

1988
Technical
Program

Contents
Papers by Sessions

Technical Program Contents

Opening Ceremonies Jacob Javits Convention Center Meeting Room 1

8:30–10:00 A.M.
Wednesday, May 25, 1988

- 8:30 a.m.* Welcome from the Chairman—Chuck Buntschuh
- 8:40 a.m.* Welcome from the Technical Program Committee—J. Taub, J. Whelehan
- 8:50 a.m.* Greetings from the City of New York—Alair Townsend, Deputy Mayor
for Financial and Economic Development
- 9:00 a.m.* Address by the IEEE President—Dr. Russell Drew
- 9:10 a.m.* Address by the MTT Society President—Dr. Barry Spielman, Washington University
- 9:20 a.m.* Keynote Address, “Tomorrow’s Microwave Technology”—Dr. Frank Brand, Vice President
& Chief Technical Officer, M/A-Com., Inc.
- 10:00 a.m.* Adjourn

Session A

Producibility and Applications

Jacob Javits Convention Center, Hall 1E—Room 1

10:30 a.m. to 12:00 Noon

Wednesday, May 25, 1988

Chairman: Steve Temple—Raytheon Company
Co-Chairman: Sanjay Moghe—Pacific Monolithic

A-1 10:30 a.m.	Commercial Applications of GaAs ICs (Invited) J. Gladstone Hewlett-Packard Company, Microwave Technology Division Santa Rosa, CA 95403	93
A-2 11:10 a.m.	GaAs Monolithic Circuit for FMCW Radars R. Leblanc, V. Pauker, P. Talbot, A. Collet and J. Bellaiche LEP: Laboratoires d'Electronique et de Physique Appliquée 3 avenue Descartes 94451 Limeil-Brevannes Cedex, France M-I. Rudelle TRT: Télécommunications Radioélectriques et Téléphoniques 5 avenue Réaumur 92350 Le Plessis Robinson, France	99
A-3 11:30 a.m.	Laser Chip Separation Method for GaAs MMIC Wafers E. H. Wong, R. B. Wylie and D. R. Johnson Hewlett-Packard, Microwave Technology Division 1412 Fountaingrove Parkway Santa Rosa, CA 95403	103
A-4 11:50 a.m.	Broad Band Monolithic Microwave Active Inductor and Application to a Miniaturized Wide Band Amplifier S. Hara, T. Tokumitsu, T. Tanaka and M. Aikawa ATR: Optical and Radio Communications Research Laboratories Radio Systems Department Twin 21 Bldg. MID Tower 2-1-61 Shiromi, Higashi-ku Osaka 540, Japan	107

Session B

Acoustics and Ferrites

Jacob Javits Convention Center, Hall 1E—Room 2

10:30 a.m. to 12:00 Noon

Wednesday, May 25, 1988

Chairman: Bruce McAvoy—Westinghouse R&D Center

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|---------------------------------|--|------------|
| B-1
10:30 a.m. | A 2 GHz Surface Transverse Wave Oscillator with Low Phase Noise
L. Eichinger, P. Russer and R. Weigel
Lehrstuhl für Hochfrequenztechnik, Technische Universität München
Arcisstr. 21, D-8000 München 2, FRG

B. Fleischmann
Siemens Research Laboratories München
Hellabrunner Str. 1
D-8000 München 90, FRG | 113 |
| B-2
10:40 a.m. | Clock Recovery in the Gigabit Region Using Dielectric Resonators as an Alternative to Surface Acoustic Wave Filters
P. Baum
GTE Laboratories Incorporated
40 Sylvan Road
Waltham, MA 02254 | 117 |
| B-3
11:00 a.m. | Millimeter Wave Ferromagnetic Resonance in Cubic and Hexagonal Ferrites
M. N. Afsar
Department of Electrical Engineering, Tufts University
Medford, MA 02155

Kenneth J. Button
P.O. Box 72, M.I.T. Branch
Cambridge, MA 02139 | 121 |
| B-4
11:20 a.m. | Low-Cost Method of the Measurement of Microwave Ferrite Parameters
J. Modelski
Warsaw University of Technology
ul. Nowowiejska 15/19
00-665 Warszawa, Poland

K. Derzakowski
Institute of Radioelectronics
00-665 Warszawa, Poland

A. Abramowicz
Institute of Electronics Fundamentals
00-665 Warszawa, Poland | 125 |
| B-5
11:30 a.m. | Quasi-Optical Ferrite Rotator for Millimeter Waves
G. F. Dionne, J. A. Weiss*, G. A. Allen† and W. D. Fitzgerald
Lincoln Laboratory, Massachusetts Institute of Technology
Lexington, MA 02173

*affiliated with the Department of Physics
Worcester Polytechnic Institute
Worcester, MA

†affiliated with the Department of Physics
Massachusetts Institute of Technology
Cambridge, MA | 127 |

Session C

**Special Session In Honor of Prof. A. A. Oliner
Jacob Javits Convention Center, Hall 1E—Room 3**

10:30 a.m. to 12:00 Noon

Wednesday, May 25, 1988

Chairman: Prof. S. T. Peng—New York Institute of Technology

10:30 a.m. Introduction by J. Taub

C-1 Perspectives on Guided Wave Phenomena (Invited) 133

10:35 a.m. T. Itoh
The University of Texas at Austin
Dept. of Electrical and Computer Engineering
Austin, TX 78712

C-2 Radiation from Open Waveguides and Leaky Wave Phenomena (Invited) 137

11:00 a.m. F. K. Schwering
US Army CECOM
Fort Monmouth, NJ 07703

C-3 Integrated Circuit Discontinuities and Radiation (Invited) 141

11:25 a.m. N. G. Alexopoulos
Electrical Engineering Department
University of California
Los Angeles, CA 90024-159410

11:50 a.m. Comments by S. T. Peng

Session D

Biological Effects and Medical Applications

Jacob Javits Convention Center, Hall 1E—Room 4

10:30 a.m. to 12:00 Noon

Wednesday, May 25, 1988

Chairman: Arye Rosen—David Sarnoff Research Center

- D-1**
10:30 a.m. **Experimental Determination of Absorbed Power Distribution in a Phantom Irradiated with a Microwave Applicator** **147**
D. Van Den Berge, S. Denayer, R. Van Loon and G. Storme
Department Radiotherapy University Hospital
V.U.B. Laarbeeklaan 101
B-1090 Brussels, Belgium
A. Barel
Department Elec V.U.B., Pleinlaan 2
B-1050 Brussels, Belgium
- D-2**
10:50 a.m. **Design Optimization of Interstitial Antennas for Microwave Hyperthermia** **151**
M. F. Iskander and A. M. Tumeh
Electrical Engineering Department
University of Utah
Salt Lake City, UT 84112
- D-3**
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G. Schaller
Institut für Hochfrequenztechnik, Universität Erlangen-Nürnberg
D-8520 Erlangen, Cauerstr. 9
- D-4**
11:10 a.m. **Microwave Imaging at 3 GHz for the Exploration of Tumors of the Breast** **157**
Giaux*, J. Delannoy[†], D. Delvaee[#], Y. Leroy[‡], A. Mamouni[‡],
J. C. Van de Velde[‡]
*Centre Anti-Cancer, Centre Bourgogne
[†]Centre Anti-Cancer
N.I.H.-Bethesda-MD, USA
[#]Centre Anti-Cancer
[‡]UA 287 CNRS Université
Sciences: Lille, France
- D-5**
11:30 a.m. **Modelisation of Microstrip-Microslot Applicator by Extension of Transmission Line Model** **161**
R. Ledee, P. Pribetich, P. Kennis and M. Chive
Centre Hyperfrequences et Semiconducteurs
UA CNRS n°287, Bât.P4
Université des Sciences et Techniques de Lille-Flandres-Artois
59655 Villeneuve D'ASCQ Cedex, France
- D-6**
11:40 a.m. ***In Vivo* Experiment for the Analysis of Multi-Frequency Microwave Radiometric Data** **165**
F. Bardati, M. Mongiardo and D. Solimini
Dipartimento di Ingegneria Elettronica, Tor Vergata University
Via O. Raimondo, 00173 Roma, Italy
B. Paolone
E.S.P., S.p.A., Via della Meccanica
04011 Aprilia, Italy

Session E

Power Amplifiers

Jacob Javits Convention Center, Hall 1E—Room 1

2:00 p.m. to 3:30 p.m.

Wednesday, May 25, 1988

Chairman: J. G. Tenedorio—Harris Microwave

Co-Chairman: D. E. Dawson—Westinghouse

E-1 2:00 p.m.	A 3-Watt X-Band Monolithic Variable Gain Amplifier R. B. Culbertson and D. C. Zimmermann Texas Instruments Incorporated P.O. Box 655474, MS 255 Dallas, TX 75265	171
E-2 2:20 p.m.	Stability and Improved Circuit Modeling Considerations for High Power MMIC Amplifiers R. G. Freitag, S. H. Lee, D. M. Krafcsik, D. E. Dawson and J. E. Degenford Westinghouse Electric Corp., Advanced Technology Division P.O. Box 1521 MS 3FT2 Baltimore, MD 21203	175
E-3 2:40 p.m.	Ka-Band Monolithic GaAs FET Power Amplifier Modules N. Camilleri, B. Kim, H. Q. Tserng and H. D. Shih Texas Instruments Incorporated Central Research Laboratories P.O. Box 655936 M/S 134 Dallas, TX 75265	179
E-4 3:00 p.m.	Wideband Variable Gain Amplifiers in GaAs MMIC K. H. Snow, J. J. Komiak and D. A. Bates General Electric Company Electronics Laboratory Syracuse, NY 13221	183

Session F

Heinrich Hertz Centennial Special Session I Jacob Javits Convention Center, Hall 1E—Room 2

2:00 p.m. to 3:30 p.m.

Wednesday, May 25, 1988

Chairman: John H. Bryant—University of Michigan

2:00 p.m. Chairman's Introduction

F-1	The History of Electromagnetics as Hertz Would Have Known It (Invited)	191
2:10 p.m.	R. S. Elliott University of California Los Angeles, CA 90024	

F-2	Heinrich Hertz: A Short Life (Invited)	193
2:55 p.m.	C. Süsskind College of Engineering University of California Berkeley, CA 94720	

Session G

Guided Wave Effects

Jacob Javits Convention Center, Hall 1E—Room 3

2:00 p.m. to 3:30 p.m.

