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Brief 66-10518

NASA TECH BRIEF

Antenna Simulator Permits Preinstallation System Checkout

The problem:

To provide a simple, easily controlled antenna simulator for evaluation checkout of corporate feeds, monopulse sum-and-difference networks, etc. in a shielded environment prior to system checkout on an antenna pattern range.

The solution:

An antenna simulator used for system checkout in place of phase-sensing, amplitude-sensing, and phase-amplitude-sensing antennas.

How it's done:

The simulator consists of four types of components: square hybrids, phase delays, load terminations, and variable phase shifters. Operation is predicated on three weighting circuits with one variable parameter (phase shift) in each. When used in the simulation of a pure phase-sensing antenna, the phase shifts are set so that equal amplitudes emanate. The phases of these signals are then adjusted according to the interferometric equations. In the simulation of a pure amplitude-sensing antenna, the phase shifts are set so that the derived ratios of field strength (voltage) amplitudes are obtained at the output terminals and the signals are made to be cophased (or at most, antiphased) with respect to one another. When used as a phase-amplitude-sensing antenna simulator, an antenna that is neither pure amplitude nor pure phase sensing is contemplated. In this case, the phase shifts provide the desired amplitudes and phase adjustment is provided to simulate the phase relationships among the received signals.

Notes:

1. This technique would be useful wherever simulation of monopulse antenna element characteristics is desired for checkout of ancillary equipment in a controlled environment.
2. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Goddard Space Flight Center
   Greenbelt, Maryland 20771
   Reference: B66-10518

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Richard F. Schmidt
and Armondo D. Elia
(GSFC-522)

Category 01