



About Wilson Electronics

Wilson Electronics, Inc., a leader in the wireless communications industry for over 40 years, designs and manufactures amplifiers, antennas and related components that significantly improve cellular telephone signal reception and transmission in a variety of mobile, small building and large building applications.

With extensive experience in antenna and amplifier research and design, the company’s engineering team uses a state-of-the-art testing laboratory, including an anechoic chamber and network analyzers, to fine-tune antenna designs and performance. For its amplifiers, Wilson uses a double electrically insulated RF enclosure and cell site simulators for compliance testing.

Wilson amplifiers feature patent-pending Smart Technology™ that enables them to automatically adjust their power based on cell site requirements. By detecting and preventing oscillation, signal overload and interference with other users, these Smart Technology™ amplifiers improve network cell phone areas without compromising carrier systems.

All products are engineered and assembled in the company’s 55,000-square-foot headquarters in St. George, Utah. Wilson has product dealers in all 50 states and in countries around the world.



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SIGNALBOOST™ DT
Dual-Band
Cellular/PCS
Amplifier System
Installation Guide



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Welcome to the Wilson Electronics Family of Products!

Thank you for purchasing the Wilson SignalBoost DT amplifier system. You are just minutes away from enjoying improved performance from your cellular phone and/or laptop data card. When installed properly, the SignalBoost DT will significantly reduce dropped calls and improve both voice and data signal quality. By taking a few minutes to read and follow the simple instructions in this guide, you will get the most out of your new amplifier system. If you have questions during or after installation, please don't hesitate to contact a member of our Technical Support team by phone (866-294-1660 or 435-673-5021) or email (tech@wilsonelectronics.com). We're here to help!

Before Getting Started

This guide will help you properly install Wilson's SignalBoost DT. **It is recommended that you read through all of the installation steps and familiarize yourself with the product.** Read the instructions and visualize where you want to place the components before mounting any equipment. If you do not understand the instructions in full, please contact Wilson Technical Support at 866-294-1660 or 435-673-5021.

Inside this Package:



Tools Required for Installation:

Depending on your particular installation, you will need the following tools:

- Wall-mount - Drill and 3/16-inch bit, Phillips-head screwdriver
- Pole-mount - 1/4-inch open-end wrench or adjustable wrench

30-Day Money-Back Guarantee

All Wilson Electronics products are protected by Wilson's 30-day money-back guarantee. If for any reason the performance of any product is not acceptable, simply return the product directly to the reseller with a dated proof of purchase.

1-Year Warranty

Wilson Electronics amplifiers are warranted for one (1) year against defects in workmanship and/or materials. Warranty cases may be resolved by returning the product directly to the reseller with a dated proof of purchase.

Amplifiers may also be returned directly to the manufacturer at the consumer's expense, with a dated proof of purchase and a Returned Material Authorization (RMA) number supplied by Wilson Electronics. Wilson shall, at its option, either repair or replace the product. Wilson Electronics will pay for delivery of the repaired or replaced product back to the original consumer if located within the continental U.S.

This warranty does not apply to any amplifiers determined by Wilson Electronics to have been subjected to misuse, abuse, neglect, or mishandling that alters or damages physical or electronic properties.

RMA numbers may be obtained by phoning Technical Support at 866-294-1660.

Installation Instructions for the Following Wilson Amplifier:

SignalBoost DT Dual-Band Cellular/PCS Amplifier
Model # 271247-50, 271247-50
FCC ID: PWO271247ASB IC: 4726A-271247ASB

The term "IC" before the radio certification number only signifies that Industry Canada technical specifications were met.

Operation is subject to the following two conditions: (1) This device may not cause interference and (2) this device must accept any interference, including interference that may cause undesired operation of this device.

Disclaimer: The information provided by Wilson Electronics, Inc. is believed to be complete and accurate. However, no responsibility is assumed by Wilson Electronics, Inc. for any business or personal losses arising from its use, or for any infringements of patents or other rights of third parties that may result from its use.

Amplifier Specifications

	Dual-Band Wireless 800/1900 MHz Specifications	
Model Number	271247-50	271247-75
Outside antenna connectors	F Female	F Female
Outside antenna impedance	75 ohms	75 ohms
Inside antenna connectors	TNC Female	F Female
Inside antenna impedance	50 ohms	75 ohms
Dimensions	6.2 x 4.2 x 1.5 inch (15.7 x 10.7 x 3.8 cm)	
Weight	0.64 lbs (0.29 kg)	
Frequency	824-894 MHz / 1850-1990 MHz	
¹Passband Gain (nominal)		
	800 MHz	60 dB Typical, 65 dB Maximum
	1900 MHz	60 dB Typical, 65 dB Maximum
²20 dB Bandwidth (nominal)		
	Uplink	Downlink
	800 MHz	44 MHz
	1900 MHz	95 MHz
Power output		
	800 MHz	1900 MHz
Power output for single cell phone (uplink)	33.2 dBm	34.0 dBm
Power output for single received channel (downlink)	15.7 dBm	10.7 dBm
⁴Power output for multiple transmitted channels (uplink)		
		Maximum Power
The maximum power is reduced by the number of channels:	Number of channels	800 MHz1900 MHz
	2	23 dBm21.3 dBm
	3	19.5 dBm17.8 dBm
	4	17.0 dBm15.3 dBm
	5	15.1 dBm13.3 dBm
	6	13.5 dBm11.8 dBm
⁴Power output for multiple received channels (downlink)		
		Maximum Power
The maximum power is reduced by the number of channels:	Number of channels	800 MHz1900 MHz
	2	6.2 dBm5.2 dBm
	3	2.7 dBm1.6 dBm
	4	0.2 dBm-0.9 dBm
	5	-1.7 dBm-2.8 dBm
	6	-3.3 dBm-4.4 dBm
Noise Figure (typical)		
		3.5 dB nominal
Isolation (uplink/downlink)		
		> 90 dB

Power Requirements	110-240 V AC, 50-60 Hz, 8 W
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Notes:

