage to the system and maximize safety. How you ground the system can also affect its performance. For more information, refer to the NEC and local electrical codes. You can find the entire *NEC* at your local library. Contact a licensed electrician or the local electric utility company if you have any questions.

- ◆ Make sure the grounding system provides a solid, permanent earth grounding in accordance with the National *Electrical Code (NEC)* and all local electrical codes. Contact a licensed electrician or the local electric utility company if you have any questions. You can find the entire *NEC* at your local library.
- ◆ Ground the satellite dish and coaxial cable to the power entry ground of the building, in accordance with the NEC and all local electrical codes.
- ◆ If you install a grounding electrode separate from the power entry ground, connect the separate electrode to the power entry ground in accordance with the NEC and all local electrical codes.


INSTALLING THE GROUND BLOCK

Depending on the mounting location and your preference, you may want to install the ground block onto the side of the building, or on some other sturdy structure near the satellite dish. Make sure that the location is stable, and that you fasten the ground block tightly to the surface. As stated in Article 820-40 of the *NEC*, locate the ground block as close to the power entry ground as possible.

ROUTING THE CABLE TO THE GROUND BLOCK

1. Using the shortest path possible, route the coaxial cable(s) from the LNBF to the coaxial terminal(s) on one side of the ground block. Note: If you are using a dual-output LNBF, you must use a dual ground block and route both coaxial cables to the ground block.


2. Put a drip loop in each cable. The drip loop allows moisture to drip from the cable before it runs into the ground block.
3. For each coaxial cable that you attach to the ground block, connect a second coaxial cable onto the coaxial terminal on the other side of the ground block. This is the cable that you will route into the building to the receiver.
4. Route the ground wire to the power entry ground of the building in accordance with the *National Electrical Code* and all local electrical codes.

 **WARNING!** A ground wire must always be a single piece of wire. Never splice two wires together for a ground. Corrosion and weathering can lead to a poor connection at the splice, making the ground ineffective and dangerous. If you cut the ground wire too short, replace it with a new single wire cut to the correct length.


5. Use cable clips to attach the cables to the side of the building. This helps prevent damage.

ROUTING THE CABLE TO THE RECEIVER


1. Using the shortest path possible, route the coaxial cable(s) from the ground block to the satellite receiver. Do not kink or pinch the cable; it should be bent only in gentle curves.

 **ATTENTION!** Do not use more than a total of 100 feet of RG-6 coaxial cable between the satellite dish and the receiver, without installing a line amplifier to boost the satellite signal. Otherwise, the system is more likely to lose the signal during periods of rain, snow, or heavy cloud cover. If the setup requires more than 100 feet of cable, you should consider having the system professionally installed.

2. Put a drip loop in each cable at a point before it enters the building. A drip loop allows moisture to drip from the cable before it runs into the building.

 **WARNING!** Before drilling any holes in the wall or roof of your building, make sure there are no wires or pipes in the area of the holes. If you are not comfortable doing this, contact a professional in your area. Make sure that you follow all safety instructions and building codes.

3. Locate the receiver inside the building, against or near an outside wall. Then drill a hole through the outer wall to pass the cable inside the building. If the receiver is located in an interior room, route the cable through the outside wall, and into an attic, basement, or crawl space in order to reach the receiver.
4. Seal any holes that you drill in the building with silicone or other weatherproof sealant after installation. Once the cable is inside the building, you may attach it to a wall receptacle or directly to the receiver.

 **WARNING!** Tighten the back panel coaxial cable connections only by hand. Using a wrench may over-tighten the connections, causing damage. Such damage is *not* covered by the Limited Warranty in the User *Guide* that came with the system.

CONNECTING THE RECEIVER TO A TELEPHONE LINE

Each receiver in the setup must be connected at all times to an active telephone connection. Without this connection, you will encounter problems including the inability to order pay per view programs and using two or more receivers at the same time. Attach a telephone line with a standard R-11 connector to the receiver back panel **Telephone Jack**, and then connect the line to an active telephone connection. Note: If there is no convenient telephone jack, you may be able to use a wireless telephone extender.

You must also set up each receiver for the type of telephone system you have (touchtone or rotary/pulse), and specify a telephone number prefix, if such a prefix is required to place an outside call.

