



# **Cisco Aironet 5-GHz MIMO Wall-Mounted Omnidirectional Antenna (AIR-ANT5140NV-R)**

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This document outlines the specifications for the Cisco Aironet 5-GHz MIMO Wall-Mounted Omnidirectional Antenna (AIR-ANT5140NV-R) and provides instructions for mounting it. The antenna operates in the 5-GHz frequency range and is designed for indoor or outdoor use.

The following information is provided in this document.

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# Technical Specifications

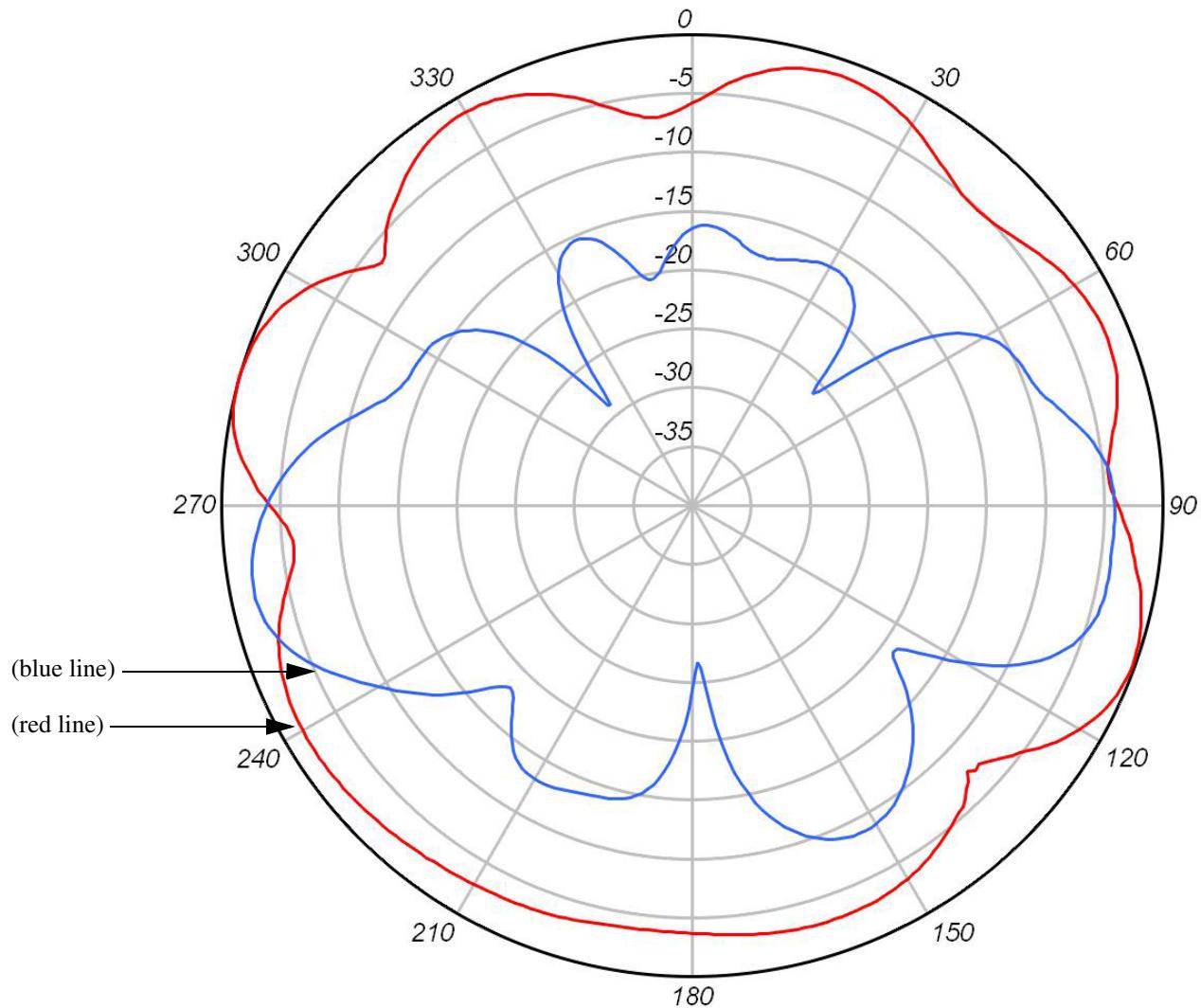
Antenna type	3-element MIMO omnidirectional
Operating frequency range	5150 – 5850 MHz
VSWR	2:1 or less
Peak gain	4 dBi
Polarization	Linear, vertical
Azimuth plane (3 dB beamwidth)	Omnidirectional
Elevation plane (3 dB beamwidth)	36°
Length	8.6 in (21.8 cm)
Diameter	6.3 in (16 cm)
Weight	Antenna: 1.33 lb (623.6 g); Antenna and packaging: 3.39 lb (1.54 kg)
Cable	3-ft. (91.4 cm) plenum rated with blue ID markers
Connector	RP-TNC
Environment	Indoor/outdoor
Temperature range	-22° F to 158° F (-30° C to 70° C)