1. Nominal gain is the maximum gain at any frequency in the passband.

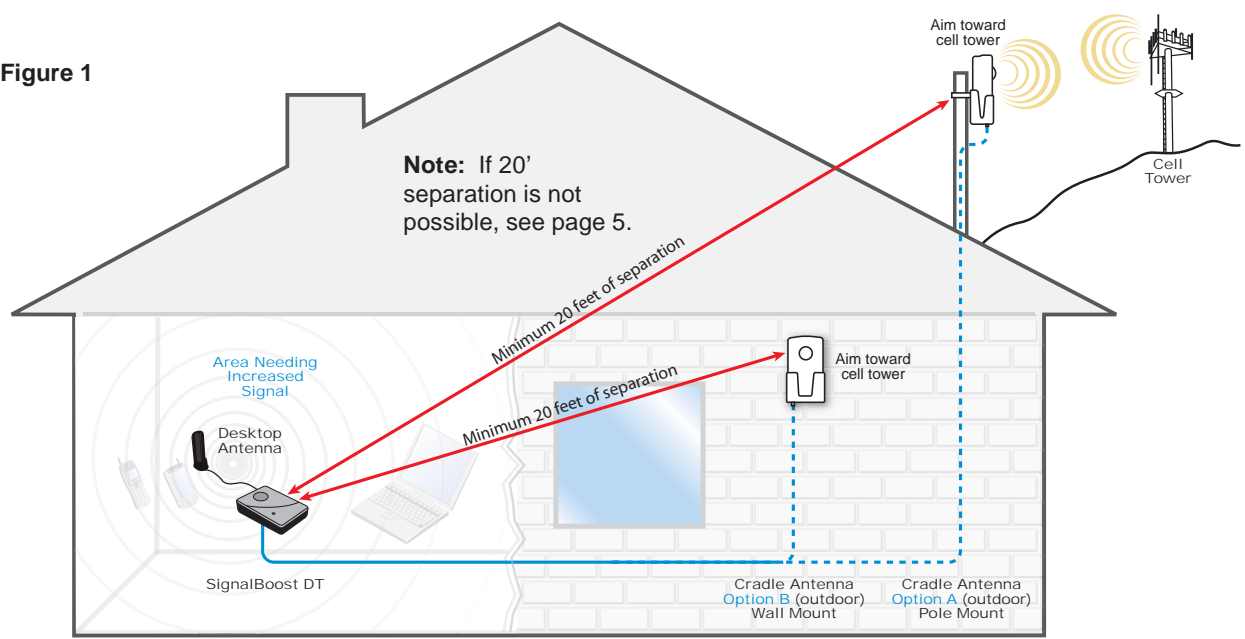
2. Nominal bandwidth is the difference between two frequencies that are adjacent to the passband where the amplification is 20 dB lower than the passband amplification. One of the frequencies is lower than the passband and the other is higher.

3. The Manufacturer's rated output power of this equipment is for single carrier operation. For situations when multiple carrier signals are present, the rating would have to be reduced by 3.5 dB, especially where the output signal is re-radiated and can cause interference to adjacent band users. This power reduction is to be by means of input power or gain reduction and not by an attenuator at the output of the device.

4. The maximum power for 2 or more simultaneous signals will be reduced by 6 dB every time the number of signals is doubled.

How it Works

Your Wilson SignalBoost DT Amplifier works by picking up a stronger signal from an antenna mounted on a pole or wall outside your building facing the cell site. The amplifier then increases the signal and transmits it to the desktop antenna. The desktop antenna then transmits the boosted signal to your cell phone or laptop data card.



Reasons for Weak Cellular Signals

Anyone who uses a cell phone or cellular data card knows the frustration of not being able to connect to or maintain a strong cellular signal. When this occurs, it's generally due to one of two reasons:

1. Location of the Nearest Cell Tower – Cell towers are situated to provide broad coverage; however, there are many areas in which signal strength may be reduced by topographic features or by local government restrictions on the height or placement of the towers themselves. Rural areas generally have fewer cell towers than urban regions.
2. Natural and Man-made Obstructions – Signal strength can also be negatively affected by trees, hills, buildings and other obstructions. You may be relatively close to a cell tower but still unable to make a call. This often occurs in homes, offices and other buildings in which stucco, concrete or metal walls block the signal.

The SignalBoost DT works with two antennas (included). The desktop antenna communicates with your cell phone or laptop data card, and the cradle antenna communicates with the cell tower. The cradle antenna is designed for installation outside on a wall or a pole. (see Figure 1).

The cradle antenna receives the outside signal and sends it through the coax cable to the SignalBoost DT, where it is amplified and retransmitted much more strongly through the desktop antenna into the room. When the desktop antenna picks up a signal from your cell phone or data card, the amplifier boosts that signal and transmits it through the cable to the cradle antenna and back to the cell site. (Note: the SignalBoost DT will only operate if there is adequate signal to amplify.)

First Step: Find the Strongest Signal

Before you install your SignalBoost DT, it is very important that you determine the location of the best available cellular signal. This will affect where you place the cradle antenna and will help you get the best performance from your system.

You will find the strongest signal outside your house or building, at the highest place available. Your cell phone can help you find the strongest outside signal, using any or all of the following methods:

- 1. Place calls from several locations outside your building and note where you get the best reception.
- 2. Check the bar indicator on your cell phone display and note where the signal appears to be the strongest. Note: cell phone bars are only an approximation of signal strength and vary from phone to phone. They can take up to 30 seconds to reset to a new reading. Be patient and repeat your signal check several times.
- 3. Some cell phones have test modes for reading accurate signal strength. Using the test mode on your cell phone, move around the outside of your building and determine the location of the strongest signal. (For assistance with the test mode on your particular phone, visit the Technical Support section of our website: www.wilsonelectronics.com or call our Technical Support Department at 866-294-1660 or 435-673-5021).

