Abstracts

Latching Ferrite Phase Shifter for Scanning Dielectric Lens

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In recent years, numerous latching ferrite phase shifters have been designed in rectangular and circular waveguide, stripline, and slow-wave structures. In all these devices, metal walls have surrounded the ferrite and played a major role in guiding the wave. A new device is now described in which no metal walls surround the phase shifter and the ferrite itself guides the wave. This unique device is intended for use in a scanning lens as shown in Figure 1. In Figure 1A we see a conventional optically-fed array in which a signal is radiated from a feed, captured by antennas at one face of the array, phase shifted in waveguide or coaxial devices, and reradiated by antennas at the opposite face. In Figure 1B the separate components of the conventional lens have been replaced by an array of ferrite tubes capped by dielectric impedance-matching elements. A wave is captured at one surface of the lens, guided by the ferrite, phase shifted according to the remanent magnetization of the ferrite, and reradiated at the opposite face. The latching wires which pass through the center of the ferrite are small enough to have a negligible effect on the RF propagation.

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