

Technical Bulletin #9901

Revised 7-01

Subject: LNB Polarization for FM Cubed and FM Squared Services

In assisting with reception problems at some customer downlink sites, it is apparent that the polarization aspect of antenna alignment is not getting the attention necessary to optimize reception of the satellite signal. While azimuth (left and right) and elevation (up and down) are generally peaked properly, polarization remains a continuing problem. One reason is that under some conditions, polarization can be off as much as 45 degrees and still maintain a receive signal. Activation of opposite polarity signals after alignment can however degrade or eliminate the desired signal's reception when polarity is not optimized.

If test equipment is not available for installation, polarization should be set to the exact degree of rotation described in the installation instructions for a given geographical site. Refer to the following diagrams for guidance, when setting the polarization. These diagrams will give an indication of the proper position of the feedhorn, but utilize the scale marked on the feedhorn for final adjustment. The diagrams and rotation direction are as viewed looking into the feedhorn throat assembly from the end pointed at the antenna.

Figure 1. Depicts the waveguide opening on the LNB for a polarization of 0 degrees (viewed looking into the feedhorn throat from the end pointed at the antenna). The waveguide opening is horizontal. There is no difference in 180 degree rotation (cannot get the LNB upside down). From the 0 degree position, positive polarization would be in the clockwise direction and negative polarization would be in the counter-clockwise direction. Again, this rotation is referenced as viewed from the antenna side of the assembly.

Figure 2: An example of a +90 degree polarization.

Figure 3: An example of a +60 degree polarization.

Figure 4: An example of a -60 degree polarization.

View looking into the feedhorn throat

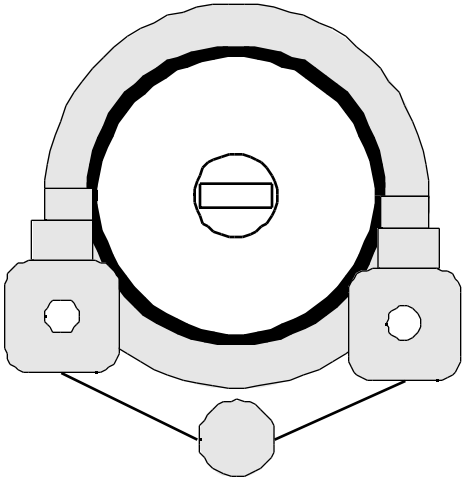


Figure 1
0 degrees

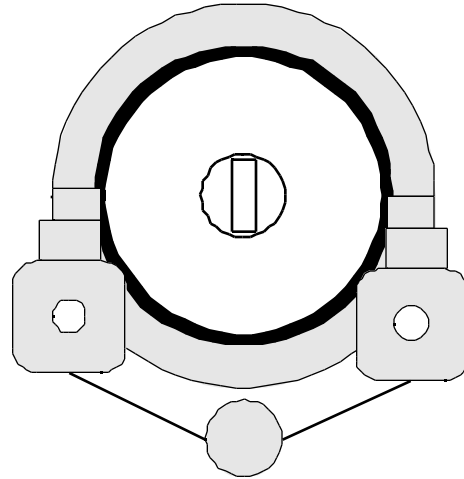


Figure 2
+90 degrees

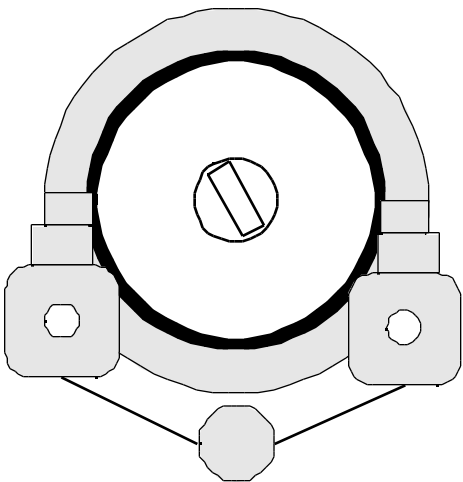


Figure 3
+60 degrees

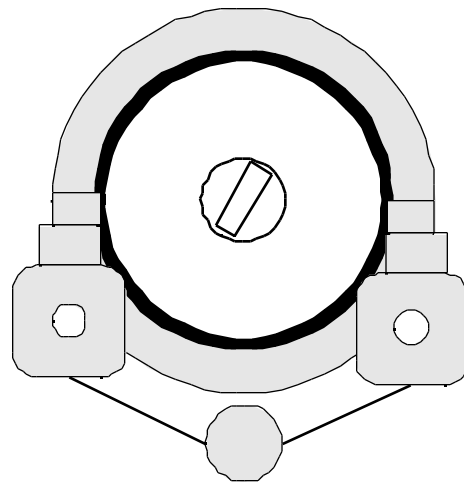


Figure 4
-60 degrees

If a spectrum analyzer or service monitor is being used, the goal is to minimize the opposite polarity signal. Two methods have proven successful.

1. If a strong opposite polarity signal can be seen on the desired polarity, minimize that opposite polarity signal while maximizing the desired polarity signal. This method generally is only available when larger antennas are being used. The antenna size required for this method is dependent on the strength of the opposite polarity signal being used for peaking.
2. If the opposite polarity cannot be seen on the desired polarity, peak the polarity for maximum signal on the opposite polarity and then rotate the feedhorn 90 degrees.

Regardless of the method used, polarization can be peaked with patience. As with most tasks, it will also become easier with practice. Optimum polarization will help insure long term error free reception of your desired satellite signal.