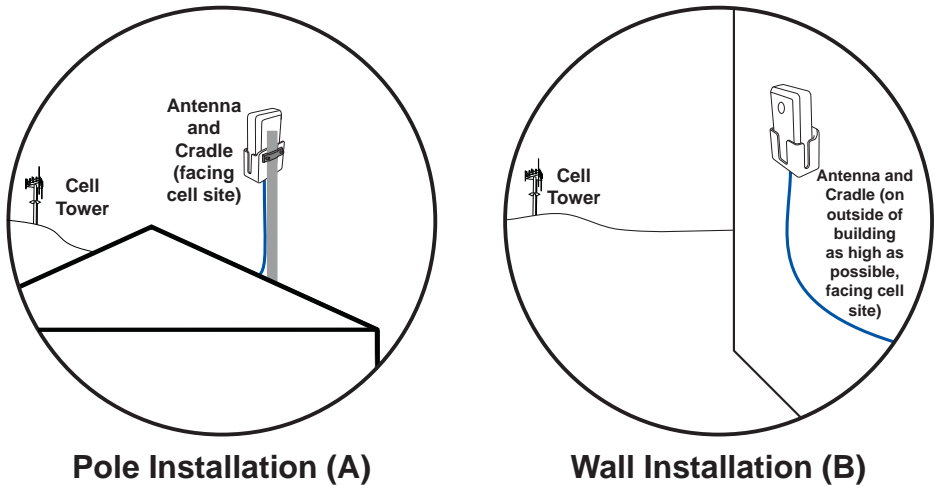
Once you have determined where the outside signal is strongest, you should plan to install the cradle antenna in that general area. (See the following section for alternative installation options).

Installation Options - Cradle Antenna

The cradle antenna is directional – it receives and transmits best in one direction. The round Wilson insignia indicates the side of the antenna that should face toward the cell site when the unit is placed in the cradle. Note: the weaker the signal is at the cradle antenna, the shorter the distance the desktop antenna will transmit; therefore, signal strength at the cradle antenna is extremely important. The SignalBoost DT comes with all necessary parts for installation of the cradle antenna in three alternative locations (see Figure 2):

- Outside on a pole (bracket, nuts and washers)
- Outside on a wall (screws, washers and anchors)

Figure 2



Can I use my own cable for my installation?

The low-loss RG6 cable included with your product has been specifically selected for the SignalBoost DT. Use of another type or longer length of cable will likely degrade the system's performance.

Can I use different antennas than the ones supplied in the box?

Yes! While the SignalBoost DT is designed to give you reliable signal improvement with the included antennas, Wilson offers a variety of optional antennas and accessories that enable you to customize your SignalBoost DT to your specific needs. Visit www.wilsonelectronics.com for details.

There are frequently several people using cell phones in my office at the same time – will the SignalBoost DT improve the signal for all of them?

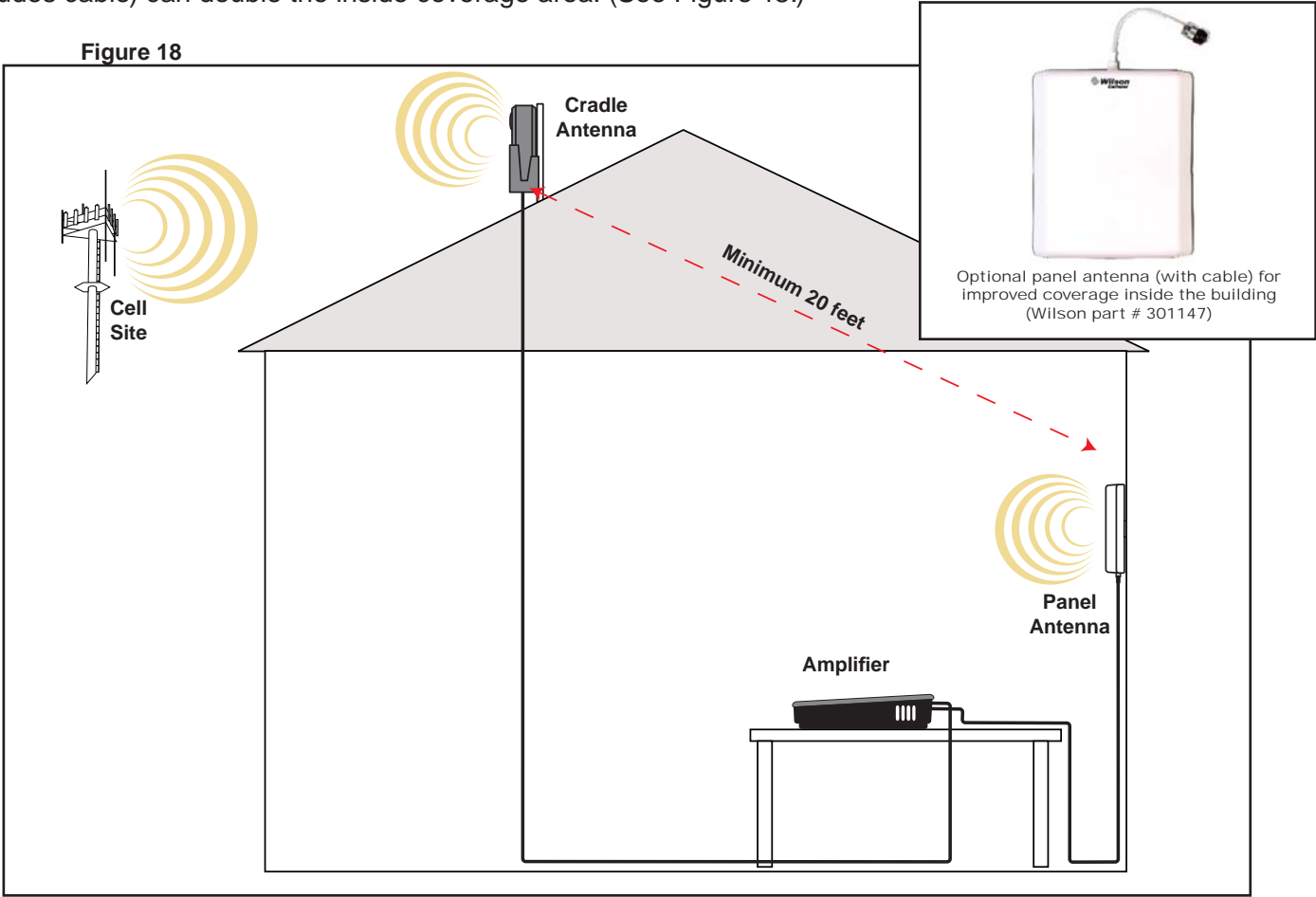
Absolutely! The SignalBoost DT is designed to support multiple users simultaneously (within the range of the desktop antenna).