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The figures below show the azimuth plane patterns (indicated by red lines) and elevation plane patterns (indicated by blue lines) for each element in the antenna.

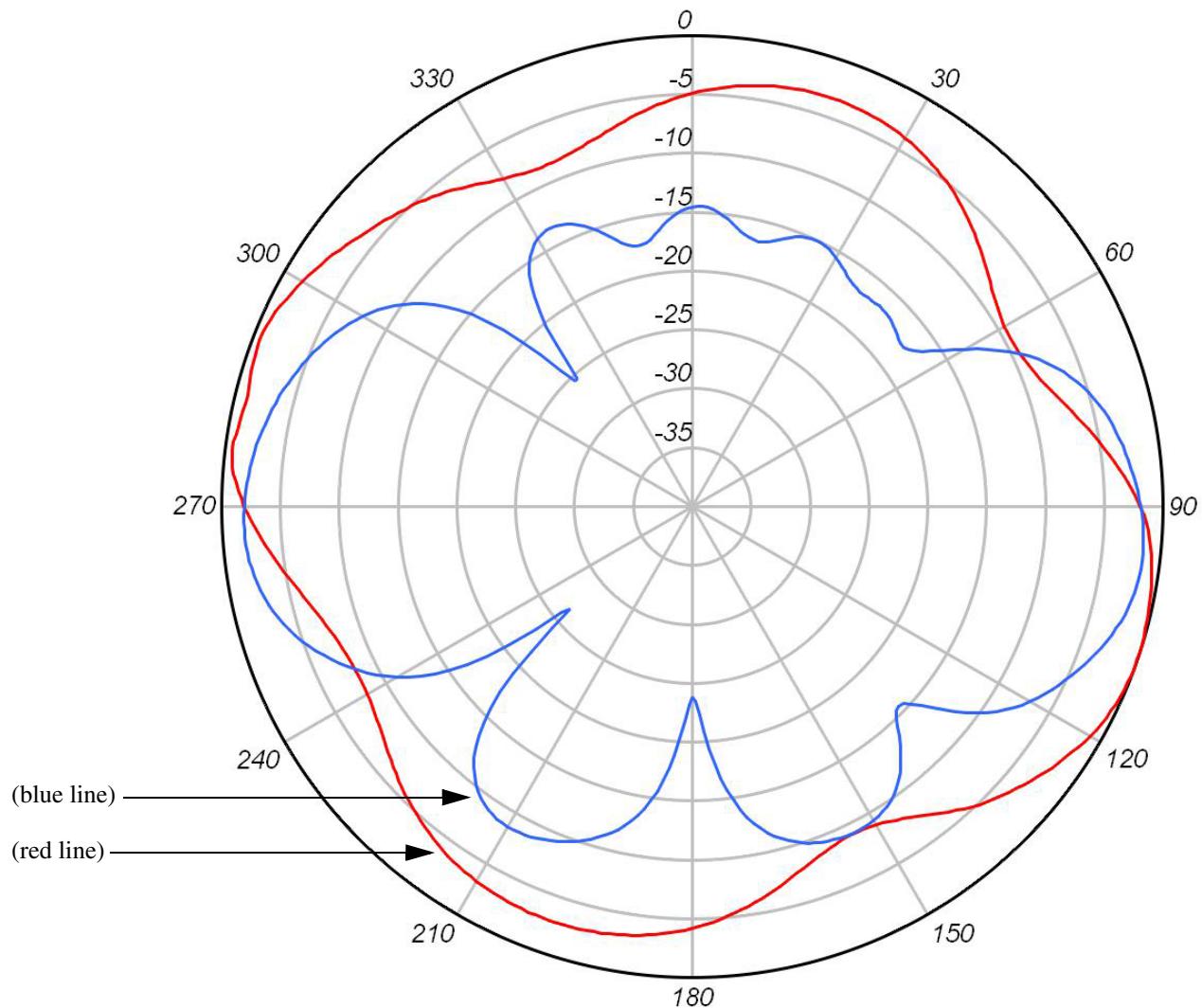
**Figure 1** *Azimuth and Elevation Plane Patterns for Element 1*



