

Measured Performance of Low Profile Antennas fed in a Balanced Configuration

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This presentation gives an in-depth analysis of the measured performance of a pair of low-profile antennas delivered to the Army. One antenna has two radiating elements and is linearly polarized while the second antenna has four radiating elements and is circularly polarized. The linearly polarized antenna is fed in a balanced configuration using a 180-degree hybrid splitter. The circularly polarized antenna uses a 90-degree hybrid splitter cascaded into two 180-degree hybrid splitters to achieve orthogonal fields in phase quadrature. This antenna is also fed in a balanced configuration. Each antenna has been fully characterized in terms of S-parameters at their input ports – after the splitters. In an effort to determine the power reflected back into the dummy loads of the hybrids, active reflection coefficients are determined from measured data. Accordingly, an adjustment to the radiation efficiency is obtained knowing both the insertion loss of the hybrids as well as the percentage of power absorbed into the dummy port of the hybrids. The dependence of the active reflection coefficient in terms of the mutual coupling between elements is quantified giving insight into possible improvements for the antennas.

Additionally, the measured radiation patterns and gain are presented for each antenna.