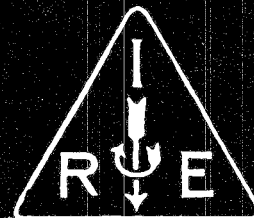


# IRE Transactions



on Microwave Theory and Techniques

Volume MTT-9

**SEPTEMBER, 1961**

Number 5

*Published Bimonthly*

## In This Issue

**Microwaves—A Review of Progress in Great Britain During 1960**

**A New Type of Circular Polarizer Using Dipoles**

**Rounded Corners in Microwave High-Power Filters and Other Components**

**A Periodic Structure of Cylindrical Posts in a Rectangular Waveguide**

**Modes in Rectangular Guides**

**Higher Order Evaluation of Electromagnetic Diffraction by Circular Disks**

**Low-Noise Properties of Microwave Backward Diodes**

**Design Theory of Up-Converters for Use as Electronically-Tunable Filters**

**Anisotropic Properties of Strip-Type Artificial Dielectric**

**Optimization of Waveguide Tapers Capable of Multimode Propagation**

**PUBLISHED BY THE**  
**Professional Group on Microwave Theory and Techniques**

## IRE PROFESSIONAL GROUP ON MICROWAVE THEORY AND TECHNIQUES

The Professional Group on Microwave Theory and Techniques is an association of IRE members with professional interest in the field of Microwave Theory and Techniques. All IRE members are eligible for membership and will receive all Group publications upon payment of the prescribed annual fee of \$3.00. Members of the American Physical Society and the Institution of Electrical Engineers of Great Britain may become affiliated with PGMTT and receive all Group publications upon payment of the Affiliate fee of \$7.50 per year.

### Administrative Committee

#### Chairman

T. N. ANDERSON

#### Vice Chairman

S. B. COHN

#### Secretary-Treasurer

M. WIND

B. D. AARON	W. W. MUMFORD	R. F. SCHWARTZ
H. M. ALTSCHULER	A. A. OLINER	G. SHAPIRO
R. W. BEATTY	R. A. RIVERS	G. SINCLAIR
A. C. BECK	S. W. ROSENTHAL	M. C. THOMPSON
R. C. HANSEN	T. S. SAAD	K. TOMIYASU
	R. D. WENGENROTH	

### *Honorary Life Members*

G. C. SOUTHWORTH      A. G. CLAVIER

### Editor

DONALD D. KING

### PGMTT Chapters

Albuquerque-Los Alamos	R. A. Lincoln	Omaha-Lincoln	W. G. Elwell
Baltimore	Kenneth Claborn	Orange Belt	A. G. Holtum, Jr.
Boston	P. A. Rizzi	Orlando	E. O. Houseman, Jr.
Buffalo-Niagara	E. L. Price, Jr.	Philadelphia	Frank Klawsnik
Chicago	R. D. Standley	San Diego	W. F. Moore
Columbus	G. J. Falkenbach	San Francisco	P. H. Vartanian, Jr.
Denver-Boulder	J. L. Dalke	Seattle	J. S. Yee
Long Island	Marc Chomet	Schenectady	C. C. Allen
Los Angeles	W. G. Perry	Syracuse	H. C. Rothenberg
New York	Adolph Brenner	Tokyo, Japan	Kiyoshi Morita
Northern N. J.	H. A. French	Washington, D.C.	Frank Reggia

### IRE TRANSACTIONS®

#### on Microwave Theory and Techniques

Published by The Institute of Radio Engineers, Inc., for the Professional Group on Microwave Theory and Techniques, at 1 East 79 Street, New York 21, N.Y. Responsibility for the contents rests upon the authors, and not upon the IRE, the Group, or its members. Individual copies of this issue and all available back issues may be purchased at the following prices: IRE members (one copy) \$2.25, libraries and colleges \$3.25, all others \$4.50. Annual subscription price: non-members, \$17.00; colleges and public libraries, \$12.75.

Address all manuscripts to Donald D. King, PGMTT Editor, Electronic Communications, Inc., 1830 York Road, Timonium, Md. Submission of three copies of manuscripts, including figures, will expedite the review.

COPYRIGHT ©1961—THE INSTITUTE OF RADIO ENGINEERS, INC.

Printed in U.S.A.

All rights, including translations, are reserved by the IRE. Requests for republication privileges should be addressed to the Institute of Radio Engineers, 1 E. 79 St., New York 21, N.Y.