Wednesday, May 25, 1988

Chairman: T. Itoh—University of Texas at Austin

G-1 2:00 p.m.	The Importance of Skin-Effect in Microstrip Lines at High Frequencies A. C. Cangellaris Electromagnetics Laboratory Department of Electrical and Computer Engineering University of Arizona Tucson, AZ 85721	197
G-2 2:10 p.m.	Conductor-Backed Slot Line and Coplanar Waveguide: Dangers and Full-Wave Analyses H. Shigesawa and M. Tsuji Doshisha University Kyoto, Japan A. A. Oliner Polytechnic University Brooklyn, NY 11201	199
G-3 2:30 p.m.	Mode Conversion Due to Discontinuities in Modified Grounded Coplanar Waveguide R. W. Jackson Department of Electrical and Computer Engineering University of Massachusetts Amherst, MA 01003	203
G-4 2:40 p.m.	Role of Complex Modes in Modeling Discontinuities of Dielectric Loaded Wave Guides S-W. Chen, C. Chen and K. A. Zaki Electrical Engineering Department University of Maryland College Park, MD 20742	207
G-5 3:00 p.m.	Nonreciprocal Millimeter Wave Propagation in Slot Guiding Structures Using Magnetoplasmons C. M. Krowne Electronics Science and Technology Division, Naval Research Laboratory Washington, D.C. 20375-5000 A. A. Mostafa and K. A. Zaki University of Maryland, Department of Electrical Engineering College Park, MD 20742	211
G-6 3:20 p.m.	Investigation of Tapered Multiple Microstrip Lines for VSLI Circuits M. A. Mehalic, C. H. Chan and R. Mittra Electromagnetics Communication Laboratory University of Illinois Urbana, IL 61801	215

Session H

Measurements I

Jacob Javits Convention Center, Hall 1E—Room 4

2:00 p.m. to 3:30 p.m.

Wednesday, May 25, 1988

Chairman: R. D. Pollard—University of Leeds, UK

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| H-1
2:00 p.m. | Constant Intermodulation Loci Measure for Power Devices
Using H.P. 8510 Network Analyzer
L. Ricco, G. P. Locatelli and F. Calzavara
Telettra S.p.A.
Vimercate (Mi) Italy | 221 |
| H-2
2:10 p.m. | A Method for Measuring Magnitude and Phase of Harmonics Generated in
Nonlinear Microwave Two-Ports
U. Lott
Institut für Feldtheorie und Höchstfrequenztechnik
ETH Zürich
CH-8092 Zürich, Switzerland | 225 |
| H-3
2:20 p.m. | Nonlinear GaAs MESFET Modeling Using Pulsed Gate Measurements
M. Paggi [†] , P. H. Williams [‡] and J. M. Borrego
Center for Integrated Electronics and
Electrical, Computer, and Systems Engineering Department
Rensselaer Polytechnic Institute
Troy, New York 12180-3590
[†] Present Address: IBM, Essex Junction, VT
[‡] Present Address: MIT Lincoln Laboratory, MA | 229 |
| H-4 | Microwave Magneto Transconductance (MMGT) Mobility Measurements of
GaAs MESFETs
S. K. Ayyar, A. G. Andereou, C. R. Westgate
Dept. Electrical and Computer Engineering
Johns Hopkins University
Baltimore, MA
(Paper not available at time of printing) | |
| H-5
2:40 p.m. | Two-Port S-Parameter Characterization of High Electron Mobility Transistors
at Millimeter Wave and Microwave Frequencies
J. H. Schaffner, F. K. Oshita and H. R. Fetterman
University of California
Los Angeles, CA 90024

J. J. Berenz, K. Nakano and H. C. Yen
Electronics Systems Group, TRW
Los Angeles, CA 90278 | 233 |

H-6 3:00 p.m.	On-Wafer Characterization of Monolithic Millimeter-Wave Integrated Circuits by a Picosecond Optical Electronic Technique P. Polak-Dingels The Laboratory for Physical Sciences College Park, MD 20740 H-L. A. Hung, T. Smith and H. C. Huang COMSAT Laboratories Clarksburg, MD 20871 K. J. Webb and C. H. Lee Department of Electrical Engineering University of Maryland College Park, MD 20742	237
H-7 3:10 p.m.	A Technique for Improving the Accuracy of Wafer Probe Measurements M. A. Magerko and E. W. Strid* North Carolina State University Raleigh, NC 27695 *Cascade Microtech, Inc.	241

Session I

MMIC Low-Noise Amplifiers

Jacob Javits Convention Center, Hall 1E—Room 1

4:00 p.m. to 5:00 p.m.

Wednesday May 25, 1988

Chairman: H. C. Huang—COMSAT Laboratories
Co-Chairman: Z. Lemnios—Ford Microelectronics, Inc.

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| I-1
4:00 p.m. | A Monolithic Ka-Band HEMT Low-Noise Amplifier
C. Yuen, C. Nishimoto, M. Glenn, Y. C. Pao, S. Bandy and G. Zdasiuk
Varian Research Center, Device Laboratory
Palo Alto, CA 94303 | 247 |
| I-2
4:20 p.m. | A High Electron Mobility Transistor with a Mushroom Gate Fabricated by Focused Ion Beam Lithography
Y. Sasaki, K. Nagahama, K. Hosono, T. Katoh and M. Komaru
LSI R&D Laboratory, Mitsubishi Electric Corporation
4-1 Mizuhara, Itami 664, Japan | 251 |
| I-3
4:40 p.m. | X-Band and Ka-Band Monolithic GaAs PIN Diode Variable Attenuation Limiters
D. J. Seymour, D. D. Heston and R. E. Lehmann
Texas Instruments Incorporated
P.O. Box 660246 MS 134
Dallas, TX 75266 | 255 |
| I-4
5:00 p.m. | A 35 GHz Monolithic MESFET LNA
S. Bandla, G. Dawe, C. Bedard, R. Tayrani, D. Shaw, L. Raffaelli and R. Goldwasser
Gamma Monolithics
20 Sylvan Road
Woburn, MA 01801 | 259 |

Session J

Heinrich Hertz Centennial Special Session II Jacob Javits Convention Center, Hall 1E—Room 2

4:00 p.m. to 5:30 p.m.

Wednesday May 25, 1988

Chairman: John H. Bryant—University of Michigan

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| J-1
4:00 p.m. | Heinrich Hertz at Work in Karlsruhe (Invited)
H. V. Friedburg
University of Karlsruhe
Institut für Hochstfrequenztechnik und Elektronik
Karlsruhe, Germany | 267 |
| J-2
4:30 p.m. | Heinrich Hertz—Theorist and Experimenter (Invited)
J. D. Kraus
Ohio State University
Columbus, OH 43015 | 271 |
| J-3 | The Legacy of Hertz: Some Highlights in Microwave History from 1889 to 1945 (Invited)
J. Brittain
Social Sciences, Georgia Institute of Technology
Atlanta, GA
(Paper not available at the time of printing) | |

Session K

High Power Microwaves (Focused Session)

Jacob Javits Convention Center, Hall 1E—Room 3

4:00 p.m. to 5:30 p.m.

Wednesday May 25, 1988

Chairman: J. Goel—TRW

K-1 4:00 p.m.	Pin Diode Limiter Spike Leakage, Recovery Time, and Damage R. J. Tan, A. L. Ward, R. V. Garver and H. Brisker Harry Diamond Labs Adelphi, MD 20783	275
K-2 4:10 p.m.	A Comprehensive Design Technique for the Radial Wave Power Combiner G. W. Swift and D. I. Stones TRW Electronic Systems Group Redondo Beach, CA 90278	279
K-3	Paper was withdrawn	
K-4 4:40 p.m.	A Microwave Powered High Altitude Platform (Invited) J. J. Schlesak, A. Alden and T. Ohno Communications Research Centre Communications Canada 701 Carling Avenue Ottawa Canada K2H 8S2	283
K-5 5:00 p.m.	Microwave Sintering of Ceramics M. E. Brodwin and D. L. Johnson Northwestern University Departments of Electrical Engineering and Computer Science and Materials Science and Engineering Evanston, IL 60208	287
K-6 5:20 p.m.	Single-Pulse RF Damage of GaAs FET Amplifiers J. H. McAdoo, W. M. Bollen Mission Research Corp. 8560 Cinderbed Rd. Suite 700 Newington, VA 22122 R. V. Garver Harry Diamond Laboratories 2800 Powder Mill Rd. Adelphi, MD 20783	289

Session L

Measurements II

Jacob Javits Convention Center, Hall 1E—Room 4

4:00 p.m. to 5:30 p.m.

Wednesday May 25, 1988

Chairman: R. E. Ham—Clemson University

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4:00 p.m. | A Second Generation Dual Six-Port Network Analyser
S. K. Judah and A. S. Wright
Microwave Lab., Dept. of Electronic Engineering
Hull University
Hull, United Kingdom | 295 |
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D. F. Williams and T. H. Miers
Ball Aerospace Systems Division
Boulder, CO 80306
(Paper not available at the time of printing) | |
| L-3
4:40 p.m. | Modeling of Some Coplanar Waveguide Discontinuities
R. N. Simons and G. E. Ponchak
National Aeronautics and Space Administration
Lewis Research Center
Cleveland, OH 44135 | 297 |
| L-4
5:00 p.m. | Electrooptic Sampling Measurement of Dispersion Characteristics of Slot Line and Coplanar Waveguide (Coupled Slot Line) Even and Odd Modes
R. Majidi-Ahy, D. M. Bloom and B. A. Auld
Edward L Ginzton Laboratory
Stanford University
Stanford, CA 94305

K. J. Weingarten
Lightwave Electronics
Mountain View, CA 94043

M. Riaziat
Varian Associates
Palo Alto, CA 94303 | 301 |

OPEN FORUM-1

Jacob Javits Convention Center, Hall 1E

4:00 p.m. to 6:00 p.m.

Wednesday May 25, 1988

Chairman: J. Levy—Eaton, Corp.

