Microwave Abstracts

Based on technical merit and timeliness, microwave papers in journals published outside the United States have been selected and compiled below, many with annotations. Reprints of the papers may be obtainable by writing directly to the author or to the source quoted. The papers are in English unless noted otherwise.

—F. G. R. Warren, *Associate Editor for Abstracts*
RCA Victor Company, Ltd., Montreal, Canada

Papers from Journals Published in Italy

Compiled by Ingr. N. Rubino, Centro Microonde, Florence, Italy.

1
Electromagnetic Wave Propagation in a Weakly Ionized Plasma—I, by P. Caldirola, O. De Barbieri, and C. Maroli (Instituto di Scienze Fisiche, Università di Milano, Italy); *Il Nuovo Cimento*, vol. 42, Sec. B, pp. 266–290, April 1966.

Using a method introduced by Frieman and Sandri, it is possible to obtain a set of equations which describe the interaction process between an electromagnetic field and a weakly ionized plasma. The expression of the electronic distribution function and of the complex dielectric permittivity tensor are explicitly calculated.

2
Scanning Performance of a Multifrequency Diffraction-Reflector, by V. Russo and A. M. Scheggi (Centro Microonde, Florence, Italy); *Alta Frequenza* (English Issue), vol. 35, pp. 73E–77E, May 1966.

Experimental tests are described, carried out on a microwave diffraction reflector which operates at difference frequencies for different field angles.

3
Radiation from a Charged Particle Passing through a Circular Opening in a Perfectly Conducting Screen, by L. Ronchi (Centro Microonde, Florence, Italy); *Alta Frequenza* (English Issue), vol. 35, pp. 78E–82E, May 1966.

The radiation arising in the passage of a charged particle in uniform straight motion through a circular opening in an ideally conducting plane screen, normal to the particle path, is investigated. The exact solution of the problem is found in terms of spheroidal functions.

4
Electromagnetic Waves Guided by the Most General Anisotropic Impedance Wall, by P. Bernardi (Instituto di Elettronica, Università di Roma, Italy); *Il Nuovo Cimento*, vol. 43, Sec. B, pp. 338–347, June 1966.

A parallel plate bounded by two anisotropic planes is considered. It is found that TE and TM waves expressed as the sum of two independent waves propagating in two different directions can exist in the considered structure; the mentioned waves can not propagate in a rectangular waveguide bounded by two anisotropic planes and two conducting planes. The tensorial surface impedance has been calculated in the case of two actual structures.

5
Antenna Characteristics in Conducting Media, by L. Calandrino (Istituto di Elettronica, Università di Bologna, Italy) and E. Carli (Istituto di Elettronica, Università di Trieste, Italy); *Alta Frequenza*, vol. 35, pp. 531–535, July 1966.

The mutual coupling between two antennas submerged in a homogeneous, conducting medium is examined, and the coupling dependence on antenna characteristic is pointed out. The results are compared with the already known characteristic of similar antennas in nonconducting media. Calculations of the gain for some antennas of practical interest are given. (In Italian.)

6
Second Approximation Methods for the Calculation of the Phase Velocity of an Electromagnetic Wave over an Open Periodic Structure, by V. Pozzolo and R. Zich (Istituto di Elettronica e Telecomunicazioni, Politecnico di Torino); *Alta Frequenza*, vol. 35, pp. 536–544, July 1966.

The results of a first approximation, obtained in a previous paper, have been improved following two different methods: either taking into account the contribution of the most important space harmonics or by employing variational techniques. The theoretical results have been compared with those obtained by an experimental technique which is described. (In Italian.)

7
Low Gain Ring Antenna Input Impedance Properties, by M. Boella, A. Villa, and R. Zich (Istituto di Elettronica e Telecomunicazioni, Politecnico di Torino, Italy) and C. Cugiani (Centro Studio di Elettronica e Telecomunicazioni, National Research Council, Turin, Italy); *Alta Frequenza* (English Issue), vol. 35, pp. 120E–125E, August 1966.

A type of ring antenna has been studied with a view to realizing small-sized structures for satellite application. Impedance properties have been examined: suggestions for proper design of the antenna are given.

8
Backward Waves in a Plasma Filled Waveguide, by P. De Santis (Istituto di Fisica, Facoltà di Ingegneria, Rome, Italy); *Alta Frequenza* (English Issue), vol. 35, pp. 126E–133E, August 1966.

The effect of a metal wall on the backward propagation characteristics of a plasma slab are examined. It is found that for each frequency, backward propagation exists within a range of suitable characteristic parameters.

9
Surface Wave Mixing, by D. Solimini (Istituto di Elettronica, Facoltà di Ingegneria, Rome, Italy); *Alta Frequenza* (English Issue), vol. 35, pp. 134E–138E, August 1966.

Surface waves guided by the plane boundary between an isotropic medium and an anisotropic one are considered. Mixing of two strong surface waves due to the nonlinearity of the anisotropic dielectric is studied with the parametric approximation. The total beat field is considered and conditions are given for a growing intensity.

