

095079-000 Revision L, May 2016

**Broad Band Antennas Omni or Elliptical Pattern**  
DB420 Series

**PRODUCT DESCRIPTION**

The DB420 series antennas are high gain, light weight, heavy duty antennas for use in station applications where an omnidirectional or an elliptical radiation pattern is desired.

**OPTIONAL RADIATION PATTERN**

One important feature of the DB420 series antennas is they permit the user to adapt the antennas to changing coverage requirements.

An omni pattern is achieved when the four dual dipole assemblies on the upper mast are positioned in line (collinear), but offset by 90° from the four dipole assemblies stacked in line (collinear) on the lower mast. When all sets of dipoles are in line as shown in Figure 1, the DB420 antenna has a directional characteristic—giving an elliptical pattern. Radiation patterns for both scenarios are shown in Figure 2.

To change the pattern from omni to elliptical, loosen the band straps of the four assemblies on the upper mast; then, reposition them so that they are in line (collinear) with the four dual dipole assemblies on the lower mast.

Tighten the band straps and re-tape the cabling harness to the mast. The tape (part no. DB11901) that is used to secure the cabling harness should be covered with an aluminum backed tape such as Scotch #425 (part no. DB11902).

To change from an elliptical to an omni pattern, simply reverse the above procedure.

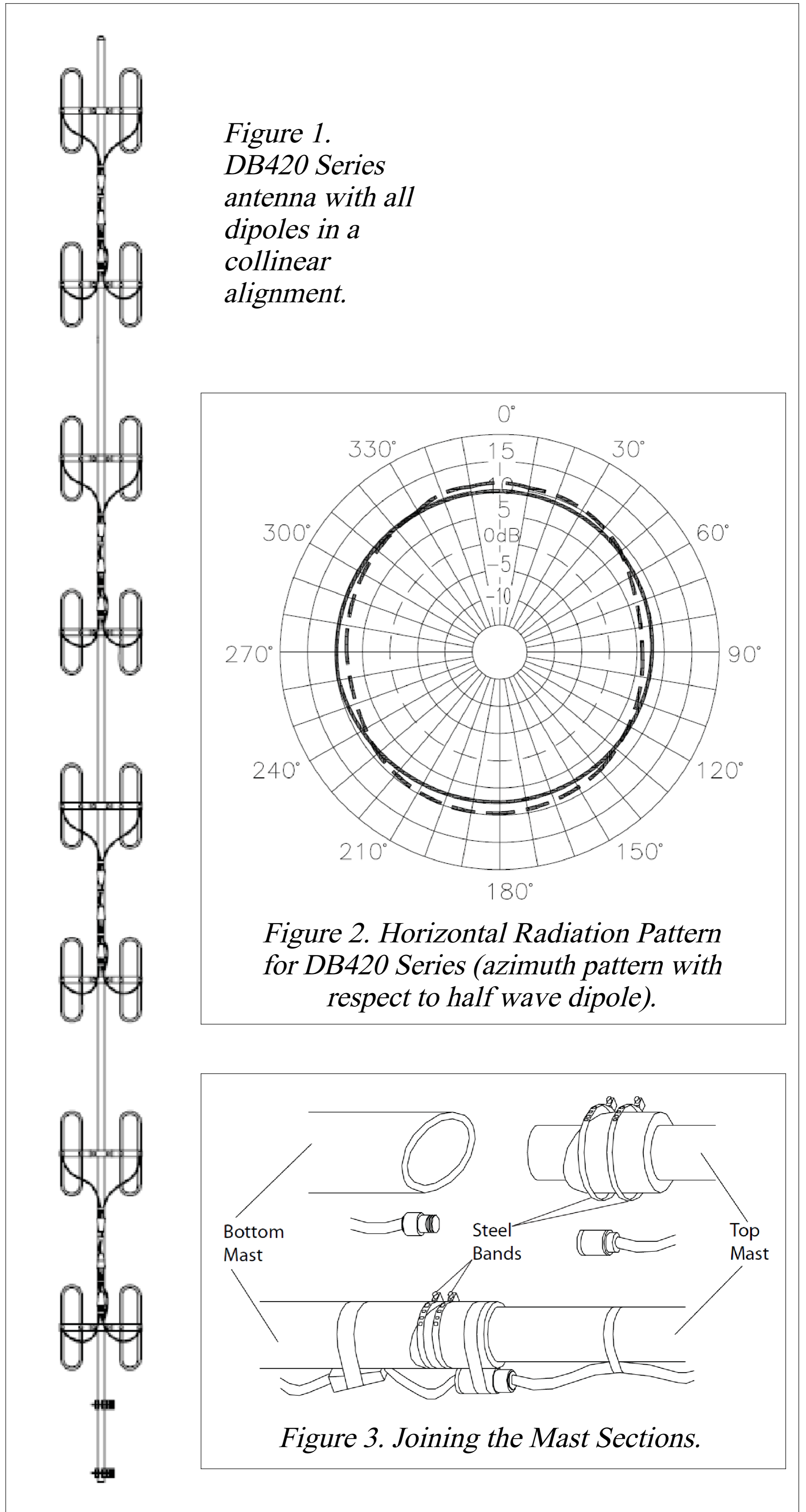
*continued on page 2*

