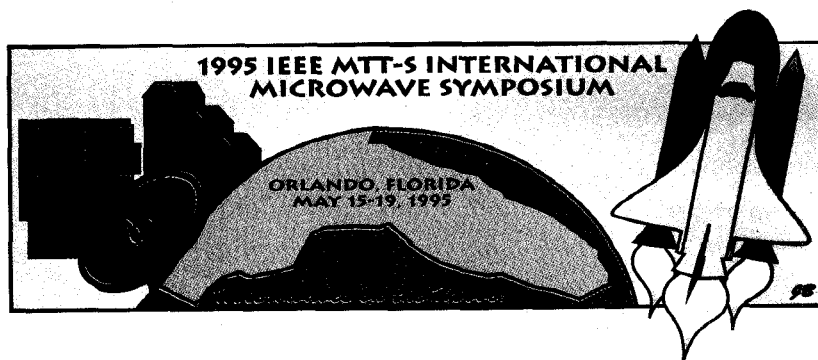


1995
IEEE MTT-S
INTERNATIONAL MICROWAVE SYMPOSIUM
DIGEST

*1995 Microwave Symposium
Technical Program Schedule*



1995 Microwave Symposium Technical Program Schedule

TU
1A

TU
1B

Session TU1A (Joint with MMWMC) Systems Applications

8:30 a.m.–10:00 a.m.

Room A1

Tuesday, May 16, 1995

Chairman: A. Gupta—Westinghouse, ESG

Co-Chairman: S. Bharj—Princeton Microwave Technology

TU1A-1	A Family of Low Cost High Performance HEMT MMICs for Commercial DBS Applications	1649
8:30 am	K. Hubbard, K. MacGowan, C. Kau, D. Smith and S. Maas	
TU1A-2	K-Band T/R-Converter Modules for the IRIDIUM® Satellite Program	1653
8:50 am	D.W. Corman, B.T. Agar, K.V. Buer, D.L. Cook	
TU1A-3	Performance of a 6 to 18 GHz Frequency Translator Utilizing GaAs MMIC 5-Bit Digital Phase Shifter	5
9:10 am	S.R. Mazumder and C.M. Isham	
TU1A-4	A 1.9 GHz-Band Ultra Low Power Consumption Amplifier Chip Set for Personal Communications	9
9:30 am	M. Muraguchi, M. Nakatsugawa, H. Hayashi and M. Aikawa	
TU1A-5	Miniature GPS Translator Module	13
9:50 am	J. Smuk, P. Katzin, V. Aparin and M. Shifrin	

Session TU1B' Progress in Time-Domain Techniques

8:30 a.m.–10:00 a.m.

Room A2

Tuesday, May 16, 1995

Chairman: A. Cangellaris—University of Arizona

TU1B-1	The Alternating Transmission Line Matrix (ATLM) Scheme	19
8:30 am	P. Russer and B. Bader	
TU1B-2	Compensation of Coarseness Error in TLM Modeling of Microwave Structures with the Symmetrical Condensed Node	23
8:50 am	J.L. Herring and W.J.R. Hoefer	
TU1B-3	Some Improvements to the FDTD Algorithm for the Analysis of Passive Circuits	1657
9:00 am	R.C. Tupynambá and A.S. Omar	
TU1B-4	Application of the PML Absorbing Boundary Condition to the FDTD Analysis of Microwave Circuits	27
9:10 am	A. Bahr, A. Lauer and I. Wolff	
TU1B-5	A Stretched Coordinate Technique for Numerical Absorption of Evanescent and Propagating Waves in Planar Waveguiding Structures	31
9:30 am	M.A. Gribbons, W.P. Pinello and A.C. Cangellaris	
TU1B-6	A Broadband Absorbing Boundary Condition for the FDTD Modeling of Circular Waveguides	35
9:40 am	T.G. Jurgens	
TU1B-7	Treatment of Instabilities of One-Way Equation Absorbing Boundary Conditions Using Digital Filters	39
9:50 am	C. Eswarappa and W.J.R. Hoefer	

Session TU1C

Photonic Devices

8:30 a.m.–10:00 a.m.

Room 12A,B,C

Tuesday, May 16, 1995

Chairman: C. Gee—Ortel Corporation

TU1C-1	Ultrahigh Speed Cryogenic Laser Diodes for Broadband Optical Fiber Link Applications	45
8:30 am	R.-C. Yu, R. Nagarajan, T. Reynolds, J.E. Bowers, M. Shakouri, J. Park, K.Y. Lau, C.-E. Zah, W. Zou and J. Merz	
TU1C-2	Analytical Model With Empirical Verification for Heterojunction Bipolar Transistors Under Illumination	49
8:40 am	L.E.M. de Barros Jr., A. Paoletta, P.R. Herczfeld and P. Enquist	
TU1C-3	1 × 8 Metal-Semiconductor-Metal Photodetector and HEMT Receiver Array with 5 GHz Bandwidth	53
8:50 am	T. Seniuk, Q.Z. Liu and G.D. Cormack	
TU1C-4	A Low Noise Broadband GaAs MESFET Monolithic Distributed Preamplifier	57
9:10 am	A.P. Freundorfer and P. Lionais	
TU1C-5	Measurement of Intermodulation Distortion in Optical Diodes	61
9:20 am	B. Kanack	
TU1C-6	Photonic Switched True Time Delay Beam Forming Network Integrated on Silica Waveguide Circuits	65
9:40 am	K. Horikawa, I. Ogawa, H. Ogawa and T. Kitoh	

Session TU1D

Sources and Control Components

8:30 a.m.–10:00 a.m.