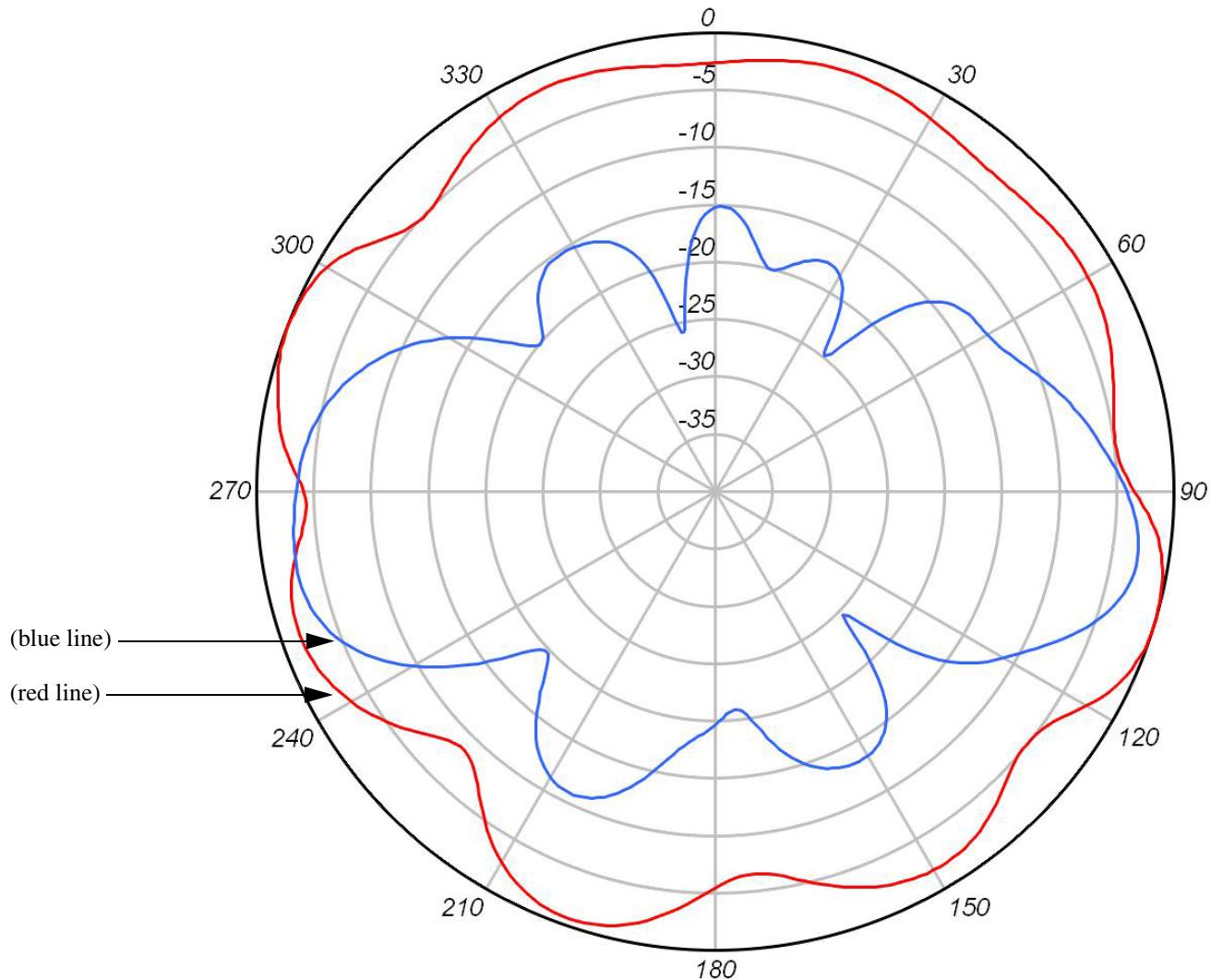
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Figure 2

