

# **Installation Instructions**

D1000.4 EA and D1000.4 WA

## Attention and Warning Symbols

You must be aware of safety when you install and use this system. This guide provides various procedures. If you do some of these procedures carelessly, you could injure or kill yourself or damage equipment or property. Some other procedures require special attention.



Marks a procedure where the following may happen:

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



Marks the following issues:

- Important operation or maintenance instructions follow.
- Special attention is required.

## Important Safety Instructions

You must keep safety in mind when you install and use the D1000.4 Eastern Arc (EA) or the D1000.4 Western Arc (WA) antenna assembly. Refer to the safety instructions in this guide. In this guide, the following notes tell you when you need to pay special attention:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.

Keep the following in mind when you install the D1000.4 EA or the D1000.4 WA satellite system:

- Before you drill any holes in your building, make sure there are no wires or pipes near the holes.
- Install the equipment in accordance with the local building and electrical codes. If you are not sure, call a licensed building inspector or electrician for help.
- Never install the antenna assembly near power lines.
- Don't install the antenna assembly 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.

**Note to Satellite TV System Installer:** This reminder is provided to call the antenna installer's attention to the *National Electrical Code*® (NEC) which provides guidelines for proper bonding and grounding of antennas and their associated cabling.

# Installation Instructions



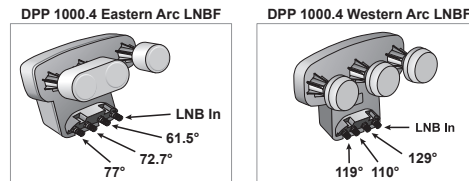
**Attention!** These installation instructions are intended for use by qualified professional technicians due to the complexity of the installation and compliance to national/local building and electrical codes.



Never handle coaxial connection installations that are connected to a receiver or accessory when that receiver or accessory is plugged into a live AC outlet.

## Overview

These instructions guide you through the installation of a DISH D1000.4 EA (Eastern Arc) and D1000.4 WA (Western Arc) antenna system, which consists of a reflector and a DISH Pro Plus Eastern Arc or Western Arc LNBF.



The DISH 1000.4 is capable of receiving digital arc television signals from three DBS satellite locations of 61.5°W, 72.7°W, and 77°W for EA and 110°W, 119°W, and 129°W for WA. These instructions cover wall mounting only. For other mounting options (for example, pole mounting or non-penetrating mounting), see the Retailer Care Site at [retailer.dishnetwork.com](http://retailer.dishnetwork.com).

## Installation Considerations

The DISH 1000.4 includes enhanced peaking controls for the azimuth and elevation settings that provide the ability to more easily obtain an optimal peaking of the antenna system. Refer to Figure 1 on page 2 for more details on the enhanced peaking controls for Eastern Arc and Figure 2 on page 3 for Western Arc.

The fine-tune azimuth and elevation settings require the use of a 1/2" wrench. All other nuts and bolts use a 7/16" wrench.

All DISH 1000.4 Eastern Arc equipment is marked with the circled A symbol shown below to help in identification. Only MPEG-4 capable receivers are fully compatible with Eastern Arc installations. These receivers have the Circle A marking. DISH ViP-series receiver models must have the circled A symbol shown on their Contents and Features label to be installed in an Eastern Arc DISH 1000.4 system.



The restriction of equipment marked with a circled A does not apply to Western Arc installations.

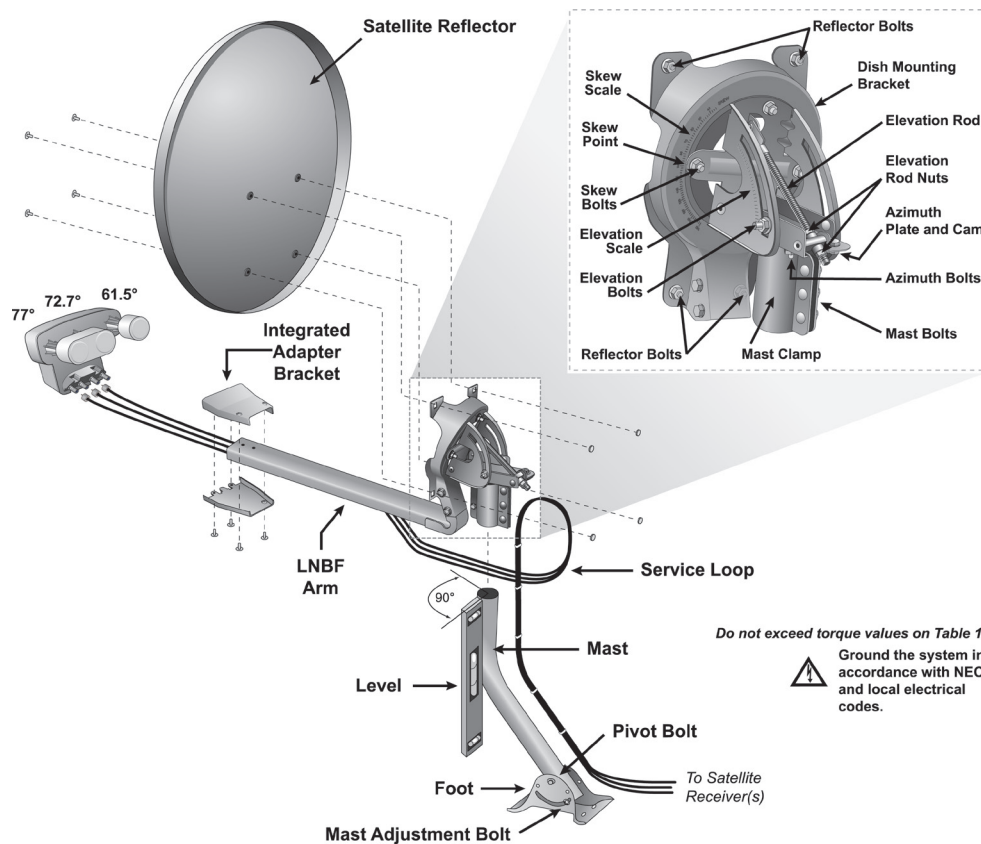
## About the System

The DISH Pro Plus 1000.4 LNBFs provide reception from the Eastern Arc 61.5°W, 72.7°W, and 77°W or from the Western Arc 110°W, 119°W, and 129°W orbital locations and provide an LNBF input port to receive programming from another satellite. The following LNBF types can be connected to the LNBF input port: DISH Pro Single, DISH Pro Dual, DISH Pro Dual Band, or DISH bandstacked LNBFs.

The LNBF assembly supports connection of up to three satellite receivers in any of the following combinations:

- Single-coaxial connection to DISH Pro Plus (dual-tuner) receivers, when each input is used with a DISH Pro Plus Triplexer or a DISH Pro Plus Separator.
- Single-coaxial connection to DISH Pro receivers.

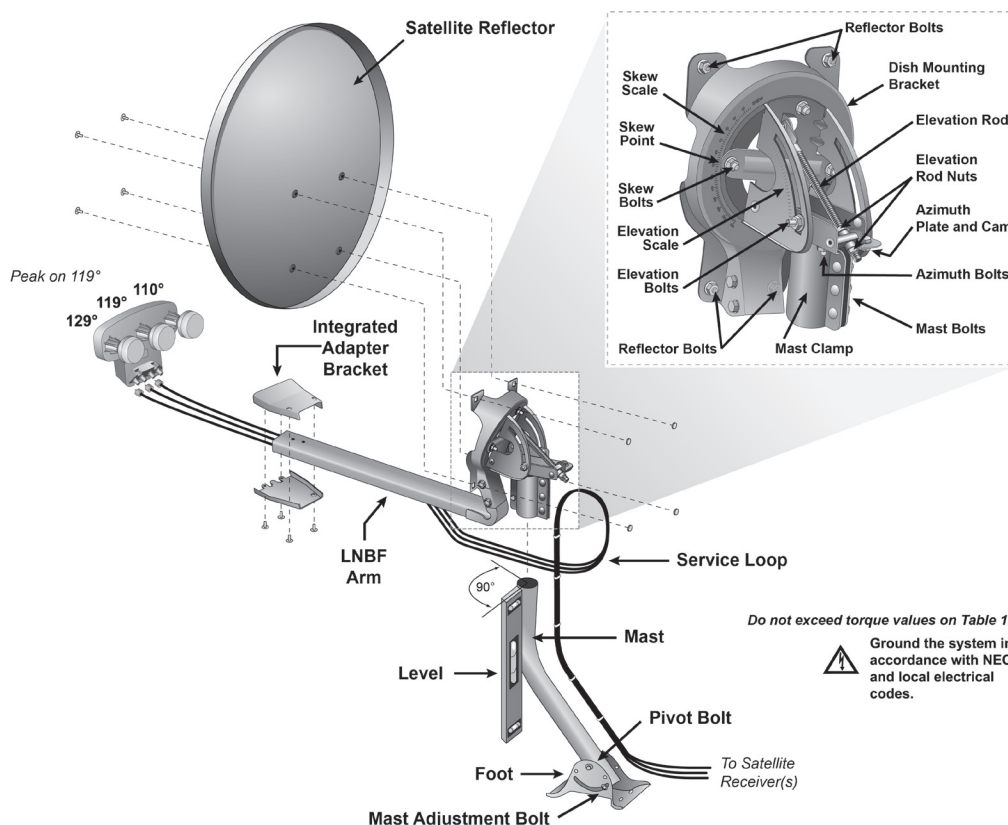
# Quick Installation Instructions for Eastern Arc (EA)



**Figure 1. DISH 1000.4 Antenna Installation Overview for Eastern Arc**

1. Find Elevation/Skew/Azimuth angles for your location (instructions on page 4 and table begins on page 16).
2. Find a location for the reflector with a clear line of sight and a sturdy mounting surface (page 4, step 1).
3. Mount the mast, making sure it is absolutely vertical (page 4, steps 2-4). If applicable, attach struts to the mast, using the instructions that came with the struts.
4. Assemble the antenna assembly, setting the skew and elevation angles in the process (page 5, steps 5-7).
5. Mount the antenna assembly on the mast and point the reflector to the azimuth angle (page 6, step 8).
6. Run coaxial between the antenna system and the receiver(s), leaving a service loop around the Mast Clamp (page 7, steps 1-2). Attach coaxial to the mast using zip ties.
7. Using a peaking meter attached to the EA DPP 1000.4 LNBF **Port 2**, rough peak the reflector on 72.7°W using transponder 5 or 9 for maximum strength. Lock the mast clamp bolts (see Table 1) and reconfirm signal (page 8, steps 3-4). **Note:** If using a peaking meter, only odd transponders are detected from 72.7°W at this time.
8. Using the azimuth fine-tune cam, fine-tune the azimuth angle to achieve maximum signal. Tighten the bolts labeled with a T and reconfirm signal. Do not tighten the azimuth fine-tune cam (page 9, step 5).
9. Using the elevation rod, fine-tune the elevation angle to achieve maximum signal. Tighten the top elevation rod nut, and then tighten the side elevation bolts marked T. Reconfirm signal after tightening all elevation bolts (page 9, step 6).
10. For DP and DPP installations, connect the receiver coaxial connection(s) to the DPP 1000.4 EA LNBF **Port 1** (and **Port 2** and **Port 3** as necessary) (page 12, steps 1-3) and receiver. For DPX installations, connect the receiver coaxial connection(s) to the DPP 1000.4 EA LNBF **Port 1** (and **Port 2** and **Port 3** as necessary) (page 12, steps 9-10) and the Node, then to the DPX receiver. Connect TV and receiver.
11. If a Receiver Setup Wizard appears, continue with the on-screen prompts; when finished, continue with step 14. If a Receiver Setup Wizard does not appear, run **Check Switch** test and confirm 72.7°W and 61.5°W reception (page 13, steps 11-12).
12. Take a software download, if you did not already (page 14, step 13).
13. Run a **Check Switch** test and confirm 72.7°W and 61.5°W reception (page 14, step 14).
14. Install additional receiver(s), if necessary (page 14, step 15).
15. If applicable, connect a second reflector to the DPP 1000.4 EA LNBF's **LNB In** port (page 15, steps 1-4).

