Abstracts

Circularly-Polarized Phase Shifter for Use in Phased Array Antennas (Dec. 1966 [T-MTT])

M.C. Mohr and S. Monaghan. "Circularly-Polarized Phase Shifter for Use in Phased Array Antennas (Dec. 1966 [T-MTT])." 1966 Transactions on Microwave Theory and Techniques 14.12 (Dec. 1966 [T-MTT]): 672-683.

An X-band, circularly-polarized, nonreciprocal, ferrite phase shifter has been developed whose size and electrical performance are favorably suited for use in transmission or reflection-type phased arrays requiring element center-to-center spacings of about 0.5 lambda. The phase shifter has the same configuration as a Faraday rotator with a ferrite rod located at the center of a circular waveguide with an axially applied field. If a circularly polarized wave is passed through this geometry, a nonreciprocal phase-current characteristic is obtained. The array antenna is configured so that no phase-control field reversals are needed between transmit and receive modes of radar operation. The radiating element has been designed as an integral part of the beam steering element using waveguide array simulator techniques, this paper will discuss various design problems and performance of the beam steering element. A 1300-element phased array was constructed and tested. Its performance, as it relates to the phase-setting accuracy of 1300 phase-shifter constituents, is stated briefly.

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