I have installed the system but I don't have the coverage I need – what can I do?

See the section below.

For Weak Areas with Insufficient Signal






In areas with particularly weak outside signals, additional coverage can be obtained by removing the on-board antenna and replacing it with a high-gain inside panel antenna (Wilson part #301147). This antenna (which includes cable) can double the inside coverage area. (See Figure 18.)



I have questions about my installation – where can I get some help?

Wilson's Technical Support representatives are just a phone call or email away. Call 866-294-1660 or 435-673-5021, or send an email to tech@wilsonelectronics.com.

Warnings and Recommendations

- **Warning:** Connecting the amplifier directly to the cell phone with use of an adapter will damage the cell phone.
- **Warning:** Attach the desktop antenna and connect the cradle antenna before powering up the amplifier.
- **Warning:** Use only the power supply provided in this package. Use of a non-Wilson product may damage your equipment.
- **Warning:** **RF Safety:** A minimum separation distance of at least 8 inches must be maintained between the antennas supplied with this amplifier and all persons. A different antenna may be used in place of the desktop antenna, provided that its gain does not exceed 15 dBi and it is separated by at least 8 inches from all persons. Antennas **outside of the building** may have gains as high as 15 dBi, provided that a separation distance of at least 30 inches is maintained between the antennas and all persons. Use of antennas with higher than the above maximum gains and/or closer to people than the specified minimum distance is in violation of FCC regulations for which the offender is fully liable.
- **Warning:** Always operate cell phone at least three feet from the desktop antenna.

Frequently Asked Questions

What kind of improvement in cell phone performance can I expect with the SignalBoost DT?
The SignalBoost DT's performance will depend somewhat on the strength of the cellular signal outside your home or building. However, if you install the SignalBoost DT in accordance with the instructions in this guide, you can expect a significant improvement in your ability to use your cell phone or cellular data card indoors.

Where should I install my SignalBoost DT to get the best coverage?
You should install the amplifier in the area where you most need an improved signal. The farther you are from the amplifier, the less improvement you will experience. It is also important to install the cradle antenna in a location where you have the strongest outside signal (see page 4). Also keep in mind the distance between the amplifier and the cradle antenna. You'll need at least 20 feet of separation to prevent the start of oscillation, but you'll probably want to stay within the 50-foot length of the coax cable. (Additional cable and the necessary connectors are available from your Wilson dealer, but using more cable will result in some signal loss.)

Instead of placing the amplifier on a desk or table, I'd rather attach it to a wall – will it still work OK?
Yes! Your SignalBoost DT comes with a triangular wall bracket that allows you to mount the amplifier on a wall. Just be sure that the desktop antenna is installed correctly (see page 9).

What color should the indicator light be showing?
Once the amplifier is powered up, the indicator light should be green during normal operation.

The amplifier light is red – what does that mean?
When the light is red, the amplifier has shut down due to oscillation between the desktop antenna and the cradle antenna. Increase the distance between the two antennas then remove and reinsert the power cable to reset the amplifier (see page 5).

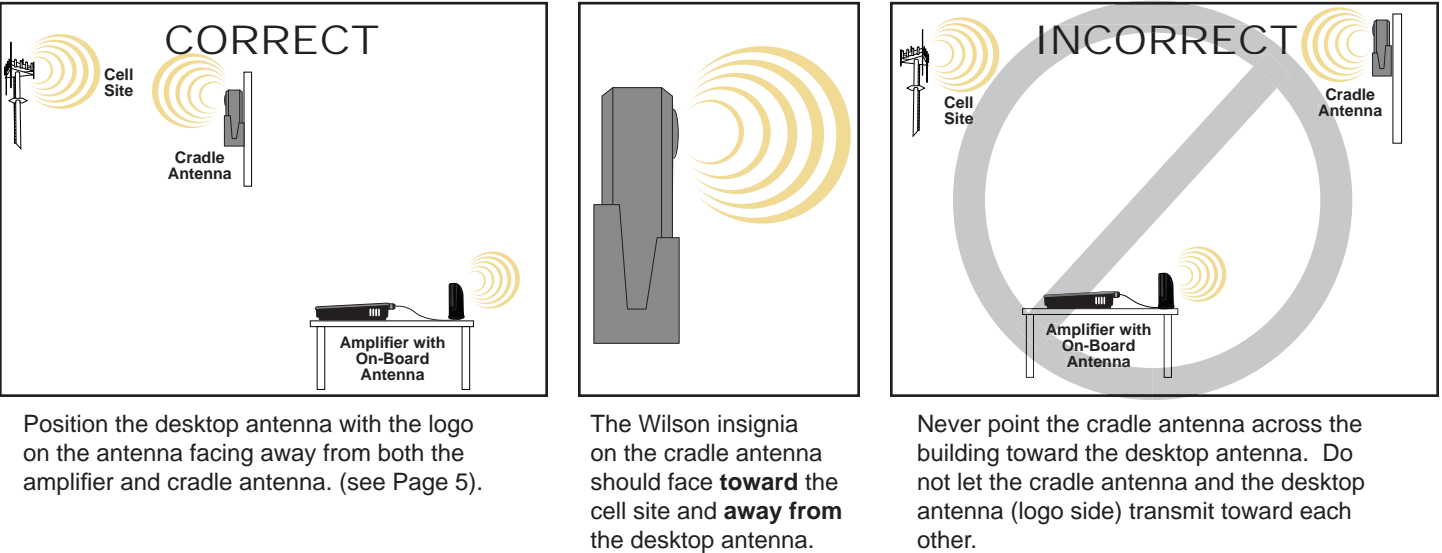
I have a Nextel phone – will the SignalBoost DT boost that signal?
The SignalBoost DT is designed to work with both the Cellular (800 MHz) and PCS (1900 MHz) bands, but not the iDEN/Nextel frequency. Wilson offers specific amplifiers for iDEN/Nextel users. Visit www.wilsonelectronics.com for details.

