



IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES

MAY 1981

VOLUME MTT-29

NUMBER 5

(ISSN 0018-9480)

A PUBLICATION OF THE IEEE MICROWAVE THEORY AND TECHNIQUES SOCIETY

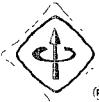


JOINT SPECIAL ISSUE ON SURFACE-ACOUSTIC-WAVE DEVICE APPLICATIONS
Also published in IEEE Transactions on Sonics and Ultrasonics, May 1981, Volume SU-28, Number 3

FOREWORD *R. C. Williamson and T. W. Bristol* 393

PAPERS

A Review of Current and Future Components for Electronic Warfare Receivers	<i>J. H. Collins and P. M. Grant</i>	395
Very Fast Signal Processors as a Result of the Coupling of Surface Acoustic Wave and Digital Technologies	<i>H. Gautier and P. Tournois</i>	404
SAW Quadrature Code Generator	<i>C. R. Vale</i>	410
Precision SAW Filters for a Large Phased-Array Radar System	<i>W. H. Haydl, W. Sander, and W.-D. Wirth</i>	414
Use of an SAW Multiplexer in FMCW Radar System	<i>L. P. Solie and M. D. Wohlers</i>	419
A Radar System Application of an 840-MHz SAW Resonator Stabilized Oscillator	<i>W. J. Tanski, R. A. St. Cyr, P. G. Dragonetti, and E. G. Kosco</i>	424
SAW Vestigial Sideband Filter for TV Broadcasting Transmitter	<i>T. Kodama, K. Sato, and Y. Uemura</i>	429
TV Tuning Systems with SAW Comb Filter	<i>S. Matsu-ura, K. Hazama, and T. Murata</i>	434
Implementation of Satellite Communication Systems Using Surface Acoustic Waves	<i>J. Henaff and P. C. Brossard</i>	439
Optimized SAW Spectral Control Filters for Digital Satellite Communications System	<i>N. G. Jones, R. A. Moore, and C. J. Huber</i>	451
Programmable Frequency-Hop Synthesizers Based on Chirp Mixing	<i>B. J. Darby and J. M. Hannah</i>	456
Acoustoelectric Convolver Technology for Spread-Spectrum Communications	<i>S. A. Reible</i>	463
An Application of SAW Convolvers to High Bandwidth Spread Spectrum Communications	<i>J. H. Goll and D. C. Malocha</i>	473
Wide-Band Signal Processing Using the Two-Beam Surface Acoustic Wave Acoustooptic Time Integrating Correlator	<i>M. W. Casseday, N. J. Berg, I. J. Abramovitz, and J. N. Lee</i>	483
Adaptive Deconvolution Using a SAW Storage Correlator	<i>J. E. Bowers, G. S. Kino, D. Behar, and H. Olaisen</i>	491
Surface-Acoustic-Wave Random-Access Memories	<i>G. F. Manes</i>	498
CONTRIBUTORS		507



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 \$8.00. Affiliate membership is available upon payment of the annual affiliate fee of \$20.00. For information on joining write to the IEEE at the address below.

ADMINISTRATIVE COMMITTEE

F. J. ROSENBAUM, President

S. F. ADAM*

J. L. ALLEN

J. C. AUKLAND

G. R. BASAWAPATNA

* Ex officio (past presidents)

R. A. SPARKS, Vice President

B. E. BERSON

J. E. DEGENFORD, JR.

V. G. GELNOVATCH

P. T. GREILING

R. B. HICKS

J. M. ROE, Secretary-Treasurer

H. G. OLTMAN, JR.

D. PARKER*

C. T. RUCKER

H. SOBOL*

B. E. SPIELMAN

Honorary Life Members

A. C. BECK
S. B. COHN

D. D. KING
W. W. MUMFORD

A. A. OLINER
T. S. SAAD

K. TOMIYASU

National Lecturer

R. A. PUCEL

S-MTT Chapter Chairmen

Albuquerque: K. KUNZ
Atlanta: G. SMITH
Baltimore: S. STITZER
Benelux: J. AASTED
Boston: A. G. CARDIASMENOS
Buffalo: INACTIVE
Canaveral: J. W. COFER
Central Illinois: G. E. STILLMAN
Chicago: B. LEVIN
Columbus: P. H. PATHAK
Connecticut: INACTIVE
Dallas: B. SCOTT
Delhi: R. P. WADHWA
Denver: C. T. JOHNK

Florida West Coast: M. MOCZYNSKI
Houston: W. L. WILSON, JR.
Huntsville: INACTIVE
Israel: A. MADJAR
Kitchener-Waterloo: Y. L. CHOW
Los Angeles: G. LINDGRIN
Milwaukee: C. J. KOTLARZ
Montreal: R. BELANGER
New Jersey Coast: D. R. GUNDERSON
New York/Long Island: J. HAUSNER
North Jersey: H. GOLDMAN
Orange County: INACTIVE
Orlando: D. D. KHANDELWAL
Ottawa: R. P. DOUVILLE

Philadelphia: M. AFIFI
Phoenix: L. JELSMA
Portland: INACTIVE
Princeton: M. KUMAR
San Diego: E. T. LIPSCOMB
San Francisco/Santa Clara: C. HSEIEH
Schenectady: T. G. MIHRAN
Seattle: T. L. BLAKNEY
Southeastern Michigan: P. J. PRESSEL
St. Louis: J. BOGDONOR
Syracuse: D. L. MATHER
Tokyo: K. SUETAKE
Tucson: INACTIVE
Washington, DC: A. W. FRIEND, JR.