# Quick Installation Instructions for Western Arc (WA)



**Figure 2. DISH 1000.4 Antenna Installation Overview for Western Arc**

1. Find Elevation/Skew/Azimuth angles for your location (instructions on page 4 and table begins on page 22).
2. Find a location for the reflector with a clear line of sight and a sturdy mounting surface (page 4, step 1).
3. Mount the mast, making sure it is absolutely vertical (page 4, steps 2-4). If applicable, attach struts to the mast, using the instructions that came with the struts.
4. Assemble the antenna assembly, setting the skew and elevation angles in the process (page 5, steps 5-7).
5. Mount the antenna assembly on the mast and point the reflector to the azimuth angle (page 6, step 8).
6. Run coaxial between the antenna system and the receiver(s), leaving a service loop around the Mast Clamp (page 7, steps 1-2). Attach coaxial to the mast using zip ties.
7. Using a peaking meter attached to the DPP 1000.4 Western Arc LNBF **Port 1**, peak the reflector on 119°W using transponder 13 or 21 for maximum strength. Lock the mast clamp bolts (see Table 1) and reconfirm maximum signal (page 8, steps 2-3).
8. Using the azimuth fine-tune cam, fine-tune the azimuth angle to achieve maximum signal. Tighten the azimuth bolts labeled with a T and reconfirm signal (see Figure 9, page 9). Do not tighten the azimuth fine-tune cam (see page 9, step 5).
9. Using the elevation rod, fine-tune the elevation angle to achieve maximum signal. Tighten the top elevation rod nut and then tighten the elevation bolts marked T. Reconfirm signal after tightening all elevation bolts (page 9, step 6).
10. For DP and DPP installations, connect the receiver coaxial connection(s) to the DPP 1000.4 WA LNBF **Port 1** (and **Port 2** and **Port 3** as necessary) (page 12, steps 9-10) and receiver. For DPX installations, connect the receiver coaxial connection(s) to the DPP 1000.4 WA LNBF **Port 1** (and **Port 2** and **Port 3** as necessary) (page 12, steps 9-10) and the Node, then to the DPX receiver. Some restrictions apply when connecting Legacy receivers. See page 12. Connect TV and receiver.
11. If a Receiver Setup Wizard appears, continue with the on-screen prompts; when finished, continue with step 14. If a Receiver Setup Wizard does not appear, run **Check Switch** test and confirm 110°W, 119°W, and 129°W reception (page 13, steps 11-12).
12. Take a software download, if you did not already (page 14, step 13).
13. Run a **Check Switch** test and confirm 110°W, 119°W, and 129°W reception (page 14, step 14).
14. Install additional receiver(s), if necessary (page 14, step 15).
15. If applicable, connect a second reflector to the DPP1000.4 WA LNB's **LNB In** port (page 15, steps 1-4).

## Locating the Antenna Assembly

Use the *Reflector Angles* table starting on page 16 for Eastern Arc (EA) and on page 22 for Western Arc (WA) to find the elevation, skew, and azimuth angles using the ZIP code of your location. Write the angles in the space provided below.

Elevation: \_\_\_\_\_ Skew: \_\_\_\_\_ Azimuth: \_\_\_\_\_

Using these elevation and azimuth angles, find a mounting location for the antenna assembly where it can be pointed toward the satellites located at these angles.

## Assembling and Mounting the Antenna System

Follow these instructions to assemble the antenna system, mount it, and point it in the direction of the satellites.

- 1. Find location for the reflector.** Using a compass and the azimuth and elevation angles, find a location for the reflector where it can be pointed toward the satellites located at the angles provided in the *Reflector Angles* table. Make sure nothing blocks the line of sight between the reflector and the satellites. Check that the line of sight will not be blocked by future growth of nearby trees or other foliage. Also ensure the mounting location provides sufficient clearance to rotate the reflector as needed to point toward the satellites.
- 2. Mount mast to solid surface.** Mount the mast to a solid surface so that the reflector cannot move or be bumped out of alignment. Keep in mind that physical and environmental conditions can block your reflector's ability to receive a clear satellite signal. Never mount the antenna assembly to a tree or a public utility pole.
- 3. Install struts.** Install struts at this time, using the instructions that came with the struts.  
**Note:** Struts are not supplied or required with the optional short mast.
- 4. Align mast vertically.** Align the top part of the mast so that it is absolutely vertical. If the top part of the mast is off vertical by only a few degrees, it will be difficult or maybe even impossible for you to find the satellites. Take at least two readings with a level, on the upper mast, that are 90 degrees apart from one another (see Figure 3). Tighten all hardware to the torque values specified in Table 1 on page 8. Ensure everything is still plumb after tightening.

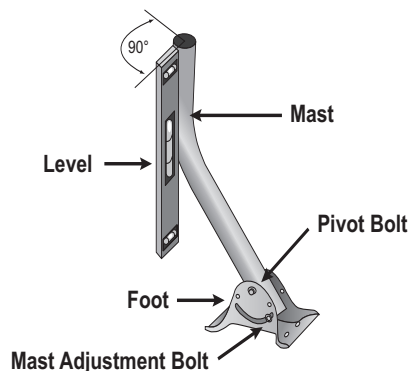
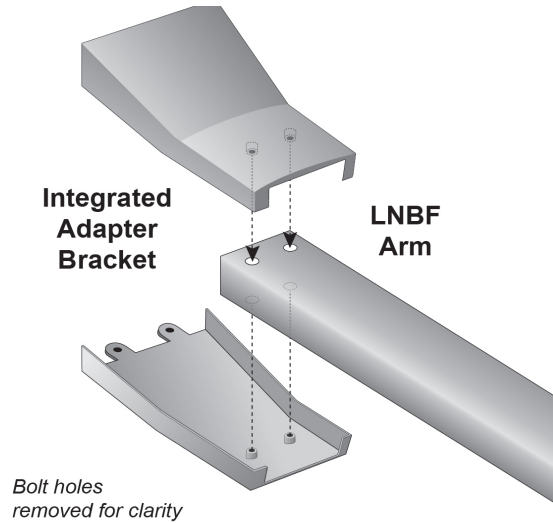


Figure 3. Vertical Alignment of the Mast

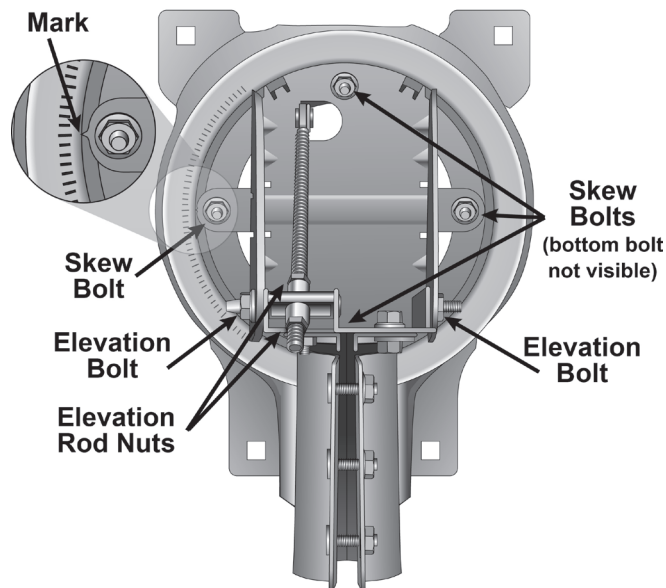
- 5. Assemble antenna assembly without LNBF.** Assemble the reflector, LNBF, integrated adapter bracket, LNBF arm, mounting bracket, and mast (antenna assembly) as shown in Figure 1 for Eastern Arc or Figure 2 for Western Arc. Do not attach the LNBF assembly at this time. When attaching the Integrated Adapter Bracket to the LNBF Arm, be sure that the small posts on the bracket fit into the holes on the LNBF Arm (see Figure 4).



**Figure 4. Bracket Posts Fitting into LNBF Arm**

- 6. Set skew.** To access the bottom skew bolt (the one not visible), loosen the elevation bolts and elevation rod nut fully and rotate elevation to the maximum value. Loosen both skew bolts. Set the skew by rotating the elevation and skew bracket to align the mark with the required angle on the skew scale that you entered on page 4 (see Figure 5). Tighten the skew bolts securely to keep the reflector from rotating. See Table 1 on page 8 for the required torque values.

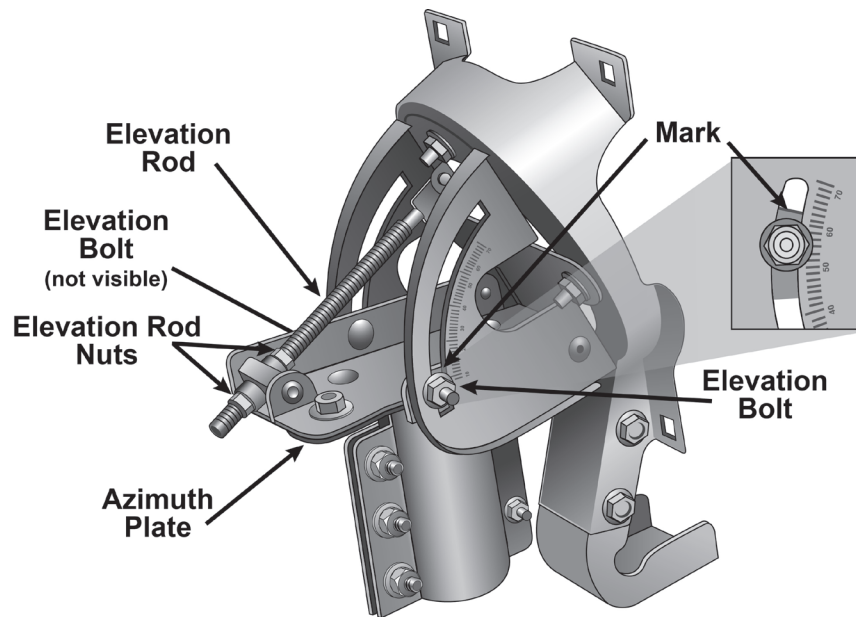
**Note:** After the skew is set, do not try to fine-tune the skew angle when aiming the reflector.



**Figure 5. Skew Plate**



- 7. Set elevation.** Set the elevation by loosening the elevation bolts and the elevation rod nuts. Tilt the elevation and skew bracket to align the edge of the azimuth plate with the required angle on the elevation scale (see Figure 6). Tighten both nuts on the elevation rod to hold the elevation, but do not tighten the elevation bolts at this time.



**Figure 6. Setting the Rough Elevation Angle**

- 8. Mount the antenna assembly on the mast and point the reflector.** Slide the antenna assembly down onto the mast. Make sure the azimuth plate rests on the top of the mast. Turn the reflector so that it points in the general direction of the satellites, using a compass and the azimuth angle you wrote on page 4.

**Note:** The DISH 1000.4 mast clamp has a gripping feature that helps prevent movement of the reflector when fully installed. This gripping feature may have a slightly rough feel when installing the reflector onto the mast or when adjusting the azimuth angle.



## Peaking the Antenna Assembly

Use the steps below while referring to Figure 1, page 2 for Eastern Arc (EA) or Figure 2, page 3 for Western Arc (WA).

**Note:** Use RG-6 coaxial connections from the D1000.4 EA and D1000.4 WA antenna system to the receiver location(s), using the following cabling requirements. Grounding, other devices, and in-home cabling must also meet these requirements.

- RG-6 coaxial connection rated for at least 950 MHz to 3 GHz must be used in this installation. Do not use existing coaxial connections such as RG-59 as it may cause signal loss. Also, be sure that any outdoor connections are made using waterproof F-connectors rated for 3 GHz or greater.
- The length of the RG-6 coaxial connection from any receiver and farthest antenna assembly connected in the system must not be longer than the following values:
  - 200 feet for DISH Pro, DISH Pro Plus, or DISH Pro X receivers.
  - 100 feet for Legacy receivers (only in D1000.4 WA installations).
- The coaxial connection length between the DISH 1000.4 and a connected compatible LNB must be 80 feet or less.



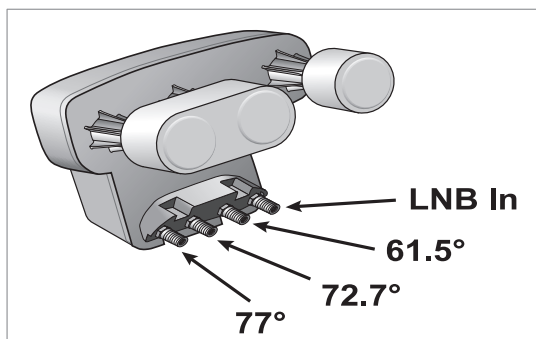
The coaxial connection's center conductor must not extend past the rim of the F-connector; it must be more than flush with the F-connector and no more than the thickness of a nickel.



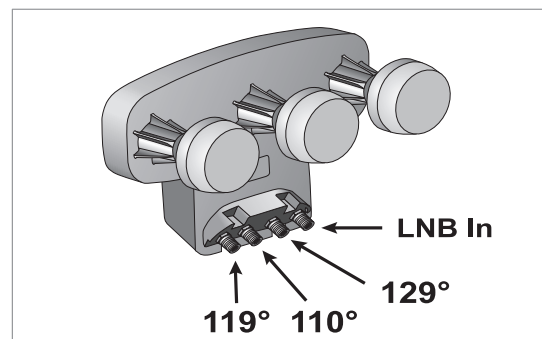
Tighten all outdoor coaxial connections up to the torque values recommended by the manufacturer to ensure seal against moisture. Damage caused by over-tightening is not covered by the limited warranty. Tighten all indoor coaxial connections to the receiver only by hand. If you use a wrench, you may over-tighten the connections and damage your equipment.

