# Abstracts

## Analysis of Coupling Loops in Waveguide and Application to the Design of a Diode Switch

*W.C. Jakes, Jr.. "Analysis of Coupling Loops in Waveguide and Application to the Design of a Diode Switch." 1966 Transactions on Microwave Theory and Techniques 14.4 (Apr. 1966 [T-MTT]): 189-200.*

A voltage-controlled switch using PIN diodes loop-coupled to a section of WR975 waveguide is described. Total switching loss of over 40 dB could be obtained at 960 Mc/s. The switch was operated at rates up to 60 c/s for use in the satellite-tracking radar system at Crawford Hill, N.J. The 3-dB bandwidth of the complete switch was 0.7 Mc/s. The forward switch loss was low enough to permit transmission of 10 kW of 960-Mc/s power with a 50 percent duty cycle without excessive heating of the diodes. Theoretical analysis of the complete waveguide switch involved determination of the coupling of individual Ioops to the dominant and higher-order waveguide modes. A reciprocity theorem was used to calculate the appropriate mode coupling coefficients. These were then related to the insertion loss by means of an equivalent circuit for the complete switch. A number of experiments confirmed the theory.

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