

waveguide radiators in a square grid rectangular cell configuration using constrained series feed, and studies on impedance loading, coupling and VSWR for such a junction. For this case, neither H-plane nor coplanar E-H plane Tee junctions can be used. The orientation of the Tee arm has to be found.

5. Since in a constrained series feed, each primary exciting guide feeds a number of cascaded sections of junctions, the equivalent network approach and loaded line analysis are applied for the estimation of length and inclination of successive oppositely inclined coupling slots for the synthesis of an array of matched waveguide radiators producing a narrow beam with a specified sidelobe level.

6. Determination of exact method of evaluation of impedance data for wide slots radiating into free space.

Self reaction in the Tee arm is evaluated from modal voltages and modal currents determined from the orthogonal expansion in terms of TE and TM modes. The effect of energy storage in the primary guide is taken into account by considering the self reaction of the magnetic field which is obtained from the solutions of Helmholtz equation. Expression for the magnetic field is determined from the appropriate Green's function. In all the cases of coupled junctions, coupling and VSWR are determined from the

parameters of the transmission matrix of the equivalent admittance.

In the case of analysis of slot coupled junctions, the self reaction assumes the form of a series in view of discrete eigenvalue spectrum. On the other hand, in the case of a slot radiating into free space, the self reaction is in the form of an integral since, the eigenvalue spectrum is continuous. In the case of wide slots, it is necessary to evaluate integral numerically over the visible region of the spectrum for the real part of the impedance and over the invisible region for the imaginary part of the impedance.