# Abstracts

## On the Optimum Design of Tapered Waveguide Transitions

*R.P. Hecken and A. Anuff. "On the Optimum Design of Tapered Waveguide Transitions." 1973 Transactions on Microwave Theory and Techniques 21.6 (Jun. 1973 [T-MTT]): 374-380.*

It has been found experimentally that the conventional optimization of waveguide tapers for the interconnection of circular waveguides with different diameters fails if the ratio in the diameters becomes too large. With the aid of an accurate numerical analysis program, the reason for the failure was found to be the reconversion from the unwanted mode to the main mode, which is neglected in all known synthesis procedures. The performance of tapers can be considerably improved by the implementation of other design equations and establishing new design criteria. This results in somewhat longer tapers. Various tapers were designed according to these procedures for a maximum of -40-dB H/sub 02/-mode level between 40 and 110 GHz, and preliminary measurements on fabricated units substantiate the improvement. It is further shown that the mode conversion at cutoff does not exhibit any singularity.

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