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A. Boag and Y. Leviatan
Department of Electrical Engineering
Technion-Israel Institute of Technology
Haifa 32000, Israel | 307 |
| OF-1-2 | A General-Purpose Computer Program for the Volterra-Series Analysis of Nonlinear Microwave Circuits
S. A. Maas
The Aerospace Corp.
P.O. Box 92957
Los Angeles, CA 90009 | 311 |
| OF-1-3 | FET Model Statistics and Their Effects on Design Centering and Yield Prediction for Microwave Amplifiers
J. Purviance and D. Monteith
University of Idaho
Dept. of Electrical Engineering
Moscow, ID 83843

D. Criss
Triquint Semiconductor
P.O. Box 4953
Beaverton, OR 97076 | 315 |
| OF-1-4 | Robust Model Parameter Extraction Using Large-Scale Optimization Concepts
J. W. Bandler, S. Ye and Q. J. Zhang
Simulation Optimization Systems Research Laboratory and
Department of Electrical and Computer Engineering
McMaster University
Hamilton, Canada L8S 4L7

S. H. Chen
Optimization Systems Associates Inc.
163 Watson's Lane
Dundas, Ontario, Canada L9H 6L1 | 319 |
| OF-1-5 | CAD Synthesis of Interstage Networks for Multi-Stage Amplifiers with a Wide Range of Topologies
D. J. Mellor
Radom Incorporated
1035 Justin Place
Meridian, ID 83642 | 323 |
| OF-1-6 | Distributed Analysis of Submicron-MESFET Noise-Properties
W. Heinrich
Institut für Hochfrequenztechnik
Technische Hochschule Darmstadt
Merckstr.25, D-6100 Darmstadt, FRG | 327 |

OF-1-7	Synthesis Equations for Shielded Suspended Substrate Microstrip Line and Broadside-Coupled Stripline W. Yunyi, G. Kaijun and S. Yonghui Radio Engineering Department Nanjing Institute of Technology Nanjing, P.R. China	331
OF-1-8	CAD of E-Plane Circuits with Field-Theory Based Lookup Tables and Discontinuity Models P. So and W. J. R. Hoefer Laboratory for Electromagnetics and Microwaves Department of Electrical Engineering University of Ottawa, Canada P. Saguet Institut National Polytechnique E.N.S.E.R.G. 23, Rue des Martyrs Grenoble, France	335
OF-1-9	Optimizing the Power-Added Efficiency of a Class B GaAs FET Amplifier S. R. LeSage Raytheon Corp., Missile Systems Division Bedford, MA 02173 J. A. Detra and J. B. Beyer Department of Electrical and Computer Engineering University of Wisconsin-Madison 1415 Johnson Drive Madison, WI 53706-1691	339
OF-1-10	GaAs Power MESFET Performance Sensitivity to Profile and Process Parameter Variations J. B. Yan, R. J. Trew and D. E. Stoneking ECE Department, Box 7911 North Carolina State University Raleigh, NC 27695-7911	343
OF-1-11	GaAs HEMT Lossy Match Amplifiers Y. Ito and A. Takeda Aero and Defense Systems Division Tokyo Keiki Co., Ltd. 2-16 Minamikamata, Ohta-ku Tokyo 144, Japan	347
OF-1-12	Lumped and Distributed Scaling of MESFETs J. P. Mondal General Electric Company Electronics Laboratory Syracuse, NY 13221	351
OF-1-13	Frequency-Dependent Characteristics of GAP Discontinuities in Suspended Striplines for Millimeter Wave Applications A. Rong and S. Li Department of Radio Engineering Nanjing Institute of Technology Nanjing, P.R. China	355

OF-1-14	Scattering From 3-Dimensional Discontinuities in Microwave Transmission Lines R. Sachs and F. J. Rosenbaum Dept. of Electrical Engineering Washington University St. Louis, MO 63130	359
OF-1-15	Time-Domain Finite Difference Approach for the Calculation of Microstrip Open-Circuit End Effect X. Zhang and K. K. Mei Department of Electrical Engineering and Computer Sciences University of California Berkeley, CA 94720	363
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OF-1-18	Matching Structures for High Yield Amplifier Design J. Purviance, W. Brakensiek and D. Monteith University of Idaho Dept. of Electrical Engineering Moscow, ID 83843 T. Ferguson Sandia National Laboratories Albuquerque, NM 87185	375
OF-1-19	Optimization of Distributed Monolithic GaAs Amplifiers Using an Analytical/Graphical Technique M. Ross Northern Telecom Ltd. St-Laurent, Quebec, Canada H4S 1K5 R. G. Harrison Department of Electronics, Carleton University Ottawa, Ontario, Canada K1S 5B6	379

OF-1-20	Experimental Confirmation of Slow-Waves in a Crosstie Overlay Coplanar Waveguide and its Application to Band-Reject Gratings T. H. Wang, T. M. Wang and T. Itoh Department of Electrical and Computer Engineering University of Texas Austin, TX 78712	383
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OF-1-23	Equivalent Coaxial Transmission Lines S-G. Pan Department of Radio Electronics Shanghai University of Science and Technology Shanghai 201800, China	395
OF-1-24	A Method for Obtaining Dispersion Characteristics of Shielded Microstrip Lines Q. Lanfen and G. Changqing Department of Electronics and Information Engineering Huazhong University of Science and Technology Wuhan, China	399

Session M

Monolithic Amplifiers

Jacob Javits Convention Center, Hall 1E—Room 1

8:30 a.m. to 10:00 a.m.

Thursday May 26, 1988

Chairman: B. E. Spielman—Washington University

M-1 8:30 a.m.	Millimeter-Wave Monolithic Integrated Circuits B. E. Spielman Washington University Electrical Engineering Department St. Louis, MS 63130	405
M-2 9:00 a.m.	V-Band Monolithic Power MESFET Amplifiers G. Hegazi, H-L. Hung, F. Phelleps, L. Holdeman, A. Cornfeld, T. Smith, J. Allison and H. Huang COMSAT Laboratories 22300 Comsat Drive Clarksburg, MD 20871-9475	409
M-3 9:20 a.m.	Ka-Band 1 Watt Power GaAs MMICs Y. Oda, S. Arai, T. Yoshida, H. Nakamura, S. Yanagawa, S. Hori and K. Kamei Microwave Solid-State Department Komukai Works, Toshiba Corporation Kawasaki, 210, Japan	413
M-4 9:40 a.m.	A 16 W Pulsed X-Band Solid-State Transmitter C. Peignet, Y. Mancuso and G. Le Meur Thomson-CSF/RCM 178 Bd Gabriel Péri Malakoff, France A. Bert, J. F. Jouen and P. Savary Thomson-CSF/THM 29 Avenue Carnot Massy, France	417

Session N

Filters and Multiplexers I

Jacob Javits Convention Center, Hall 1E—Room 2

8:30 a.m. to 10:00 a.m.

Thursday May 26, 1988

Chairman: Jerry Fiedziuszko—Ford Aerospace

N-1 8:30 a.m.	Commensurate-Line, Microstrip, Band-Pass Filters M. Gat Avantek Inc. 481 Cottonwood Drive Milpitas, CA 95035	423
N-2 8:50 a.m.	High Performance Parallel Coupled Microstrip Filters A. Riddle Avantek 481 Cottonwood Drive Milpitas, CA 95035	427
N-3 9:00 a.m.	Rigorous Design of Septate E-Plane Multiplexers with Printed Circuit Elements J. Dittloff and F. Arndt Microwave Department University of Bremen Kufsteiner Str., NW1, D-2800 Bremen, West Germany	431
N-4 9:20 a.m.	Computer-Aided Design of Parallel-Connected Millimeter-Wave Diplexers/Multiplexers R. Vahldieck and B. Varailhon de la Filolie University of Victoria Department of Electrical and Computer Engineering Victoria, B.C. V8W 2Y2, Canada	435
N-5 9:30 a.m.	Electronically Tunable Band-Stop Filter D. Auffray and J. L. Lacombe Thomson-CSF Branche Equipements Aéronautiques 178, Bd Gabriel Péri 92240 Malakoff, France	439

Session O

High Frequency Superconductivity

Jacob Javits Convention Center, Hall 1E—Room 3

8:30 a.m. to 10:00 a.m.

Thursday May 26, 1988

Chairman: R. L. Camisa—David Sarnoff Research Center

- O-1** **Microwave Superconductors (Invited)**
M. Nissenoff
Naval Research Laboratory
Washington, DC
(Paper not available at the time of printing)
- O-2** **Microwave Characteristics of Bulk High-T_c Superconductors** **445**
9:00 a.m. E. Belohoubek, A. Fathy and D. Kolokitis
David Sarnoff Research Center
Princeton, NJ 08543-5300
- O-3** **Slow-Wave Properties of Superconducting Microstrip Transmission Lines** **449**
9:20 a.m. J. M. Pond and C. M. Krowne
Electronics Science and Technology Division
Naval Research Laboratory
Washington D.C. 20375-5000
- O-4** **Loss Reduction in Superconducting Microstrip-Like Transmission Lines** **453**
9:40 a.m. B. Young
Texas A&M University
Dept. of Electrical Engineering
College Station, TX 77843

T. Itoh
Dept. of Electrical and Computer Engineering
University of Texas
Austin, TX 78712
- O-5** **A Superconducting-Dielectric Resonator at W-Band** **457**
9:50 a.m. C-S. Pao, Y. Li and S-P Chou
Millimeter and Submillimeter Waves Laboratory
Shanghai University of Science & Technology
Shanghai, P.R. China

Session P

Millimeter Wave Integrated Circuits and Technology

Jacob Javits Convention Center, Hall 1E—Room 4

8:30 a.m. to 10:00 a.m.

Thursday May 26, 1988

Chairman: J. Wiltse—Georgia Tech.