Azimuth and Elevation Plane Patterns for Element 2



254364

**Figure 3** Azimuth and Elevation Plane Patterns for Element 3

254355

## System Requirements

This antenna is designed for indoor and outdoor use with any 5-GHz Cisco Aironet radio device that uses an RP-TNC connector.

# Safety Precautions



**Warning**

**Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, as they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (e.g. U.S.: NFPA 70, National Electrical Code, Article 810, Canada: Canadian Electrical Code, Section 54). Statement 280**

For your safety, read and follow these safety precautions.

1. Before you install an antenna, contact your Cisco account representative to explain which mounting method to use for the size and type of antenna that you are about to install.
2. Find someone to help you—installing an antenna is often a two-person job.
3. Select your installation site with safety, as well as performance, in mind. Remember that electric power lines and phone lines look alike. For your safety, assume that any overhead line can kill you.
4. Contact your electric power company. Tell them your plans and ask them to come look at your proposed installation.
5. Plan your installation carefully and completely before you begin. Each person involved in an installation should be assigned to a specific task, and should know what to do and when to do it. One person should be in charge of the operation to issue instructions and watch for signs of trouble.
6. When installing your antenna, follow these guidelines:
  - a. Do not use a metal ladder.
  - b. Do not work on a wet or windy day.
  - c. Do dress properly—wear shoes with rubber soles and heels, rubber gloves, and a long-sleeved shirt or jacket.
7. If the assembly starts to drop, move away from it and let it fall. Because the antenna, mast, cable, and metal guy wires are all excellent conductors of electrical current, even the slightest touch of any of these parts to a power line completes an electrical path through the antenna and the installer.
8. If any part of the antenna system should come in contact with a power line, do not touch it or try to remove it yourself. Call your local power company to have it removed safely.
9. If an accident should occur with the power lines, call for qualified emergency help immediately.

# Installation Notes

Antennas transmit and receive radio signals which are susceptible to RF obstructions and common sources of interference that can reduce throughput and range of the device to which they are connected. Follow these guidelines to ensure the best possible performance:

- Install the antenna vertically and mount it with the cables pointing towards the ground.
- Keep the antenna away from metal obstructions such as heating and air-conditioning ducts, large ceiling trusses, building superstructures, and major power cabling runs. If necessary, use a rigid conduit to lower the antenna away from these obstructions.
- The density of the materials used in a building's construction determines the number of walls the signal can pass through and still maintain adequate signal strength. Consider the following before choosing the location for your antenna:
  - Signals penetrate paper and vinyl walls with little change to signal strength.
  - Signals penetrate only one or two solid and pre-cast concrete walls without degrading signal strength.
  - Signals penetrate three or four concrete and wood block walls without degrading signal strength.
  - Signals penetrate five or six walls constructed of drywall or wood without degrading signal strength.
  - Signals will likely reflect off a thick metal wall and may not penetrate it at all.
  - Signals will likely reflect off a chain link fence or wire mesh spaced between 1 and 1 1/2 in. (2.5 and 3.8 cm). The fence acts as a harmonic reflector that blocks the signal.
- Install the antenna away from microwave ovens and 2-GHz cordless phones. These products can cause signal interference because they operate in the same frequency range as the device to which your antenna is connected.

