# Abstracts

## Design Considerations for Bent-Beam Waveguides

*D. Marcuse. "Design Considerations for Bent-Beam Waveguides." 1965 Transactions on Microwave Theory and Techniques 13.5 (Sep. 1965 [T-MTT]): 647-651.*

The description of the beam-waveguide in terms of ray optics and wave optics is combined to describe the performance of waveguides with predetermined bending radii. We require that the beam in a bend of the beam-waveguide departs from its axis no more than an amount equal to half its spot size. This requirement is sufficient to determine uniquely the spacing and focal length of the lenses. It turns out that it is advantageous to space the lenses close to four times their focal length, in order to enable the waveguide to direct a light beam around sharp bends. However, transverse random displacements of the lenses also cause the beam to depart from the axis of the guide. This departure becomes very large if the lens spacing approaches four times the focal length. A guide which is designed to negotiate sharp bends is more seriously affected by random displacements of the lenses. Further analysis of imperfections and experimental work will be required before a final design choice can be made.

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