Room A3

Tuesday, May 16, 1995

Chairman: A.P.S. Khanna—Hewlett Packard Company

TU1D-1	A 60GHz MMIC Stabilized Frequency Source Composed of a 30GHz DRO and a Doubler	71
8:30 am	M. Funabashi, T. Inoue, K. Ohata, K. Maruhashi, K. Hosoya, M. Kuzuhara, K. Kanekawa and Y. Kobayashi	
TU1D-2	Dielectric Loaded Gaussian Beam Oscillator in the 40 GHz Band	75
8:40 am	M. Kiyokawa, T. Matsui and N. Hirose	
TU1D-3	Microwave Oscillator Control Using a Switched Delay-Line Technique	79
9:00 am	C.E. Free and C.S. Aitchison	
TU1D-4	Microwave Oscillators and Filters Based on Microstrip Ring Resonators	83
9:10 am	D.K. Paul and P. Gardner	
TU1D-5	The Influence of I-Region Width Modulation on PIN Diode Attenuator Design	87
9:20 am	R.H. Caverly and Z.W. Tang	
TU1D-6	Micromechanical Membrane Switches for Microwave Applications	91
9:30 am	C. Goldsmith, T.-H. Lin, B. Powers, W.-R. Wu and B. Norvell	

Session TU1E

Advances in Ferrite Technologies

8:30 a.m.–10:00 a.m.

Room A4

Tuesday, May 16, 1995

Chairman: J.M. Owens—Auburn University

TU1E-1	Monolithic Integration of an X-Band Circulator with GaAs MMICs	97	TU 1C
8:30 am	J.D. Adam, H. Buhay, M.R. Daniel, M.C. Driver, G.W. Eldridge, M.H. Hanes and R.L. Messham		
TU1E-2	Normal-Mode Analysis of Coupled-Slots with an Axially-Magnetized Ferrite Substrate	99	TU 1D
8:50 am	C.S. Teoh and L.E. Davis		
TU1E-3	A Latching Ferrite Rotary-Field Phase Shifter	103	TU 1E
9:10 am	C.R. Boyd, Jr.		
TU1E-4	Thin Film Isolators Utilizing MSSW Transducers	107	
9:30 am	E.-B. El-Sharawy and J.-S. Guo		TU 2G
TU1E-5	A Reflection Type of MSW Signal-to-Noise Enhancer in the 400-MHz Band	111	
9:40 am	T. Kuki and T. Nomoto		TU 3A

Session TU2G

(Plenary Session)

Moving Cellular Communications into Space

10:30 a.m.–12:00 a.m.

Hall A5

Tuesday, May 16, 1995

Session TU3A

(Joint with MMWMC)

Mixers and Related Components

1:30 p.m.–3:00 p.m.

Room A1

Tuesday, May 16, 1995

Chairman: A. Chu—MITRE Corporation

Co-Chairman: L. Liu—TRW Incorporated

TU3A-1	A Monolithic Broadband Doubly Balanced EHF HBT Star Mixer with Novel Microstrip Baluns	119
1:30 pm	Y.I. Ryu, K.W. Kobayashi and A.K. Oki	
TU3A-2	A PMHFET Based MMIC Gate Mixer for Ka-Band Applications	123
1:50 pm	M. Matthes, J.-M. Dieudonné, W. Stiebler, L. Klapproth	
TU3A-3	A K-Band Monolithic CPW Upconverter Utilizing a Source Mixing Concept	127
2:00 pm	M. Madihian, L. Desclos, K. Maruhashi, K. Onda and M. Kuzuhara	
TU3A-4	Monolithic Mixers with MESFETs Technology to Up and Down Convert Between C and V Band	131
2:10 pm	J.P. Torres, F. Fortes, M.J. Rosário, J.M. Dieudonné and J. Costa Freire	
TU3A-5	MMIC Active Bandpass Filter Using Negative Resistance Elements	135
2:20 pm	U. Karacaoglu and I.D. Robertson	
TU3A-6	Capacitive-Division Traveling-Wave Amplifier with 340 GHz Gain-Bandwidth Product	1661
2:40 pm	J. Puhl, B. Agarwal, R. Pallela, L.D. Nguyen, M.V. Le, M.J.W. Rodwell, L. Larson, J.F. Jensen, R.Y. Yu and M.G. Case	

Session TU3B

Leaky-Wave Effects on Planar Transmission Lines

1:30 p.m.–3:00 p.m.

Room A2

Tuesday, May 16, 1995

Chairman: P. Lampariello—"La Sapienza" University of Rome

TU3B-1	The Effect of Substrate Anisotropy on the Dominant-Mode Leakage from Stripline with an Air Gap	141
1:30 pm	D. Nghiem, J.T. Williams, D.R. Jackson and A.A. Oliner	
TU3B-2	Simultaneous Propagation of Bound and Leaky Dominant Modes on Printed-Circuit Lines: A New General Effect	145
1:50 pm	H. Shigesawa, M. Tsuji and A.A. Oliner	
TU3B-3	Analysis and Design of Feeding Structures for Microstrip Leaky Wave Antenna	149
2:10 pm	Y.-D. Lin, J.-W. Sheen and C.-K.C. Tzuang	
TU3B-4	Leaky Dominant Modes and Microwave Circuit Coupling in Layered Symmetric Coupled Lines	153
2:30 pm	C.-K.C. Tzuang and S.-P. Liu	

Session TU3C

Millimeter Wave Frequency Optical Detectors

1:30 p.m.–3:00 p.m.