The roof or the outside walls of your house or building are the preferred place to mount the cradle antenna. The best choice is to place the cradle antenna outside on the roof, mounted to a pole, facing toward the cell site (see page 3), where you can make calls or you have several bars on your phone. **Note:** install the antenna as high as possible on the roof or wall for the strongest signal.

Antenna Placement

The location of the amplifier with the desktop antenna in relation to the cradle antenna is very important. Once you find a good signal location for the cradle antenna, the amplifier and desktop antenna need to be located *behind it* to reduce the possibility of oscillation (indicated by a red indicator light on the amplifier). In other words, the front of the cradle antenna (indicated by the Wilson insignia) needs to face in the direction of the cell site and not in the direction of the amplifier and the desktop antenna (see Figure 3).

Figure 3



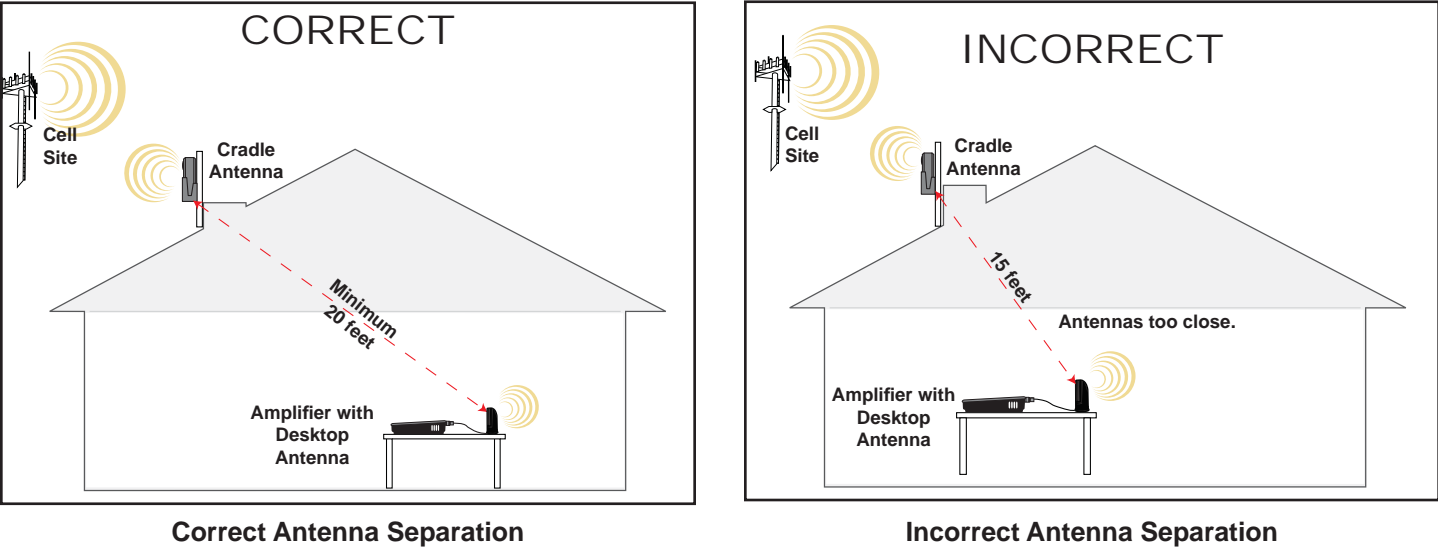
In addition, it is important that the desktop antenna be positioned so that the logo is not pointed towards the amplifier or the cradle antenna, as shown below. Also, the desktop antenna is recommended to be at least a minimum of 18 inches away from the amplifier.



Antenna Separation

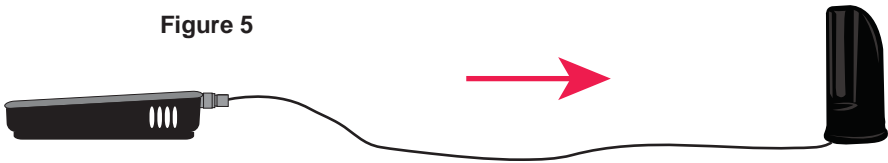
The distance between the cradle antenna and the amplifier with the desktop antenna is extremely important! If they are too close together, they will oscillate, causing the system to shut down, as indicated by a red light on the amplifier. The following three rules should be applied to make your Wilson DT perform correctly: **1-** Make sure the Desktop Antenna is facing AWAY FROM the Cradle Antenna. Ideally the Desktop Antenna should be pointed 180 degrees from the position of the Cradle Antenna. **2-** Make sure the position of the Desktop Antenna observes the minimum required separation distance from the Cradle Antenna. The Desktop Antenna must be positioned at least **20 horizontal feet OR 12 vertical feet** from the Cradle Antenna. **3-** If your installation maintains at least 12 vertical feet of separation distance but the red light remains illuminated, then relocate the Desktop Antenna more directly beneath the position of the Cradle Antenna, inside the imaginary Cone of Signal. Make sure the relocated Desktop Antenna maintains the 12-vertical-foot minimum required separation distance.

Figure 4



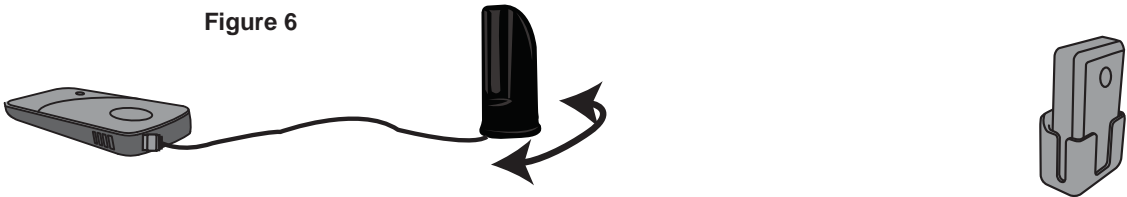
Even at 20 feet, the amplifier may shut down, as indicated by the red light. By moving the desktop antenna further away from the amplifier, you may be able to change the red light to a green light, indicating that the system is operating properly (see Figure 5).

Figure 5



If you are unable to maintain the 20-foot minimum separation between antennas, it may be possible to achieve normal operation (a green light) at less than 20 feet by moving the desktop antenna to a different position, as noted above, and rotating the desktop antenna in relation to the cradle antenna (see Figure 6). Do not position the desktop antenna towards the amplifier unit or the cradle antenna.