**SAFETY NOTICE**

The installation, maintenance, or removal of an antenna requires qualified, experienced personnel. CommScope installation instructions are written for such installation personnel. Antenna systems should be inspected once a year by qualified personnel to verify proper installation, maintenance, and condition of equipment.

CommScope disclaims any liability or responsibility for the results of improper or unsafe installation practices.

It is recommended that transmit power be turned off when the field installation is performed. Follow all applicable safety precautions as shown on this page.



*Figure 1. DB420 Series antenna with all dipoles in a collinear alignment.*

*Figure 2. Horizontal Radiation Pattern for DB420 Series (azimuth pattern with respect to half wave dipole).*

*Figure 3. Joining the Mast Sections.*



Do not install near power lines. Power lines, telephone lines, and guy wires look the same. Assume any wire or line can electrocute you.



Do not install on a wet or windy day or when lightning or thunder is in the area. Do not use metal ladder.



Wear shoes with rubber soles and heels. Wear protective clothing including a long-sleeved shirt and rubber gloves.

Continued from page 1

## GENERAL MOUNTING INFORMATION

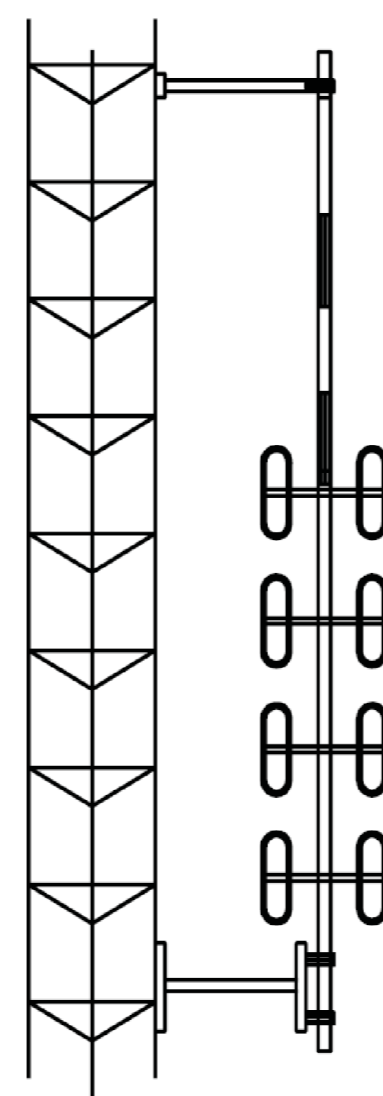
The DB420 series antennas are designed for mounting on top of a tower or wooden pole. For best operation, it is recommended that the bottom dipole be above the tower top. Side mounting of the antenna requires the use of a DB5012 side mount kit. Radiation patterns obtained with the antenna side mounted on an 18" tower are shown in Figure 4.