Room 12A,B,C

Tuesday, May 16, 1995

Chairman: P. Herczfeld—Drexel University
Co-Chairman: N. Dietrich—AT&T Bell Laboratories

TU3C-1	Travelling-Wave Photodetectors	159
1:30 pm	K. Giboney, J. Bowers and M. Rodwell	
TU3C-2	Monolithic High Speed Long Wavelength Photoreceivers Incorporating Photodetectors with Transistor Preamplifiers	*
2:00 pm	S. Chandrashekhar and L.M. Lunardi	
TU3C-3	Travelling-Wave Optoelectronic Devices for Microwave Applications	163
2:30 pm	D. Jäger, R. Kremer and A. Stöhr	

Session TU3D

High Density Microwave Packaging (HDMP) Program

1:30 p.m.—3:00 p.m.

Room A3

Tuesday, May 16, 1995

Chairman: T. Kemerley—USAF—Wright Laboratory

TU3D-1	High Density Microwave Packaging Program	169
1:30 pm	E.D. Cohen	
TU3D-2	High Density Microwave Packaging Program Phase 1—Texas Instruments/Martin Marietta	
1:45 pm	Team	173
	J.A. Reddick III, R.K. Peterson, M. Lang, W.R. Kritzler, P. Piacente and W.P. Kornrumpf	
TU3D-3	The Westinghouse High Density Microwave Packaging Program	177
2:10 pm	J.A. Costello, M. Kline, F. Kuss, W. Marsh, R. Kam, B. Fasano, M. Berry and N. Koopman	
TU3D-4	High Density Microwave Packaging for T/R Modules	181
2:35 pm	J. Wooldridge	

Session TU3E

Superconducting Components and Applications

1:30 p.m.—3:00 p.m.

Room A4

Tuesday, May 16, 1995

Chairman: C. Jackson—TRW

TU3E-1	An Optical Switch for High Temperature Superconducting Microwave Band Reject	
1:30 pm	Resonators	187
	K.F. Raihn, N.O. Fenzi, E.R. Soares and G.L. Matthaei	
TU3E-2	High-Temperature Superconducting Microstrip Filters with High Power-Handling	
1:40 pm	Capability	191
	G.-C. Liang, D. Zhang, C.-F. Shih, M.E. Johansson, R. Withers, A.C. Anderson, D.E. Oates, P. Polakos, P. Mankiewicz, E. de Obaldia and R.E. Miller	
TU3E-3	Miniature Circulators for Microwave Superconducting Systems	195
2:00 pm	A. Fathy, E. Denlinger, D. Kalokitis, V. Pendrick, H. Johnson, A. Pique, K.S. Harshavardhan and E. Belohoubek	
TU3E-4	Frequency Agile Superconducting Thin-Film (FAST TM) Filter	*
2:20 pm	G.A. Koepf, R.R. Bonetti, M. Hiney, M. Rivkin, R.M. Yandrofski, D.A. Rudman, J.S. Horwitz, D. Dumos and J.D. Cuchiaro	
TU3E-5	Comparison Between Direct and Aperture Coupling Y-Ba-Cu-O Mixer Antennas	*
2:40 pm	K. Suzuki, K. Yamaguchi, K. Hayashi, M. Ban, S. Tokunaga and Y. Enomoto	



*Manuscript not available at time of printing.

Session TU4A

(Joint with MMWMC)

Monolithic Receiver Components

3:30 p.m.–5:00 p.m.

Room A1

Tuesday, May 16, 1995

Chairman: V. Nair—Motorola-PCRL

Co-Chairman: S. Moghe—Northrop-Grumman

TU4A-1	A Novel Baseband-1.5 GHz Monolithic HBT Variable Gain Amplifier with PIN Diode Gain Control	201
3:30 pm	K.W. Kobayashi, A.K. Oki, L. Tran and D.C. Streit	
TU4A-2	A 9-16 GHz Monolithic HEMT Low Noise Amplifier with Embedded Limiters	205
3:50 pm	P. Huang, W.L. Jones, A. Oki, D. Streit, W. Yamasaki, P. Liu, S. Bui and B. Nelson	
TU4A-3	A W-Band Monolithic Low Noise AlGaAs/InGaAs Pseudomorphic HEMT Amplifier Mounted on a Small Hermetically-Sealed Package with Waveguide Interface	207
4:00 pm	Y. Itoh, M. Nakayama, K. Nakahara, T. Takagi, T. Sakura, N. Yoshida, T. Katoh, T. Kashiwa and Y. Ito	
TU4A-4	A Monolithic Integrated HEMT Frontend in CPW Technology from 10-50 GHz for Measurement Systems or Broadband Receivers	211
4:10 pm	R. Heilig, D. Hollmann, G. Baumann	
TU4A-5	A 2-32 GHz Coplanar Waveguide InAlAs/InGaAs-InP HBT Cascode Distributed Amplifier	215
4:20 pm	K.W. Kobayashi, J. Cowles, L. Tran, T. Block, A.K. Oki and D.C. Streit	
TU4A-6	A Distributed Optical Receiver Preamplifier with Unequal Gate/Drain Impedances	219
4:40 pm	I. Darwazeh, P. Moreira, A. Borjak and J. O'Reilly	

Session TU4B

Leaky-Wave Effects and Discontinuities

3:30 p.m.–5:00 p.m.