Figure 6



If you are not able to change the red light to green in this manner, more separation is needed between the cradle antenna and the desktop antenna.

Powering Up the Amplifier

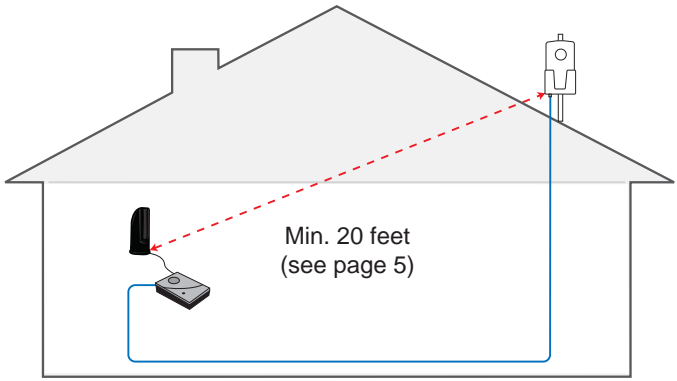


Figure 17

1. Ensure that the distance between the amplifier and the cell phone or cellular data card does not exceed 4 feet.
2. **Important:** Ensure that any other cell phones and cellular data cards are turned off unless they are at least twice the distance from the amplifier than the desired unit.
3. Ensure that the distance between the desktop antenna and the cradle antenna is a minimum of 20 feet (see Figure 17). If you are using a different antenna configuration, see the separation guidelines for your specific antennas or call Wilson's Technical Support department at 866-294-1660 or 435-673-5021.
4. Ensure that the coax cable is attached to the amplifier and the cradle antenna before powering up the amplifier.
5. Plug the power supply into the amplifier input marked "Power" (carefully, to avoid damaging the center pin) and then into a wall outlet.

Warning: Verify that the desktop antenna is attached and that the cable from the cradle antenna is connected before powering up the amplifier.

Warning: Use only the power supply provided in this package. Use of a non-Wilson product may damage your equipment.

Understanding the Indicator Light

- GREEN:** The indicator light on the top of the amplifier will be **GREEN** when the unit is powered up and working properly.
- ORANGE:** A solid **ORANGE** light indicates the amplifier has cut back it's gain by either 4 dB or 8 dB due to the amount of oscillation it is experiencing.
- RED:** A blinking **RED** light indicates the receiving or downlink signal on either the 800 or 1900 band or both is overloaded and the amplifier has shutdown either that particular downlink signal or both.
- RED:** A **RED** light indicates amplifier shut-down as a result of oscillation between the desktop antenna and the cradle antenna. When this occurs, greater separation distance is required between the two units (see page 5). Also, it is very important to ensure that the front of the cradle antenna (the side with the Wilson insignia) is facing away from the amplifier and the desktop antenna. If you see the red light come on, followed by a green light and then back to red, the amplifier is in the process of shutting down. It will attempt to reset itself every five seconds; however, if proper separation is not achieved between the amplifier and the cradle antenna, the light will change to a constant red after four tries. If that occurs, increase the separation distance between the two units, then unplug and re-plug the power supply cable to manually reset the amplifier.

To reset the amplifier, unplug and re-plug the power supply.

NOTE: If you are planning on using the vertical separation mounting options the desktop antenna must be located at least 15 vertical feet below the cradle antenna and within 5 horizontal feet of the cradle antenna. This space is referred to as the **Null Zone**.

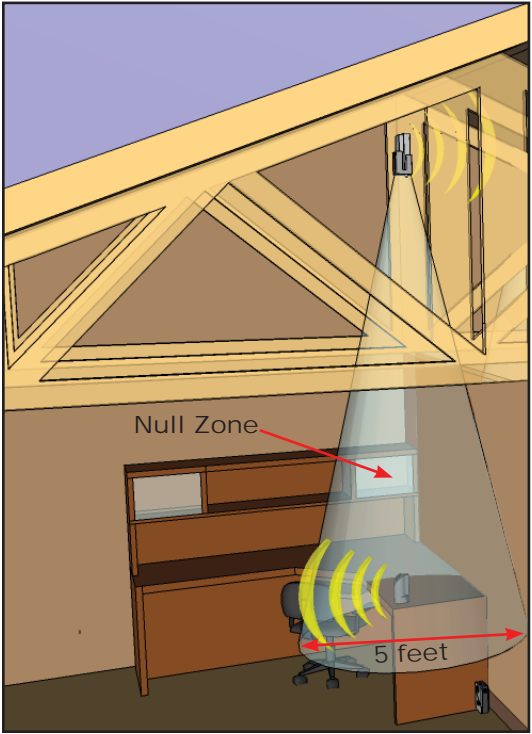


Figure 8-2

Installing the Amplifier Unit

Warning: The amplifier unit is designed for use in an indoor, temperature-controlled environment (less than 100 degrees Fahrenheit). It is not intended for use in attics or similar locations subject to temperatures in excess of that range.



Figure 14

Warning: The desktop antenna must have a separation distance from all persons that is at least 8 inches.

Warning: Connecting the amplifier directly to the cell phone with use of an adapter will damage the cell phone.

Desk or Table Mount

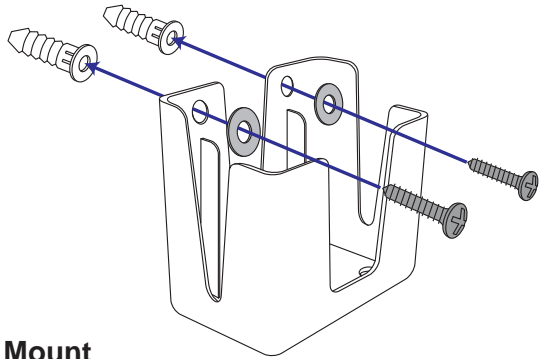
1. Attach the desktop antenna by screwing it onto the threaded connector on the amplifier (see Figure 14).
2. Place the amplifier on a desk, table or similar surface where you have routed the coax cable.
3. Attach the cable to the connector on the amplifier.