- | | | |
|--------------------------------|--|------------|
| P-1
8:30 a.m. | A 43 GHz-Band Balanced Low-Noise Amplifier
M. Ishizaki, T. Hamabe, Y. Oohashi and S. Asai
Fujitsu Laboratories Ltd.
1015 Kamikodanaka
Nakahara-ku, Kawasaki
Kanagawa 211 Japan

T. Kasuga and K. Miyazawa
Nobeyama Radio Observatory
Tokyo Astronomical Observatory
University of Tokyo
Minamimaki-mura, Minamisaku-gun
Nagano 384-13 Japan | 461 |
| P-2
8:50 a.m. | An SIS Mixer for 85-116 GHz Using Inductively Shunted Edge-Junctions
S.-K. Pan and A. R. Kerr
National Radio Astronomy Observatory
Charlottesville, VA 22903

M. J. Feldman
University of Virginia
Charlottesville, VA 22901

A. W. Kleinsasser, J. Stasiak, R. L. Sandstrom and W. J. Gallagher
IBM Thomas J. Watson Research Center
Yorktown Heights, NY 10598 | 465 |
| P-3
9:10 a.m. | A Broadband Low Noise SIS Receiver for Submillimeter Astronomy
T. H. Buttgenbach, M. J. Wengler*, D. M. Watson and T. G. Phillips
Department of Physics
California Institute of Technology
Pasadena, CA 91125

R. E. Miller
AT&T Bell Laboratories
Murray Hill, NJ 07974

*Department of Electrical Engineering
University of Rochester
Rochester, NY 14627 | 469 |

P-4 9:20 a.m.	Waveguide-To-Microstrip Transitions for Millimeter-Wave Applications Y-C Shih Hughes Aircraft Company Microwave Products Division Torrance, CA 90509 T-N Ton TRW One Space Park Redondo Beach, CA 90278 L. Q. Bui Technical Consultant 809 Hickory Ave. Torrance, CA 90509	473
P-5 9:30 a.m.	Experimental Modeling for Millimeter-Wave Monolithic Integrated Circuit Components W. Lam, A. K. Sharma, K. Nakano, K. Ip, C. Yang, L. Liu and H. C. Yen TRW Millimeter-Wave and Microwave Technology Center One Space Park Redondo Beach, CA 90278	477
P-6 9:40 a.m.	A 94 GHz Low Noise GaAs FET Oscillator Using Whispering-Gallery Dielectric Resonator Modes and a New Push-Push Configuration Reducing 1/f Converted Noise L. A. Bermudez Universidade de Brasília ENE, Caixa Postal 153041 70910 Brasilia, DF, Brasil P. Guillon and J. Obregon Universit de Limoges IRCOM, 123, Av. Albert Thomas 87100 Limoges, France A. Bert Thomson-CSF/THM R.D. 128, B.P. 48 91401 Orsay, France	481

Session Q

Monolithics-Components

Jacob Javits Convention Center, Hall 1E—Room 1

10:30 a.m. to 12:00 p.m.

Thursday May 26, 1988

Chairman: L. D. Cohen—Eaton, Corp.

Q-1 10:30 a.m.	Optimized X & Ku Band GaAs MMIC Varactor Tuned FET Oscillators E. Reese, Jr. and J. M. Beall Texas Instruments Incorporated P.O. Box 655474, MS 255 Dallas TX 75265	487
Q-2 10:50 a.m.	2.5–6.0 GHz Broadband GaAs MMIC VCO J. E. Andrews, T. J. Holden, K.W. Lee and A. F. Podell Pacific Monolithics, Inc. 245 Santa Ana Court Sunnyvale, CA 94568	491
Q-3 11:10 a.m.	A Miniature Integrated Monolithic VCO Module K. J. Anderson and D. L. Allen Texas Instruments Incorporated P.O. Box 655474, MS 255 Dallas, TX 75265	495
Q-4 11:20 a.m.	DC-50GHz MMIC Variable Attenuator with a 30dB Dynamic Range H. Kondoh Hewlett-Packard Co. Microwave Technology Division Santa Rosa, CA 95401	499
Q-5 11:40 a.m.	A Distributed Broadband Monolithic Frequency Multiplier A. M. Pavio, S. D. Bingham, R. H. Halladay and C. A. Sapahe Texas Instruments Incorporated P.O. Box 655474, MS 245 Dallas, TX 72265	503

Session R

Filters and Multiplexers II

Jacob Javits Convention Center, Hall 1E—Room 2

10:30 a.m. to 12:00 p.m.

Thursday May 26, 1988

Chairman: C. Kudsia—COMDEV, Ltd, Canada

R-1 10:30 a.m.	A Bandpass Filter Using Electrically Coupled TM_{016} Dielectric Rod Resonators Y. Kobayashi and M. Minegishi Department of Electrical Engineering Saitama University Urawa, Saitama 338, Japan	507
R-2 10:40 a.m.	A TE Triple-Mode Filter R. R. Bonetti and A. E. Williams COMSAT Laboratories Clarksburg, MD 20871-9475	511
R-3 11:00 a.m.	Modeling of Coupling by Probes in Dual Mode Cavities K. A. Zaki and C. Chen University of Maryland College Park, MD 20742 A. E. Atia COMSAT Corporation 22300 COMSAT Drive Clarksburg, MD 20871	515
R-4	The Design and Realization of an Aeronautical L Band Diplexer C. J. Radcliffe Phase Devices Ltd. Luton, England (Paper not available at the time of printing)	
R-5 11:30 a.m.	800MHz High-Power Bandpass Filter using TM_{110} Mode Dielectric Resonators for Cellular Base Stations T. Nishikawa, K. Wakino, T. Hiratsuka and Y. Ishikawa Murata Manufacturing Company Limited Kyoto, Japan	519

Session S

Solid State Devices

Jacob Javits Convention Center, Hall 1E—Room 3

10:30 a.m. to 12:00 p.m.

Thursday May 26, 1988

Chairman: Peter Stecker—M/A-COM, Inc.

- | | | |
|---------------------------------|--|------------|
| S-1
10:30 a.m. | 22 GHz Performance of the Permeable Base Transistor
L. J. Kushner, M. A. Hollis, Richard H. Mathews, K. B. Nichols, and
C. O. Bozler
Lincoln Laboratory
Massachusetts Institute of Technology
Lexington, MA 02173 | 525 |
| S-2
10:50 a.m. | Microwave Performance of npn and pnp AlGaAs/GaAs Heterojunction Bipolar Transistors
B. Bayraktaroglu and N. Camilleri
Texas Instruments Incorporated
POB 655936, MS 134
Dallas, TX 75265 | 529 |
| S-3
11:10 a.m. | Watt-Level Millimeter-Wave Monolithic Diode-Grid Frequency Multipliers
R. J. Hwu and N. C. Luhmann, Jr.
Department of Electrical Engineering
University of California
Los Angeles, CA 90024

C. F. Jou
Hughes Aircraft Company
Torrance, CA 90509

W. W. Lam and D. C. Streit
TRW
Redondo Beach, CA 90278

J. Maserjian
JPL
Pasadena, CA 91100

D. B. Rutledge
Division of Engineering and Applied Science
Cal. Tech.
Pasadena, CA 91100 | 533 |
| S-4
11:30 a.m. | Silicon Permeable Base Transistors for Low-Phase-Noise Oscillator Applications up to 20 GHz
D. D. Rathman
Lincoln Laboratory, Massachusetts Institute of Technology
Lexington, MA 02173

W. K. Niblack
Loral Frequency Sources
Chelmsford, MA 01824 | 537 |

Session T

Microwave Integrated Circuits

Jacob Javits Convention Center, Hall 1E—Room 4

10:30 a.m. to 12:00 p.m.

Thursday May 26, 1988

Chairman: Natalino Camilleri—Texas Instruments

T-1	Paper was withdrawn	
T-2 10:50 a.m.	Optimised Synthesis of Microstrip Branch-Line Couplers Taking Dispersion, Attenuation Loss and T-Junction Into Account A. Angelucci and R. Burocco CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A. Via G. Reiss Romoli 274-10148 Torino, Italy	543
T-3 11:10 a.m.	Thin-Film Millimeter Wave Subassemblies C. Bueb and D. Murrow Avantek Incorporated Folsom, CA 95630	547
T-4 11:30 a.m.	Microstrip Disk Cavities Filter Using GAP Capacitances Coupling L. Zhuang, L. Yu-Quan and G. Zhong-Min Nanjing Communication Engineering Institute Nanjing, China	551
T-5 11:40 a.m.	Real Frequency Technique Applied to Synthesis of Lumped Broadband Matching Networks with Arbitrary Nonuniform Losses for MMIC's L. Zhu, B. Wu and C. Sheng Radio Engineering Department Nanjing Institute of Technology Nanjing, Jiangsu, P.R. China	555

Session U

Monolithics-Systems

Jacob Javits Convention Center, Hall 1E—Room 1

2:00 p.m. to 3:30 p.m.

Thursday May 26, 1988

Chairman: Joseph F. White—J. F. White Consulting

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|--------------------------------|---|------------|
| U-1
2:00 p.m. | A 32 Tap Digitally Controlled Programmable Transversal Filter Using LSI GaAs ICs
J. W. Culver, D. E. Zimmerman and C. M. Panasik
Texas Instruments Incorporated
P.O. Box 655936, MS 134
Dallas, TX 75265 | 561 |
| U-2
2:20 p.m. | A 30 GHz-Band Full-MMIC Receiver for Satellite Transponders
H. Kato, T. Ohira and N. Imai
NTT Radio Communication Systems Laboratories
1-2356, Take, Yokosuka-shi
Kanagawa-ken, 238-03 Japan

F. Ishitsuka
NTT Applied Electronics Laboratories
3-9-11, Midori-cho, Musashino-shi
Tokyo 180 Japan | 565 |
| U-3
2:40 p.m. | A Monolithic L-Band Limiting Amplifier and Dual-Modulus Prescaler GaAs Integrated Circuit
A. E. Geissberger, R. A. Sadler, H. P. Singh, G. K. Lewis, I. J. Bahl and M. L. Balzan
ITT Gallium Arsenide Technology Center
Roanoke, VA 24019 | 569 |
| U-4
3:00 p.m. | A Monolithic Channelized Preselector for EW Receiver Applications
R. H. Halladay, A. M. Pavio, S. D. Bingham and A. Kikel
Texas Instruments Incorporated
P.O. Box 655474, MS 255
Dallas, TX 75265 | 573 |

Session V

Passive Networks I

Jacob Javits Convention Center, Hall 1E—Room 2

2:00 p.m. to 3:30 p.m.

Thursday May 26, 1988

Chairman: H. C. Bell—Wavecom, Inc.

