Abstracts

Double-Ridge Waveguide for Commercial Airlines Weather Radar Installation

T.N. Anderson. "Double-Ridge Waveguide for Commercial Airlines Weather Radar Installation." 1955 Transactions on Microwave Theory and Techniques 3.4 (Jul. 1955 [T-MTT]): 2-9.

This paper describes the design and development of a double-ridge waveguide designed to propagate both C-band and X-band (5,400 and 9,300 mc) so as to allow for a common waveguide installation in commercial airliners which could use either a C-band or an X-band weather penetration radar. This double-ridge waveguide is capable of propagating over the desired frequency range with single mode operation only; it yields attenuation at C-band which is only slightly higher than that of normal C-band waveguide and has somewhat reduced attenuation at X-band compared to standard 1 X ½ rectangular waveguide. This double-ridge guide has been adopted by Aeronautical Radio, Inc. and is specified in their Characteristic No. 529 entitled "5.7 Cm Weather Penetration Airborne Radar." This paper also gives an analysis of the calculated guide wavelength in this double-ridge guide, attenuation, and peak power-handling capabilities; and compares the results of these calculations with measured data. Peak power-handling capability for this double-ridge guide is well within the requirements of this application. The testing procedures used for high-power breakdown measurements are described. This paper also covers the development of double-ridge waveguide flanges, elbows, bends, twists, transitions, and flexible waveguide for use over this extremely broad band.

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