10
A Klystron-Varactor Wideband Frequency Deviator, by F. Aspesi (Istituto di Elettronica, Politecnico di Milano, Italy); *Alta Frequenza* (English Issue), vol. 35, pp. 139E–144E, August 1966.

A frequency deviator using a varactor coupled to the cavity of a klystron oscillator is described. Linear deviation of ± 20 MHz and total deviation of ± 50 MHz are reported.

11
Microwave Nearly-Optimum Phase-Lock Demodulator, by Ongaro and F. Rocca (Istituto di Elettronica, Politecnico di Milano, Italy); *Alta Frequenza* (English Issue), vol. 35, pp. 145E–155E, August 1966.

Description of a microwave phase-lock demodulator in which a 5.85 GHz Klystron is phase-locked onto an RF carrier phase-modulated by 24 telephonic channels in the band 12–108 kHz. Measured signal-to-noise ratios are compared to the theoretical predictions.

12
A Spherical Antenna for "SAN MARCO" Satellites, by P. Bruscaglioni (Istituto di Onde Elettromagnetiche, Università di Firenze, Italy); *Alta Frequenza*, vol. 35, pp. 669–675, September 1966.

An antenna is described which is constituted by two slots cut along two crossed great circles of a spherical metallic surface. An analysis of the radiation field is made in order to evaluate the effect of the lack of uniformity of the feeding voltage along the slots.

13
Generalized Reflection Operator for the Analysis of the Electromagnetic Field in Gyrotropic Media, by G. C. Someda (Istituto di Eletronica, Università di Trieste, Italy); *Alta Frequenza*, vol. 35, pp. 676–687, September 1966.

Papers from Journals Published in Australia

Compiled by Prof. A. E. Karbowiak, University of New South Wales, Kensington, N.S.W., Australia.

14
The Design of High-Power Harmonic Suppression Filters, by S. W. Conning (Standard Telephones & Cables Pty. Ltd., Liverpool, N.S.W.); *Proc. Institution of Radio and Electronics Engineers, Australia*, vol. 25, pp. 701–718, October 1964.

A brief theory of low-pass lumped element ladder networks is given and a new type of filter using helical or re-entrant coaxial elements is described. Details of construction and performance of several such filters are given.

15
A UHF Plasma Torch, by J. Swift (School of Elec. Engrg., University of New South Wales); *Proc. Institution of Radio and Electronics Engineers, Australia*, vol. 25, pp. 779–782, November 1964.

This torch operates at 460 MHz with a maximum power of 300 watts CW. Theory and engineering problems are discussed.

16
A Note on the Heavily Loaded Coaxial Resonator, by J. Swift (School of Elec. Engrg., University of New South Wales); *Proc. Institution of Radio and Electronics Engineers, Australia*, vol. 25, pp. 867–868, December 1964.

A new technique for matching of a UHF disk-sealed amplifier is described.

17
Surface Wave Transmission Lines with Single and Stranded Conductors, by R. M. Huey and K. L. Cheong (School of Elec. Engrg., University of New South Wales; Amalgamated Wireless (Australasia) Ltd., Sydney); *Proc. Institution of Radio and Electronics Engineers, Australia*, vol. 27, pp. 301–310, September 1965.

This paper discusses theory of single wire transmission lines and also gives results of loss measurements obtained on several experimental lines of about 200 ft. length.

18
A Circular to Rectangular Waveguide Transition Maintaining a Constant Cut-off Wavelength, by J. R. Pyle (Weapons Research Establishment, Salisbury, South Australia); *Proc. Institution of Radio and Electronics Engineers, Australia*, vol. 26, pp. 338–341, October 1965.

A suitable transition is described giving computed values of the geometrical parameters.

19
An Analysis of the High-Power Varactor Up-Converter, by S. W. Conning (Standard Telephones and Cables Pty. Ltd., Liverpool, N.S.W.); *Proc. Institution of Radio and Electronics Engineers, Australia*, vol. 27, pp. 163–173, July 1966.

Design formulas are obtained for an upper sideband up-converter using varactor diodes with no restrictions on the exponent of the power-law of the capacitance-bias-voltage curve. The results are carefully compared with those obtained by other investigators.

20
Pressure-Broadening Effects in Mixtures of Methylchloride and Non-Polar Gases at Microwave Frequencies, by C. H. Burton, J. H. Noon, W. B. Lasich, and R. W. Parsons (Dept. of Physics, University of Queensland, St. Lucia., Brisbane, Qld.); *Australian J. Phys.*, vol 19, pp 283–295, June 1966.

21
Collision Broadening of the Microwave Spectrum of Methylchloride by Hydrogen and Argon at Pressures up to 100 Atmospheres, by R. W. Parsons, C. H. Burton, and W. B. Lasich (Dept. of Physics, University of Queensland, St. Lucia., Brisbane, Qld); *Australian J. Phys.*, vol. 19, pp. 535–43, August 1966.