## INSTALLATION PROCEDURES

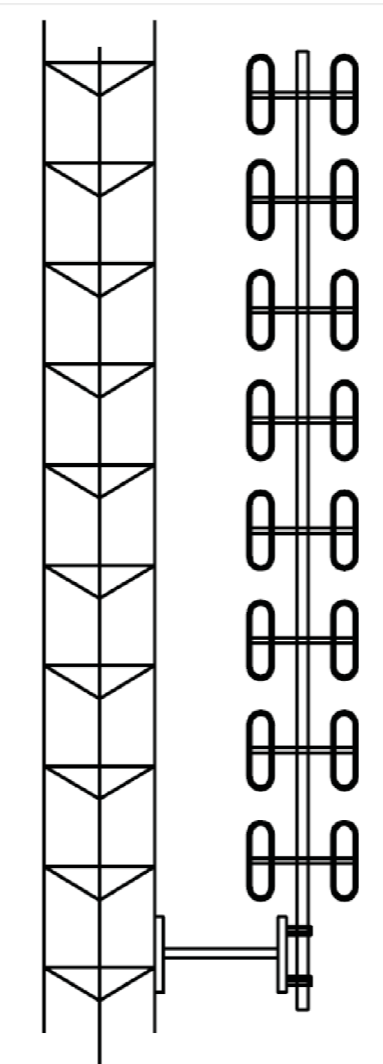
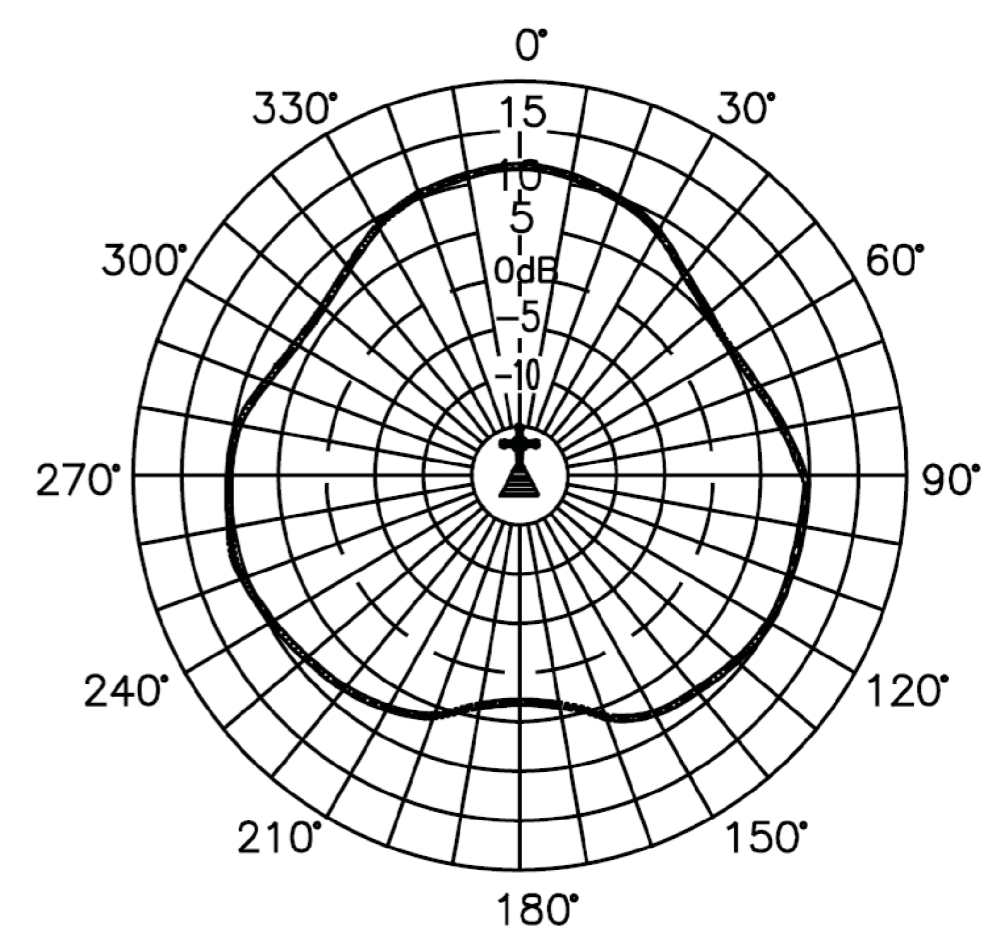
1. After removing the antenna from the shipping box, inspect it to be sure all parts are on hand, and that there is no physical damage.
2. Inspect the antenna feed assembly output connector to determine that it mates with the end of your station transmission line. Do not remove any connector or cable from the antenna feed assembly as they are all part of your antenna.
3. Verify that the frequency to which the antenna has been tuned is the frequency at which your radio system is to operate.
4. Slip the mast sections together and tighten the bands securely. Join the connectors (Figure 3). Make the connections snug but do not apply heavy force with pliers. To avoid moisture problems, carefully wrap the connection with Vapor-Wrap (part no. 11317 or 11316), working the compound into all cracks and smoothing over the outer jackets. Failure to waterproof the cable connection will result in improper operation of your antenna. Secure the connectors to the mast with several wraps of tape. (Note: For quad type antennas, there are two connections to be made where the mast sections join.)
5. Attach the DB365 mounting clamps (supplied) to the bottom of the antenna mast at designated locations. Mount the antenna on the tower with the bottom dipoles above the tower.
6. A check of the antenna VSWR as measured at the antenna is recommended at this point. Note this measurement carefully and record it for future reference.
7. After checking the VSWR at the antenna, connect the station transmission line to the antenna. Make the connection snug but do not apply heavy force with pliers. To avoid moisture problems, carefully wrap the connection with Vapor-Wrap (part no. 11317 or 11316), working the compound into all cracks and smoothing over the outer jackets. Failure to waterproof the cable connection will result in improper operation of your antenna.
8. Secure the feeder cable and antenna transmission line to the tower in the best position to avoid physical damage to the cable.
9. After the antenna and transmission lines have been installed, a careful visual check should be made to ensure that:
  - All mechanical connections have been securely made.
  - The antenna is mounted on the proper leg of the tower with sufficient physical clearance.
  - All connections have been carefully wrapped with Vapor-Wrap to prevent moisture problems.