- 1. Connect peaking meter to LNB.** Connect a temporary coaxial connection to a peaking meter. Connect the temporary cable to **Port 2** for Eastern Arc (72.7°W) or **Port 1** for Western Arc (119°W) of the DISH Pro Plus LNB (see Figure 7). **Port 2** provides signal from the 72.7° satellite, while **Port 1** provides signal from the 119° satellite.

**DPP 1000.4 Eastern Arc LNB**



**DPP 1000.4 Western Arc LNB**



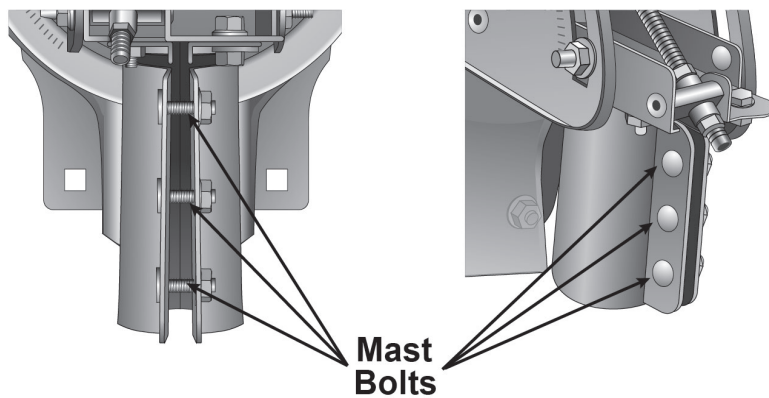
**Figure 7. Bottom View of LNB Assembly Showing Port 2 (71.7°W) and Port 1 (119°W) on DISH Pro Plus Eastern and Western Arc LNB**

- 2. Mount LNB onto LNB arm.** Mount the LNB assembly on the adapter bracket and LNB arm as shown on Figure 1, page 2 for Eastern Arc or Figure 2, page 3 for Western Arc.

- 3. Rough peak the reflector for signal on 72.7°W for Eastern Arc or 119°W for Western Arc.** Rough peak the reflector for the strongest possible signal on the 72.7°W for Eastern Arc or 119°W for Western Arc satellite signal using the azimuth and elevation settings you wrote on page 4. Do not adjust the skew.

**Note:** If you cannot find the Eastern Arc 72.7°W or Western Arc 119°W signal, try adjusting the elevation up or down one or two degrees. When peaking on Eastern Arc 72.7°W, use transponder 5 or 9. When peaking on Western Arc 119°W, use transponder 13 or 21.

- 4. Tighten three mast bolts and reconfirm signal strength.** With the peaking meter still connected, confirm that the front two mast bolts (the mast bolts that are closest to the reflector) are tight. Tighten the three mast bolts labeled with a T to the torque values listed in Table 1 (see Figure 8). Reconfirm signal strength after tightening the bolts. Peaking goal at this point is to get signal locked. Maximizing signal is in a later step.



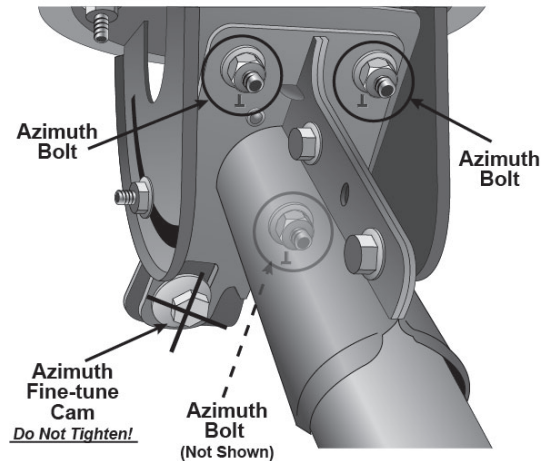
**Figure 8. Mast Bolts**

**Table 1: Torque Values**

Location	Torque Value (ft-lbs unless otherwise noted)
Mast pivot through bolt (ensure no mast deformation occurs during tightening)	3
Mast locking nuts	12
Reflector mounting bolts	8
Mast bolts	12
Elevation bolts	12
Elevation rod nuts	Handtight
Azimuth bolts (do not tighten azimuth fine-tune cam)	12
Skew bolts	12
LNBF arm to elevation and skew bracket bolts	4
LNB and LNBF bracket attachment hardware	Handtight

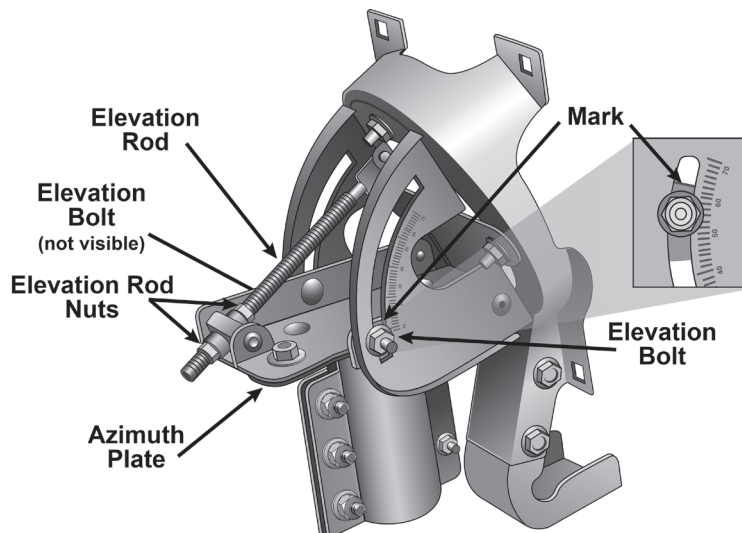
- 5. Fine-tune the azimuth angle.** With the peaking meter still connected, fine-tune the azimuth angle (see Figure 9). Ensure the three azimuth bolts are finger-tight. Using a 1/2" wrench, rotate the azimuth fine-tune cam to adjust the azimuth angle to achieve maximum signal. After obtaining maximum signal, tighten the three azimuth bolts labeled with a T to the recommended torque value given in Table 1. **Do not torque the azimuth fine-tuning cam nut.**

**Note:** You can adjust the azimuth angle three degrees in either direction using the azimuth fine-tune cam. If the azimuth angle needs to be adjusted more than three degrees, loosen the mast bolts to make the adjustment.



**Figure 9. Fine Tuning the Azimuth Angle**

- 6. Fine-tune elevation angle.** Using the peaking meter, fine-tune the elevation angle. Using a 1/2" wrench, loosen the top elevation nut on the elevation rod to allow the reflector to be moved up and down in elevation. Move the bottom elevation nut along the elevation rod to adjust the reflector's elevation angle and to achieve maximum signal. After obtaining maximum signal, tighten the top elevation nut on the elevation rod, then tighten the elevation bolts labeled with a T to the recommended torque value given in Table 1 (see Figure 10).



**Figure 10. Fine Tuning the Elevation Angle**

**7. Optional. Use only if connecting more than three receivers. Connect LNBF and switch.** Remove the temporary cable used for peaking the reflector.

**Eastern Arc—Connecting the DPP 1000.4 Eastern Arc LNBF to a DPP44 Switch**

The DPP 1000.4 Eastern Arc LNBF can be connected to provide 61.5°W, 72.7°W, and 77°W satellite signals to a DISH Pro Plus 44 switch. Refer to the instructions provided with the switch for additional considerations and instructions. Signal for a fourth satellite location must be provided directly from the fourth satellite location's LNBF to the DPP switch (see Figure 11). The **LNBF In** port on the DPP 1000.4 Eastern Arc LNBF must not be connected. In this installation, the DPP 1000.4 Eastern Arc LNBF defaults to the following settings:

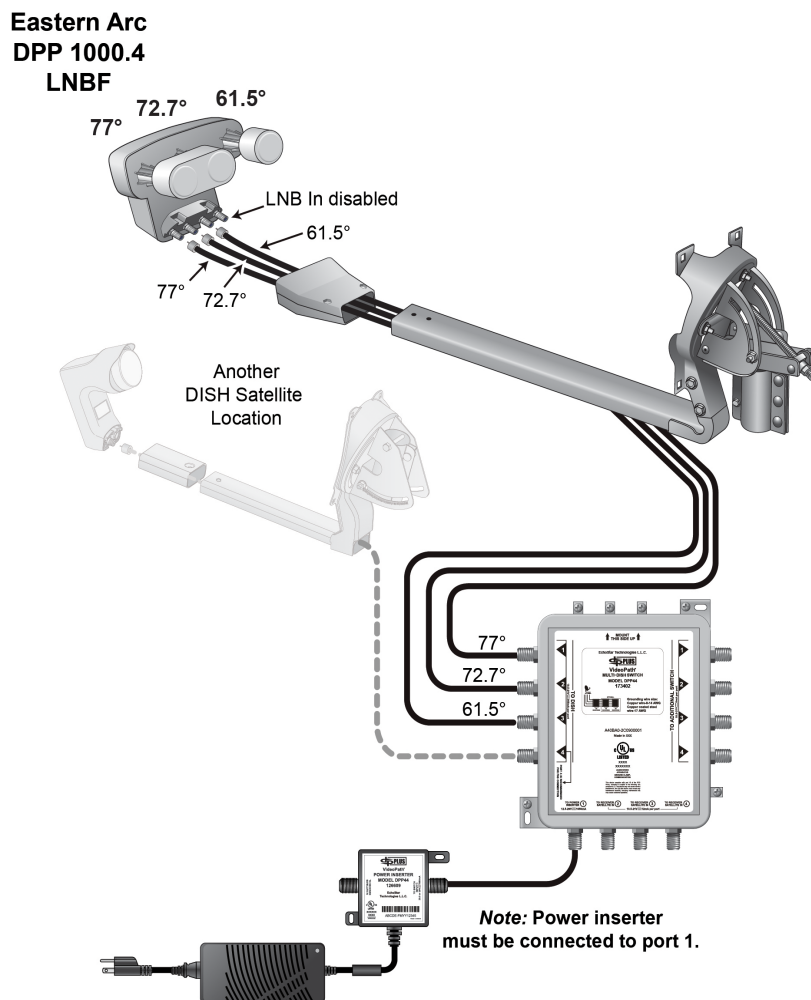
**Port 1**—77°W

**Port 2**—72.7°W

**Port 3**—61.5°W

**LNBF In**—Disabled when DPP 1000.4 Eastern Arc LNBF is connected to a switch. When connected to a switch, any LNBF connected to the **LNBF In** port must be disconnected from the DPP 1000.4 Eastern Arc LNBF and connected directly to that switch.

**Note:** The DPP 1000.4 Eastern Arc LNBF is NOT compatible with DISH Pro switches or the DISH Pro Plus 33 Switch in any installation.



**Figure 11. Eastern Arc DPP 1000.4 and DPP44 Switch Connection**

## Western Arc—Connecting the DPP 1000.4 Western Arc LNBF to a DPP44 Switch

**Restrictions:** If all the receivers are legacy receivers for a Western Arc DPP 1000.4, then you have to use a switch.

The DPP 1000.4 Western Arc LNBF can be connected to provide 119°W, 110°W, and 129°W satellite signals to a DISH Pro Plus 44 switch. Refer to the instructions provided with the switch for additional considerations and instructions. Signal for a fourth satellite location must be provided directly from the fourth satellite location's LNBF to the DPP switch. The **LNB In** port on the DPP 1000.4 Western Arc LNBF must not be connected (see Figure 12). In this installation, the DPP 1000.4 Western Arc LNBF defaults to the following settings:

**Port 1**—119°W

**Port 2**—110°W

**Port 3**—129°W

**LNB In**—Disabled when DPP 1000.4 Western Arc LNBF is connected to a switch. When connected to a switch, any LNBF connected to the **LNB In** port must be disconnected from the DPP 1000.4 Western Arc LNBF and connected directly to that switch.

**Note:** The DPP 1000.4 Western Arc LNBF is NOT compatible with DISH Pro switches or the DISH Pro Plus 33 switch in any installation.

