A waveguide feed has been designed to provide specified illumination patterns for a dual-reflector antenna in two wavelength bands: 8 to 9 GHz and 30 to 40 GHz. The feed (see figure) has a coaxial configuration: A wider circular tube surrounds a narrower circular tube that serves as a waveguide for the signals in the 30-to-40-GHz band. The annular space between the narrower and the wider tube serves as a coaxial waveguide for the signals in the 8-to-9-GHz band. The nominal design frequencies of the outer and inner waveguides are 8.45 and 32 GHz, respectively.

Each of the two waveguides is terminated in a component that is sized and shaped to help focus the radiation in its respective frequency band into the specified illumination pattern. For the outer waveguide, the beam-shaping termination is a corrugated horn; for the inner waveguide, the beam-shaping termination is a dielectric rod insert.

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