IEEE TRANSACTIONS® ON MICROWAVE THEORY AND TECHNIQUES

Editor

R. H. KNERR

H. G. OLTMAN, JR.

Associate Editors

B. PERLMAN
(Computer Program
Descriptions)

E. YAMASHITA
(Abstracts Editor—
Asia)

Address all manuscripts to the Editor, R. H. Knerr, Bell Laboratories, 555 Union Boulevard, Allentown, PA 18103. Submission of three copies of manuscripts, including figures, will expedite the review. *Publication Policy:* All papers will be reviewed for their technical merit, and decisions to publish will be made independently of an author's ability or willingness to pay charges. Voluntary page charges of \$70 per printed page will be requested for papers of five pages or less. Page charges of \$100 per page are mandatory for each page in excess of five printed pages. Also, the MTT-S Administrative Committee has established a quota for the number of pages printed in each issue of this TRANSACTIONS whose costs are not defrayed by payment of page charges. Papers not covered by page charges may be delayed until space in an issue is available. The Editor can waive the quota requirement for exceptional papers or because of other extenuating circumstances.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Officers

RICHARD W. DAMON, President
ROBERT W. LUCKY, Executive Vice President
CHARLES A. ELDON, Treasurer
DICK J. POORTVLIET, Secretary
E. W. ERNST, Vice President, Educational Activities

RICHARD J. GOWEN, Vice President, Professional Activities
THEODORE H. BONN, Vice President, Publication Activities
LARRY K. WILSON, Vice President, Regional Activities
ROBERT E. LARSON, Vice President, Technical Activities

ALLAN C. SCHELL, Division IV Director

Headquarters Staff

ERIC HERZ, Executive Director and General Manager

THOMAS W. BARTLETT, Controller
DONALD CHRISTIANSEN, Editor of *Spectrum*
JOSEPH D. CODISPOTI, Staff Director, Public Relations
IRVING ENGELSON, Staff Director, Technical Activities
LEO FANNING, Staff Director, Professional Activities
ELWOOD K. GANNETT, Staff Director, Publishing Services

PATRICIA LECH, Staff Director, Field Services
SAVA SHERR, Staff Director, Standards
EMILY L. SIRJANE, Staff Director, Corporate Services
CHARLES F. STEWART, JR., Staff Director, Administration Services
JOHN F. WILHELM, Staff Director, Professional Activities

Publications Department

H. JAMES CARTER, Associate Staff Director

Production Managers: ANN H. BURGMEYER, CAROLYNE ELFNOWITZ, GAIL S. FERENC*, ISABEL NAREA
Associate Editors: MARY E. GRANGEIA, THOMAS R. GRECO, PRIJONO HARDJOWIROGO,
ELAINE A. MAROTTA, JEFFREY S. MARTIN, BARBARA A. SOMOGYI

* Responsible for this Transactions

IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES is published monthly by The Institute of Electrical and Electronics Engineers, Inc. **Headquarters:** 345 East 47 Street, New York, NY 10017. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society, or its members. **IEEE Service Center** (for orders, subscriptions, address changes): 445 Hoes Lane, Piscataway, NJ 08854. **Telephones:** Headquarters 212-644-7 extension: Information -7900 General Manager -7910, Controller -7748, Educational Services -7860, Publishing Services -7560, Region/Section Services -7750, Standards -7960, Technical Services -7890. IEEE Service Center 201-981-0060, Washington Office/Professional Services 202-785-0017. **NY Telecopier:** 212-752-4929. **Telex:** 236-411 (International messages only). Individual copies: IEEE members \$5.00 (first copy only), nonmembers \$10.00 per copy. Annual subscription price: IEEE members, dues plus Society fee. Price for nonmembers on request. Available in microfiche and microfilm. **Copyright and Reprint Permission:** Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limits of U.S. Copyright law for private use of patrons. (1) those post-1977 articles that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through the Copyright Clearance Center; (2) pre-1978 articles without fee. Instructors are permitted to photocopy isolated articles for noncommercial classroom use without fee. For other copying, reprint or republication permission, write to Director, Publishing Services at IEEE Headquarters. All rights reserved. Copyright © 1981 by The Institute of Electrical and Electronics Engineers, Inc. Printed in U.S.A. Second-class postage paid at New York, NY and at additional mailing offices.