



IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES

JANUARY 1974

VOLUME MTT-22

NUMBER 1

A PUBLICATION OF THE IEEE MICROWAVE THEORY AND TECHNIQUES SOCIETY



PAPERS

In-Line Waveguide Selective Linear Phase Filters.....	<i>J. D. Rhodes and M. Z. Ismail</i>	1
Launching Efficiency of the HE_{11} Surface-Wave Mode on a Dielectric Tube.....	<i>G. L. Yip and T. Auyeung</i>	6
Systematic Design of Stacked-Crystal Filters by Microwave Network Methods.....	<i>A. Ballato, H. L. Bertoni, and T. Tamir</i>	14
Design of Unapodized Surface-Wave Transducers with Spectral Weighting.....	<i>G. R. Nudd, M. Waldner, and R. L. Zimmerman</i>	25
High-Permittivity Dielectrics in Waveguides and Resonators.....	<i>J. Van Bladel</i>	32
Noise Considerations in Self-Mixing IMPATT-Diode Oscillators for Short-Range Doppler Radar Applications.....	<i>M.-S. Gupta, R. J. Lomax, and G. I. Haddad</i>	37

SHORT PAPERS

Scattering Parameter Approach to the Design of Narrow-Band Amplifiers Employing Conditionally Stable Active Elements.....	<i>C. S. Gledhill and M. F. Abulela</i>	43
Equivalent Circuits of Microstrip Impedance Discontinuities and Launchers.....	<i>J. S. Wight, O. P. Jain, W. J. Chudobiak, and V. Makios</i>	48
Microwave Measurement of Dielectric Constant of Liquids and Solids Using Partially Loaded Slotted Waveguide.....	<i>I. J. Bahl and H. M. Gupta</i>	52
A Finite Difference Method for the Solution of Electromagnetic Waveguide Discontinuity Problems.....	<i>G. Mur</i>	54
Finite-Gap Stripline-Latching Circulator.....	<i>M. E. El-Shandwily and E. A. F. Abdallah</i>	57
Curved-Rim Open Resonators.....	<i>A. Consortini</i>	60
Circularly Polarized Equalizer Networks.....	<i>R. D. Wanselow and D. A. Taggart</i>	63
Mode Compensation Applied to Parallel-Coupled Microstrip Directional Filter Design.....	<i>Y. S. Lee</i>	66

LETTERS

A Small MIC Coupler with Good Directivity.....	<i>R. R. Weirather</i>	70
Comments on "A New Concept for Broadbanding the Ferrite Substrate Circulator Based on Experimental Modal Analysis".....	<i>S. March</i>	71
Authors' Reply.....	<i>T. Miura and T. Hashimoto</i>	72
Reply by S. March.....	<i>S. March</i>	73
Comments on "Dissipation and Scattering Matrices of Lossy Junctions".....	<i>E. Schwartz</i>	75

COMPUTER PROGRAM DESCRIPTIONS

A Special Program for Least p th Approximation Including Interpolation.....	<i>J. R. Popović and J. W. Bandler</i>	76
A General Program for Discrete Least p th Approximation.....	<i>J. R. Popović and J. W. Bandler</i>	76
DICOSY (Directional Coupler Synthesis).....	<i>M. Hoffman and G. Mörler</i>	77

CONTRIBUTORS.....	78
-------------------	----



IEEE MICROWAVE THEORY AND TECHNIQUES SOCIETY

The Microwave Theory and Techniques Society is an organization, within the framework of the IEEE, of members with principal professional interest in the field of microwave theory and techniques. All members of the IEEE are eligible for membership in the Society and will receive this TRANSACTIONS upon payment of the annual Society membership fee of \$7.00. Affiliate membership is available upon payment of the annual affiliate fee of \$18.00. For information on joining write to the IEEE at the address below.