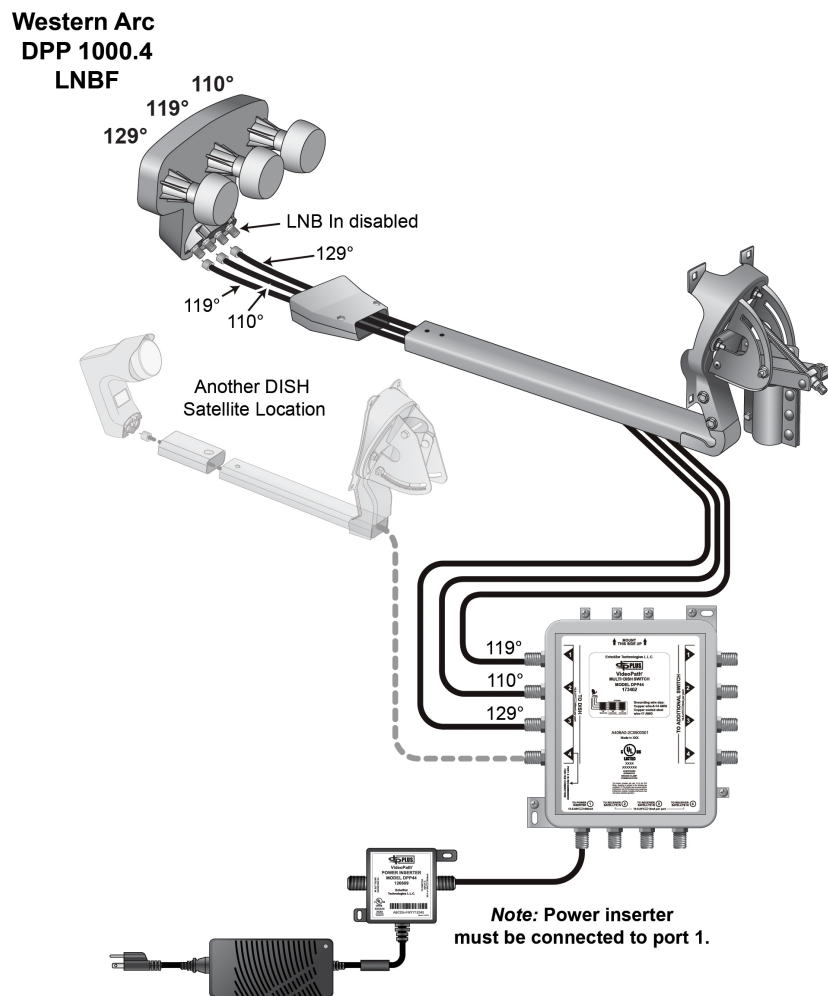


Figure 12. Western Arc DPP 1000.4 and DPP 44 Switch Connection

- 8. Optional. Use this step only if there are more than three receivers. Connect switch and receiver.** Connect the cable(s) from the switch's **Port 1** (or **Port 2**, **Port 3**, or **Port 4**, as applicable) to a receiver's **Satellite In** connection(s).



Tighten all indoor coaxial cable connections to the receiver only by hand. If you use a wrench, you may over-tighten the connections and damage your equipment.

## 9. Connecting DPP Receivers

To connect DISH Pro Plus (dual-tuner) receivers with a single coaxial connection, install a DISH Pro Plus Triplexer as follows:

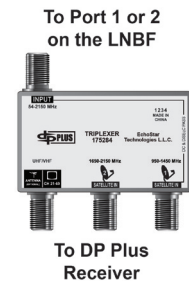
- Connect a coaxial connection from the LNBF output (**Port 1**, **Port 2**, or **Port 3**) to the DISH Pro Plus Triplexer Input.
- Connect coaxial connections between the receiver's **Satellite In 1** and **Satellite In 2** to **Satellite In 1** and **Satellite In 2** respectively on the DISH Pro Plus Triplexer.



You must use a DISH Pro Plus Triplexer to achieve a single-coaxial connection installation with a dual-tuner receiver. A splitter or other device will not work in this configuration.

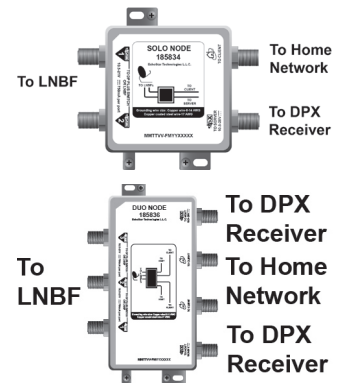


Tighten all indoor coaxial connections to the receiver only by hand. If you use a wrench, you may over-tighten the connections and damage your equipment.



## Connecting DPX Receivers

- Connect a coaxial connection from the LNBF output (**Port 1**, **Port 2**, or **Port 3**) to either a Solo or Duo Node. The LNBF output goes into the Node (either **Port 1**, **Port 2**, or **Port 3** for a Duo or **Port 1** or **Port 2** for a Solo Node).
- From the Node's **DPX** port, connect a coaxial connection to the DPX receiver's **To Node DPX** port.
- Connect the Node to the DPX receiver and to the Home Network. For additional information, see the *Product Launch Bulletin, Whole-Home HD DVR System*.



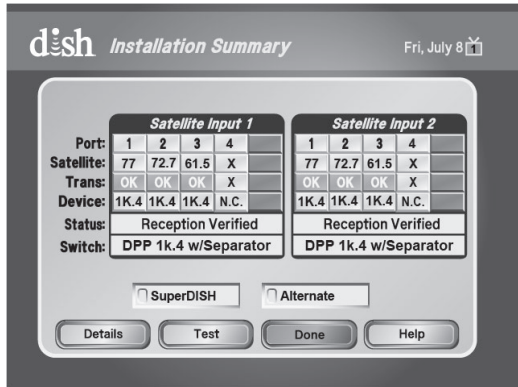


- 10. Connect TV and receiver.** Connect the receiver(s) to the TV(s) and power on the receiver(s) and the TV(s). If a Receiver Setup Wizard displays, follow the on-screen prompts for this Wizard to program the remote to the receiver, download software, and run **Check Switch**. Proceed to step 14 after the Receiver Setup Wizard is complete.

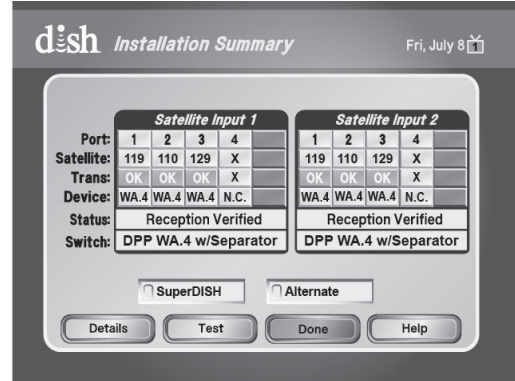
**Note:** The Download Software step of the Receiver Setup Wizard fails to proceed if the reflector is not pointed correctly. If you see a pop-up instructing you to make sure that all cables leading to the receiver are connected securely and correctly, verify your reflector is pointed correctly before selecting **Continue** on this screen.

If a Receiver Setup Wizard does not appear, display the **Point Dish** screen (if not shown, for most receivers, press MENU-1-1 if in Factory software or MENU-6-1-1 if in Production software on the remote control) and continue to step 11.

- 11. Run Check Switch.** From the **Point Dish** screen, run **Check Switch**. When the Check Switch procedure finishes, you should see an **Installation Summary** screen similar to the ones shown below. Make sure the summary screen shows reception from the satellites—61.5°W and 72.7°W for EA and 119°W, 110°W, and 129°W for WA on all available satellite tuners.



**Figure 13. EA 1000.4 Installation Summary**



**Figure 14. WA 1000.4 Installation Summary**



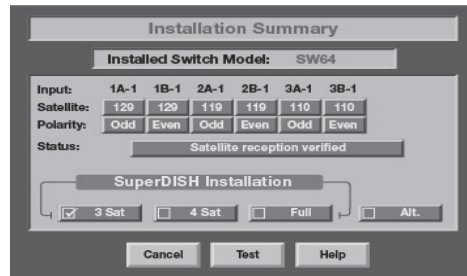
**Figure 15. DPX Installation Summary**

The summary screen below (see Figure 16) is similar to what should be shown for a legacy



receiver connected to the Western Arc DISH 1000.4. Eastern Arc does not support legacy receivers. Make sure the summary screen shows reception from 110°W, 119°W, and 129°W for Western Arc satellites on all available satellite tuners.

**Note:** Legacy receiver models 1000, 3000, and 4000 cannot receive signals and will not detect signal from the 129°W satellite locations. Select **3 SAT** or **4 SAT** for DISH 1000.4 on a legacy receiver.



**Figure 16. Western Arc 1000.4 Legacy Installation Summary**

- 12. Verify signal strength bar is green and locked.** Exit the **Installation Summary** screen to display the **Point Dish/Signal** screen. Make sure the signal strength bar is green and locked for the 61.5°W and 72.7°W EA satellites and 119°W, 110°W, and 129°W for WA satellites.

**Note:** You might not see signal from all satellites or proper LNBF identification until you take a software download and run a check switch in steps 13 and 14.

- 13. Take a software download.** Exit the **Point Dish/Signal** screen and follow the onscreen instructions for taking a receiver software download. Do not disturb the receiver during the process of downloading software. If exiting the **Point Dish** screen does not start the download process, put the receiver in standby mode for at least 20 minutes (on most receivers) to allow the receiver to take a software download.

- 14. Run Check Switch.** Run **Check Switch** again and confirm reception for all satellites on all available satellite tuners. Your **Installation Summary** screen should be similar to the ones shown above in step 11. Software on some models may identify the DPP 1000.4 LNBF as a **DPP 1K.4**. This identification is OK.

- 15. Install additional receivers.** If installing an additional receiver, follow steps 9 through 14 on pages 12-14. Make sure the summary screen shows reception from the 61.5°W and 72.7°W satellites for EA and from 110°W, 119°W, and 129°W satellites for WA. Keep in mind that a DISH Pro, DISH Pro Plus, or a DISH Pro X receiver must remain connected and powered at all times to power the LNBF.

## Connecting a Second Reflector

After completing the previous sections to install the DISH 1000.4, use these instructions to add a fourth satellite location from a second reflector to the DISH 1000.4. The LNBF from the second reflector must be a DISH Pro Single, DISH Pro Dual, DISH Pro Dual Band, or a DISH Network bandstacked LNBF.

1. Install and peak the second reflector using a peaking meter and the instructions that come with that reflector. Skip any steps regarding taking a receiver software upgrade since this was done in the previous section of the DISH 1000.4 Installation Instructions.
2. Run cable from the second reflector location to the DISH 1000.4 or the DPP44 switch, referring to the cable requirements stated in step 1 on page 7.
3. Connect the coaxial cable between the LNBF on the second reflector and the **LNB In** port on the DPP 1000.4 LNBF. Refer to Figure 1, page 2 for Eastern Arc or Figure 2, page 3 for Western Arc.
4. From the **Point Dish** screen (accessed by pressing MENU-6-1-1 on most receivers), run **Check Switch** again on all connected receivers. When the Check Switch procedure finishes, you should see a summary screen similar to the summary screen below (see Figure 17). Make sure the summary screen shows reception from the 61.5°W, 72.7°W, and 77°W satellites for EA and reception from the 110°W, 119°W, and 129°W for WA and the fourth satellite location on all available satellite tuners. If there is not reception, adjust the wing satellite reflector as needed to achieve the required signal levels. Confirm the installed LNBF on the second satellite reflector is correctly identified.



Figure 17. Examples of Installation Summary Screen

# Eastern Arc Reflector Angles

Use the table below as follows for Eastern Arc. **Note:** For Western Arc, go to page 22.

1. Find the ZIP code for your location.
2. Find the row that contains the ZIP code or the first three digits of the ZIP code. For example, the correct row for ZIP code 80112 is 801XX.
3. Write down the number in the EL column in the “Elevation” blank on page 4.
4. Write down the number in the SK column in the “Skew” blank on page 4.
5. Write down the number in the AZ column in the “Azimuth” blank on page 4.