## SIDE MOUNTING

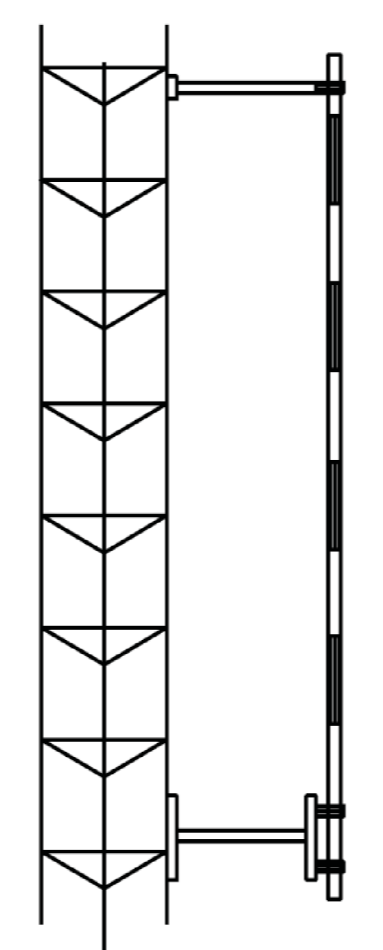
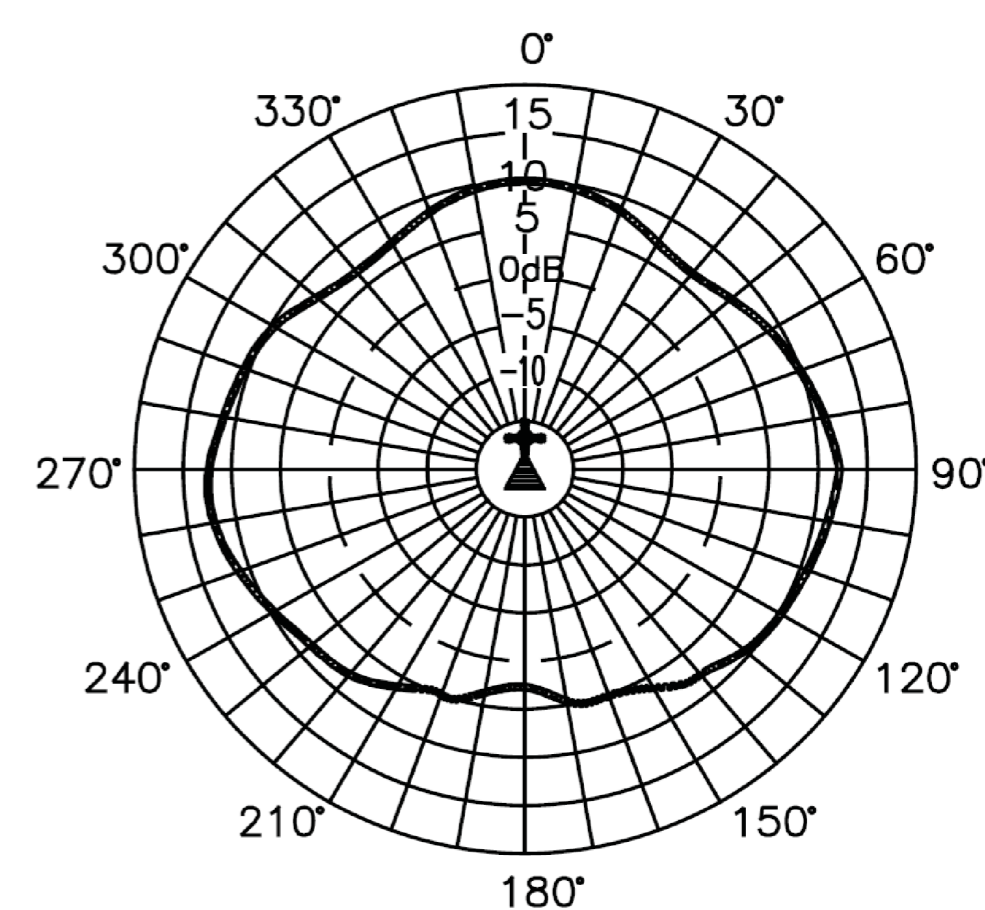
When the antenna is mounted to the side of a tower, the horizontal radiation pattern necessarily becomes distorted. The patterns below indicate the typical pattern shapes of an antenna that is side mounted – using the DB5012 side mount kit – onto a tower with an 18" face. The patterns for 12" and 24" towers will be similar.