Room A2

Tuesday, May 16, 1995

Chairman: S.M. El-Ghazaly—Arizona State University

TU4B-1	Mode Conversion and Leaky-Wave Excitation at Open-End Coupled Microstrip Discontinuities	225
3:30 pm	J. Cina and L. Carin	
TU4B-2	Surface-Wave Leakage Properties of Coplanar Strips	229
3:50 pm	Y.-D. Lin, J.-W. Sheen and C.-Y. Chang	
TU4B-3	Analysis of the Effects of Metal Discontinuities in Nonradiative Dielectric Waveguide	233
4:00 pm	C. Di Nallo, F. Frezza, A. Galli and P. Lampariello	
TU4B-4	Study of Non-Leaky Coplanar (NLC) Waveguide Discontinuities	237
4:20 pm	C.-Y. Lee, Y. Liu and T. Itoh	
TU4B-5	Multimode Network Representation for H- and E-Plane Uniform Bends in Rectangular Waveguide	241
4:30 pm	B. Gimeno and M. Guglielmi	

Session TU4C

High Speed Optical Modulators Fabricated on III-V Compounds

3:30 p.m.–5:00 p.m.

Room 12A,B,C

Tuesday, May 16, 1995

Chairman: J. Bowers—University of California at Santa Barbara

Co-Chairman: A. Rosen—SRI

TU4C-1	Integrated Laser/Modulators for High Capacity WDM Transmission Systems	247
3:30 pm	W.T. Tsang, J.E. Johnson, P.A. Morton, T. Tanbun-Ek, S.N.G. Chu and W.D. Johnston	
TU4C-2	Ultra Wide Electrical Bandwidth GaAs/AlGaAs Electrooptic Modulators	251
4:00 pm	N. Dagli, R. Spickermann, S. Sakamoto and M. Peters	
TU4C-3	High-Speed Directional Coupler Modulator with Velocity-Matched Electrode Structure	255
4:30 pm	M. Yu and A. Gopinath	
TU4C-4	Integrated Optic Distributed Bragg Reflector Fabry-Perot Modulator for Microwave Applications	259
4:50 pm	W.J. Zubrzycki, B.V. Borges, P.R. Herczfeld, S.H. Kravitz, G.R. Hadley, G.A. Vawter, R.F. Corless, R.E. Smith, J.R. Wendt, J.C. Word and T.M. Bauer	

Session TU4D

Field Theory I

3:30 p.m.–5:00 p.m.

Room A3

Tuesday, May 16, 1995

Chairman: A. Beyer—Gerhard-Mercator—University at Duisburg

TU4D-1	Field Theory Analysis of Circular Ridge Waveguides with Partial Dielectric Filling	265
3:30 pm	S. Xiao, R. Vahldieck and M. Guglielmi	
TU4D-2	Generalized Scattering Matrix of Waveguide Corners Distorted by Discontinuities in the Resonator Region	269
3:50 pm	V.A. Labay and J. Bornemann	
TU4D-3	A Wide-Band S-Parameter Extraction Procedure for Arbitrarily Shaped, Inhomogeneous Structures Using Time Domain Numerical Techniques	273
4:00 pm	J. Ritter, V.J. Branković, D.V. Krupežević and F. Arndt	
TU4D-4	The Generalized Scattering Matrix Separation Technique Combined with the MM/FE Method for the Efficient Modal Analysis of a Comprehensive Class of 3D Passive Waveguide Circuits	277
4:20 pm	R. Beyer and F. Arndt	
TU4D-5	Modelling of Cascaded Coplanar Waveguide Discontinuities by the Mode-Matching Approach	281
4:40 pm	R. Schmidt and P. Russer	
TU4D-6	Axisymmetric Edge-Based Finite Element Formulation for Bodies of Revolution: Application to Dielectric Resonators	285
4:50 pm	M.F. Wong, M. Prak and V.F. Hanna	



Session TU4E

Biomedical Applications

3:30 p.m.–5:00 p.m.

Room A4

Tuesday, May 16, 1995

Chairman: P. Yu—University of California at San Diego

TU4E-1	Field Calculation in Models of Man in the Near-Field of Antennas	291
3:30 pm	G. Schaller, R. Engelbrecht and J. Erb	
TU4E-2	Variations of the Somatosensory Evoked Potentials Due to Microwave Fields in Rabbits Spinal Cord	295
3:50 pm	J. Teng, D. Carton de Tournai, F. Duhamel and A. Vander Vorst	
TU4E-3	Modeling a Microwave Catheter Antenna for Cardiac Ablation	299
4:10 pm	A. Khebir, Z. Kaouk and P. Savard	
TU4E-4	Monopoles for Microwave Catheter Ablation of Heart Tissue	303
4:20 pm	S. Labonté, H.O. Ali and L. Roy	
TU4E-5	Field Simulation of Applicators for Interstitial Microwave Hyperthermia	307
4:30 pm	G. Schaller, J. Erb, R. Engelbrecht and H.M. Seegenschmiedt	
TU4E-6	Coupled Radiation Between Concentrically Placed Waveguide Applicators: Optimization of the Deposited Power Distribution Inside A Lossy Medium	311
4:40 pm	K.S. Nikita, N.K. Uzunoglu and N.G. Maratos	
TU4E-7	Design and Modeling of Multipatches Planar Applicators for Microwave Hyperthermia	315
4:50 pm	C. Michel, L. Dubois, P.-Y. Cresson, M. Chive and J. Pribetich	

Session WE1A

Microwave Power Devices and Amplifiers I

8:30 a.m.–10:00 a.m.