ZIP Code	EL	SK	AZ
00008	9	60	91
00013	24	48	104
00019	23	49	104
00020	25	47	105
00022	21	47	100
00025	22	50	104
00028	23	104	48
00031	25	44	102
00032	26	104	44
00033	23	48	104
00034	20	49	102
00035	21	49	103
00037	21	48	101
00038	22	48	102
00039	21	48	101
00040	25	47	105
00044	24	47	104
00047	22	47	102
00048	22	47	102
00049	20	49	101
00050	20	48	101
00051	24	47	104
00052	24	47	104
00054	20	48	101
00055	21	48	101
00058	25	47	105
00065	23	48	104
00087	56	75	167
00097	59	73	164
00116	50	60	141
00119	51	61	144
00120	51	61	143
00124	48	62	143
00125	36	93	204
00126	38	92	201
00127	38	95	205
00128	38	92	199
00130	37	94	205

ZIP Code	EL	SK	AZ
00132	37	93	203
00133	38	92	201
00134	38	95	206
00135	37	93	203
00136	37	94	204
00137	36	94	206
00138	37	94	205
00139	38	92	200
00140	38	92	201
00141	38	94	205
00145	38	93	202
00147	38	92	201
00148	36	94	206
00151	38	95	206
00152	46	87	187
00155	46	86	185
00156	46	86	184
00157	45	86	184
00159	42	92	198
00160	32	75	157
00161	32	74	154
00164	30	71	146
00165	30	71	147
00166	31	71	147
00168	39	92	199
00169	39	92	199
00170	38	92	199
00172	39	91	199
00173	39	91	199
00174	39	91	199
00176	39	91	199
00177	39	91	199
00179	39	91	199
00180	39	91	199
00181	39	91	199
00182	39	91	199
00183	39	92	199
00184	39	92	199

ZIP Code	EL	SK	AZ
00185	39	91	199
00186	38	91	199
00187	38	92	199
00188	48	51	128
00189	48	51	129
00190	38	91	198
00191	38	91	198
00192	38	91	198
00195	17	53	100
00198	-2	77	62
00199	33	45	111
00200	33	44	110
00201	35	46	112
00203	27	45	105
00205	26	46	105
00206	27	44	104
00214	26	42	103
00215	26	42	103
00216	27	43	104
00217	26	46	105
00218	23	48	103
00219	34	57	124
00222	54	75	166
00223	58	74	165
00225	56	75	167
00226	59	74	165
00228	59	74	166
00229	55	74	165
00232	57	72	162
00234	58	75	166
00236	24	54	109
00238	49	62	144
00241	32	73	154
00243	51	65	149
00246	24	60	117
00250	35	52	120
00252	37	49	118
00255	41	58	133

ZIP Code	EL	SK	AZ
00257	18	51	101
00258	20	52	103
00259	20	50	103
00260	19	53	102
00266	29	53	115
00267	17	57	104
00268	20	55	105
00270	19	54	104
00276	26	58	117
00277	18	57	104
00278	19	52	103
00279	26	58	116
00280	24	48	104
00281	28	55	115
00282	28	55	116
00283	41	81	176
00284	38	90	197
00285	43	89	191
00286	49	83	180
00401	42	89	191
00501	43	90	193
00544	43	90	193
006XX	67	108	211
007XX	67	108	211
008XX	67	113	217
009XX	67	109	212
010XX	41	90	195
011XX	41	90	195
012XX	41	89	193
013XX	41	90	195
014XX	41	91	196
015XX	41	91	196
016XX	41	91	196
017XX	41	91	198
018XX	41	92	198
019XX	41	92	199
020XX	41	92	198
021XX	41	92	198

ZIP Code	EL	SK	AZ
022XX	41	92	198
023XX	41	92	199
024XX	41	92	198
025XX	42	92	199
026XX	42	93	200
027XX	42	92	197
028XX	42	91	197
029XX	42	91	197
030XX	41	91	198
031XX	40	91	198
032XX	40	91	197
033XX	40	91	198
034XX	40	91	196
035XX	39	91	199
036XX	40	90	196
037XX	40	91	197
038XX	40	92	198
039XX	40	92	199
040XX	40	92	200
041XX	40	93	201
042XX	39	92	200
043XX	39	93	202
044XX	38	94	205
045XX	39	93	201
046XX	38	95	206
047XX	36	94	206
048XX	39	94	203
049XX	38	93	202
050XX	39	90	196
051XX	40	90	195
052XX	40	90	194
053XX	40	90	195
054XX	39	90	196
055XX	41	92	198
056XX	39	90	196
057XX	40	90	194
058XX	39	91	197
059XX	38	91	198
060XX	42	90	194
061XX	42	90	194
062XX	42	91	196
063XX	42	91	196
064XX	42	90	194
065XX	42	90	194
066XX	42	89	193

ZIP Code	EL	SK	AZ
067XX	42	89	193
068XX	42	89	192
069XX	43	89	192
070XX	43	88	191
071XX	43	88	191
072XX	43	88	191
073XX	43	88	191
074XX	43	88	191
075XX	43	88	191
076XX	43	88	191
077XX	43	88	191
078XX	43	88	189
079XX	43	88	190
080XX	44	87	188
081XX	44	87	188
082XX	44	88	189
083XX	44	87	188
084XX	44	88	189
085XX	43	88	189
086XX	43	88	189
087XX	44	88	190
088XX	43	88	189
089XX	43	88	189
100XX	43	89	191
101XX	43	89	191
102XX	43	88	191
103XX	43	88	191
104XX	43	89	191
105XX	42	89	191
106XX	43	89	191
107XX	43	89	191
108XX	43	89	191
109XX	42	88	194
110XX	43	89	191
111XX	43	89	191
112XX	43	89	191
113XX	43	89	191
114XX	43	89	191
115XX	43	89	192
116XX	43	89	191
117XX	43	89	192
118XX	43	89	192
119XX	43	90	194
120XX	41	89	192
121XX	41	89	192

ZIP Code	EL	SK	AZ
122XX	41	89	192
123XX	41	89	192
124XX	41	88	191
125XX	42	89	192
126XX	42	89	191
127XX	42	88	190
128XX	40	89	193
129XX	39	89	193
130XX	40	86	187
131XX	40	86	187
132XX	40	86	187
133XX	40	87	189
134XX	40	87	189
135XX	40	87	189
136XX	39	87	190
137XX	41	87	188
138XX	41	87	188
139XX	41	86	187
140XX	40	84	181
141XX	40	84	181
142XX	40	83	181
143XX	40	83	181
144XX	40	85	184
145XX	40	85	184
146XX	40	85	184
147XX	41	83	181
148XX	41	85	184
149XX	41	85	185
150XX	43	81	177
151XX	43	82	177
152XX	43	82	177
153XX	43	81	176
154XX	43	82	177
155XX	43	83	179
156XX	43	82	178
157XX	42	83	179
158XX	42	83	180
159XX	43	83	180
160XX	42	82	177
161XX	42	81	176
162XX	42	82	179
163XX	41	82	179
164XX	41	82	177
165XX	41	82	177
166XX	43	83	180

ZIP Code	EL	SK	AZ
167XX	41	84	181
168XX	42	84	182
169XX	41	85	184
170XX	43	85	183
171XX	43	85	184
172XX	43	84	182
173XX	44	85	183
174XX	44	85	184
175XX	44	86	186
176XX	44	86	185
177XX	42	85	184
178XX	43	85	185
179XX	43	86	186
180XX	43	87	188
181XX	43	87	188
182XX	43	86	187
183XX	42	87	188
184XX	42	87	188
185XX	42	87	188
186XX	42	86	187
187XX	42	86	187
188XX	42	86	187
189XX	43	87	188
190XX	44	87	188
191XX	44	87	188
192XX	44	87	188
193XX	44	86	186
194XX	43	87	188
195XX	43	86	186
196XX	43	86	186
197XX	44	86	186
198XX	44	87	187
199XX	45	87	187
200XX	45	85	183
201XX	45	84	182
202XX	45	85	183
203XX	45	85	183
204XX	45	85	183
205XX	45	85	183
206XX	45	85	184
207XX	45	85	183
208XX	44	85	183
209XX	45	85	183
210XX	44	85	184
211XX	44	85	184

ZIP Code	EL	SK	AZ
212XX	44	85	184
214XX	45	85	184
215XX	44	82	179
216XX	45	86	186
217XX	44	84	183
218XX	46	86	186
219XX	44	86	186
220XX	45	84	182
221XX	45	84	182
222XX	45	85	183
223XX	45	85	183
224XX	46	85	183
225XX	46	85	183
226XX	44	83	180
227XX	45	83	180
228XX	45	82	178
229XX	46	83	179
230XX	46	84	182
231XX	46	84	182
232XX	46	84	181
233XX	47	86	185
234XX	47	86	185
235XX	47	85	184
236XX	47	85	184
237XX	47	85	184
238XX	47	84	181
239XX	47	82	179
240XX	46	80	175
241XX	46	80	175
242XX	46	77	169
243XX	46	79	172
244XX	45	82	177
245XX	46	82	176
246XX	46	78	170
247XX	46	79	172
248XX	46	79	172
249XX	45	80	175
250XX	45	79	172
251XX	45	79	172
252XX	44	79	172
253XX	45	79	172
254XX	44	84	181
255XX	45	78	170
256XX	45	78	170
257XX	44	78	170

ZIP Code	EL	SK	AZ
258XX	45	79	172
259XX	45	79	173
260XX	43	81	175
261XX	44	80	173
262XX	44	81	175
263XX	44	80	175
264XX	44	81	175
265XX	44	81	176
266XX	45	80	174
267XX	44	82	178
268XX	44	82	178
270XX	47	80	173
271XX	47	80	173
272XX	48	80	175
273XX	48	81	175
274XX	47	80	175
275XX	48	82	177
276XX	48	82	177
277XX	48	82	176
278XX	48	84	180
279XX	48	85	183
280XX	48	78	171
281XX	48	79	172
282XX	48	79	171
283XX	49	81	176
284XX	50	82	177
285XX	49	84	180
286XX	47	78	170
287XX	47	76	167
288XX	47	77	167
289XX	48	74	164
290XX	50	78	171
291XX	50	78	171
292XX	49	78	170
293XX	48	77	169
294XX	51	79	172
295XX	50	80	174
296XX	48	76	167
297XX	49	78	171
298XX	50	77	168
299XX	51	77	170
300XX	49	73	162
301XX	48	73	161
302XX	49	73	161
303XX	49	73	162

ZIP Code	EL	SK	AZ
304XX	51	76	167
305XX	48	74	164
306XX	49	75	165
307XX	48	73	161
308XX	50	76	167
309XX	50	76	167
310XX	50	74	164
311XX	49	73	162
312XX	50	74	163
313XX	52	76	168
314XX	52	77	168
315XX	52	75	165
316XX	52	73	163
317XX	51	72	161
318XX	50	72	160
319XX	50	72	160
320XX	53	74	165
321XX	54	75	166
322XX	53	75	167
323XX	52	71	160
324XX	52	69	157
325XX	51	67	153
326XX	54	73	164
327XX	55	75	166
328XX	55	75	166
329XX	56	76	168
330XX	59	74	166
331XX	59	75	167
332XX	59	75	166
333XX	58	75	167
334XX	58	75	168
335XX	56	73	163
336XX	56	72	162
337XX	56	72	161
338XX	56	73	164
339XX	57	72	163
342XX	56	72	161
344XX	55	73	164
346XX	55	72	162
347XX	55	74	165
349XX	57	75	168
350XX	48	70	156
351XX	48	70	156
352XX	48	70	156
354XX	48	68	154

ZIP Code	EL	SK	AZ
355XX	47	69	154
356XX	47	70	155
357XX	47	71	158
358XX	47	71	157
359XX	48	71	158
360XX	50	70	157
361XX	50	70	156
362XX	49	71	158
363XX	51	70	157
364XX	50	68	154
365XX	50	66	151
366XX	50	66	151
367XX	49	68	154
368XX	50	71	158
369XX	49	67	151
370XX	45	71	158
371XX	46	72	158
372XX	45	72	158
373XX	47	73	161
374XX	47	73	161
375XX	45	67	150
376XX	47	77	169
377XX	46	75	164
378XX	46	75	165
379XX	47	75	164
380XX	45	68	152
381XX	45	67	150
382XX	45	69	153
383XX	45	69	153
384XX	46	70	156
385XX	46	73	161
386XX	46	67	149
387XX	46	65	147
388XX	47	68	152
389XX	47	66	149
390XX	48	65	148
391XX	48	65	147
392XX	48	65	147
393XX	48	66	151
394XX	49	65	148
395XX	50	64	148
396XX	49	63	146
397XX	47	67	151
399XX	49	73	162
400XX	44	74	163

ZIP Code	EL	SK	AZ
401XX	44	73	161
402XX	44	74	162
403XX	44	76	165
404XX	45	75	164
405XX	44	75	164
406XX	44	75	164
407XX	45	75	164
408XX	46	76	167
409XX	46	76	166
410XX	43	76	166
411XX	44	77	169
412XX	45	77	169
413XX	45	76	167
414XX	45	77	167
415XX	45	78	169
416XX	45	77	169
417XX	45	76	167
418XX	46	77	167
420XX	44	70	155
421XX	45	73	160
422XX	45	72	158
423XX	44	72	158
424XX	44	71	156
425XX	45	75	164
426XX	45	74	163
427XX	45	73	161
430XX	42	78	169
431XX	43	78	169
432XX	43	78	169
433XX	42	78	169
434XX	41	78	171
435XX	41	77	168
436XX	41	78	169
437XX	43	79	172
438XX	42	79	172
439XX	43	80	174
440XX	41	80	174
441XX	41	80	174
442XX	42	80	174
443XX	42	80	174
444XX	42	81	175
445XX	42	81	176
446XX	42	80	174
447XX	42	80	174
448XX	41	79	171

ZIP Code	EL	SK	AZ
449XX	42	79	171
450XX	43	76	166
451XX	43	77	167
452XX	43	76	166
453XX	42	77	166
454XX	42	77	166
455XX	42	77	167
456XX	44	78	169
457XX	43	79	172
458XX	41	77	167
459XX	43	76	165
460XX	42	75	162
461XX	42	74	161
462XX	42	74	162
463XX	40	74	161
464XX	40	74	161
465XX	40	75	163
466XX	40	75	163
467XX	41	76	164
468XX	41	76	164
469XX	41	75	163
470XX	43	75	164
471XX	43	74	161
472XX	43	74	162
473XX	42	76	164
474XX	43	73	160
475XX	43	73	159
476XX	43	72	158
477XX	43	72	158
478XX	42	73	159
479XX	41	74	160
480XX	40	79	171
481XX	40	78	169
482XX	40	79	171
483XX	40	79	171
484XX	39	79	171
485XX	39	78	170
486XX	38	78	169
487XX	38	79	171
488XX	39	77	168
489XX	39	77	168
490XX	40	76	165
491XX	40	75	163
492XX	40	77	168
493XX	38	77	166

