Title (en)

LOW SIDELOBE SOLID STATE PHASED ARRAY ANTENNA APPARATUS

Publication

EP 0275303 B1 19931013 (EN)

Application

EP 87905342 A 19870721

Priority

US 89145686 A 19860729

Abstract (en)

[origin: WO8801106A1] A low sidelobe, solid state array antenna apparatus comprises a large radiating aperture divided into a large number, N, of small, closely spaced radiating apertures, each small radiating aperture having associated therewith a radiating element and a linearly polarized solid state power module. The large radiating aperture is divided into M, preferably between (3) and about (10), differently sized, elliptically shaped, concentric radiating zones superimposed, for analysis purposes, upon another. Each such zone has an output voltage amplitude, Ei, and semi-major and semi-minor axes of respective lengths, ai and bi, each zone being considered separately in the far field equation: G(theta , PHI) = [f(theta ,$ gamma (PHI) (â theta cos PHI - â PHI sin PHI cos theta)]<2>, wherein f(theta , PHI) = (I), ui = (II), J1<(u>i<)> is the first order Bessel function, â theta and â PHI are unit vectors in the spherical coordinates and Ko is the wave number associated with the radiated field. Using the far field equation, values of Ei, ai and bi for each zone are computed which result in the far field sidelobe peak gain being a minimum or being a specified number of dB, for example, at least about 30 dB, below the far field mainlobe gain. The values of Ei in overlapping zones are summed to establish the required voltage amplitudes of the underlying power modules associated with the N radiation apertures.

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H01Q 21/00; H01Q 21/22

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