ADMINISTRATIVE COMMITTEE

R. A. RIVERS, *President*

H. W. COOPER, *Vice President*

H. STINEHELFER, *Secretary-Treasurer*

J. L. ALLEN
R. W. BEATTY
A. CLAVIN*
A. W. GUY

G. I. HADDAD
J. B. HORTON
R. M. KNOX
N. LIPETZ

S. OKWIT*
H. G. OLTMAN
D. PARKER
G. P. RODRIGUE

F. J. ROSENBAUM
H. SOBOL
R. A. SPARKS
J. J. TAUB

D. F. WAIT
L. R. WHICKER

* *Ex officio (past chairmen)*

Honorary Life Members

A. C. BECK

W. W. MUMFORD

National Lecturer

JOHN L. ALLEN

S-MTT Chapter Chairmen

Atlanta
Baltimore
Boston
Boulder-Denver
Chicago
Columbus
Connecticut
Dallas
Fort Worth
Houston
Huntsville

H. A. ECKER
L. K. STALEY
R. LEVY
R. L. GALLAWAY
R. N. HARGIS
G. A. THIELE
M. GILDEN
M. L. WALLACE
S. D. COLEMAN
H. C. BOURNE, JR.
O. C. WILLIAMS

NY/Long Island
Los Angeles Council
Milwaukee
Montreal
N. J. Coast
North Jersey
Orange County
Orlando
Ottawa
Philadelphia
Phoenix

M. A. BALFOUR
D. E. KREINHEDER
R. H. FARMER
T. M. CHAN
W. B. GLENDINNING
S. ANGHEL
J. A. SANGUINET
E. E. ERICKSON
W. J. STEENAART
J. E. MULHOLLAND
T. A. DE MASSA

St. Louis
San Diego
San Francisco
Schenectady
Seattle
S. E. Michigan
Syracuse
Tel Aviv
Tokyo, Japan
Tucson
Washington, D. C.

J. A. ZIEGLER
D. RUBIN
D. E. MESSNER
I. W. PENCE, JR.
A. RUDZITIS
W. G. JAECKLE
A. T. ADAMS
A. I. MADJAR
S. SAITO
E. P. PIERCE
B. E. SPIELMANN

IEEE TRANSACTIONS® ON MICROWAVE THEORY AND TECHNIQUES

Editor

F. J. ROSENBAUM

H. G. OLTMAN
(*Institutional Listings*)

J. W. BANDLER
(*Computer Program
Descriptions*)

Associate Editors

M. CAULTON
(*Special Issues*)

T. OKOSHI
(*Abstracts Editor—Asia*)

Address all manuscripts to the Editor, F. J. Rosenbaum, Dep. Elec. Eng., Washington Univ., St. Louis, Mo. 63130. Submission of three copies of manuscripts, including figures, will expedite the review.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Officers

JOHN J. GUARRERA, *President*
JOHN D. RYDER, *Vice President*
ARTHUR P. STERN, *Vice President, Regional Activities*
ROBERT F. COTELLESA, *Vice President, Technical Activities*

FRANK S. BARNES, *Vice President, Publication Activities*
SEYMOUR CAMBIAS, JR., *Secretary*
JOSEPH K. DILLARD, *Treasurer*

Headquarters Staff

DONALD G. FINK, *Executive Director*

ELWOOD K. GANNETT, *Director, Publishing Services*
WILLIAM J. KEYES, *Director, Administrative Services*
JOHN M. KINN, *Director, Educational Service*
CHARLES F. STEWART, JR., *Director, Member and Field Services*

BETTY J. STILLMAN, *Executive Assistant to the Executive Director*
RICHARD M. EMERSON, *Director, Technical Services*
EDWIN D. MACDONALD, *Conference Services*
SAVA I. SHERR, *Standards*

Editorial Department

H. JAMES CARTER, *Manager, Editorial Services*

Senior Editors: NANCY B. BUDDE,* ANN H. BURGMAYER, CAROLYN ELENOWITZ, GAIL S. FERENC, NELA RYBOWICZ

Associate Editors: CLARA FEGER, HELEN S. GOLDMAN, TRUMBULL ROGERS

* *Responsible for this Transactions*

IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES is published monthly by The Institute of Electrical and Electronics Engineers, Inc., 345 East 47 Street, New York, N. Y. 10017. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society, or its members. This journal is available in either microfiche or printed form. Individual copies may be purchased at \$3.00 (first copy only) by IEEE members and \$6.00 per copy by nonmembers. Annual subscription price: IEEE members dues plus Society fee. Price for nonmembers available on request. Abstracting is permitted with mention of source. All rights, including translation, are reserved by the IEEE. Requests for republication permission should be addressed to the IEEE Editorial Department, 345 East 47 Street, New York, N. Y. 10017. Copyright © 1974 by The Institute of Electrical and Electronics Engineers, Inc. Printed in U.S.A. Second-class postage paid at New York, N. Y., and at additional mailing offices.