ZIP Code	EL	SK	AZ
494XX	38	76	164
495XX	39	76	165
496XX	37	77	166
497XX	36	79	170
498XX	35	76	163
499XX	34	75	160
500XX	37	68	146
501XX	37	68	146
502XX	37	68	146
503XX	37	68	146
504XX	36	69	148
505XX	36	68	146
506XX	37	70	149
507XX	37	70	150
508XX	38	67	144
509XX	37	68	146
510XX	35	67	142
511XX	35	66	141
512XX	35	67	142
513XX	35	68	144
514XX	36	67	143
515XX	37	66	143
516XX	37	66	142
520XX	38	71	153
521XX	37	71	151
522XX	38	70	151
523XX	38	70	151
524XX	38	70	151
525XX	39	69	148
526XX	39	70	151
527XX	38	71	153
528XX	39	71	153
530XX	37	74	159
531XX	38	74	159
532XX	38	74	159
534XX	38	74	160
535XX	38	73	156
537XX	38	73	156
538XX	37	72	153
539XX	37	73	156
540XX	34	71	151
541XX	36	75	160
542XX	37	75	161
543XX	36	75	161
544XX	36	74	156

ZIP Code	EL	SK	AZ
545XX	34	74	157
546XX	36	72	154
547XX	35	72	153
548XX	34	73	154
549XX	37	74	158
550XX	34	71	149
551XX	34	71	149
553XX	34	70	147
554XX	34	71	149
555XX	34	70	147
556XX	33	74	156
557XX	32	72	152
558XX	33	73	152
559XX	36	71	151
560XX	35	69	147
561XX	34	68	144
562XX	33	69	144
563XX	33	70	147
564XX	32	71	147
565XX	31	70	143
566XX	31	71	148
567XX	30	70	144
570XX	34	67	141
571XX	34	67	141
572XX	33	68	141
573XX	33	66	138
574XX	32	67	138
575XX	32	64	134
576XX	30	65	132
577XX	31	62	129
580XX	31	69	141
581XX	31	69	142
582XX	30	69	141
583XX	29	68	138
584XX	30	67	138
585XX	30	66	134
586XX	29	65	130
587XX	28	67	134
588XX	27	65	129
590XX	27	60	121
591XX	27	60	121
592XX	26	64	126
593XX	28	63	125
594XX	24	60	117
595XX	24	62	119

ZIP Code	EL	SK	AZ
596XX	24	59	116
597XX	25	58	115
598XX	23	58	112
599XX	22	59	112
600XX	39	74	159
601XX	39	73	158
602XX	39	74	159
603XX	39	74	159
604XX	40	73	159
605XX	39	73	158
606XX	39	74	159
607XX	39	74	159
609XX	40	73	158
610XX	38	72	156
611XX	38	73	156
612XX	39	71	153
613XX	39	72	156
614XX	39	71	153
615XX	40	71	154
616XX	40	71	155
617XX	40	72	156
618XX	41	72	158
619XX	41	72	157
620XX	41	70	153
622XX	42	70	153
623XX	40	69	151
624XX	42	72	156
625XX	41	71	155
626XX	41	70	153
627XX	41	71	154
628XX	43	71	155
629XX	43	70	154
630XX	42	69	150
631XX	42	69	152
633XX	41	69	150
634XX	40	69	149
635XX	39	68	148
636XX	42	68	150
637XX	43	69	152
638XX	44	68	152
639XX	43	68	150
640XX	40	66	144
641XX	39	65	143
644XX	38	66	143
645XX	39	66	143

ZIP Code	EL	SK	AZ
646XX	39	67	145
647XX	40	65	142
648XX	41	64	142
649XX	39	65	142
650XX	41	67	147
651XX	41	67	147
652XX	40	68	147
653XX	40	66	145
654XX	42	67	147
655XX	42	67	147
656XX	42	65	144
657XX	42	65	144
658XX	42	65	144
659XX	42	65	146
660XX	39	65	142
661XX	39	65	142
662XX	39	65	142
664XX	38	64	140
665XX	38	64	140
666XX	39	64	141
667XX	40	64	141
668XX	39	63	139
669XX	37	63	137
670XX	39	61	136
671XX	39	61	136
672XX	39	62	136
673XX	41	63	139
674XX	38	62	136
675XX	38	61	134
676XX	37	61	134
677XX	36	60	131
678XX	37	59	130
679XX	37	58	129
680XX	36	66	140
681XX	37	66	141
683XX	37	64	139
684XX	37	65	140
685XX	37	65	140
686XX	36	65	138
687XX	35	65	138
688XX	35	63	135
689XX	36	63	135
690XX	35	61	131
691XX	34	61	131
692XX	33	63	133

ZIP Code	EL	SK	AZ
693XX	32	61	128
700XX	50	62	146
701XX	50	63	146
703XX	50	61	144
704XX	50	63	146
705XX	49	60	141
706XX	48	59	140
707XX	49	62	144
708XX	49	62	144
710XX	46	61	141
711XX	46	61	140
712XX	47	63	144
713XX	48	61	142
714XX	47	61	141
716XX	46	64	145
717XX	45	63	142
718XX	45	62	141
719XX	44	63	142
720XX	44	65	146
721XX	44	65	145
722XX	45	64	145
723XX	45	67	149
724XX	44	67	149
725XX	44	66	147
726XX	43	65	144
727XX	42	63	141
728XX	43	63	143
729XX	43	63	141
730XX	41	59	134
731XX	41	59	134
733XX	45	54	130
734XX	43	59	135
735XX	41	57	132
736XX	40	58	131
737XX	40	60	134
738XX	39	59	132
739XX	38	57	128
740XX	41	61	138
741XX	41	62	138
743XX	42	63	140
744XX	42	62	139
745XX	43	61	137
746XX	40	61	137
747XX	43	60	137
748XX	42	60	136

ZIP Code	EL	SK	AZ
749XX	43	62	140
750XX	44	58	135
751XX	44	58	135
752XX	44	58	134
753XX	44	58	134
754XX	44	59	136
755XX	45	61	139
756XX	45	60	138
757XX	45	59	136
758XX	46	57	135
759XX	47	59	138
760XX	44	57	133
761XX	44	57	133
762XX	43	58	133
763XX	42	57	132
764XX	43	56	131
765XX	45	55	132
766XX	45	56	133
767XX	45	56	132
768XX	43	54	129
769XX	43	53	127
770XX	47	56	134
772XX	47	56	134
773XX	47	57	135
774XX	47	55	133
775XX	48	56	135
776XX	48	58	137
777XX	48	58	137
778XX	46	56	133
779XX	47	53	130
780XX	46	52	128
781XX	46	53	129
782XX	46	52	129
783XX	47	51	128
784XX	48	52	129
785XX	48	49	126
786XX	45	54	130
787XX	45	54	130
788XX	44	51	125
789XX	46	55	132
790XX	39	56	127
791XX	39	55	127
792XX	40	56	129
793XX	40	53	125
794XX	40	54	126



ZIP Code	EL	SK	AZ
795XX	42	54	128
796XX	42	54	128
797XX	41	51	124
798XX	40	48	120
799XX	38	48	118
800XX	33	57	124
801XX	34	57	124
802XX	33	57	124
803XX	33	57	124
804XX	33	57	122
805XX	33	58	125
806XX	33	58	125
807XX	34	59	128
808XX	34	57	126
809XX	34	57	124
810XX	35	56	125
811XX	34	54	122
812XX	34	55	122
813XX	33	53	118
814XX	32	54	119
815XX	32	54	118
816XX	32	56	121
820XX	32	59	125
821XX	26	58	117
822XX	31	60	126
823XX	30	58	121
824XX	28	59	120
825XX	28	58	119
826XX	30	59	123
827XX	30	61	126
828XX	28	60	123
829XX	29	56	117
830XX	27	57	117
831XX	28	56	117
832XX	27	56	114
833XX	25	54	111
834XX	26	57	115
835XX	22	57	109
836XX	23	54	109
837XX	24	54	109
838XX	21	58	110
840XX	29	54	115
841XX	28	54	115
842XX	28	54	114
843XX	28	55	114

ZIP Code	EL	SK	AZ
844XX	28	54	114
845XX	31	53	116
846XX	29	53	114
847XX	30	50	112
850XX	33	46	112
852XX	33	46	112
853XX	32	46	110
855XX	34	47	114
856XX	35	45	112
857XX	34	46	112
859XX	34	48	115
860XX	32	49	113
863XX	32	47	112
864XX	30	47	110
865XX	33	50	116
870XX	36	51	119
871XX	36	52	120
872XX	36	52	120
873XX	34	51	117
874XX	34	52	118
875XX	35	53	121
877XX	36	54	122
878XX	36	50	118
879XX	37	49	117
880XX	37	48	117
881XX	38	53	123
882XX	39	51	122
883XX	38	50	120
884XX	37	54	124
885XX	38	48	118
889XX	29	47	109
890XX	28	48	109
891XX	29	47	109
893XX	27	50	109
894XX	24	49	105
895XX	24	48	105
897XX	24	48	104
898XX	26	52	109
900XX	28	43	105
902XX	28	43	105
903XX	28	43	105
904XX	28	43	105
905XX	28	43	105
906XX	28	43	105
907XX	28	43	105

ZIP Code	EL	SK	AZ
908XX	28	43	105
910XX	28	44	105
911XX	28	44	105
912XX	28	44	105
913XX	27	43	105
914XX	28	43	105
915XX	28	44	105
916XX	28	43	105
917XX	28	44	105
918XX	28	44	105
919XX	30	43	106
920XX	29	43	106
921XX	29	43	106
922XX	30	44	107
923XX	29	45	106
924XX	28	44	106
925XX	29	44	105
926XX	28	43	105
927XX	28	43	105
928XX	28	43	105
930XX	27	43	104
931XX	26	43	104
932XX	26	45	104
933XX	27	44	105
934XX	25	44	103
935XX	27	45	106
936XX	25	46	104
937XX	25	46	104
938XX	25	46	104
939XX	24	44	102
940XX	23	45	101
941XX	23	45	101
942XX	23	47	103
943XX	23	45	101
944XX	23	45	101
945XX	23	46	101
946XX	23	46	102
947XX	23	46	102
948XX	23	46	102
949XX	22	46	101
950XX	23	45	102
951XX	23	45	102
952XX	24	46	103
953XX	24	46	103
954XX	22	46	101

ZIP Code	EL	SK	AZ
955XX	20	48	101
956XX	23	47	103
957XX	23	47	103
958XX	23	47	103
959XX	23	48	103
960XX	21	49	102
961XX	23	49	104
970XX	19	53	102
971XX	18	53	101
972XX	19	53	102
973XX	19	52	101
974XX	19	51	101
975XX	20	50	101
976XX	21	51	104
977XX	21	52	104
978XX	21	54	106
979XX	23	54	108
980XX	18	55	102
981XX	18	55	102
982XX	17	56	102
983XX	18	55	102
984XX	18	55	102
985XX	17	54	101
986XX	18	54	102
988XX	19	56	105
989XX	19	55	104
990XX	20	57	108
991XX	20	57	107
992XX	20	57	108
993XX	20	55	106
994XX	22	56	108
998XX	6	61	87
999XX	8	60	90

# Western Arc Reflector Angles

Use the table below as follows for Western Arc. **Note:** For Eastern Arc, go to page 16.

1. Find the ZIP code for your location.
2. Find the row that contains the ZIP code or the first three digits of the ZIP code. For example, the correct row for ZIP code 80112 is 801XX.
3. Write down the number in the EL column in the “Elevation” blank on page 4.
4. Write down the number in the SK column in the “Skew” blank on page 4.
5. Write down the number in the AZ column in the “Azimuth” blank on page 4.

