Abstracts

Millimeter-Wave Integrated Phased Arrays with Ferrite Control

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A new class of scanning arrays will be described. The antenna is of a traveling wave type and consists of a waveguide with a magnetogyrotropic medium. The radiating discontinuities are placed periodically along the waveguide. The waveguide may consist of an open three-layer structure made up of ferrite-dielectric-ferrite materials. A set of microstrip dipoles is placed on top of the outer ferrite layer, spaced equidistantly (one half wavelength apart), perpendicular to the direction of wave propagation. The opposite side of the structure is covered with a metal screen and the ferrite plates are transversely magnetized using wires. The inner dielectric layer with a high dielectric constant consists of a number of rods, each of which is placed under a row of microstrip dipoles. Each dielectric rod with its row of dipoles forms a line-source antenna with negligible electromagnetic coupling to its nearest neighbors. This structure forms the planar scanning array.

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