Installation Instructions

1. Press the remote control Menu button to display the Main Menu.
2. Select the **System Setup** option to display the System Setup menu.
3. Select the **Installation** option to display the Installation and Setup menu.
4. Select the **Telephone System** option to display the Telephone System Setup menu.
5. Use the **Up/Down/Left/Right arrow** buttons to move the highlight to the **TouchTone** or the **Rotary/Pulse** option in the **Phone Type** list.

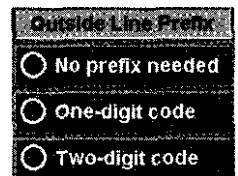


Press the **Select** button to select the highlighted option.

If you do need to specify a telephone number prefix, then *instead* of selecting the Save option, go on to the next step.

Note: A telephone number prefix is usually required only for business installations. For most residential installations, all you need to do is specify the telephone system type. The default prefix setting of No prefix needed will enable correct operation. If this is the case, highlight and select the **Save** option to save the above setting, and stop here.

6. Use the **Up/Down/Left/Right arrow** buttons to move the highlight to the **One-digit code** or the **Two-digit code** option in the **Outside Prefix List**.



Press the **Select** button to select the highlighted option.

7. If you selected the **One-digit code** option, the receiver displays and highlights a box where you must enter the digit. Press the appropriate number pad button to do this.

If you selected the **Two-digit code** option, the receiver displays two boxes (highlighting the top box) where you must enter the digits. To do this, do the following:

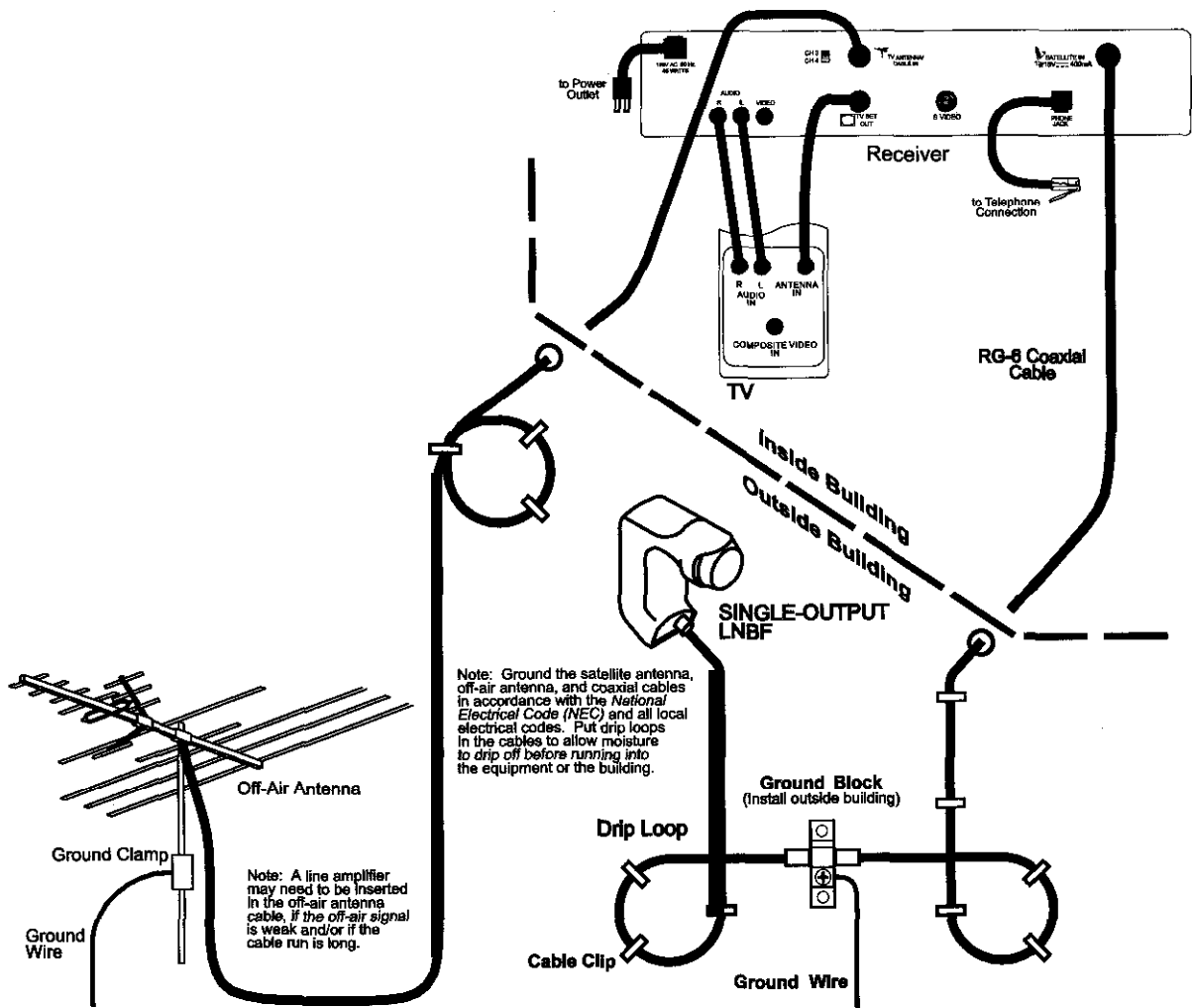
- a) Press the appropriate number pad button to enter the first digit in the top box.
- b) Press the **Down arrow** button to move the highlight to the bottom box.
- c) Press the appropriate number pad button to enter the second digit in the bottom box.