ZIP Code	EL	SK	AZ
00001	15	71	118
00002	12	78	121
00003	17	69	118
00004	16	73	121
00006	15	76	122
00007	9	78	117
00008	26	83	141
00010	11	71	116
00011	17	74	122
00013	44	89	163
00019	42	89	162
00020	45	90	165
00022	43	85	157
00025	41	89	161
00028	43	88	161
00031	47	88	163
00032	48	89	165
00033	43	89	163
00034	41	86	157
00035	41	88	160
00037	42	86	158
00038	42	87	160
00039	42	86	157
00040	45	90	165
00044	44	90	163
00047	43	87	160
00048	43	86	159
00049	41	85	157
00050	41	85	157
00051	44	89	163
00052	44	89	163
00054	41	85	157
00055	41	86	157

ZIP Code	EL	SK	AZ
00058	45	90	165
00065	43	88	162
00087	36	139	243
00097	38	142	243
00116	44	128	221
00119	43	130	224
00120	43	130	224
00124	42	127	221
00125	17	125	257
00126	19	126	256
00127	18	128	259
00128	19	126	254
00130	18	127	258
00132	18	126	257
00133	19	126	256
00134	18	128	259
00135	18	126	257
00136	18	126	258
00137	17	126	259
00138	17	127	259
00139	19	127	255
00140	19	127	256
00141	18	127	259
00145	19	127	256
00147	19	127	256
00148	17	126	259
00151	17	128	260
00152	26	131	248
00155	27	131	246
00156	27	130	246
00157	27	130	246
00159	21	130	254
00160	28	113	216

ZIP Code	EL	SK	AZ
00161	28	113	214
00164	29	109	205
00165	29	110	207
00166	29	110	207
00168	20	127	255
00169	20	127	255
00170	20	126	254
00172	20	127	255
00173	20	127	255
00174	20	127	255
00176	20	127	255
00177	20	127	255
00179	20	127	255
00180	20	127	255
00181	20	127	254
00182	20	127	254
00183	20	127	255
00184	20	127	255
00185	20	127	254
00186	20	126	254
00187	20	126	254
00188	49	125	213
00189	49	124	213
00190	20	126	254
00191	20	126	254
00192	20	126	254
00195	36	86	154
00198	16	75	122
00199	50	100	180
00200	51	100	179
00201	50	103	183
00203	47	91	167
00205	46	91	166

ZIP Code	EL	SK	AZ
00206	48	90	167
00214	49	89	165
00215	49	89	165
00216	49	90	166
00217	47	91	167
00218	43	88	161
00219	42	107	191
00222	36	137	240
00223	37	141	243
00225	36	139	243
00226	38	142	244
00228	37	142	244
00229	36	137	240
00232	38	139	240
00234	37	141	244
00236	39	93	168
00238	42	128	222
00241	28	112	213
00243	41	130	227
00246	34	97	175
00250	45	107	190
00252	48	108	191
00255	43	116	206
00257	38	86	156
00258	38	87	158
00259	40	87	159
00260	37	88	158
00266	42	99	178
00267	33	88	158
00268	36	90	161
00270	36	89	159
00276	37	98	177
00277	33	89	159

ZIP Code	EL	SK	AZ
00278	38	87	158
00279	37	98	177
00280	44	89	163
00281	40	99	177
00282	40	99	178
00283	27	125	238
00284	20	126	252
00285	24	129	250
00286	30	133	245
00401	24	129	250
00501	23	130	252
00544	23	130	252
006XX	27	157	268
007XX	27	157	268
008XX	26	158	270
009XX	27	157	268
010XX	22	128	252
011XX	22	128	252
012XX	22	128	251
013XX	22	128	252
014XX	21	128	253
015XX	22	129	253
016XX	22	129	253
017XX	21	129	254
018XX	21	129	254
019XX	21	129	255
020XX	21	129	255
021XX	21	129	255
022XX	21	129	255
023XX	21	129	255
024XX	21	129	255
025XX	21	130	255
026XX	21	130	256
027XX	21	129	254
028XX	22	129	254
029XX	22	129	254
030XX	21	128	254
031XX	21	128	254
032XX	21	127	254

ZIP Code	EL	SK	AZ
033XX	21	128	254
034XX	21	128	252
035XX	20	127	254
036XX	21	128	252
037XX	21	127	253
038XX	20	128	254
039XX	20	128	255
040XX	20	128	255
041XX	20	128	256
042XX	20	127	255
043XX	19	128	257
044XX	18	127	259
045XX	19	128	256
046XX	18	128	259
047XX	17	126	259
048XX	19	128	258
049XX	19	127	257
050XX	21	127	253
051XX	22	127	252
052XX	22	127	251
053XX	22	128	252
054XX	21	126	252
055XX	21	129	254
056XX	21	126	252
057XX	22	127	251
058XX	20	126	253
059XX	20	126	254
060XX	22	129	251
061XX	22	129	251
062XX	22	129	253
063XX	22	129	253
064XX	23	129	252
065XX	23	129	251
066XX	23	129	251
067XX	23	129	251
068XX	23	129	251
069XX	23	129	250
070XX	24	129	250
071XX	24	129	250

ZIP Code	EL	SK	AZ
072XX	24	129	250
073XX	24	129	250
074XX	24	129	249
075XX	24	129	250
076XX	24	129	250
077XX	24	129	250
078XX	24	129	248
079XX	24	129	249
080XX	25	130	248
081XX	25	129	248
082XX	25	130	249
083XX	25	130	248
084XX	25	130	249
085XX	25	129	248
086XX	25	129	248
087XX	24	130	249
088XX	24	129	248
089XX	24	129	248
100XX	24	129	250
101XX	24	129	250
102XX	24	129	250
103XX	24	129	250
104XX	24	129	250
105XX	23	129	250
106XX	24	129	250
107XX	24	129	250
108XX	24	129	250
109XX	24	129	252
110XX	24	129	250
111XX	24	129	250
112XX	24	129	250
113XX	24	129	250
114XX	24	129	250
115XX	24	129	250
116XX	24	129	250
117XX	23	129	250
118XX	24	129	250
119XX	23	130	252
120XX	23	127	250

ZIP Code	EL	SK	AZ
121XX	23	127	250
122XX	23	127	250
123XX	23	127	250
124XX	23	128	249
125XX	23	128	250
126XX	23	128	249
127XX	24	128	249
128XX	22	127	250
129XX	22	125	250
130XX	24	126	246
131XX	24	126	245
132XX	24	126	246
133XX	23	126	247
134XX	23	126	247
135XX	23	126	247
136XX	23	125	248
137XX	24	127	247
138XX	24	127	246
139XX	24	127	246
140XX	26	125	241
141XX	26	125	241
142XX	26	125	241
143XX	26	124	241
144XX	25	125	243
145XX	25	125	243
146XX	25	125	243
147XX	26	125	241
148XX	25	126	244
149XX	25	126	244
150XX	28	126	239
151XX	28	126	239
152XX	28	126	239
153XX	28	126	239
154XX	28	127	240
155XX	28	127	241
156XX	28	127	240
157XX	27	126	241
158XX	27	126	241
159XX	27	127	241

ZIP Code	EL	SK	AZ
160XX	28	126	239
161XX	28	125	238
162XX	27	126	240
163XX	27	125	240
164XX	27	125	238
165XX	27	125	238
166XX	27	127	242
167XX	26	126	242
168XX	26	127	243
169XX	25	126	244
170XX	26	128	244
171XX	26	128	244
172XX	27	128	244
173XX	26	128	244
174XX	26	128	245
175XX	26	129	246
176XX	26	129	246
177XX	26	127	245
178XX	26	128	245
179XX	25	128	246
180XX	25	128	247
181XX	25	129	247
182XX	25	128	247
183XX	24	128	247
184XX	24	128	247
185XX	25	128	247
186XX	25	128	247
187XX	25	128	247
188XX	25	127	246
189XX	25	129	248
190XX	25	129	248
191XX	25	129	248
192XX	25	129	248
193XX	26	129	247
194XX	25	129	248
195XX	25	128	246
196XX	25	129	246
197XX	26	129	247
198XX	26	129	247

ZIP Code	EL	SK	AZ
199XX	26	130	247
200XX	27	129	245
201XX	27	129	244
202XX	27	129	245
203XX	27	129	245
204XX	27	129	245
205XX	27	129	245
206XX	27	130	245
207XX	27	129	245
208XX	27	129	245
209XX	27	129	245
210XX	26	129	245
211XX	26	129	245
212XX	26	129	245
214XX	27	130	245
215XX	28	128	242
216XX	26	130	247
217XX	27	129	244
218XX	26	131	248
219XX	26	129	247
220XX	27	129	244
221XX	27	129	244
222XX	27	129	245
223XX	27	129	245
224XX	28	130	245
225XX	28	130	245
226XX	28	129	243
227XX	28	129	243
228XX	28	129	241
229XX	29	129	242
230XX	28	131	245
231XX	28	131	245
232XX	28	130	244
233XX	27	131	247
234XX	27	132	247
235XX	28	132	247
236XX	28	132	246
237XX	28	132	247
238XX	28	131	245

ZIP Code	EL	SK	AZ
239XX	29	130	243
240XX	30	129	240
241XX	30	129	240
242XX	32	128	236
243XX	31	129	238
244XX	29	129	241
245XX	30	130	241
246XX	31	128	236
247XX	31	128	238
248XX	31	128	237
249XX	30	128	239
250XX	30	127	237
251XX	30	127	237
252XX	30	127	237
253XX	30	127	237
254XX	27	128	243
255XX	31	127	235
256XX	31	127	236
257XX	31	127	235
258XX	31	128	237
259XX	30	128	238
260XX	29	126	238
261XX	30	127	237
262XX	29	128	239
263XX	29	127	238
264XX	29	127	238
265XX	29	127	239
266XX	30	128	238
267XX	28	128	241
268XX	28	128	241
270XX	31	130	239
271XX	31	130	239
272XX	31	131	241
273XX	31	131	241
274XX	31	131	241
275XX	30	132	242
276XX	30	132	242
277XX	30	131	242
278XX	29	132	244

ZIP Code	EL	SK	AZ
279XX	28	133	246
280XX	32	131	238
281XX	32	131	239
282XX	32	131	238
283XX	31	132	242
284XX	31	133	244
285XX	29	133	245
286XX	32	130	237
287XX	33	129	235
288XX	33	129	235
289XX	34	129	233
290XX	33	132	239
291XX	33	132	239
292XX	33	132	239
293XX	33	130	237
294XX	33	134	241
295XX	32	133	242
296XX	34	130	236
297XX	32	131	238
298XX	34	132	238
299XX	34	134	240
300XX	35	130	233
301XX	36	129	232
302XX	36	130	233
303XX	35	130	233
304XX	35	133	238
305XX	34	130	234
306XX	35	131	235
307XX	35	128	231
308XX	34	132	237
309XX	34	132	237
310XX	36	132	235
311XX	35	130	233
312XX	35	131	235
313XX	34	134	239
314XX	34	134	239
315XX	35	134	238
316XX	36	134	237
317XX	37	133	235

ZIP Code	EL	SK	AZ
318XX	36	131	233
319XX	37	131	233
320XX	36	135	239
321XX	36	137	240
322XX	36	136	240
323XX	38	134	235
324XX	38	133	233
325XX	40	131	230
326XX	37	136	239
327XX	36	138	241
328XX	36	138	241
329XX	36	139	243
330XX	37	142	244
331XX	37	142	244
332XX	37	142	244
333XX	37	141	244
334XX	37	141	244
335XX	37	138	240
336XX	38	138	240
337XX	38	138	239
338XX	37	138	241
339XX	38	140	241
342XX	38	138	240
344XX	37	137	239
346XX	38	137	239
347XX	37	138	240
349XX	36	140	244
350XX	37	128	228
351XX	37	128	228
352XX	37	128	228
354XX	38	128	227
355XX	37	127	227
356XX	37	127	227
357XX	36	127	229
358XX	36	127	229
359XX	36	128	230
360XX	38	130	231
361XX	38	130	230
362XX	36	129	230

ZIP Code	EL	SK	AZ
363XX	38	132	232
364XX	39	130	229
365XX	40	130	228
366XX	40	130	228
367XX	38	129	228
368XX	37	130	232
369XX	39	129	227
370XX	35	126	227
371XX	35	126	228
372XX	35	126	228
373XX	35	128	231
374XX	35	128	231
375XX	38	124	222
376XX	32	129	236
377XX	33	128	233
378XX	33	128	233
379XX	34	128	233
380XX	37	124	223
381XX	38	124	222
382XX	36	124	223
383XX	37	125	224
384XX	36	126	226
385XX	34	127	230
386XX	38	125	222
387XX	40	125	222
388XX	38	126	225
389XX	39	125	222
390XX	40	127	223
391XX	40	127	223
392XX	40	127	223
393XX	39	128	226
394XX	41	129	225
395XX	41	130	226
396XX	41	127	223
397XX	39	127	225
398XX	37	133	236
399XX	35	130	233
400XX	33	125	230
401XX	34	125	228

ZIP Code	EL	SK	AZ
402XX	33	125	228
403XX	32	126	232
404XX	33	126	231
405XX	32	126	231
406XX	33	125	230
407XX	33	127	232
408XX	32	128	234
409XX	33	127	233
410XX	32	125	232
411XX	31	126	234
412XX	31	127	235
413XX	32	127	233
414XX	32	127	233
415XX	31	128	235
416XX	32	127	235
417XX	32	127	234
418XX	32	127	234
420XX	36	124	224
421XX	34	126	229
422XX	35	125	227
423XX	34	124	226
424XX	35	124	225
425XX	33	126	231
426XX	34	127	231
427XX	34	125	229
430XX	30	125	233
431XX	30	125	234
432XX	30	125	233
433XX	30	124	233
434XX	29	123	234
435XX	30	123	231
436XX	29	123	232
437XX	29	126	236
438XX	29	125	235
439XX	29	126	237
440XX	28	124	236
441XX	28	124	236
442XX	28	125	236
443XX	28	125	236