## Choosing a Mounting Location

The antenna should be mounted clear of any obstructions to the sides of the radiating elements. Generally, the higher an antenna is above the floor, the better it performs. If possible, find a mounting place directly above your wireless device to ensure the lead-in cable can be as short as possible.

# Installing the Antenna

You can install the antenna on any flat vertical surface, on a pole, or on a ceiling. All hardware for mounting the antenna on a wall or ceiling is provided. If you intend to install your antenna on another surface, you must provide the appropriate hardware.

## Tools and Equipment Required

A mounting installation kit is included with the antenna and consists of the following hardware:

- Mount interface bracket
- Mount base
- Wall bracket
- One 1/4–20 x ½-in. cap screw
- One 1/4–20 wing screw
- Two #10 x ¾-in. screws
- Two #10 x ½-in. screws
- One screen mesh washer
- One spherical washer
- 3/16 allen wrench
- Rubber gasket
- Jam nut

You may need the following tools and equipment, which are not provided.

- A #2 Phillips screwdriver
- A drill and drill bit
- A pencil
- Two hose clamps

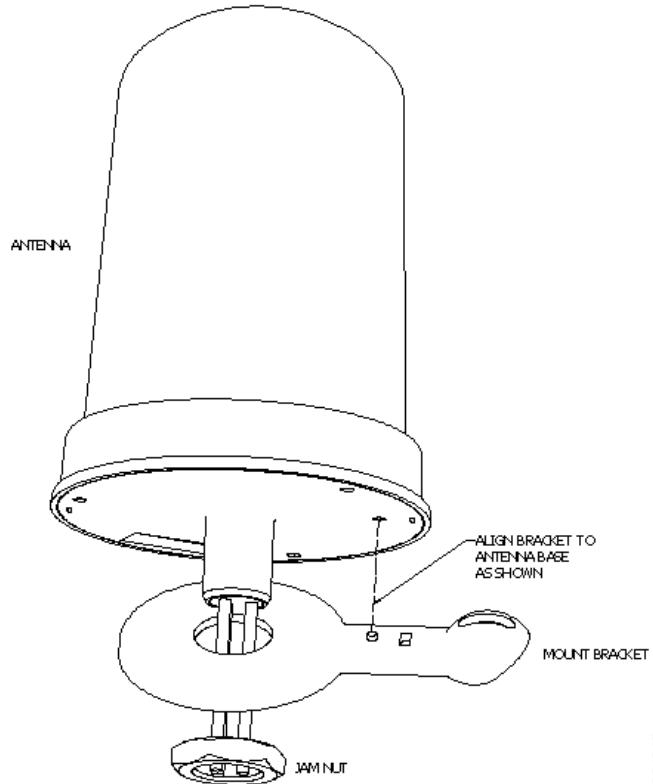
## Mounting on a Vertical Surface

Follow these steps to mount your antenna on a vertical surface.