8. Use the **Up/Down/Left/Right arrow** buttons to move the highlight to the **Save** option. Press the **Select** button to save the settings.

Installation Instructions

BASIC WIRING DIAGRAM

The diagram below shows a basic wiring setup using one satellite dish and one receiver. For more wiring setup diagrams, see **the** multi-dish wiring diagrams in this guide or the *User Guide* that came with the system. Note: The off-air television antenna shown in this diagram is optional.



ORDERING YOUR PROGRAMMING

YOU need to have your services activated before you can start enjoying your desired programming. You must authorize your services when the system is first installed, and whenever you request to add or remove services. See the *User Guide* that came with **the** system for details on ordering your programming.

Installation Instructions

INSTALLING AN ADDITIONAL DISH

For a system with more than one dish, all cables must run through a multi-dish switch. The multi-dish switch replaces the ground block used in a single dish system. This section provides information on how to install a multi-dish system.

ASSEMBLING, MOUNTING, AND WIRING THE DISH

First, assemble and install each additional dish in the same manner as described in this guide. Once all dishes are connected, wired, and have a locked signal, go on to “Installing the Multi-Dish Switch” below.


Note: If you are installing a dish to a system that already has more than one dish and a multi-dish switch, be sure to *first* wire the dish without the multi-dish switch, aim it and get a locked signal, then wire it through the multi-dish switch.

INSTALLING THE MULTI-DISH SWITCH

Once the dishes are connected and aimed at the appropriate satellites with locked signals, you must **run** the cables through the multi-dish switch. Mount the multi-dish switch onto the exterior wall of your building, near the power entry ground. The multi-dish switch will take the place of the existing grounding block. Make sure that the location is stable, and that you fasten the multi-dish switch tightly to the surface.

ROUTING CABLES TO THE MULTI-DISH SWITCH


1. Using the shortest path possible, route the coaxial cables from the LNBFs to the coaxial terminals on one side of the multi-dish switch.
2. Put a drip loop in each cable. The drip loop allows moisture to drip from the cable before it runs into the multi-dish switch.
3. For each coaxial cable that you attach to the switch, connect a second coaxial cable onto the coaxial terminal on the other side of the switch. This is the cable that you will route into the building to the receiver.
4. Route the ground wire to the power entry ground of the building in accordance with the *National Electrical Code* and all local electrical codes.

WARNING!  A ground wire must always be a single piece of wire. Never splice two wires together for a ground. Corrosion and weathering can lead to a poor connection at the splice, making the ground ineffective and dangerous. If you cut the ground wire too short, replace it with a new single wire cut to the correct length.


5. Use cable clips to attach the cables to the side of the building. This helps prevent damage.

ROUTING CABLES TO THE RECEIVERS


1. Using the shortest path possible, route the coaxial cables from the multi-dish switch to the satellite receivers. Do not kink or pinch the cable; it should be bent only in gentle curves.

