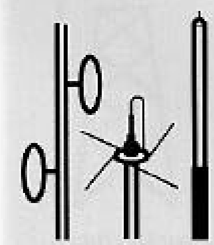
STYLE



STYLE

There is some performance overlap in the areas of horizontal beamwidth, gain and bandwidth among differing antenna designs. The external dipole array antenna, for example, features electrical specifications nearly identical with a comparable fiberglass collinear antenna. Both designs enjoy wide popularity. What factors influence the choice of one style over the other? In this example, mechanical considerations dictate the choice. Both antennas are DC grounded and afford a high degree of lightning protection for the equipment below. However, the lightning current discharge capability of the external dipole array is greater than that of the fiberglass antenna because it features a 2-1/4 inch pipe as the discharge path. The fiberglass style utilizes its soldered internal elements as the path to ground. Therefore, the external dipole is more rugged, but the fiberglass style antenna offers radome-protected radiating elements and tends to shed ice buildup, whereas the external dipole antenna is prone to ice buildup in heavy snowstorms.

A similar argument can be made between Yagis and panels. For similar RF performance characteristics, Yagi antennas are generally lighter, more easily mounted and less expensive than the panel. However, Yagis are prone to ice buildup, have a longer horizontal profile, and are not generally available in the wide variety of bandwidths, beamwidths, and gain choices. Panels offer greater front-to-back ratios and fewer side lobes than Yagis, and are capable of bandwidths up to 100 MHz to satisfy the multiple-channel requirements of trunked 800 systems and cellular operators. Panel antennas also provide a weather tight enclosure around the radiating elements, and tend to shed ice from their radomes. Finally, panel antennas can be painted to blend into the background when mounted on buildings, in keeping with architectural aesthetic requirements. Consult your Celwave Sales Engineer for advice on painting antennas.

NOTES ON CELLITE PANEL ANTENNAS

CELLITE PANEL

The result of a major breakthrough in technology, CELlite panel antennas virtually eliminate intermodulation.

The basic concept behind this technology is to make the entire antenna from one piece of the same aluminum alloy. In a CELlite antenna, the dipoles and the microstripline feeding network are manufactured from a single piece of aluminum. The unit is then welded into the reflector box. Because the welding is also accomplished with aluminum, there is no material discontinuity in the process. The construction of CELlite panel antennas is therefore the solution when low intermodulation is required.

In a measurement series on a standard GSM antenna, Celwave has established that at 2 x 43 dBm signal input, we can consistently obtain 3rd order intermodulation prospects lower than -110 dBm or -151 dBc. If this is calculated for the DCS requirements of 2 x 38 dBm, intermodulation of better than -166 dBc result.

CELlite panel antennas have very large bandwidths. On antennas currently in production, it is 20% for a VSWR of less than 1.5:1. For smaller bandwidths, an impressively low VSWR can be obtained. This technology makes the possibility of achieving VSWR of less than 1.2:1 in the transmit band and less than 1.3:1 in the rest of the band a reality.

All CELlite panel antennas are surface treated after welding. This ensures that all components have additional protection against severe weather and other hostile environments. Corrosion is therefore prevented and the antennas' lifetime is significantly extended.

SIDE OR TOP MOUNT

Location of an antenna on its supporting structure exerts an influence on a system's coverage area. This can be another parameter beyond the designer's control, particularly in cases where the tower site is rented on a space-available basis and there is little choice.

Antennas mounted at the top of supporting structures such as towers have the greatest approximation to free space radiation patterns.

Antennas mounted on the side of a support structure suffer distortion of their radiating patterns, which are influenced by the nearby tower legs and coaxial runs within the antenna's aperture. The resultant effect is a “serration" of an otherwise smooth radiation pattern.