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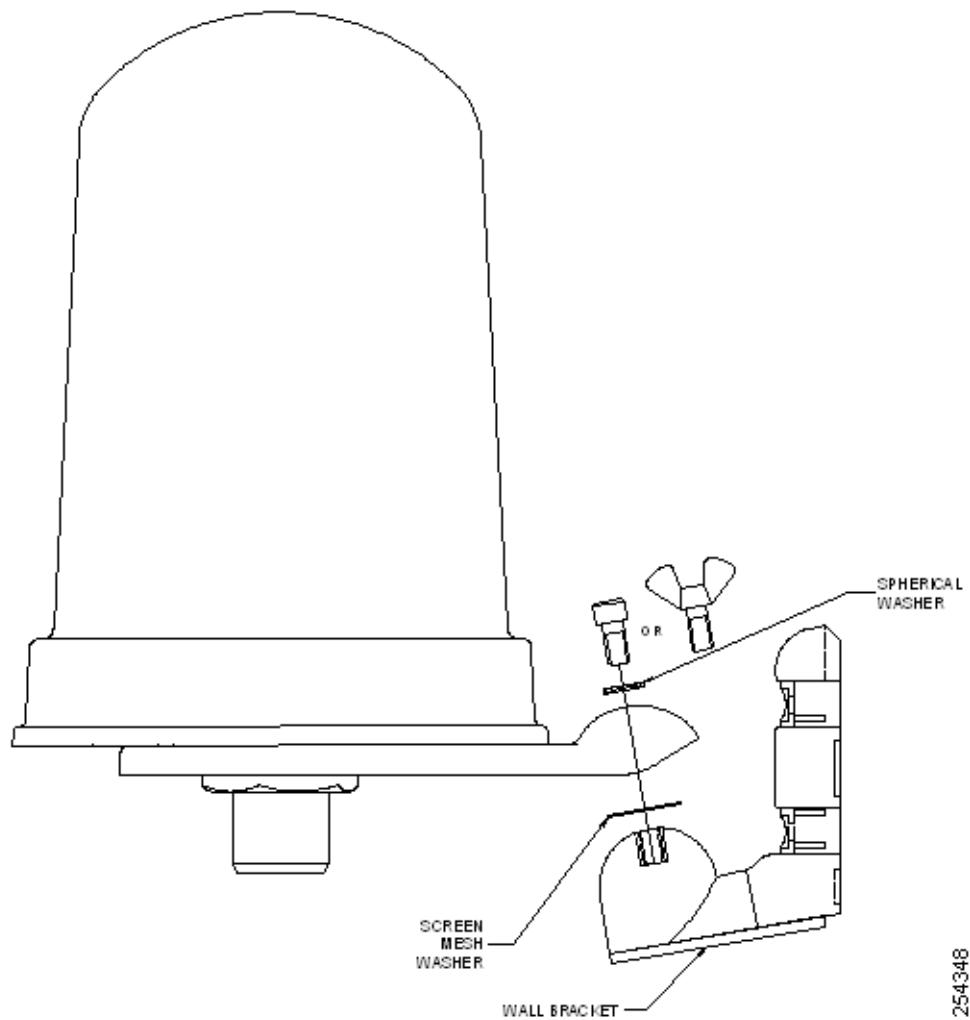
**Step 1** Attach the antenna bracket to the antenna using the jam nut provided ([Figure 4](#)).

**Figure 4** *Antenna Bracket*



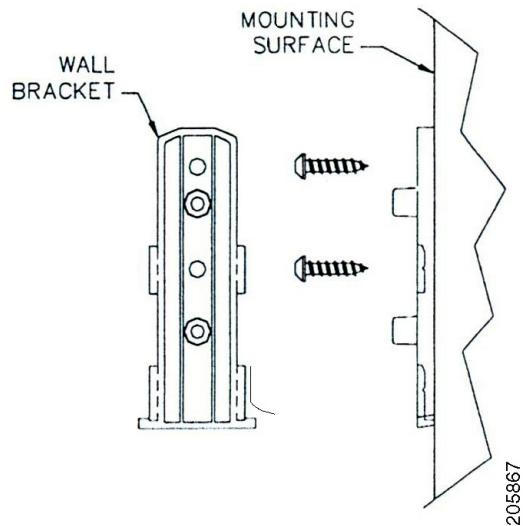
**Step 2** With the screen mesh washer between the two brackets, attach the antenna bracket to the mounting bracket using the spherical washer and wing bolt provided ([Figure 5](#)).