ATTENTION!  Do not use more than a total of 100 feet of RG-6 coaxial cable between the satellite dish and the receiver, without installing a line amplifier to boost the satellite signal. Otherwise, the system is more likely to lose the signal during periods of rain, snow, or heavy cloud cover. If the setup requires more than 100 feet of cable, you should consider having the system professionally installed. See each switch setup for specific instructions, on the following pages.

2. Put a drip loop in each cable at a point before it enters the building. A drip loop allows moisture to drip from the cable before it runs into the building.

WARNING!  Before drilling any holes in the wall or roof of your building, make sure there are no wires or pipes in the area of the holes. If you are not comfortable doing this, contact a professional in your area. Make sure that you follow all safety instructions and building codes.

3. Locate all receivers inside the building, against or near an outside wall. Then drill a hole through the outer wall to pass the cable inside the building. If the receiver is located in an interior room, route the cable through the outside wall, and into an attic, basement, or crawl space in order to reach the receiver.
4. Seal any holes that you drill in the building with silicone or other weatherproof sealant after installation. Once the cable is inside the building, you may attach it to a wall receptacle or directly to the receiver.

WARNING!  Tighten the back panel coaxial cable connections only by hand. Using a wrench **may** over-tighten the connections, causing damage. Such damage is not covered by the Limited Warranty in the User Guide that came with the system.

GROUNDING THE MULTI-DISH SYSTEM


As with any such installed devices, the satellite dish and the coaxial cable(s) should be grounded in accordance with the latest revision of the **National Electrical Code (NEC)** and all local electrical codes to provide some protection against damage caused by lightning strikes and other electrical discharges. Even lightning strikes several miles away can generate enough electricity in the air to damage the system.



The importance of proper grounding cannot be overemphasized. It will minimize the potential for damage to the system and maximize safety. How you ground the system can also affect its performance. Contact a licensed electrician or the local electric utility company if you have any questions.

COMPLETING THE SWITCH SETUP

Permanently connect each receiver to a television, VCR, or any other electronic devices that you use. For more information on wiring your system, see the wiring diagrams that follow or the User **Guide** that came with the system.

ATTENTION!  When the wiring of your multi-dish system is complete, you **must** check your switch setup. See “Checking the Multi-Dish Switch Setup” on page 22.

MULTI-DISH WIRING SETUP DIAGRAMS

Following are wiring diagrams for each of the multi-dish switches and some installation tips. Be sure to put drip loops in the cables and mount the switch horizontally to avoid corrosion to the connections. Use only **RG-6** coaxial cable to ensure optimum signal strength.