V-1 2:00 p.m.	New Slot-Coupled Directional Couplers Between Double-Sided Substrate Microstrip Lines, and Their Applications T. Tanaka, K. Tsunoda and M. Aikawa ATR: Optical and Radio Communications Research Laboratories Twin 21 Bldg. MID Tower 2-1-61 Shiromi, Higashi-ku Osaka 540, Japan	579
V-2 2:20 p.m.	Computer Aided Modeling of a Multidielectric Structure and its Application to the Design of Overlay Couplers J. Gallimore Marconi Electronic Devices Ltd. Doddington Road Lincoln, LN6.3LF, England	583
V-3 2:40 p.m.	Synthesis and Design of Wideband Symmetrical Nonuniform Directional Couplers for MIC Applications S. Uysal and A. H. Aghvami Department of Electronic and Electrical Engineering King's College London (University of London) Strand, London WC2R 2LS	587
V-4 3:00 p.m.	Ideal W.G. to Coax Transitions Using A F.B.M. Monopole F. C. deRonde University of Bath School of El. Eng. Bath Avon, BA2 7AY, UK	591
V-5 3:20 p.m.	Ultra-Broadband High-Directivity Directional Coupler Design J. D. Bickford Hewlett-Packard Company Santa Rosa, CA 95401 University of California, Davis Davis, CA 92626 G. R. Branner University of California, Davis Davis, CA 92626 Avantek Inc. Santa Clara, CA 95054	595

Session W

Dielectric Resonator Oscillators

Jacob Javits Convention Center, Hall 1E—Room 3

2:00 p.m. to 3:30 p.m.

Thursday May 26, 1988

Chairman: J. F. White—Consulting

W-1 2:00 p.m.	A Fast-Locking X-Band Transmission Injection-Locked DRO A. P. S. Khanna and E. Gane Oscillator and Filter Products Avantek Inc. 3175 Bowers Avenue Santa Clara, CA 95054	601
W-2 2:20 p.m.	Dielectric Split-Ring Resonators and Their Application to Filters and Oscillators M. Sagawa, I. Ishigaki, M. Makimoto and T. Naruse Tokyo Research Laboratory Matsushita Electric Industrial Co., Ltd. Higashimita, Tama-ku, Kawasaki 214, Japan	605
W-3 2:40 p.m.	A Broadband VCO Using Dielectric Resonators P. C. Kandpal and C. Ho Rockwell International Dallas, TX 75207	609
W-4 3:00 p.m.	Oscillator Applications of Double Dielectric Resonator S. Jerry Fiedziuszko Ford Aerospace Corporation Space Systems Division 3939 Fabian Way Palo Alto, CA 94303	613

Session X

New Methods for Planar Circuits

Jacob Javits Convention Center, Hall 1E—Room 4

2:00 p.m. to 3:30 p.m.

Thursday May 26, 1988

Chairman: N. G. Alexopoulos—UCLA

X-1 2:00 p.m.	Numerical Methods for Passive Components (Invited) R. Sorrentino Tor Vergata University Department of Electronic Engineering Via O. Raimondo, 00173 Rome, Italy	619
X-2 2:20 p.m.	The Transfinite Element Method for Modeling MMIC Devices Z. J. Cendes and J-F Lee Department of Electrical and Computer Engineering Carnegie Mellon University Pittsburgh, PA 15213	623
X-3 2:40 p.m.	Time-Domain Method of Lines Applied to a Partially Filled Waveguide S. Nam, S. El-Ghazaly, H. Ling and T. Itoh Dept. of Electrical and Computer Engineering University of Texas at Austin Austin, TX 78712	627
X-4 3:00 p.m.	Dispersion Characteristics of Transient Signals in Microstrip Step Discontinuity K. S. Chen and G. W. Zheng Zhejiang University Hangzhou, Zhijiang, China S. T. Peng New York Institute of Technology Old Westbury, NY 11568	631
X-5 3:10 p.m.	Challenge to 3-D Discontinuous Dielectric Waveguide Circuit Analysis M. Tsuji and H. Shigesawa Department of Electronics Doshisha University Kamikyo-ku, Kyoto 602, Japan	635

Session Y

An Overview of European Activities

Jacob Javits Convention Center, Hall 1E—Room 1

4:00 p.m. to 5:30 p.m.

Thursday May 26, 1988

Chairman: R. Sparks—Raytheon Co.

Y-1 4:00 p.m.	GaAs Device Activities in Europe (Invited) W. Baechtold Swiss Federal Institute of Technology Zurich, Switzerland	641
Y-2 4:30 p.m.	European MMIC Activities (Invited) J. Magarshack Thomson CSF/THM-Massy 91302, France	645
Y-3 5:00 p.m.	Millimeter-Wave Systems and Applications in Europe (Invited) H. H. Meinel AEG Aktiengesellschaft Postfach 1730 D-7900 ULM, West Germany	649

Session Z

Passive Networks II

Jacob Javits Convention Center, Hall 1E—Room 2

4:00 p.m. to 5:30 p.m.

Thursday May 26, 1988

Chairman: R. V. Snyder—RS Microwave

Z-1 4:00 p.m.	Broadbanding Techniques for TEM N-Way Power Dividers A. Shor ACRIAN Inc. San Jose, CA 95126	657
Z-2 4:20 p.m.	Use of Circular Sector Shaped Planar Circuits for Multiport Power Divider-Combiner Circuits M. D. Abouzahra and A. Dumanian MIT Lincoln Laboratory Lexington, MA 02173 K. C. Gupta University of Colorado Boulder, CO 80306	661
Z-3 4:40 p.m.	A Compact Seven-Way Power Divider for Satellite Beam Forming Networks S. C. Holme and V. E. Dunn Ford Aerospace Corporation Space Systems Division Palo Alto, CA 94303 V. Jamnejad California Institute of Technology Jet Propulsion Laboratory Pasadena, CA 91100	665
Z-4 5:00 p.m.	Polarization Adaptor C. S. Kim and N. Moldovan Prodelin Corporation P.O. Box 368 Conover, NC 28613	669
Z-5 5:10 p.m.	Broadband Phase Invariant Attenuator D. Adler and P. Maritato General Microwave Corporation Amityville, NY 11701	673

Session AA

New Developments in Oscillator and Mixer Technology

Jacob Javits Convention Center, Hall 1E—Room 3

4:00 p.m. to 5:30 p.m.

Thursday May 26, 1988

Chairman: M.Dydyk—Motorola Inc.

AA-1 4:00 p.m.	A Low-Noise Ku-Band AlGaAs/GaAs HBT Oscillator N.Hayama, M. Madihian and K. Honjo Microelectronics Research Laboratories NEC Corporation 4-1-1 Miyazaki, Miyamae-ku Kawasaki, 213 Japan S. R. LeSage Missile Systems Division Raytheon Co. Bedford, MA 01730	679
AA-2 4:20 p.m.	Monolithic and Discrete MM-Wave InP Lateral Transferred-Electron Oscillators S. C. Binari, R. E. Neidert and K. E. Meissner Electronics Science and Technology Division Naval Research Laboratory Washington, DC 20375-5000	683
AA-3 4:30 p.m.	V-Band Monolithic IMPATT VCO B. Bayraktaroglu Texas Instruments Incorporated P.O. Box 655936, MS 134 Dallas, TX 75265	687
AA-4 4:50 p.m.	A Uni-Planar Double-Balanced Mixer Using a New Miniature Beam Lead Crossover Quad J. Izadian, R. Forse and K. Van Buren Avantek, Inc 481 Cottonwood Drive Milpitas, CA 95035 K. Irwin and R. Curby Avantek, Inc. 39201 Cherry Street Newark, CA 94560	691
AA-5 5:10 p.m.	4 to 40 GHz Even Harmonic Schottky Mixer J. L. Merenda, D. Neuf, P. Piro RHG Electronics Laboratory, Inc. Deer Park, NY 11729	695

Session BB

Microstrip and Fin-Line Discontinuities

Jacob Javits Convention Center, Hall 1E—Room 4

4:00 p.m. to 5:30 p.m.

Thursday May 26, 1988

Chairman: Arvind K. Sharma—TRW

- | | | |
|--------------------------|--|------------|
| BB-1
4:00 p.m. | A New Method for Discontinuity Analysis in Shielded Microstrip
L. P. Dunleavy and P. B. Katehi
The Radiation Laboratory
University of Michigan
Ann Arbor, MI 48109 | 701 |
| BB-2
4:20 p.m. | Analysis of Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Configuration
H-Y Yang and N. G. Alexopoulos
Electrical Engineering Department
University of California
Los Angeles, CA 90024

D. R. Jackson
Electrical Engineering Department
Houston University
University Park, TX 77004 | 705 |
| BB-3
4:30 p.m. | Special Iterative Techniques for the Full-Wave 3D Analysis of (M)MIC Structures
W. Wertgen
University of Duisburg
FB9, D-4100 Duisburg 1, West Germany

R. H. Jansen
Plessey Research Caswell Ltd.
GaAs MMIC Dept.
Great Britain | 709 |
| BB-4
4:40 p.m. | Simplified Description of the Field Distribution in Finlines and Ridge Waveguides and its Application to the Analysis of E-Plane Discontinuities
R. R. Mansour and R. S. K. Tong
COM DEV Ltd.
Cambridge, Ontario, Canada N1R 7H6

R. H. MacPhie
Department of Electrical Engineering
University of Waterloo
Waterloo, Ontario, Canada N2L 3G1 | 713 |
| BB-5
4:50 p.m. | Non-Uniform Finlines on Anisotropic Substrates
A. Beyer and D. Köther
Dept. of El. Engineering
University of Duisburg Bismarckstraße 81
D-4100 Duisburg 1, FRG

W. J. R. Hoefer
Dept. El. Engineering
University of Ottawa
Ottawa, Ontario, Canada, K1N 5N5 | 717 |

BB-6 5:00 p.m.	Analysis and Optimization of E-Plane Directional Couplers S. Labonté and W. J. R. Hoefer Laboratory for Electromagnetics and Microwaves Department of Electrical Engineering University of Ottawa Ottawa, Ontario, Canada K1N 6N5	721
BB-7 5:10 p.m.	Fullwave Analysis of Coupled-Finline Discontinuities G. Schiavon, P. Tognolatti and R. Sorrentino Tor Vergata University Dept. of Electronic Engineering Via O. Raimondo, 00173 Rome, Italy	725

Open Forum 2

Jacob Javits Convention Center, Hall 1E

4:00 p.m. to 5:30 p.m.

Thursday May 26, 1988

Chairman: J. Levy—Eaton Corp.