**Figure 5** *Antenna Bracket Attached to Mounting Bracket*

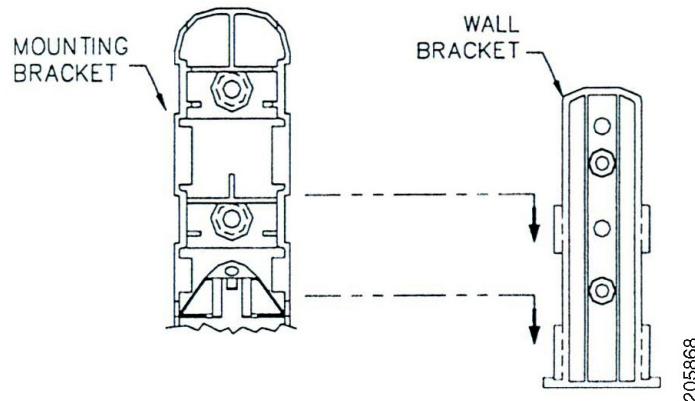


**Step 3** Determine the mounting location for the antenna.

**Step 4** Attach the wall bracket to the wall using the two screws provided ([Figure 6](#)).

**Figure 6** Wall Mounting

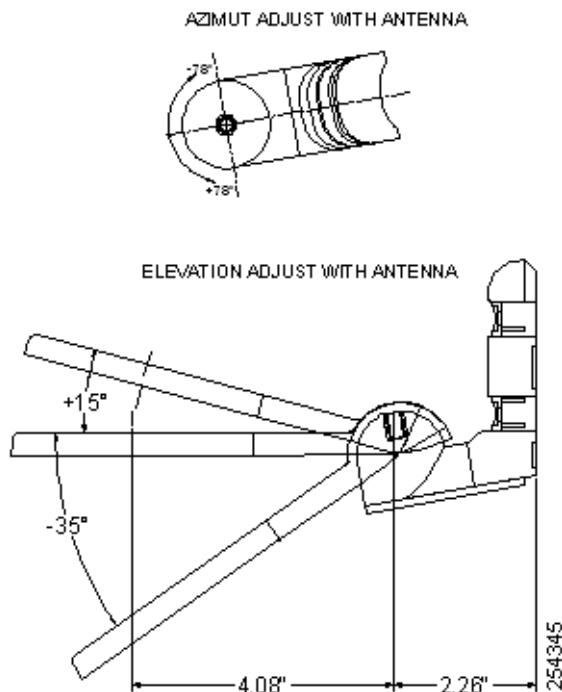
**Step 5** Slide the mounting bracket onto the wall bracket and secure it in place (optional) with the two screws provided (Figure 7).

**Figure 7** Attaching Mounting Bracket to Wall Bracket

Once the antenna is secured on the wall, you can adjust the azimuth and elevation.

**Step 6** To adjust the azimuth and elevation, loosen the bolt that attaches the antenna bracket to the mounting bracket (Figure 8). Azimuth can be adjusted  $\pm 90$  degrees. Elevation can be adjusted  $+15$  degrees and  $-35$  degrees.

