



Ku-Band Electronically Scanning Antenna PRODUCT DATA SHEET



This small Ku-Band antenna

was designed to provide electronic scanning capability for the terminal guidance system of a ground-to-air missile. Two-axis monopulse tracking is provided over an instantaneous frequency band of 500 Megahertz.

GENERAL DESCRIPTION

The r-f portion of the Ku-Band Antenna consists of the lens and feed assemblies. The electronics portion consists of the phase shifter drivers, a phase shifter controller and a PC-based beam controller. The r-f portion fits within a nine-inch diameter.

The lens assembly consists of 396 reciprocal ferrite phase shifters contained between a feed network and a radiating ground plane. The phase shifters are arranged in an equilateral triangle pattern. These dual-mode ferrite phase shifters accept linearly polarized r-f energy from the feed by means of a nonhomogeneous rectangular waveguide transition, provide variable phase shift to the r-f energy and then radiate the same sense of linear polarization into space by means of a homogeneous circular waveguide radiating element physically integrated with the phase shifter. The radiating aperture consists of an aluminum ground plane with through holes which accept the circular waveguide radiating elements.

The feed assembly consists of the monopulse network, 5-way unequal power dividers, 6-way unequal power dividers and equal 4-way power dividers. The input power is divided into four equal parts by the monopulse network. The quadrant output of the monopulse network is connected to the 5-way unequal power dividers which are used to feed the rows of the antenna. The outputs of the 5-way unequal power dividers are connected to the 6-way power dividers each of whose output is connected to a 4-way equal power divider. The outputs of these power dividers are connected to the phase shifters.

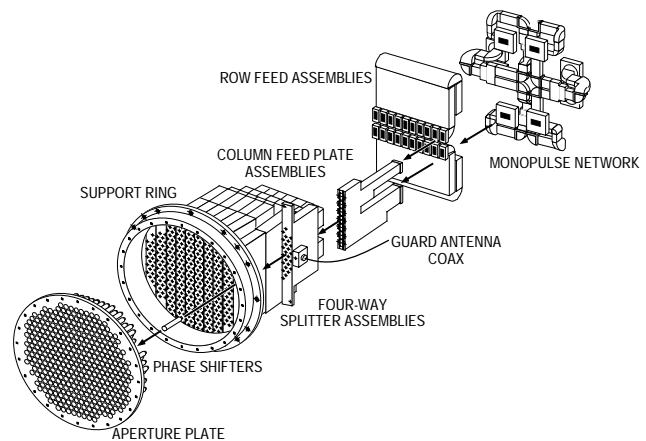
The phase shifter drivers use the MAG ASIC mounted to printed wiring boards. The phase shifter controller is a single board computer compatible with the VME specification. The beam controller is either a desktop or laptop PC.

Features and specifications of the Ku-Band Antenna are given on the back side of this data sheet.

Ku-Band Electronically Scanning Antenna

Features

- 396 Radiating Elements Located on an Equilateral Triangle Grid
- Linear Polarization
- Two-Axis Monopulse Tracking
- Guard Antenna
- Latching Ferrite Phase Shifters
- Built-In-Test



Specifications

- Ku-band frequency, 6 percent bandwidth
- 500 MHz instantaneous bandwidth
- 29 dB gain
- 60 degree conical scan coverage
- 5.5 degree beamwidth
- -35 dB monopulse null
- -25 dB peak sidelobes
- 35 microseconds beam switching time