- OF-2-1 Finite Difference Analysis of Integrated Optical Channel Waveguides with Arbitrarily Graded Index Profile 731**
N. Schulz, K-H. Bierwirth and F. Arndt
Microwave Department, University of Bremen
Kufsteiner Str., NW1,
D-2800 Bremen 33, West Germany
- OF-2-2 A High Frequency GaAlAs Travelling Wave Electro-Optic Modulator at 0.82 μ m 735**
C. M. Chorey and A. Ferendici
Electrical Engineering and Applied Physics
Case Western Reserve University
Cleveland, OH 44106

K. Bhasin
National Aeronautics and Space Administration
12000 Brookpark Rd.
Cleveland, OH 44135
- OF-2-3 A Simple Coupled-Mode Analysis Method for Multiple-Core Optical Fiber and Coupled Dielectric Waveguide Structures 739**
N. Kishi and E. Yamashita
University of Electro-Communications
Chofu-shi, Tokyo, Japan 182
- OF-2-4 An Alternative Broadband Method for Automatic Measurement of the Complex Permeability and Permittivity of Materials at Microwave Frequencies 743**
B. B. Szendrenyi, K. Kazi and I. Mojzes
Research Institute for Technical Physics of the
Hungarian Academy of Sciences
H-1325 Budapest, Ujpest 1
P.O. Box 76, Hungary
- OF-2-5 Sensitivity Analysis of Through-Short-Delay Standards and its Extension to Microwave and Millimeter Wave Monolithic Integrated Circuits De-Embedding 747**
C. C. Tzuang and K. P. Chang
National Chiao Tung University
Hsinchu, Taiwan, Republic of China
(Paper not available at the time of printing)
- OF-2-6 A Millimeter-Wave Vector Network Analyzer 747**
J. V. Bellantoni, G. C. Dalman and R. C. Compton
School of Electrical Engineering
Cornell University
Ithaca, NY 14853
- OF-2-7 A New Method for Measuring the Properties of Dielectric Substrate 751**
G. Kent
Dielectric Laboratories, Inc.
Cazenovia, NY 13035

OF-2-8	Q-Band Computerized Slotted Line System A. Tongyi, M. Jiaheng, M. Qingxiang, Y. Hua and F. Jinlin Microwave Institute East China Normal University Shanghai, China	755
OF-2-9	Lumped-Element Circulator Optimization E. Schloemann Raytheon Company Research Division Lexington, MA 02173	757
OF-2-10	Considerations on the Frequency Dependence of Waveguide Modes in Premagnetized Ferrites Near Resonance D. Köther and A. Beyer Department of Electrical Engineering and SFB 254 Duisburg University, Bismarckstraße 81 D-4100 Duisburg 1, FRG	761
OF-2-11	The Analysis of Magnetostatic Waves in a Waveguide Using the Integral Equation Method M. Radmanesh Hughes Aircraft Company Microwave Products Division Torrance, CA 90509 C. M. Chu and G. I. Haddad University of Michigan Department of Electrical Engineering and Computer Science Ann Arbor, MI 48106	765
OF-2-12	A 20 GHz FET Amplifier in an Integrated Finline/Microstrip Configuration J. Ruxton BTI, Bolriet 150 Mill St., P.O. Box 53 Carleton Place, Ont. Canada K7C 3P3 R. Vahldieck Dept. of Elect. & Comp. Eng. University of Victoria P.O. Box 1700 Victoria, British Columbia, Canada V8W 2Y2 W. J. R. Hoefer Lab. for Electromagnetic & Microwaves Dept. of Electrical Engineering University of Ottawa Ottawa, Ontario, Canada K1N 6N5	769
OF-2-13	Finite Element Analysis of Skin Effect in Copper Interconnects at 77K and 300K U. Ghoshal and L. N. Smith Microelectronics and Computer Technology Corporation Austin, TX 78727	773
OF-2-14	A Single MESFET Down-Converter for TVRO Application J. L. Cáceres and J. Pérez Dpto. Señales, Sistemas y Radiocomunicaciones Univ. Politécnica de Madrid. E.T.S.I. Telecomunicación Ciudad Universitaria s/n. 28040, Madrid	777

OF-2-15	Quasioptical Patch Mixers at 35 and 94 GHz C. M. Jackson, J. A. Lester, M. A. Yu and Y. C. Ngan TRW Electronic Systems Group One Space Park Redondo Beach, CA 90278	781
OF-2-16	Design of a Rugged Millimeter-Wave Doubler Using a Series Varactor Configuration E. Boch COMDEV Ltd. Cambridge, Ontario, Canada, N1R 7H6	785
OF-2-17	A 32-GHz Reflected-Wave Maser Amplifier with Wide Instantaneous Bandwidth J. Shell and D. Neff Jet Propulsion Laboratory California Institute of Technology Pasadena, CA 91100	789
OF-2-18	Hybrid HEM_{11p}-Mode Dielectric Resonators for Filter Applications at Short Millimeter Wavelengths W. Holpp AEG Aktiengesellschaft Radio and Radar Systems Group Ulm/Donau, F.R. Germany	793
OF-2-19	New Compact Broadband High-Efficiency Mode Converters for High Power Microwave Tubes with TE_{On} or TM_{On} Mode Outputs M. J. Buckley, G. H. Luo and R. J. Vernon Department of Electrical and Computer Engineering University of Wisconsin Madison, WI 53706-1691	797
OF-2-20	Computer Aided Design of Microstrip Antenna Arrays P. Pouse ETSIT, Barcelona, Spain S. Toutain ENST Br. Brest, France E. Penard CNET, Lannion, France J. P. Daniel Universite des Sciences Rennes, France (Paper not available at the time of printing)	
OF-2-21	Impedance of GaAs P-I-N Diodes A. Gopinath University of Minnesota Department of Electrical Engineering Minneapolis, MN 55455	801
OF-2-22	Electronically Tunable and Switchable Filters Using Microstrip Ring Resonator Circuits T. S. Martin, F. Wang and K. Chang Department of Electrical Engineering Dept. Texas A&M University College Station, TX 77843-3128	803

OF-2-23	U-Band Shield Suspended-Stripline (SSL) Gunn DRO and VCO H. Zhen-Qi Nanjing Solid-State Devices Research Institute P.O. Box 1601 Nanjing, China	807
OF-2-24	Microwave-Induced Arcing in Filters S. L. Kaplan, A. A. Cuneo and R. V. Garver Harry Diamond Laboratories Adelphi, MD 20783	811
OF-2-25	An Integrated 18.75/37.5 GHz FET Frequency Doubler S. Meszaros, C. J. Verver, R. J. P. Douville Communications Research Centre, Ottawa Ontario, Canada W. J. R. Hoefer Dept. of Electrical Engineering Univ. of Ottawa Ontario, Canada	815

Session CC

Fiber Optic Links and Transmission Systems I (Focused Session)

Jacob Javits Convention Center, Hall 1E—Room 1

8:30 a.m. to 10:00 a.m.

Friday May 27, 1988

Chairman: N. R. Dietrich—AT&T Bell Labs.

CC-1 8:30 a.m.	Lightwave Applications in Communications—An Overview (Invited) R. H. Knerr AT&T Bell Laboratories Allentown, PA 18103	821
CC-2 8:50 a.m.	Fibre Optic Systems in UK and Europe (Invited) T. R. Rowbotham British Telecom Research Laboratories Martlesham Heath, UK	823
CC-3 9:10 a.m.	Fiber-Optic Transmission Systems in Japan (Invited) S. Shimada and T. Matsumoto NTT Transmission Systems Laboratories 1-2356 Take, Tokosuka-Shi Kanagawa-Ken, 238-03 Japan	827
CC-4 9:30 a.m.	Wide-Band Semiconductor Lasers and Optical Modulators for Communications (Invited) R. S. Tucker AT&T Bell Laboratories Crawford Hill Laboratory Holmdel, NJ 07733	831

Session DD

FET Power Amplifiers

Jacob Javits Convention Center, Hall 1E—Room 2

8:30 a.m. to 10:00 a.m.

Friday May 27, 1988

Chairman: Douglas Maki—Tachonics Corporation

- | | | |
|---------------------------------|---|------------|
| DD-1 | High Power and High Efficiency GaAs FET's in C-Band | |
| | S. Igi, S. Sakamodo, T. Sakayori, M. Wataze, T. Sonoda, M. Yamanouchi,
S. Takamiya and S. Mitsui
Kiti-Itami Works
Mitsubishi Electric Corp.
Itami, Japan
(Paper not available at the time of printing) | |
| DD-2
8:50 a.m. | Quasi-Monolithic 4-GHz Power Amplifiers with 65-Percent Power-Added Efficiency | 835 |
| | B. D. Geller and P. E. Goettle
COMSAT Laboratories
Clarksburg, MD 20871-9475 | |
| DD-3
9:10 a.m. | High-Efficiency 5-Watt Power Amplifier with Harmonic Tuning | 839 |
| | B. Koff and D. D. Heston
Texas Instruments Incorporated
Dallas, TX 75265 | |
| DD-4
9:20 a.m. | High Efficiency Small Size 6W Class AB X-Band Power Amplifier Module Using a Novel MBE GaAs FET | 843 |
| | M. Avasarala, D. S. Day, S. Chan, P. Gregory and J. R. Basset
Microwave Semiconductor Group
Avantek Inc.
Santa Clara, CA 95054 | |
| DD-5
9:40 a.m. | X and Ku Band High Power GaAs FETs | 847 |
| | Y. Yamada, H. Kuroda, H. Izumi, T. Soezima, H. Wakamatsu and S. Hori
Microwave Solid-State Department
Komukai Works, Toshiba Corporation
Kawasaki, 210, Japan | |

Session EE

High Speed Digital Transmission

Jacob Javits Convention Center, Hall 1E—Room 3

8:30 a.m. to 10:00 a.m.

Friday May 27, 1988

Chairman: I. Mack—NRL

EE-1 8:30 a.m.	Signal Processing at 4.5 GBIT/S with SI-ICs for Optical Transmission Systems G. Hanke Research Institute of Deutsche Bundespost Darmstadt, FRG	853
EE-2 8:50 a.m.	Noise in High Speed Digital Systems (Invited) Madhu S. Gupta Hughes Research Laboratories Palibu, CA 90265	1127
EE-3 9:10 a.m.	High-Speed QPSK Modulator and Demodulator with Subharmonic Pumping R. Trambarulo, M. V. Schneider and M. J. Gans AT&T Bell Laboratories Holmdel, NJ 07733	857
EE-4 9:30 a.m.	Digital Radio Link Synthesized with A Direct-Division PLL at 22 GHz P. Dorta and J. Pérez ETSIT. Ciudad Universitaria s/n. 28040 Madrid, Spain I. Rodríguez T. y C., S.A. C/ Albasanz 79. 28037 Madrid, Spain	861

Session FF

Microwave and MM Wave Ferrites

Jacob Javits Convention Center, Hall 1E—Room 4

8:30 a.m. to 10:00 a.m.