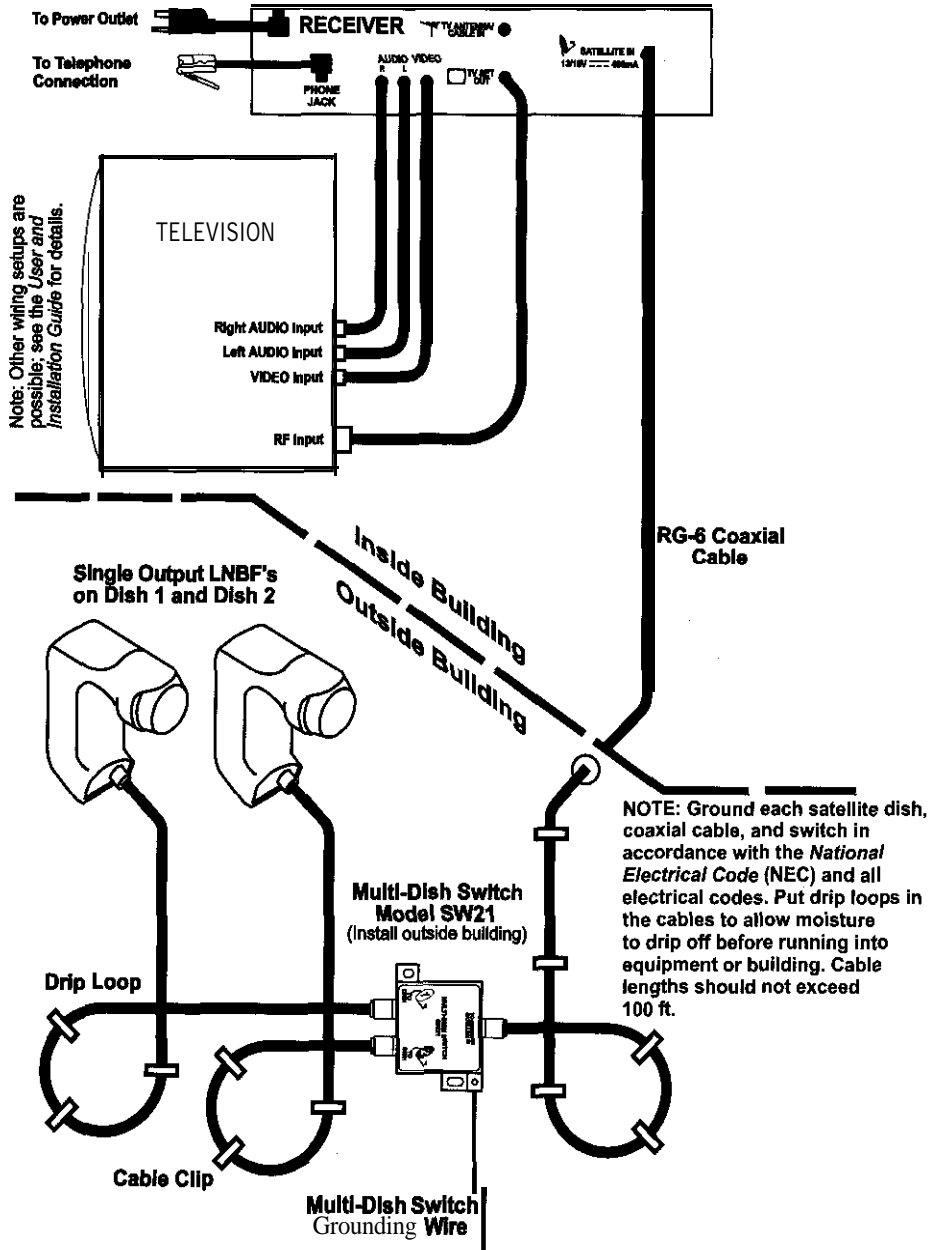
Installation Instructions

MODEL SW21 MULTI-DISH SWITCH

The Model SW21 Multi-Dish Switch can support the following installed lengths of cable:

Receiver to SW21	SW21 to LNBF
10 feet	165 feet
20 feet	155 feet
30 feet	140 feet
40 feet	115 feet
50 feet	100 feet
60 feet	85 feet
70 feet	60 feet
80 feet	40 feet
90 feet	10 feet

Note: Two SW21 switches may be used with two dual LNBFs.