Room A1

Wednesday, May 17, 1995

Chairman: H.J. Kuno—Quin Star Technology, Incorporated

WE1A-1	High Power, High Efficiency PHEMTs for Use at 8 GHz	323
8:30 am	D. Teeter, S. Bouthillette, L. aucoin, A. Platzker, C. Alfaro and D. Bradford	
WE1A-2	A High Efficiency 10 Watt HBT Power Amplifier Assembly using Combining Techniques	327
8:50 am	G. Ferrell, L. Dickens, J. Gipprich, B. Hayes and F. Sacks	
WE1A-3	Development of a Low Cost X-Band Solid State Transmitter for Low Volume Commercial Applications	331
9:10 am	J. Faulkner, E. Lee, J. Masti and M. Pingor	
WE1A-4	Ku-Band 10W High Efficiency HJFET Power Amplifier	335
9:30 am	K. Matsunaga, Y. Okamoto and M. Kuzuhara	
WE1A-5	An 11 W Ku-Band Heterostructure FET with WSi/Au T-Shaped Gate	339
9:50 am	J. Udomoto, S. Chaki, M. Komaru, T. Kunii, Y. Kohno, S. Goto, K. Gotoh, A. Inoue, N. Tanino, T. Takagi and O. Ishihara	
WE1A-6	Ku-Band 20 W Power GaAs FETs	343
10:00 am	Y. Saito, T. Kuzuhara, T. Ohmori, K. Kai, H. Ishimura and H. Tokuda	



Session WE1B

Applications of Time Domain Methods

8:30 a.m.–10:00 a.m.

Room A2

Wednesday, May 17, 1995

Chairman: W.J.R. Hoefer—University of Victoria

WE1B-1	3D FDTD Simulation of Superconductor Coplanar Waveguides	349
8:30 am	S. Xiao and R. Vahldieck	
WE1B-2	Analysis of Anisotropic Conductors on Anisotropic Substrates	353
8:50 am	M.A. Megahed and S.M. El-Ghazaly	
WE1B-3	FDTD Simulation of a Microwave Amplifier	357
9:00 am	C.-N. Kuo, S.T. Chew, B. Houshmand and T. Itoh	
WE1B-4	Simulation of HF Circuits with FDTD Technique Including Non-Ideal Lumped Elements	361
9:10 am	P. Ciampolini, P. Mezzanotte, L. Roselli, D. Sereni, R. Sorrentino and P. Torti	
WE1B-5	Modelling of General Constitutive Relationships in SCN TLM	365
9:20 am	L. de Menezes and W.J.R. Hoefer	
WE1B-6	Dispersion Characteristics of the TLM Scheme with Symmetrical Super-Condensed Node	369
9:40 am	M. Krumpholz, L. Roselli and P. Russer	
WE1B-7	Dispersion of TLM Condensed Nodes in Media with Arbitrary Electromagnetic Properties	373
9:50 am	V. Trenkic, C. Christopoulos and T.M. Benson	

Session WE1C

Miniaturized Filters

8:30 a.m.–10:00 a.m.

Room 12A,B,C

Wednesday, May 17, 1995

Chairman: Y.-C. Shih—Hughes Space and Communications Company

WE1C-1	Narrowband Lumped-Element Microstrip Filters using Capacitively-Loaded Inductors	379
8:30 am	D. Zhang, G.-C. Liang, C.F. Shih and R.S. Withers	
WE1C-2	A New Semi-Lumped Microwave Filter Structure	383
8:50 am	A.F. Sheta, K. Hettak, J.Ph. Coupez, C. Person, S. Toutain and J.P. Blot	
WE1C-3	A Novel MMIC Filter—Measured and Simulated Data	387
9:10 am	F. Mernyei, I. Aoki and H. Matsuura	
WE1C-4	A Miniaturized Ceramic Bandpass Filter for Cordless Phone Systems	391
9:30 am	S. Kobayashi and K. Saito	
WE1C-5	Generalized Slot Coupled Compline Filters	395
9:40 am	H.-W. Yao, K.A. Zaki, A.E. Atia and R. Hershtig	



Session WE1D

(Joint with NTC)

Wireless Communications Systems

8:30 a.m.–10:00 a.m.