Friday May 27, 1988

Chairman: J. M. Owens—Santa Clara University

FF-1 8:30 a.m.	Ferrite Tuned Millimeter Wave Bandpass Filters With High Off Resonance Isolation D. Nicholson Hewlett-Packard Microwave Technology Division Santa Rosa, CA 95401	867
FF-2 8:50 a.m.	Ferrite Tunable Millimeter Wave Printed Circuit Filters J. Uher, F. Arndt Microwave Department, University of Bremen Kufsteiner Str. NW1 D-2800 Bremen 33, West Germany J. Bornemann Dept. of El. and Comp. Eng. University of Victoria Victoria, B.C., Canada V8W2Y2	871
FF-3 9:10 a.m.	A Microwave Circuit Model for a Magnetostatic Wave Filter S. N. Stitzer Westinghouse Electric Corp. Baltimore, MD 21203	875
FF-4 9:20 a.m.	A 13-Channel Magnetostatic Wave Filterbank J. D. Adam, M. R. Daniel and S. H. Talisa Westinghouse R & D Center Pittsburgh, PA 15235	879
FF-5 9:30 a.m.	Analysis of Microwave Ferrite Devices by The Transfinite Element Method J-F Lee and Z. J. Cendes Department of Electrical and Computer Engineering Carnegie Mellon University Pittsburgh, PA 15213	883
FF-6 9:50 a.m.	A Magnetostatic Forward Volume Wave Directional Coupler with a Guiding Slot Structure M. Kaneta, K. Yashiro and S. Ohkawa Department of Electronic Engineering Chiba University Yayoi-cho Chiba 260, Japan	887

Session GG

Fiber Optic Links and Transmission Systems II (Focused Session)

Jacob Javits Convention Center, Hall 1E—Room 1

10:30 a.m. to 12:00 a.m.

Friday May 27, 1988

Chairman: H-W. Yen—Hughes Research Lab.

GG-1 10:30 a.m.	Military and Aerospace Applications of Lightwave Technology (Invited) A. E. Popa Hughes Research Laboratories Malibu, CA 90265	893
GG-2 10:50 a.m.	Devices and Components for Lightwave Transmission Systems (Invited) M. Nakamura and N. Chinone Central Research Laboratory Hitachi Ltd. Kokubunji, Tokyo 185, Japan	897
GG-3 11:10 a.m.	Microwave Multiplexing Techniques for Wideband Lightwave Distribution Networks (Invited) R. Olshansky, V. Lanzisera and P. Hill GTE Laboratories Incorporated 40 Sylvan Road Waltham, MA 02254	901
GG-4 11:30 a.m.	New Developments in Optical Control Techniques for Phased Array Radar (Invited) A. J. Seeds, I. D. Blanchflower and N. J. Gomes Department of Electronic and Electrical Engineering University College London, Torrington Place London, WC1E 7JE, England G. King and S. J. Flynn Marconi Defence Systems Ltd. The Grove, Warren Lane Stanmore, HA7 4LY, England	905

Session HH

FET Amplifiers

Jacob Javits Convention Center, Hall 1E—Room 2

10:30 a.m. to 12:00 a.m.

Friday May 27, 1988

Chairman: W. Kennan—Microwave Technology, Inc.

HH-1 10:30 a.m.	The DUAL-FED Distributed Amplifier C. S. Aitchison, N. Bukhari, C. Law, N. Nazoa-Ruiz ERA Technology Ltd., Leatherhead Surrey KT22 7SA, England, UK	911
HH-2 10:40 a.m.	The Stackfet: An Improved Implementation of the Dual Gate FET W. W. Hoppin, S. C. Cripps and J. R. Anderson Celeritek, Inc. 617 River Oaks Parkway San Jose, CA 95134	915
HH-3 11:00 a.m.	Noise and Small-Signal Distributed Model of Millimeter-Wave FETs L. Escotte and J. C. Mollier IRCOM Université de Limoges 123 Av. Albert Thomas 87060 Limoges Cédex, France M. Lecrefff Thomson Semi-Conducteurs Division DHM 29 Av. Carnot 91300 Massy, France	919
HH-4 11:20 a.m.	Millimeter-Wave Low-Noise HEMT Amplifiers K. H. G. Duh, P. C. Chao, P. M. Smith, L. F. Lester, B. R. Lee, J. M. Ballingall and M. Y. Kao GE Electronics Laboratory Syracuse, NY 13221	923
HH-5 11:40 a.m.	InGaAs Pseudomorphic HEMTs for Millimeter Wave Power Applications P. M. Smith, P. C. Chao, L. F. Lester, R. P. Smith, B. R. Lee, D. W. Ferguson, A. A. Jabra, J. M. Ballingall and K. H. G. Duh General Electric Company Electronics Laboratory Syracuse, NY 13221	927

Session II

Communication Systems

Jacob Javits Convention Center, Hall 1E—Room 3

10:30 a.m. to 12:00 a.m.

Friday May 27, 1988

Chairman: P. G. Petrelis—TRW

II-1 10:30 a.m.	Fiber Optic Links for Millimeter Wave Communication Satellites A. S. Daryoush Millimeter Wave & Lightwave Engineering Laboratory E.C.E. Dept, Drexel University Philadelphia, PA 19104 A. P. S. Khanna Avantek Santa Clara, CA 95054 K. Bhasin and R. Kunath NASA Lewis Research Center Cleveland, OH 44135	933
II-2 10:50 a.m.	A Broadband Down Converter for 4- and 6-GHz Radio Systems C. Ho and P. C. Kandpal Rockwell International Corporation Dallas, TX 75207	937
II-3 11:10 a.m.	Balanced FET Up-Converter for 6 GHz, 64-QAM Radio P. Bura and D. Gelerman Northern Telecom Montreal, Canada	941
II-4 11:30 a.m.	Cryogenic, HEMT, Low-Noise Receivers for 1.3 to 43 GHz Range S. Weinreb, M. W. Pospieszalski and R. Norrod National Radio Astronomy Observatory 2015 Ivy Road Charlottesville, VA 22903	945

Session JJ

Phased and Active Array Techniques

Jacob Javits Convention Center, Hall 1E—Room 4

10:30 a.m. to 12:00 a.m.

Friday May 27, 1988

Chairman: H. G. Oltman, Jr—Tecom Ind., Inc.

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|----------------------------------|---|------------|
| JJ-1
10:30 a.m. | A C-Band Low-Noise MMIC Phased Array Receive Module
F. Ali, S. Mitchell, S. Moghe, P. Ho and A. Podell
Pacific Monolithics, Inc.
245 Santa Ana Court
Sunnyvale, CA 94086-4512 | 951 |
| JJ-2
10:50 a.m. | Monolithic Millimeter-Wave IMPATT Oscillator and Active Antenna
N. Camilleri and B. Bayraktaroglu
Texas Instruments Incorporated
P.O. Box 655936, M/S 134
Dallas, TX 75265 | 955 |
| JJ-3
11:10 a.m. | Optical Control of A GaAs MMIC Transmit/Receive Module
A. Paolella* and P. R. Herczfeld
Center for Microwave Wave-Lightwave Engineering
Dept. of E.C.E.
Drexel University
Philadelphia, PA 19104
*On leave from U.S. Army LABCOM, ETDL
Ft. Monmouth, NY | 959 |
| JJ-4
11:30 a.m. | Microstrip Active Antennas and Arrays
K. A. Hummer and K. Chang
Department of Electrical Engineering
Texas A&M University
College Station, TX 77843-3128 | 963 |
| JJ-5
11:50 a.m. | A SPACE-FED Local Oscillator for Spaceborne Phased Arrays
G. M. Shaw and R. B. Dybdal
Electronics Research Laboratory
The Aerospace Corporation
Los Angeles, CA 90009 | 967 |

Session KK

High Speed Fiber Optic Links

Jacob Javits Convention Center, Hall 1E—Room 1

2:00 p.m. to 3:30 p.m.

Friday May 27, 1988

Chairman: Paul J. Stabile—David Sarnoff Research Center

KK-1 2:00 p.m.	0.83- and 1.3-Micron Microwave (2-18 GHz) Fiber-Optic Links Using Directly Modulated Laser Sources R. D. Esman, L. Goldberg and J. F. Weller Naval Research Laboratory Washington, D.C. 20375-5000	973
KK-2 2:20 p.m.	21 GHz Wideband Fiber Optic Link J. J. Pan E-TEK Dynamics, Inc. Melbourne, FL 32904	977
KK-3 2:30 p.m.	High Signal to Noise Operation of Fiber Optic Links to 18 GHz H. Blauvelt and K. Lau Ortel Corporation 2015 W. Chestnut St. Alhambra, CA 91803	979
KK-4 2:40 p.m.	High Speed Fiber Optic Links for Short-Haul Microwave Applications I. Koffman, P. R. Herczfeld, A. S. Daryoush Center for Microwave/Lightwave Engineering Department of Electrical and Computer Engineering Drexel University Philadelphia, PA 19104	983
KK-5 2:50 p.m.	Radar Applications of X-Band Fiber Optic Links I. L. Newberg, C. M. Gee, G. D. Thurmond, and H. W. Yen Hughes Research Laboratories Malibu, CA 90265	987
KK-6 3:00 p.m.	Frequency-Dependent and Frequency-Independent Nonlinear Characteristics of a High-Speed Laser Diode W. I. Way Bell Communications Research Red Bank, NJ 07701	991

Session LL

Signal Distribution FET Applications

Jacob Javits Convention Center, Hall 1E—Room 2

2:00 p.m. to 3:30 p.m.

Friday May 27, 1988

Chairman: Mahesh Kumar—MSC, Inc.