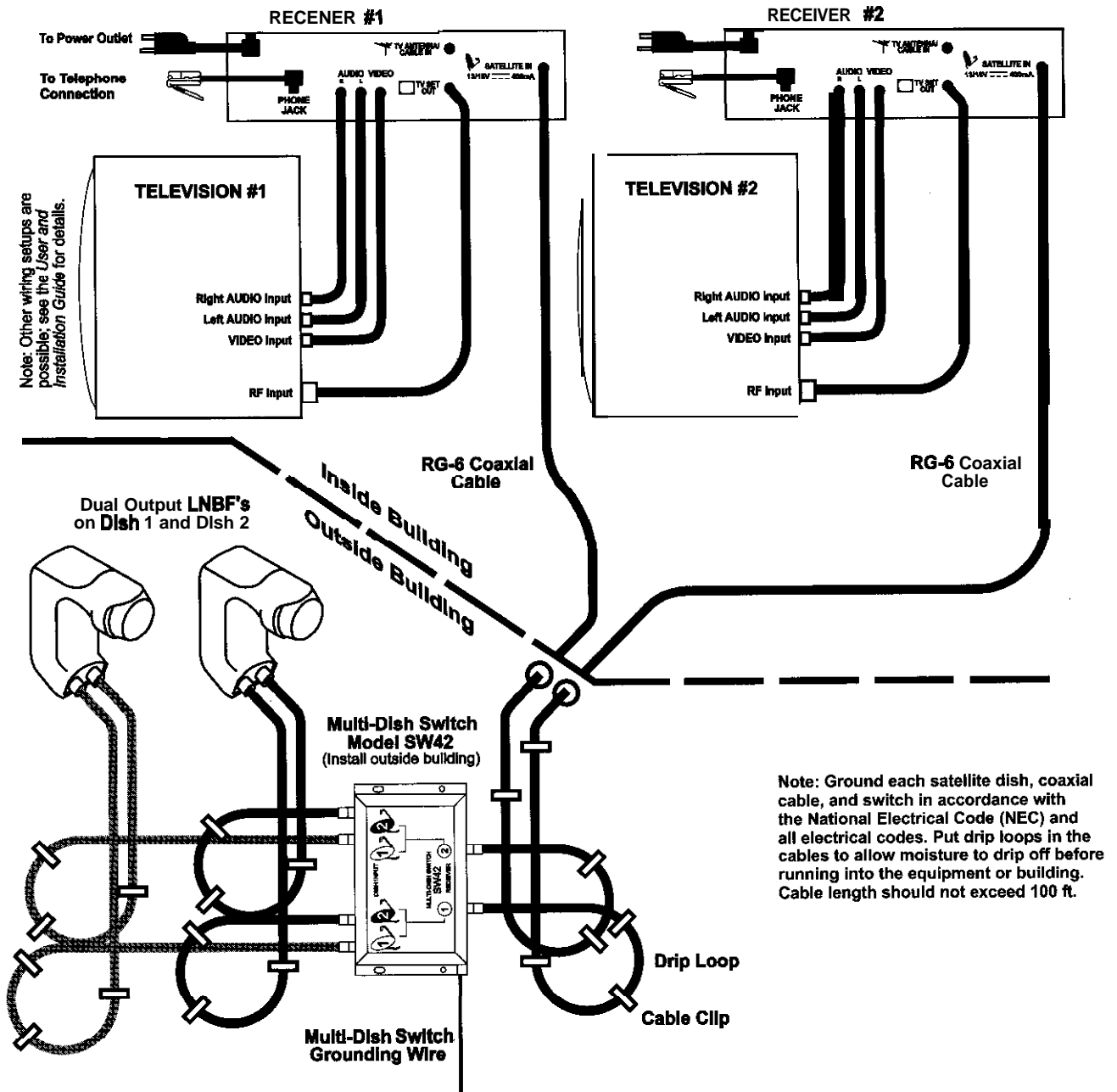


MODEL SW42 MULTI-DISH SWITCH

The Model SW42 Multi-Dish Switch can support the following installed lengths of cable:

Receiver to SW42	SW42 to LNBF
10 feet	150 feet
20 feet	140 feet
30 feet	130 feet
40 feet	100 feet
50 feet	85 feet
60 feet	60 feet
70 feet	40 feet
80 feet	30 feet
90 feet	10 feet

Note: If an installation requires more cable length than recommended in this table, use the SW21 m&dish switch.