ZIP Code	EL	SK	AZ
444XX	28	125	237
445XX	28	125	238
446XX	29	125	237
447XX	29	125	237
448XX	29	124	234
449XX	29	124	234
450XX	31	124	231
451XX	31	125	232
452XX	32	125	231
453XX	31	124	231
454XX	31	124	231
455XX	31	124	231
456XX	31	126	234
457XX	30	126	236
458XX	30	123	231
459XX	32	125	231
460XX	32	123	227
461XX	32	123	227
462XX	32	123	227
463XX	31	121	225
464XX	31	120	225
465XX	31	121	227
466XX	31	121	227
467XX	31	122	228
468XX	31	122	228
469XX	31	122	228
470XX	32	124	230
471XX	33	124	228
472XX	32	124	228
473XX	31	123	229
474XX	33	123	227
475XX	34	123	226
476XX	34	123	226
477XX	34	123	225
478XX	33	122	225
479XX	32	122	226
480XX	28	122	233
481XX	29	122	232
482XX	28	123	233

ZIP Code	EL	SK	AZ
483XX	28	122	233
484XX	28	122	232
485XX	28	122	232
486XX	28	120	230
487XX	28	121	232
488XX	29	121	230
489XX	29	121	230
490XX	30	121	228
491XX	31	121	227
492XX	29	122	231
493XX	29	120	228
494XX	30	120	226
495XX	29	120	228
496XX	28	119	227
497XX	27	119	230
498XX	28	117	224
499XX	28	115	221
500XX	35	115	211
501XX	34	116	212
502XX	34	116	211
503XX	35	116	211
504XX	33	115	212
505XX	34	114	210
506XX	33	116	213
507XX	33	116	215
508XX	36	115	210
509XX	35	116	211
510XX	35	113	206
511XX	35	113	206
512XX	34	112	206
513XX	34	113	208
514XX	35	114	208
515XX	36	114	208
516XX	36	115	209
520XX	33	117	217
521XX	32	116	215
522XX	33	117	216
523XX	33	117	216
524XX	33	117	216

ZIP Code	EL	SK	AZ
525XX	35	117	214
526XX	34	118	216
527XX	33	118	218
528XX	33	118	218
530XX	30	118	222
531XX	31	119	222
532XX	31	119	222
534XX	31	119	224
535XX	32	118	219
537XX	31	118	220
538XX	32	117	217
539XX	31	117	219
540XX	31	114	213
541XX	29	117	222
542XX	29	118	223
543XX	29	117	223
544XX	30	116	218
545XX	29	115	218
546XX	31	116	217
547XX	31	115	215
548XX	30	114	215
549XX	30	117	221
550XX	31	114	212
551XX	31	113	211
553XX	32	113	210
554XX	31	113	211
555XX	32	113	210
556XX	28	113	216
557XX	29	112	212
558XX	29	113	213
559XX	32	115	214
560XX	33	114	210
561XX	33	112	207
562XX	32	112	206
563XX	31	112	208
564XX	31	111	208
565XX	31	110	204
566XX	29	111	208
567XX	30	109	203

ZIP Code	EL	SK	AZ
570XX	34	111	204
571XX	34	112	205
572XX	33	110	204
573XX	35	110	202
574XX	33	109	199
575XX	35	108	197
576XX	34	107	194
577XX	36	106	191
580XX	31	109	202
581XX	31	109	203
582XX	30	108	201
583XX	31	107	198
584XX	32	108	199
585XX	33	106	194
586XX	33	105	191
587XX	31	105	193
588XX	32	103	189
590XX	35	100	181
591XX	36	100	181
592XX	32	102	185
593XX	34	103	186
594XX	34	97	175
595XX	33	99	177
596XX	35	97	174
597XX	36	97	174
598XX	35	95	170
599XX	34	94	169
600XX	31	119	223
601XX	32	119	223
602XX	31	120	223
603XX	31	120	223
604XX	32	120	223
605XX	32	120	223
606XX	31	120	223
607XX	31	120	223
609XX	32	121	223
610XX	32	118	220
611XX	32	119	220
612XX	33	118	218

ZIP Code	EL	SK	AZ
613XX	33	119	221
614XX	34	119	219
615XX	33	119	220
616XX	33	119	221
617XX	33	120	222
618XX	33	121	224
619XX	33	121	223
620XX	35	121	220
622XX	35	121	221
623XX	35	119	217
624XX	34	122	223
625XX	34	121	222
626XX	34	120	220
627XX	34	120	220
628XX	35	122	223
629XX	36	123	223
630XX	36	121	219
631XX	35	121	220
633XX	36	120	218
634XX	35	118	216
635XX	35	117	214
636XX	36	121	219
637XX	36	122	221
638XX	37	123	222
639XX	37	122	220
640XX	37	117	212
641XX	37	117	211
644XX	36	116	210
645XX	37	116	210
646XX	36	117	212
647XX	38	118	211
648XX	39	119	212
649XX	37	117	211
650XX	37	119	216
651XX	37	119	216
652XX	36	119	215
653XX	37	118	213
654XX	37	120	217
655XX	37	120	217

ZIP Code	EL	SK	AZ
656XX	38	120	214
657XX	38	120	215
658XX	38	119	214
659XX	39	120	216
660XX	38	116	210
661XX	37	117	210
662XX	37	117	210
664XX	38	115	207
665XX	38	115	207
666XX	38	116	209
667XX	39	117	211
668XX	39	116	208
669XX	38	113	204
670XX	40	115	205
671XX	40	115	205
672XX	40	115	206
673XX	39	117	209
674XX	39	114	205
675XX	40	113	202
676XX	39	112	201
677XX	40	110	198
678XX	41	112	199
679XX	42	111	198
680XX	36	113	206
681XX	36	114	207
683XX	37	114	206
684XX	37	114	206
685XX	37	114	206
686XX	36	112	204
687XX	36	112	203
688XX	37	111	201
689XX	38	112	201
690XX	39	110	198
691XX	38	109	196
692XX	37	109	197
693XX	38	107	192
700XX	42	129	225
701XX	42	129	225
703XX	43	129	223

ZIP Code	EL	SK	AZ
704XX	42	129	224
705XX	43	127	220
706XX	44	126	219
707XX	42	128	222
708XX	42	128	222
710XX	42	124	217
711XX	42	123	216
712XX	41	125	220
713XX	42	126	220
714XX	43	125	218
716XX	40	124	219
717XX	41	123	217
718XX	41	122	215
719XX	41	122	216
720XX	39	123	218
721XX	39	123	218
722XX	40	122	218
723XX	38	124	221
724XX	38	123	220
725XX	38	122	218
726XX	39	121	215
727XX	40	120	213
728XX	40	121	215
729XX	40	120	213
730XX	42	117	207
731XX	42	117	207
733XX	47	121	210
734XX	43	118	209
735XX	43	116	206
736XX	43	115	203
737XX	41	115	205
738XX	42	114	202
739XX	42	112	198
740XX	41	117	209
741XX	41	118	209
743XX	40	118	211
744XX	41	119	211
745XX	42	119	211
746XX	41	116	208

ZIP Code	EL	SK	AZ
747XX	42	120	212
748XX	42	118	209
749XX	41	120	213
750XX	44	120	210
751XX	44	120	211
752XX	44	120	210
753XX	44	120	210
754XX	43	120	211
755XX	42	122	214
756XX	43	122	215
757XX	44	122	213
758XX	44	122	213
759XX	44	124	216
760XX	44	119	209
761XX	44	119	209
762XX	44	119	208
763XX	44	117	206
764XX	45	118	207
765XX	46	121	210
766XX	45	121	210
767XX	45	121	210
768XX	47	118	206
769XX	47	117	204
770XX	46	124	215
772XX	46	124	215
773XX	45	124	215
774XX	46	124	214
775XX	46	125	216
776XX	45	125	217
777XX	45	125	217
778XX	46	122	213
779XX	47	123	212
780XX	48	121	209
781XX	48	122	210
782XX	48	121	209
783XX	49	124	212
784XX	49	124	213
785XX	50	125	213
786XX	47	121	210

ZIP Code	EL	SK	AZ
787XX	47	121	210
788XX	49	119	206
789XX	46	123	212
790XX	44	113	199
791XX	44	112	199
792XX	44	114	202
793XX	46	113	199
794XX	46	113	200
795XX	46	116	204
796XX	46	117	204
797XX	48	114	200
798XX	50	112	196
799XX	49	109	192
800XX	41	106	190
801XX	41	107	191
802XX	41	106	190
803XX	41	106	190
804XX	41	105	188
805XX	40	106	190
806XX	40	106	191
807XX	39	108	194
808XX	41	108	193
809XX	42	107	191
810XX	42	108	194
811XX	43	106	189
812XX	42	106	189
813XX	44	103	185
814XX	43	104	185
815XX	42	103	183
816XX	41	104	186
820XX	39	105	190
821XX	37	99	177
822XX	38	105	190
823XX	39	103	185
824XX	37	101	181
825XX	38	101	181
826XX	38	103	186
827XX	36	104	188
828XX	36	102	184



ZIP Code	EL	SK	AZ
829XX	40	100	180
830XX	38	99	177
831XX	39	99	179
832XX	39	97	175
833XX	39	95	171
834XX	38	97	175
835XX	36	93	166
836XX	38	93	167
837XX	39	93	168
838XX	34	93	166
840XX	41	99	178
841XX	41	98	177
842XX	41	98	176
843XX	40	98	176
844XX	41	98	176
845XX	43	101	181
846XX	43	99	177
847XX	45	98	177
850XX	49	100	181
852XX	49	101	181
853XX	49	99	178
855XX	49	103	184
856XX	50	103	184
857XX	50	103	183
859XX	48	103	184
860XX	47	101	180
863XX	48	100	179
864XX	47	97	176
865XX	46	103	184
870XX	46	107	189
871XX	46	107	190
872XX	46	107	190
873XX	46	104	186
874XX	45	104	186
875XX	45	107	190
877XX	44	108	192
878XX	47	106	189
879XX	48	107	190
880XX	49	107	189

ZIP Code	EL	SK	AZ
881XX	46	111	196
882XX	47	112	196
883XX	47	109	193
884XX	44	110	195
885XX	49	109	192
889XX	47	95	173
890XX	46	95	172
891XX	47	96	173
893XX	43	95	171
894XX	43	91	165
895XX	43	90	164
897XX	44	90	164
898XX	41	94	170
900XX	49	92	168
902XX	49	92	168
903XX	49	92	168
904XX	49	91	168
905XX	49	92	168
906XX	49	92	168
907XX	49	92	168
908XX	49	92	168
910XX	49	92	168
911XX	49	92	168
912XX	49	92	168
913XX	49	91	168
914XX	49	91	168
915XX	49	92	168
916XX	49	92	168
917XX	49	92	169
918XX	49	92	168
919XX	51	94	172
920XX	50	93	171
921XX	50	93	171
922XX	49	95	173
923XX	49	93	170
924XX	49	93	170
925XX	49	93	170
926XX	49	92	169
927XX	49	92	169

ZIP Code	EL	SK	AZ
928XX	49	92	169
930XX	49	91	167
931XX	49	90	166
932XX	47	90	165
933XX	48	91	167
934XX	48	89	163
935XX	48	92	168
936XX	46	90	165
937XX	46	90	165
938XX	46	90	165
939XX	46	87	162
940XX	45	87	160
941XX	45	86	159
942XX	44	88	161
943XX	45	87	160
944XX	45	87	160
945XX	45	87	160
946XX	45	87	160
947XX	45	87	160
948XX	45	87	160
949XX	45	86	159
950XX	46	87	161
951XX	46	87	160
952XX	45	88	162
953XX	45	89	163
954XX	44	86	159
955XX	42	85	157
956XX	44	88	161
957XX	44	88	162
958XX	44	88	161
959XX	43	88	161
960XX	42	87	159
961XX	43	89	163
967XX	41	33	101
968XX	40	33	100
970XX	37	87	157
971XX	37	86	156
972XX	37	87	157
973XX	37	86	156

ZIP Code	EL	SK	AZ
974XX	39	86	156
975XX	40	86	157
976XX	40	88	161
977XX	39	89	161
978XX	37	91	163
979XX	38	92	166
980XX	35	88	157
981XX	34	87	156
982XX	34	88	156
983XX	35	87	156
984XX	35	87	156
985XX	35	87	155
986XX	36	87	157
988XX	34	90	160
989XX	36	89	160
990XX	34	92	164
991XX	34	91	163
992XX	34	92	164
993XX	36	91	162
994XX	36	92	165
995XX	15	71	119
996XX	15	71	118
997XX	11	76	119
998XX	22	81	136
999XX	25	82	139

# Federal Communications Commission (FCC) Notification

## Regulatory Information

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Do not make changes or modifications to this equipment. This could void the user's authority to operate the equipment.

If none of the remedies stops the radio interference, you should contact a licensed radio/television technician, your satellite dealer, or call the Customer Service Center at 1-800-333-DISH (3474) for assistance.

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