Warning: RF Safety: The amplifier must be placed so that its on-board antenna has a separation distance of at least 8 inches from all persons.

Warning: RF Safety: The amplifier must be placed so that the desktop antenna has a separation distance of at least 8 inches from all persons.

Rafter Mounting Option

1. Using the cradle as a template, position it on the rafter in the desired location and mark the screw holes with a pencil.
2. Drill two holes where marked, using a 3/16-inch bit and insert the screw anchors.
3. Line up the holes in the cradle with the screw anchors and mount the cradle to the wall using two screws and two washers (see Figure 9). Tighten the screws with a Phillips-head screwdriver.
4. Insert the antenna into the cradle **with the Wilson insignia facing in the direction of the cell tower**. The cable connection should protrude through the bottom of the cradle.
5. Connect the supplied coax cable to the antenna. Route the cable as desired to where the amplifier will be located. Depending on the distance between the amplifier and antenna, you may need one or both lengths of the supplied cable. If you use both, connect them together with the supplied cable connector.



Installing the Cradle Antenna

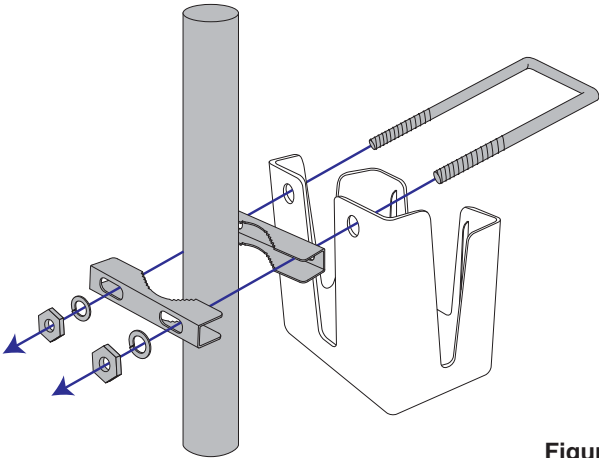
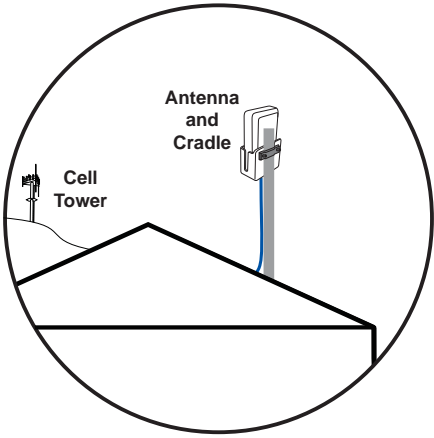
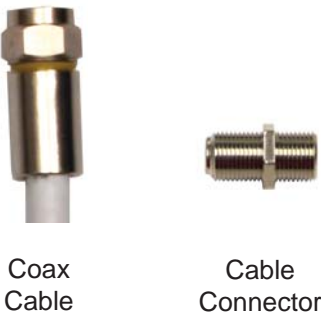


Figure 7



Coax Cable

Cable Connector

Outside Pole Mount (Packet A)

1. The supplied pole-mount bracket is designed to accommodate a pole diameter of 1 to 2 inches. Install the pole in the desired location using your own hardware.

Warning: RF Safety: The cradle antenna, when used with the included cable, must have a separation distance of at least 8 inches from all persons. If the cable is shortened, or if a different type of cable is used, or if a different antenna is used, consult with Wilson Technical Support to verify that the planned installation is safe. Call 866-294-1660 or 435-673-5021, or email tech@wilsonelectronics.com.

Warning: Take care to ensure that neither you nor the pole comes near any power lines during installation.

2. Insert the supplied U-bolt through the holes in the cradle and slide one half of the bracket assembly onto the U-bolt (see Figure 7).
3. Fitting the assembly onto the pole, slide the second half of the bracket onto the U-bolt and secure it with lock washers and nuts. Be sure the cradle is at the desired height on the pole and is rotated toward the nearest cell tower before tightening the nuts. (Do not over-tighten the nuts.)
4. Insert the antenna into the cradle **with the Wilson insignia facing in the direction of the cell tower**. The cable connection should protrude through the bottom of the cradle.
5. Connect the supplied coax cable to the antenna. Route the cable as desired to where the amplifier will be located. Depending on the distance between the amplifier and antenna, you may need one or both lengths of the supplied cable. If you use both, connect them together with the supplied cable connector.

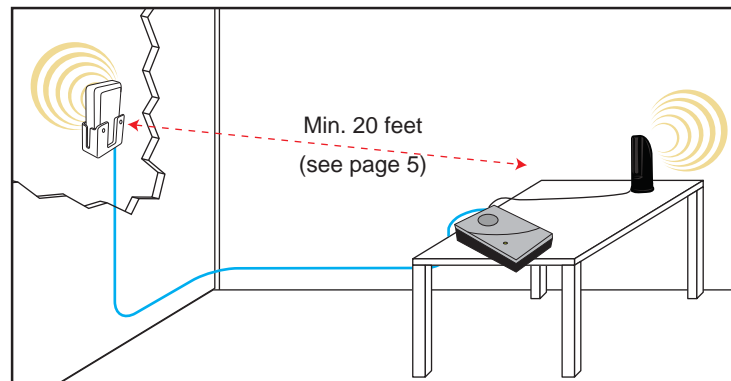
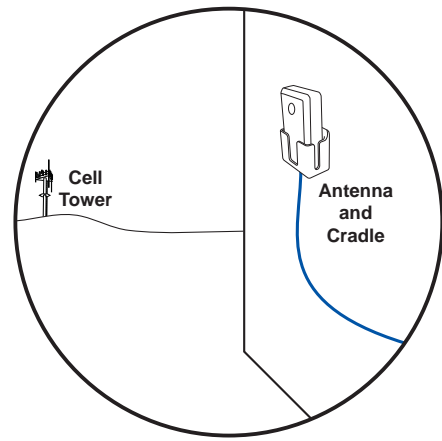