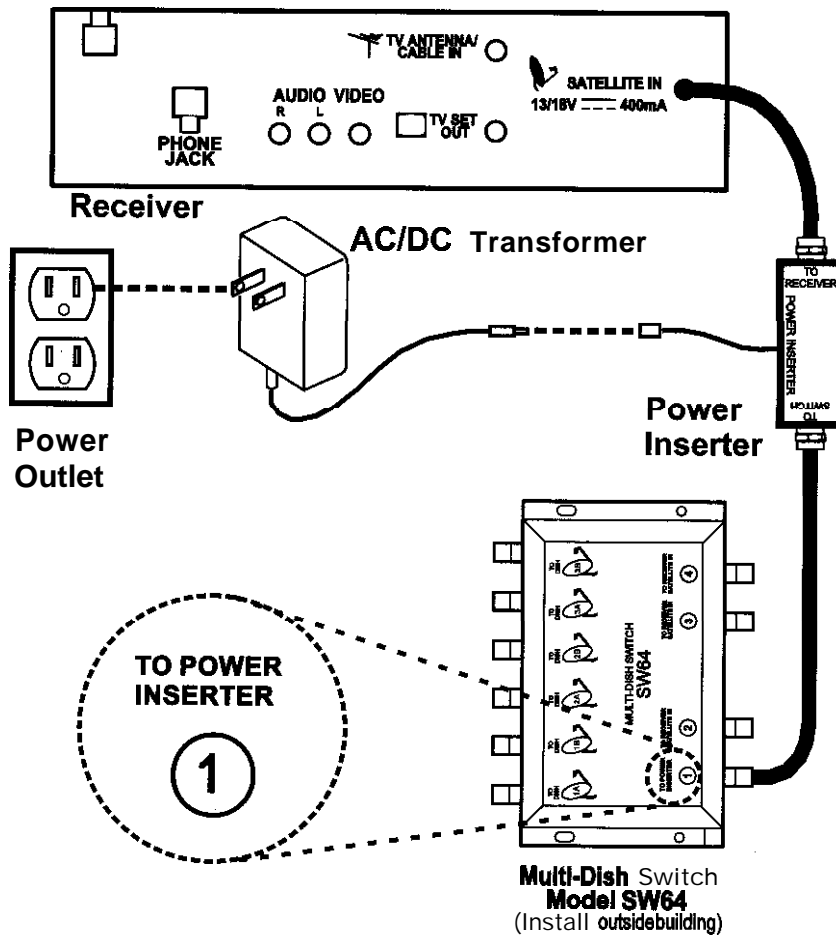


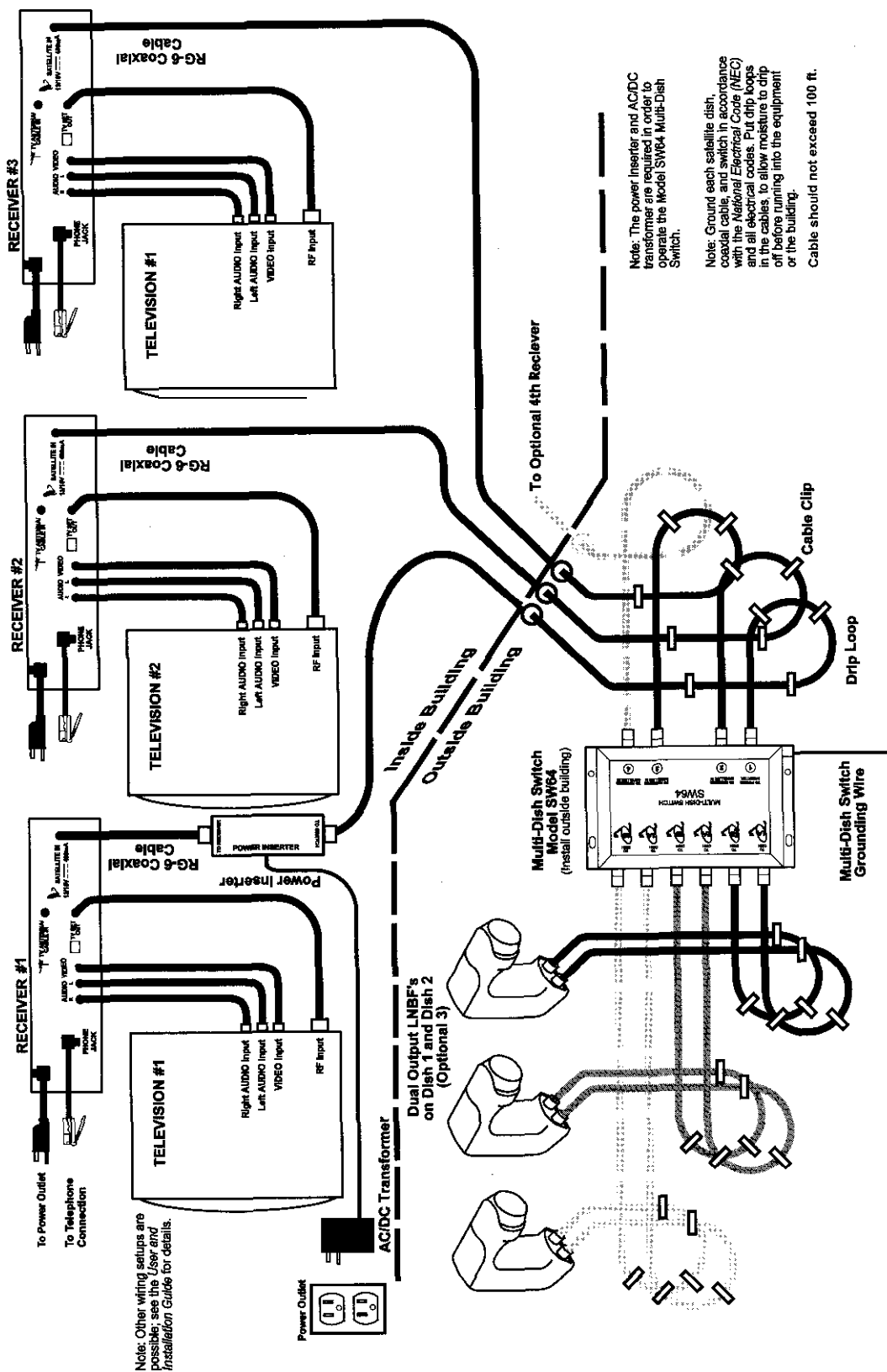
Installation Instructions

MODEL SW64 MULTI-DISH SWITCH

You must install the power inserter and AC/DC transformer included in the SW64 Multi-Dish Kit to provide power for the switch and the LNBs (as shown in the diagram below).

1. Route a coaxial cable from the **TO POWER INSERTER** connection on the multi-dish switch to the **TO SWITCH** connection on the power inserter.
2. Route another coaxial cable from the **TO RECEIVER** connection on the power inserter to the **SATELLITE IN** connection on the back panel of one of the receivers.
3. Route the AC/DC transformer power cord to the **POWER IN** connection on the power inserter.
4. Plug the AC/DC transformer into a wall outlet.





Note: The power inserter and AC/DC transformer are required in order to operate the Model SW64 Multi-Dish Switch.

Note: Ground each satellite dish, coaxial cable, and switch in accordance with the National Electrical Code (NEC) and all electrical codes. Put drip boots in the cables to allow moisture to drip off before running into the equipment or the building.
Cable should not exceed 100 ft.

Installation Instructions

CHECKING THE MULTI-DISH SWITCH SETUP

Once you have aimed the satellite dishes at the appropriate satellites, connected the multi-dish switch, and then grounded and wired the system, you *must* check the switch setup. Use the **Point Dish and Signal Strength menu** to do this check.



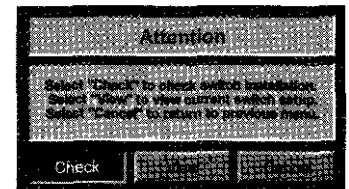
If your setup includes more than one receiver, you must repeat this check using the **Point Dish and Signal Strength menu** displayed by each receiver in the setup.