Room A3

Wednesday, May 17, 1995

Chairman: J.B. Horton—TRW

WE1D-1	Opening Remarks NTC “95” Microwave Systems Conference	*
8:30 am	M.A. Belkerdid and D.C. Malocha	
WE1D-2	Recent Advances on Millimeterwave PCN System Development in Europe (Invited)	401
8:40 am	H.H. Meinel	
WE1D-3	Recent Activities on Millimeter Wave Indoor LAN System Development in Japan (invited)	405
9:00 am	Y. Takimoto	
WE1D-4	Advanced MMIC Components for Ka-Band Communications Systems—A Survey	409
9:20 am	J.-M. Dieudonné, B. Adelseck, P. Narozny and H. Dämbkes	
WE1D-5	Microwave and Millimetre-Wave Technology Requirements for the European Fourth Framework Programme	413
9:40 am	J.G. Gardiner	

Session WE1E

Millimeter-Wave Circuits and Systems

8:30 a.m.–10:00 a.m.

Room A4

Wednesday, May 17, 1995

Chairman: K. Agarwal—University of Bridgeport
Co-Chairman: M. Matloubian—Hughes Research Laboratories

WE1E-1	A W-Band Monolithic 175-mW Power Amplifier	419
8:30 am	H. Wang, Y. Hwang, T.H. Chen, M. Biedenbender, D.C. Streit, D.C.W. Lo, G.S. Dow and B.R. Allen	
WE1E-2	W-Band Integrated Monopulse Radar Transceiver	423
8:50 am	P. Toullos, Y.-H. Shu, J. Navarro and R. Knox	
WE1E-3	A 40 to 50 GHz HEMT Test Fixture	427
9:10 am	A. Prabhu and N. Erickson	
WE1E-4	Manufacturable and Reliable Millimeter-Wave HJFET MMIC Technology Using Novel 0.15μm MoTiPtAu Gates	431
9:20 am	Y. Hori, K. Onda, M. Funabashi, H. Mizutani, K. Maruhashi, A. Fujihara, K. Hosoya, T. Inoue and M. Kuzuhara	
WE1E-5	A High Performance, High Yield, Dry-Etched, Pseudomorphic HEMT for W-Band Use	435
9:40 am	N.I. Cameron, M.R.S. Taylor, H. McLelland, M. Holland, I.G. Thayne, K. Elgaid and S.P. Beaumont	

*Manuscript not available at time of printing.

Session WE2A

Microwave Power Devices and Amplifiers II

10:30 a.m.–12:00 p.m.

Room A1

Wednesday, May 17, 1995

Chairman: B. Bayraktaroglu—Westinghouse EGS

WE2A-1 10:30 am	Variable Output, High Efficiency-Low Distortion S-Band Power Amplifiers and Their Performances Under Single Tone and Noise Power Excitations A. Platzker and S. Bouthillette	441	WE 1D
WE2A-2 10:50 am	High-Performance 0.15- μ m-Gate-Length pHEMTs Enhanced with a Low-Temperature-Grown GaAs Buffer R. Actis, K.B. Nichols, W.F. Kopp, T.J. Rogers and F.W. Smith	445	WE 1E
WE2A-3 11:10 am	Robust GaAs MMIC Amplifiers Using Planar Ion-Implanted Power MESFETs with Improved Open-Channel Burnout D.C. Miller, R.A. Sadler and A.H. Peake	449	WE 2A
WE2A-4 11:20 am	GaAs/InGaAs Heterostructure FETs with 1.6W Output Power at 1GHz J.W. Lee, M.K. Gong, S.G. Cho and B. Kim	453	WE 2B
WE2A-5 11:30 am	A Scalable MMIC-Compatible Power HBT G. Jackson, D. Teeter, D. Bradford and M. Cobb	457	
WE2A-6 11:40 am	Three-Dimensional Modeling of Thermal Flow in Multi-Finger High Power HBTs R. Hattori, T. Shimura, M. Kato, T. Sonoda and S. Takamiya	461	
WE2A-7 11:50 am	High Performance Millimeter Wave AlInAs/GaInAs/InP HEMTs with Individually Grounded Source Finger Vias K.Y. Hur, R.A. McTaggart, M.P. Ventresca, R. Wohlert, L.M. Aucoin and T.E. Kazior	465	

Session WE2B

Frequency-Domain Electromagnetic Modeling

10:30 a.m.–12:00 p.m.

Room A2

Wednesday, May 17, 1995

Chairman: R. Sorrentino—University of Perugia

WE2B-1 10:30 am	An Entire-Domain Basis Galerkin's Method for the Modeling of Integrated MM-Wave and Optical Circuits G. Athanasoulis and N.K. Uzunoglu	471	
WE2B-2 10:50 am	Proximity Coupled Microstrip Elements and Interconnects of Arbitrary Shape in Multilayered Media M-J. Tsai and N.G. Alexopoulos	475	
WE2B-3 11:00 am	Full-Wave Modal Analysis of Arbitrarily-Shaped Dielectric Waveguides Through an Efficient Boundary-Element-Method Formulation C. Di Nallo, F. Frezza and A. Galli	479	
WE2B-4 11:20 am	The Finite-Integration Beam-Propagation Method (FIBPM) M. Niederhoff, W. Heinrich and P. Russer	483	
WE2B-5 11:30 am	A New Frequency-Domain TLM Symmetrical Condensed Node Derived Directly from Maxwell's Equations H. Jin and R. Vahldieck	487	
WE2B-6 11:50 am	The Method of Lines for the Hybrid Analysis of Multilayered Dielectric Resonators D. Kremer and R. Pregla	491	

Session WE2C

Coupled Mode Waveguide Filters

10:30 a.m.–12:00 p.m.