Figure 8

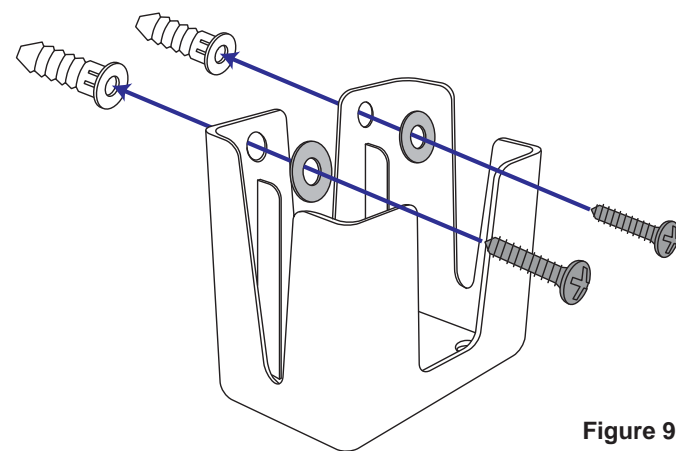
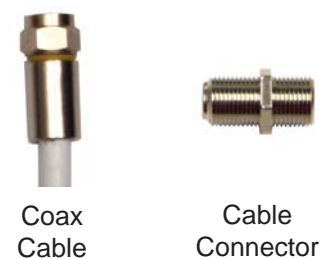


Figure 9



Outside Wall Mount (Packet B)

1. Select a location on an outside wall as high as possible and at least 20 feet away from where the amplifier will be located (see Figure 8).



Warning: RF Safety: The cradle antenna, when used with the included cable, must have a separation distance of at least 8 inches from all persons. If the cable is shortened, or if a different type of cable is used, or if a different antenna is used, consult with Wilson Technical Support to verify that the planned installation is safe. Call 866-294-1660 or 435-673-5021, or email tech@wilsonelectronics.com.

2. Using the cradle as a template, position it on the wall in the desired location and mark the screw holes with a pencil.
3. Drill two holes where marked, using a 3/16-inch bit and insert the screw anchors.
4. Line up the holes in the cradle with the screw anchors and mount the cradle to the wall using two screws and two washers (see Figure 9). Tighten the screws with a Phillips-head screwdriver.
5. Insert the antenna into the cradle **with the Wilson insignia facing in the direction of the cell tower**. The cable connection should protrude through the bottom of the cradle.
6. Connect the supplied coax cable to the antenna. Route the cable as desired to where the amplifier will be located. Depending on the distance between the amplifier and antenna, you may need one or both lengths of the supplied cable. If you use both, connect them together with the supplied cable connector.

NOTE: If you are planning on using the vertical separation mounting options the desktop antenna must be located at least 15 vertical feet below the cradle antenna and within 5 horizontal feet of the cradle antenna. This space is referred to as the **Null Zone**.

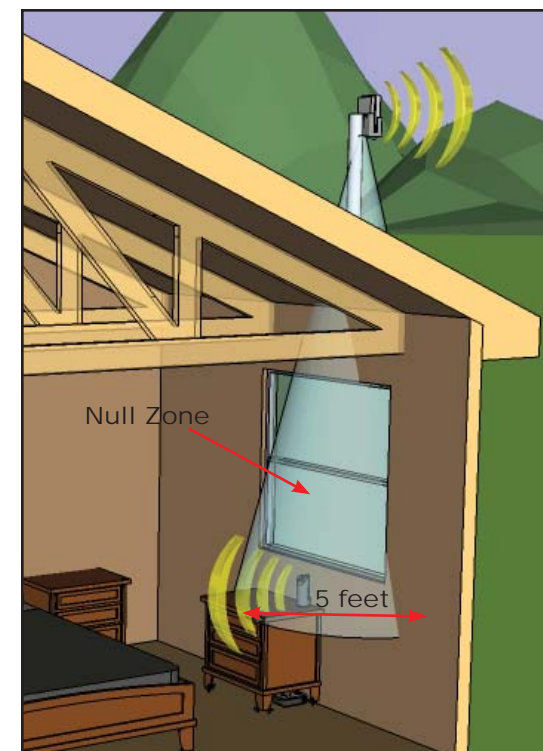
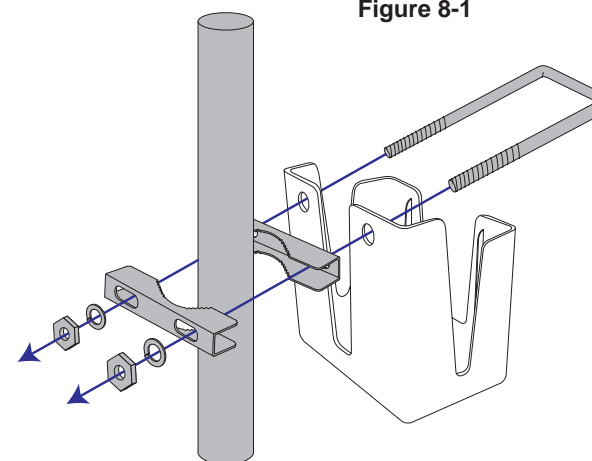


Figure 8-1



Vertical Separation Installation (Pole Mount or Rafter Mount)

Select a location on the roof where the cradle antenna can be mounted on a pole directly above the desktop antenna with at least 15 feet vertical separation (see Figure 8-1).

The cradle antenna may also be mounted in the buildings rafters, if the 15 feet of vertical separation between the cradle antenna and the desktop can be achieved (see Figure 8-2).

Pole Mounting Option

2. Insert the supplied U-bolt through the holes in the cradle and slide one half of the bracket assembly onto the U-bolt (see Figure 7).
3. Fitting the assembly onto the pole, slide the second half of the bracket onto the U-bolt and secure it with lock washers and nuts. Be sure the cradle is at the desired height on the pole and is rotated toward the nearest cell tower before tightening the nuts. (Do not over-tighten the nuts.)
4. Insert the antenna into the cradle **with the Wilson insignia facing in the direction of the cell tower**. The cable connection should protrude through the bottom of the cradle.
5. Connect the supplied coax cable to the antenna. Route the cable as desired to where the amplifier will be located. Depending on the distance between the amplifier and antenna, you may need one or both lengths of the supplied cable. If you use both, connect them together with the supplied cable connector.