

The eigenvalue diagram at the Dicke planes of the E-plane tee junction is not unlike that of the H-plane geometry available in the literature. The purpose of this paper is to remedy the situation. It includes an investigation of such a junction loaded with both inductive and capacitive vanes at its symmetry plane. This paper also introduces an alternate definition of the Dicke planes in terms of the location of a piston in the main waveguide, which produces a bandstop response between the other two and that of a similar piston in the side waveguide, which establishes a bandpass between the other two. The electrical symmetrical cases at the Altman and Dicke ports for which the magnitudes of the scattering parameters are those of a symmetrical wye junction are separately realized. Each solution has a distinct eigenvalue diagram, which is symmetric about the real axis. This paper includes the realization and fabrication of one device and is in excellent agreement with the theory. The work is undertaken in WR75 waveguide at a frequency of 13.25 GHz.