Microwave Abstracts

Based on technical merit and timeliness, microwave papers in journals published outside the United States have been selected and compiled below, generally with brief abstracts. Reprints of the papers may be obtainable by writing directly to the author or to the source quoted.

—F. G. R. Warren, *Associate Editor for Abstracts*
RCA Limited, Montreal, P.Q., Canada

Papers from Journals Published in the United Kingdom

Compiled by Dr. M. G. F. Wilson, University College, London, England

1
Construction of a Sensitive Microwave Noise Spectrometer, by W. A. Gambling and D. M. Kitching (Dept. of Electronics, Southampton University); *Proc. IEE* (*London*), vol. 115, pp. 615–621, May 1968.

The design and construction of a system suitable for measuring am and fm noise spectra from low-power, low-noise oscillators and nonlinear amplifiers is described. The noise temperature is 10°K in a bandwidth of 150 kHz over a range 2.5–3.5 GHz.

2
Electromagnetic Scattering by Slots on a Sphere, by M. A. Plonus (Dept. of Elec. Engrg., Northwestern University, Evanston, Ill.); *Proc. IEE* (*London*), vol. 115, pp. 622–626, May 1968.

Expressions for radiation admittance and the scattered fields are derived. Theoretical and experimental backscattering cross-section are found to be in very good agreement.

3
Propagation Behaviour of Periodically Loaded Waveguides Containing Dielectric and Ferrimagnetic Materials, by P. J. B. Clarricoats and M. I. Sobhy (Queen Mary College, University of London, and University of Kent, U. K.; both authors were formerly at University of Leeds); *Proc. IEE* (*London*), vol. 115, pp. 652–661, May 1968.

Dispersion characteristics are obtained for circular waveguides periodically loaded with dielectric or axially magnetized ferrimagnetic material. For the ferrite structures, two passbands being a function of the axial magnetic field.

4
Some Possibilities and Limitations of Graded Dielectric Loading as a Means of Reducing Loss on Coaxial Cables, by A. L. Cullen (Dept. of Elec. Engrg., University College London, U. K.); *Proc. IEE* (London), vol. 115, pp. 759–761, June 1968.

This is concerned with Barlow's suggestion for reducing loss in coaxial cables. It is found that no decrease in attenuation is possible if the permittivity decreases with increasing radius.

5
Generation and Effect of Surface Waves at a Waveguide-Ferrite Boundary, by L. Lewin (Standard Telecommunication Laboratories, Harlow, U. K.); *Proc. IEE* (London), vol. 115, pp. 895–897, July 1968.

The "thermodynamic paradox" situation is again considered. It is found that a surface wave must be included in the solution, but that its contribution to the junction impedance is small for large wall conductivity.

6
Riccati Approach to the Propagation of Axially Symmetric Waves in a Coaxial Guide, by G. Millington and S. Rotheram (Marconi Co. Ltd., Great Baddow, Essex, U. K.); *Proc. IEE* (London), vol. 115, pp. 1079–1088, August 1968.

This work is concerned with Barlow's proposal for reducing attenuation in coaxial guides by introducing a thin layer of dielectric. It is found that a decrease of attenuation can be achieved but this is offset by the dielectric losses. It is concluded that the experimental evidence of Barlow and Sen has not been satisfactorily explained.

7
General N-Way Distributed-Constants Combiner, by G. Luzzatto (Marconi Italiana S. p. A. Genova-Cornigliano, Italy); *Proc. IEE* (London), vol. 115, pp. 1115–1117, August 1968.

A general $(N+1)$ port network is described which may be employed as a combiner for N coherent signal generators without wasting power even if each generator delivers a different power and requires a different load impedance.

8
Synthesis of Multimode Waveguide Transition Sections, by E. Bahar and G. Crain (University of Nebraska, Lincoln, Neb., U.S.A., and Standard Telephone Laboratories, Harlow, Essex, U. K.); *Proc. IEE* (London), vol. 115 pp. 1395–1397, October 1968.

A waveguide taper transition is analysed using a) generalized telegraphists equation and b) a generalized quasi-optical method. The results are in fair agreement but method b) needs fewer elementary sections and yields a phase variation which is closer to the experimental results.

9
Wedge-Diffraction Functions and Their Use in Quasioptics, by L. Lewin (Dept. of Elec. Engrg., University of Colorado, Boulder, Colo.); *Proc. IEE* (London), vol. 116, pp. 71–76, January 1969.

Asymptotic and other formulas are derived for a field diffracted by a perfectly conducting wedge when illuminated by a line source. The wedge diffraction functions find application in electromagnetic problems in which the dimensions are too large for mode analysis but too small for geometric optics to apply.

10
Propagation in Corrugated Waveguides, by G. H. Bryant (Plessey Radar Ltd., Cowes, I.O.W., U.K.); *Proc. IEE* (London), vol. 116, pp. 203–213, February 1969.

Rectangular and circular corrugated waveguides are analyzed by imposing a nonisotropic surface-reactance boundary condition at the walls of the guide. Space harmonics are ignored, and this implies many corrugations per wavelength. Mode charts are presented which show the possible fast and slow modes present in the guide.

11
17.5 Ft.-Long Multiconal Taper for TE_{01} Mode in 29.7 Inch Diameter Waveguide at X Band, by K. Tomiyasu (General Electric Research and Development Center, Schenectady, N. Y.; *Proc. IEE* (London), vol. 116, pp. 373–376, March 1969.

This taper was developed for a high power waveguide system. Construction of the taper is described and field plots are presented. The unwanted TE_{02} and Te_{03} modes were estimated to be -25 dB relative to the wanted TE_{01} mode.