Room 12A,B,C

Wednesday, May 17, 1995

Chairman: A.E. Williams—COMSAT Laboratories

WE2C-1	Direct Synthesis of Cascaded Quadruplet (CQ) Filters	497
10:30 am	R. Levy	
WE2C-2	Mixed Modes Cylindrical Planar Dielectric Resonator Filters with Rectangular Enclosure	501
10:50 am	C. Wang, H.-W. Yao and K.A. Zaki	
WE2C-3	Complete Design for Five-Pole in Line Elliptic Filter	505
11:10 am	Ph. Guillot, H. Baudrand, S. Vigneron and B. Theron	
WE2C-4	Dual-Mode Dielectric-Loaded Resonators with Cross-Coupling Flats	509
11:20 am	J.-F. Liang, K.A. Zaki and R. Levy	
WE2C-5	Mode-Selective Negative Coupling for Implementing Multiple Attenuation Poles in	
11:40 am	Evanescent-Mode Waveguide Filters	513
	K. Iguchi, M. Tsuji and H. Shigesawa	

Session WE2D

(Joint with NTC)

Wireless Technologies

10:30 a.m.–12:00 p.m.

Room A3

Wednesday, May 17, 1995

Chairman: V. Nair—Motorola—PCRL
Co-Chairman: D. Maki—Raytheon Company

WE2D-1	A Low Cost Mixer for Wireless Applications	519
10:30 am	J.-M. Maurant	
WE2D-2	A Low-Current Linearity Sweet Spot in HFET's	523
10:50 am	R. Vaitkus, V. Nair and S. Tehrani	
WE2D-3	A Novel 3V, 7 mA PHEMT GaAs Active MMIC Mixer/LNA for Wireless Applications	527
11:10 am	H. Morkner, M. Frank, B. Ingram	
WE2D-4	A Double-Polysilicon Bipolar Process with a 0.3-μm Minimum Emitter Width and NMOS	
11:30 am	Transistors for Low Power Wireless Applications	531
	K. O, C. Tsai, T. Tewksbury, G. Dawe, C. Kermarrec and J. Yasaitis	
WE2D-5	A Low Cost 3.6V Single-Supply GaAs Power Amplifier IC for the 1.9-GHz DECT System	535
11:50 am	J. Griffiths and V. Sadhir	

Session WE2E

Millimeter Wave Sources and Measurements

10:30 a.m.–12:00 p.m.

Room A4

Wednesday, May 17, 1995

Chairman: M. Frerking—Jet Propulsion Laboratory

Co-Chairman: M. Afsar—Tufts University

WE2E-1	60-GHz Monolithic Oscillator using InGaP/InGaAs/GaAs HEMT Technology	541
10:30 am	Y. Kawasaki, K. Shirakawa, Y. Ohashi and T. Saito	
WE2E-2	New Insight in Operation Principles and Accurate Design of Fundamental and Harmonic Millimeter-Wave Oscillators	545
10:50 am	M. Curow	
WE2E-3	A Ka-Band Planar Tripler Based on a Stacked Symmetric InP Heterostructure-Barrier Varactor	549
11:10 am	K. Krishnamurthi, E. Boch and R.G. Harrison	
WE2E-4	Millimeter-Wave Fresnel Zone Planar Lens and Antenna	553
11:30 am	H.D. Hristov and M.H.A.J. Herben	
WE2E-5	Absolute Loss Measurement of Highly Reflective Samples by Using a High Q Gaussian Beam Open Resonator at Short Millimeter Wave Frequencies	557
11:40 am	T. Matsui, M. Kiyokawa and K. Araki	



Session WE3A

Power Amplifiers for Wireless Applications

1:30 p.m.–3:00 p.m.

Room A1

Wednesday, May 17, 1995

Chairman: R.E.S. Bryan—Ericsson, Incorporated

WE3A-1	Low-Voltage High-Performance Silicon RF Power Transistors	563
1:30 pm	M. Versleijen, R. Dekker, W.v.d. Einde and A. Pruijboom	
WE3A-2	Analogue/Digital Dual Power Module Using Ion-Implanted GaAs MESFETs	567
1:50 pm	H. Masato, M. Maeda, H. Fujimoto, S. Morimoto, M. Nakamura, Y. Yoshikawa, H. Ikeda, H. Kosugi and Y. Ota	
WE3A-3	A 3.3V, 1.4W GaAs Power Amplifier for CDMA/AMPS Dual-Mode Cellular Phone	571
2:10 pm	S.-J. Maeng, C.-S. Lee, K.-J. Youn, J.-L. Lee and H.-M. Park	
WE3A-4	A High Power Density and High Efficiency UHF-Band HFET for Low Voltage Operation	575
2:30 pm	T. Kunii, Y. Kohno, T. Kitano, S. Miyakuni, J. Udomoto, K. Yamamoto, K. Maemura, H. Takano, O. Ishihara and N. Tsubouchi	
WE3A-5	A High Power and High Efficiency Amplifier with Controlled Second-Harmonic Source Impedance	579
2:40 pm	M. Maeda, H. Takehara, M. Nakamura, Y. Ota and O. Ishikawa	

Session WE3B

Quasi-Optical Passive and Amplifier Arrays

1:30 p.m.–3:00 p.m.