1. Press the **Menu** button to open the **Main Menu**.

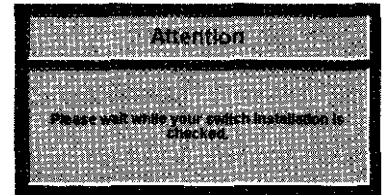
Note: Remote control buttons and on-screen menus vary among systems. See the *User Guide* that came with your system.

2. Select the **System Setup** option.
3. Select the **Installation and Setup** option.
4. Select the **Multi-Dish Installation** option.
5. Select the **Check Switch** option.

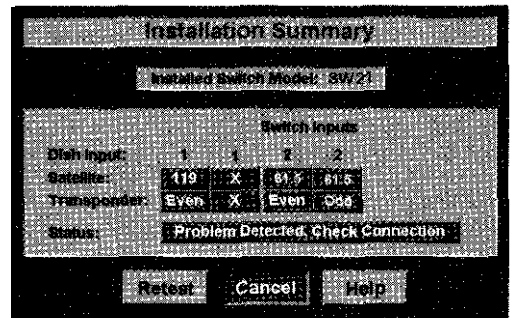
6. The receiver displays an **Attention** message. Select the **Check** option.



7. The receiver displays another **Attention** message (as shown) asking you to wait until the switch setup check is done, and giving you the status of the check.



8. When the setup is finished, the receiver displays the **Installation Summary** menu. On the **Installation Summary** menu, the **Installed Switch Model** field displays either the multi-dish switch model number, or "Unknown" if no switch is installed or there is a problem with the switch. The **Dish Input** fields display the satellite designation (61.5, 119, or 148) and the polarity (even or odd) of the satellite transponder for each input from each satellite dish.



The letter X in a box indicates that there is no satellite signal on that satellite and polarity. This may indicate a problem with the satellite cabling or the switch box. The **Status** field displays either a message that the switch setup is correct, or appropriate **error** messages. If a problem is detected, recheck your connections and select **Retest**.

For help information, highlight and select the **Help** option.