**Figure 8** *Azimuth and Elevation Adjustment*



## Mounting on a Ceiling

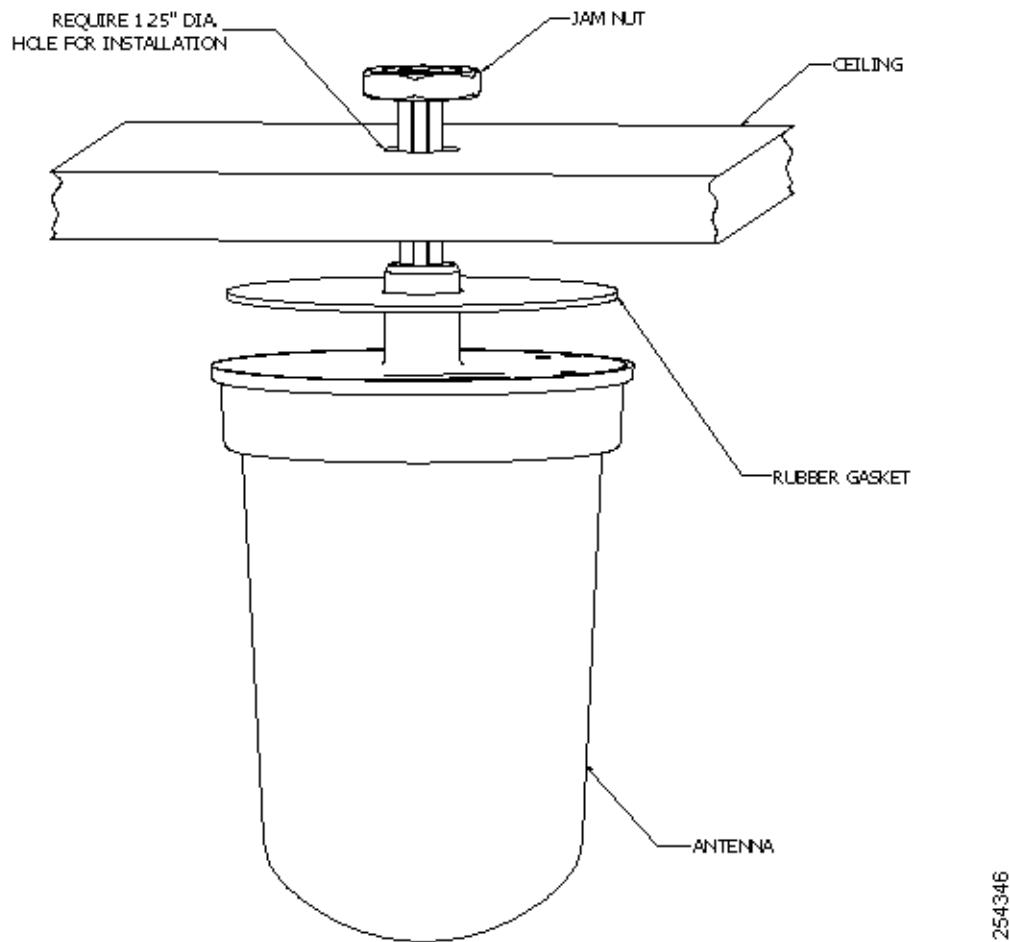
To mount the antenna on a ceiling, follow these steps:

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- Step 1** Drill a hole in the ceiling approximately 1.25 in. in diameter.
- Step 2** Fit the rubber gasket onto the bottom of the antenna.
- Step 3** Insert the antenna shaft through the hole in the ceiling.
- Step 4** Thread the jam nut onto the antenna shaft and tighten.

[Figure 9](#) shows the ceiling mount process.

**Figure 9** Mounting on a Ceiling



## Mounting on a Mast

The antenna can be mounted on a mast rather than on a wall using two 1/2 inch-wide hose clamps (not provided).

To mount the antenna on a mast, follow these steps:

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- Step 1** Follow Steps 1 and Step 2 from the “Mounting on a Vertical Surface” section on page 9.
- Step 2** Position the antenna, mounting bracket, and hose clamps on the mast.
- Step 3** Tighten the hose clamps until the antenna is secure on the mast.

Once the antenna is secured on the mast, you can adjust the azimuth and elevation.

**Step 4** To adjust the azimuth and elevation, loosen the bolt that attaches the antenna bracket to the mounting bracket (Figure 8). Azimuth can be adjusted  $\pm 90$  degrees. Elevation can be adjusted +15 degrees and -35 degrees.

## Suggested Cable

Cisco recommends a high-quality, low-loss cable for use with the antenna.



**Note** Coaxial cable loses efficiency as the frequency increases, resulting in signal loss. The cable should be kept as short as possible because cable length also determines the amount of signal loss (the longer the run, the greater the loss).

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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