LL-1 2:00 p.m.	GaAs Semi-Insulated-Gate FETs (SIGFETs) as High Power MMIC Control Devices Y-H. Yun M/A-COM Advanced Semiconductor Operations Lowell, MA 01851 R. J. Gutmann Rensselaer Polytechnic Institute Troy, NY 12180	997
LL-2 2:10 p.m.	DC-20 GHz N × M Passive Switches M. J. Schindler, M. E. Miller and K. M. Simon Raytheon Co Research Div 131 Spring Street Lexington, MA 02173	1001
LL-3 2:20 p.m.	High Efficiency Microwave Harmonic Reaction Amplifier T. Nojima and S. Nishiki NTT Radio Communication Systems Laboratories Take, Yokosuka-shi Kanagawa-ken, 238-03, Japan	1007
LL-4 2:40 p.m.	The Design of a 6-Port Active Circulator I. J. Bahl ITT/Gallium Arsenide Technology Center 7670 Enon Drive Roanoke, VA 24019	1011
LL-5 2:50 p.m.	GaAs Monolithic Implementation of Active Circulators M. A. Smith Texas Instruments Incorporated P.O. Box 660246 M/S 255 Dallas, TX 75266	1015

Session MM

System Applications

Jacob Javits Convention Center, Hall 1E—Room 3

2:00 p.m. to 2:30 p.m.

Friday May 27, 1988

Chairmen: K. K. Agarwal—E-Systems, Garland Div.
D. N. McQuiddy—Texas Instruments, Inc.

MM-1 2:00 p.m.	Microwaves in Brazil: Significant Research and Development Activities (Invited) A. de Salles CETUC-PUC/RJ-Rua Marquês de São Vicente 225-Gávea 22453-Rio de Janeiro, Brazil	1019
MM-2 2:20 p.m.	A 50-GHz Compact Communication System for Video Link Fabricated in MIC K. Ogawa, T. Ishizaki, K. Hashimoto, M. Sakakura and T. Uwano Matsushita Electric Industrial Co., Ltd. Information Systems Research Laboratory 1006, Kadoma, Osaka, 571 Japan	1023
MM-3 2:30 p.m.	A Noncoherent W-Band Transceiver R. S. Robertson, R. T. Kihm, E. L. Holzman, J. Poelker and R. L. Bowen Hughes Aircraft Company Missile Systems Group Canoga Park, CA 91304	1027
MM-4 2:50 p.m.	35-GHz-Dopplerradar for Law Enforcement Agencies in Europe R. Westphal and A. Kessler Institut für Hochfrequenztechnik TH Darmstadt, West Germany	1031
MM-5 3:10 p.m.	Hidden Electronics Detection M. K. Ferrand Microlab/FXR Ten Microlab Rd. Livingston, NJ 07039	1035

Session NN

Computer Aided Design: Large Signal Analysis Jacob Javits Convention Center, Hall 1E—Room 4

2:00 p.m. to 3:30 p.m.

Friday May 27, 1988

Chairman: Stephen E. Sussman-Fort—State Univ. of NY

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|---------------------------------|---|-------------|
| NN-1
2:00 p.m. | A Unified Framework for Harmonic Balance Simulation and Sensitivity Analysis
J. W. Bandler, Q. J. Zhang and R. M. Biernacki
Optimization Systems Associates Inc.
163 Watson's Lane
Dundas, Ontario, Canada L9H 6L1 | 1041 |
| NN-2
2:20 p.m. | Large-Signal MESFET Characterization Using Harmonic Balance
B. R. Epstein, S. M. Perlow, D. L. Rhodes and J. L. Schepps
David Sarnoff Research Center
Princeton, NJ 08543
M. M. Ettenberg
City University
New York, NY 10017
R. Barton
Cornell University
Ithaca, NY 14853 | 1045 |
| NN-3
2:40 p.m. | Optimized C.A.D. of Power Amplifiers, for Maximum Added Power or Minimum Third Order Intermodulation, Using an Optimization Software Coupled to a Single Tone Source and Load-Pull Set-up
J. M. Nebus, J. P. Villotte, J. F. Vidalou, L. Hagerman and H. Jallageas
I.R.C.O.M., Université de Limoges
123 Avenue A. Thomas
87060 Limoges, France
M. C. Albuquerque
Giers Schlumberger
12 Pl. des Etats-Unis
92124 Montrouge, France | 1049 |
| NN-4
2:50 p.m. | A GaAs MESFET Large-Signal Circuit Model for Nonlinear Analysis
M. Sango, O. Pitzalis, L. Lerner, C. McGuire, P. Wang and W. Childs
EEsof, Inc
Westlake Village, CA 91362 | 1053 |
| NN-5 | Optimization of Large Signal Spice GaAs FET Model from Measured Scattering Parameters
C. K. C. Tzuang and F. Liu
Inst. of Communication Engr.
Nat. Chiao Tung Univ.
Hsinchu, Taiwan, Republic of China
(Paper not available at the time of printing) | |
| NN-6
3:20 p.m. | Load Pull Characteristics of GaAs MESFETs Calculated Using an Analytic, Physics Based Large Signal Device Model
D. E. Stoneking, R. J. Trew and J. B. Yan
ECE Dept., Box 7911
North Carolina State University
Raleigh, NC 27695-7911 | 1057 |

Session OO

High Speed Optical Techniques and Components Jacob Javits Convention Center, Hall 1E—Room 1

4:00 p.m. to 5:30 p.m.

Friday May 27, 1988

Chairman: P. Wahi—TASC

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|---------------------------------|--|-------------|
| OO-1
4:00 p.m. | A 100-kHz—22-GHz Instrumentation Photoreceiver
D. J. Derickson, C. M. Miller and R. L. Van Tuyl
Hewlett-Packard Co.
Signal Analysis Division
Rohnert Park, CA 94928 | 1063 |
| OO-2
4:20 p.m. | Calibration of Optical Receivers and Modulators Using an Optical Heterodyne Technique
T. S. Tan, R. L. Jungerman and S. S. Elliott
Hewlett-Packard Co.
Microwave Technology Division
1412 Fountaingrove Pkwy.
Santa Rosa, CA 95401 | 1067 |
| OO-3
4:40 p.m. | High Power RF Generation with Optically Activated Bulk GaAs Devices
A. Kim, M. Weiner and R. Youmans
US Army Electronics Technology & Devices Laboratory, LABCOM
Fort Monmouth, NJ 07703-5000

P. Herczfeld
Drexel University
Electrical Engineering Department
Philadelphia, PA 19104

A. Rosen
David Sarnoff Research Center
Subsidiary of SRI International
Princeton, NJ 08543 | 1071 |
| OO-4
4:50 p.m. | Pulsed Operation of an Optoelectronic Finline Switch
K. Uhde and J. Müller
Technische Universität Hamburg-Harburg
Postfach 90 14 03, D-2100
Hamburg 90, West Germany | 1075 |
| OO-5
5:00 p.m. | Characteristics of Coplanar Waveguides with Metal Coating on Multilayer Substrate: Application to Broadband LiNbO₃:Ti Traveling Wave Light Modulators/Switch
D. Bourreau and P. Guillon
I.R.C.O.M., U.A. C.N.R.S. 356
Faculté des Sciences
123 Av. A. Thomas
87060 Limoges Cédex, France | 1079 |

Session PP

Non-Linear FET Applications

Jacob Javits Convention Center, Hall 1E—Room 2

4:00 p.m. to 5:30 p.m.

Friday May 27, 1988

Chairman: E. C. Niehenke—Westinghouse Electric Co.

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|------------------|--|-------------|
| PP-1 | A 13-GHz YIG-Film Tuned Oscillator for VSAT Applications | 1085 |
| 4:00 p.m. | Y. Mizunuma, T. Ohgihara, H. Nakano, T. Okamoto and Y. Murakami
Sony Corporation Research Center
174 Fujitsuka-cho, Hodogaya-ku
Yokohama, 240 Japan | |
| PP-2 | FET Upconverter Design Using Load Dependent Mixing Transconductance | 1089 |
| 4:20 p.m. | J. L. M. Lord
University of British Columbia
Vancouver, Canada

J. L. Fikart
MPR Limited, Burnaby
British Columbia, Canada | |
| PP-3 | A Quasi-Optical HEMT Self-Oscillating Mixer | 1093 |
| 4:30 p.m. | V. D. Hwang and T. Itoh
Dept. of Electrical and Computer Engineering
University of Texas
Austin, TX 78712 | |
| PP-4 | 2 to 8 GHz Double Balanced MESFET Mixer with +30 DBM Input
3rd Order Intercept | 1097 |
| 4:50 p.m. | S. Weiner, D. Neuf and S. Spohrer
RHG Electronics Laboratory, Inc.
A Subsidiary of Adams-Russell Electronics Co., Inc.
Deer Park, NY 11729 | |

Session QQ

Computer Aided Design, Analysis and Modeling Jacob Javits Convention Center, Hall 1E—Room 3

4:00 p.m. to 5:30 p.m.

Friday May 27, 1988

Chairman: Barry S. Perlman—David Sarnoff Research Center

QQ-1 4:00 p.m.	Numerical Analysis of Intermodulation Distortion in Microwave Mixers V. Rizzoli and A. Lipparini Dipartimento di Elettronica Informatica e Sistemistica University of Bologna C. Cecchetti Fondazione Ugo Bordoni Villa Griffone 40044 Pontecchio Marconi Bologna, Italy	1103
QQ-2 4:20 p.m.	A Mixer Computer-Aided Design Tool Based in the Time Domain P. Estabrook and B. B. Lusignan Stanford University Stanford, CA 94305	1107
QQ-3 4:30 p.m.	Non-Linear Modelling and Design of Microwave Mixers M. I. Sobhy and F. Bassirat Electronic Engineering Laboratories The University of Kent at Canterbury Canterbury, Kent CT2 7NT U.K.	1111
QQ-4 4:40 p.m.	Optimal CAD of MESFETS Frequency Multipliers With and Without Feedback C. Guo, E. Ngoya, R. Quere and J. Obregon I.R.C.O.M. Université de Limoges CNRS 87060 Limoges Cedex, France M. Camiade Thomson Hybrides et Microondes/DHM 29 Avenue Carnot 91300 Massy, France	1115
QQ-5 4:50 p.m.	A Novel Approach for the Large Signal Analysis and Optimisation of Microwave Frequency Doublers S. El-Rabaie, J. A. C. Stewart and V. F. Fusco Department of Electrical and Electronic Engineering The Queen's University of Belfast Northern Ireland J. J. McKeown Department of Engineering Mathematics The Queen's University of Belfast Northern Ireland	1119
QQ-6 5:00 p.m.	The Use of Parametric Modeling in Microwave Circuit Design M. Eron and D. L. Rhodes David Sarnoff Research Center, CN 5300 Princeton, NJ 08543-5300	1123