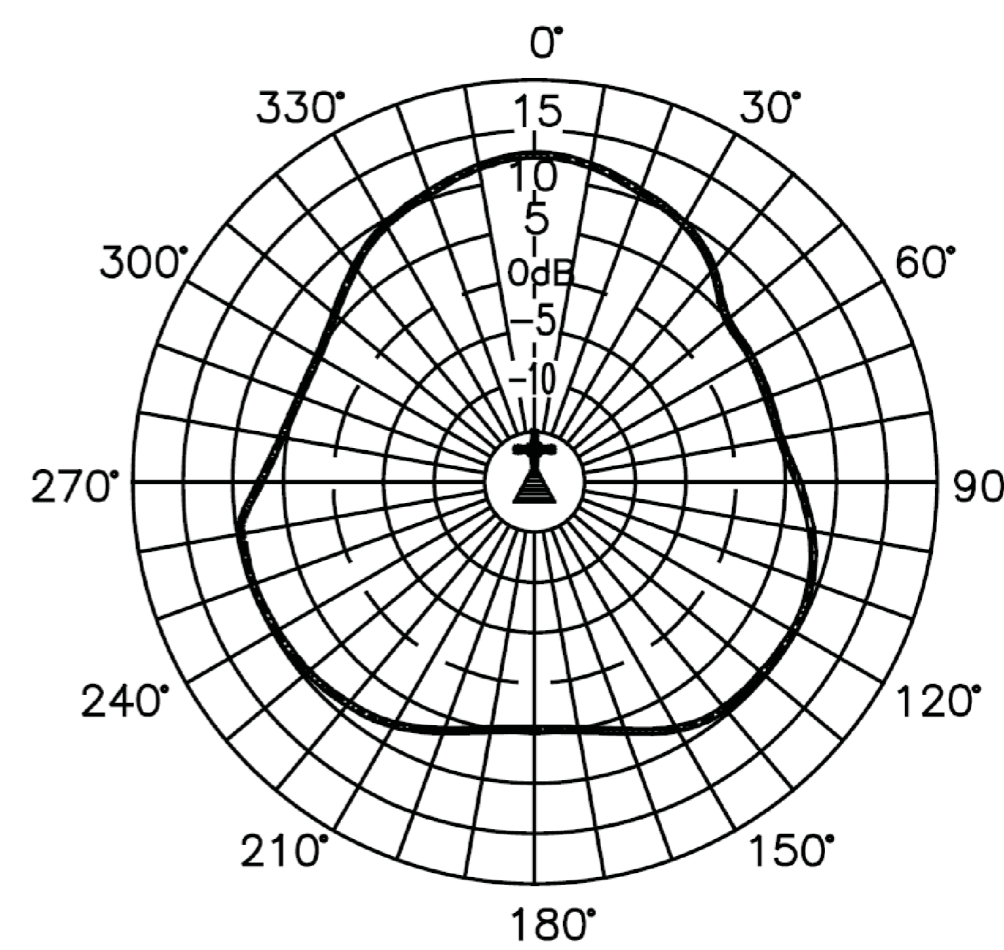
Mounted on the Side of the Tower (Omni)



Elements Pointed Toward the Tower



Elements Broadside to the Tower



The DB5012 Side Mount Kit positions the antenna approximately 16" from the tower. It consists of an upper sway brace, a lower bracket (both galvanized) and the necessary hardware for attaching the bracket to round tower members measuring up to 2-1/2" on a side. Clamps in other sizes can be special ordered.

Figure 4. Side Mounting.