Abstracts

Periodic Structures in Trough Waveguide

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The center fin in trough waveguide can be modified in a periodic fashion to alter the propagation characteristics of the guide. Two such periodic modifications, one an array of circular holes and the second a periodic array of teeth, have been measured fairly extensively and analyzed theoretically. These configurations are useful in connection with antenna scanning or waveguide filter applications. The array of holes produces only a mild slowing of the propagating wave, but the toothed structure, which may alternatively be described as a series of flat strips extending beyond the edge of the tin, can cause the propagating wave to vary from a very slow to a very fast wave. The periodic structures are theoretically treated by two methods, a transverse resonance procedure and a periodic cell approach. These theoretical results agree very well with each other and with the measured data.

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