Room A2

Wednesday, May 17, 1995

Chairman: J.F. Harvey—U.S. Army Research Office

WE3B-1	High-Power Hybrid Quasi-Optical Ka-Band Amplifier Design	585
1:30 pm	J. Hubert, J. Schoenberg and Z.B. Popovic	
WE3B-2	Two Stage Double Layer Microstrip Spatial Amplifiers	589
1:50 pm	T. Ivanov and A. Mortazawi	
WE3B-3	Quasi-Optical Amplifier Array Using Direct Integration of MMICs and 50 Ω Multi-Slot Antennas	593
2:10 pm	H.S. Tsai and R.A. York	
WE3B-4	Metal Mesh Couplers Using Evanescent Waves at Millimeter and Submillimeter Wavelengths	597
2:20 pm	J. Bae, J. Chiao, K. Mizuno and D.B. Rutledge	
WE3B-5	Analysis of Cascaded Quasi-Optical Grids	601
2:30 pm	S.C. Bundy, W.A. Shiroma and Z.B. Popović	
WE3B-6	Quasi-Optical Antenna Array Amplifiers	605
2:40 pm	J. Schoenberg, T. Mader, B. Shaw, Z.B. Popović	

Session WE3C

Active Device Modeling

1:30 p.m.–3:00 p.m.

Room 12A,B,C

Wednesday, May 17, 1995

Chairman: A.K. Sharma—TRW
Co-Chairman: J. Laskar—Georgia Tech.

WE3C-1	New MODFET Small Signal Circuit Model Required for Millimeter-Wave MMIC Design: Extraction and Validation to 120 GHz	611
1:30 pm	P.J. Tasker and J. Braunstein	
WE3C-2	An Improved GaAs MESFET Model for the Pulsed I-V Measurement	615
1:50 pm	K. Fujii	
WE3C-3	High-Frequency Large-Signal Physical Modeling of Microwave Semiconductor Devices	619
2:00 pm	M.A. AlSunaidi and S.M. El-Ghazaly	
WE3C-4	A Table Based Bias and Temperature Dependent Small Signal and Noise Equivalent Circuit Model	623
2:10 pm	P.B. Winson, S.M. Lardizabal and L. Dunleavy	
WE3C-5	A Novel Algorithm for Bias-Dependent Cascode FET Modeling	627
2:20 pm	P.B. Winson, L.P. Dunleavy, H.C. Gordon, Jr., M.V. Calvo and J. Sherman	
WE3C-6	Small-Signal Equivalent Circuit Scaling Properties of AlGaAs/GaAs HBTs	631
2:40 pm	D.-W. Wu, M. Fukuda, Y.-H. Yun and D.L. Miller	

Session WE3D

Field Theory II

1:30 p.m.–3:00 p.m.

Room A3

Wednesday, May 17, 1995

Chairman: J.W. Mink—North Carolina State University

WE3D-1	Radial Mode Matching Analysis of Ridged Circular Waveguide	637
1:30 pm	U. Balaji and R. Vahldieck	
WE3D-2	Slow-Wave Phenomena and Pulse Distortions in Optically Excited Schottky-Contacted Coplanar Waveguide	641
1:50 pm	A.S. Rong, S.M. Goodnick, V.K. Tripathi, H.X. Wang, Z.L. Sun and W.B. Dou	
WE3D-3	A Novel Wide Band Absorbing Boundary Condition for FDTD Method Simulations	645
2:10 pm	A.S. Rong, Z.L. Sun, V.K. Tripathi, H.X. Wang and W.B. Dou	
WE3D-4	Full Wave Analysis of Microstrip Filters Containing Dielectric and Metallic Resonators with the Method of Lines	649
2:20 pm	A. Kornatz and R. Pregla	
WE3D-5	Analysis of Planar Structures by an Integral Multi-Scale Approach	653
2:30 pm	M. Nadarassin, H. Aubert and H. Baudrand	
WE3D-6	A Novel Leaky-Mode Cylindrical Dielectric Resonator Used as Feeds of Omnidirectional Antenna for Wireless Communications	657
2:40 pm	T. Wang, H. An, K. Wu, J.-J. Laurin and R.G. Bosisio	

Session WE3E

Passive Planar Components

1:30 p.m.–3:00 p.m.

Room A4

Wednesday, May 17, 1995

Chairman: J. Taub—Consultant

WE3E-1	MMIC Wilkinson Couplers for Frequencies up to 110 GHz	663
1:30 pm	D. Köther, B. Hopf, Th. Sporkmann and I. Wolff	
WE3E-2	A New Wide-Band and Reduced-Size Uniplanar Magic-T	667
1:40 pm	L. Fan, S. Kanamaluru and K. Chang	
WE3E-3	A Broadband, High Directivity 3 DB Coupler Using Coplanar Waveguide Technology	671
2:00 pm	E. Rius, T. Le Gougec, K. Hettak, J.P. Coupez and S. Toutain	
WE3E-4	Miniature Stub and Filter Designs Using the Microshield Transmission Line	675
2:10 pm	T.M. Weller and L.P. Katehi	
WE3E-5	Quasi Static Analysis of Microstrip Bondwire Interconnects	679
2:20 pm	F. Alimenti, U. Goebel and R. Sorrentino	
WE3E-6	Broadband Uniplanar Microstrip to Slot-Line Transitions	683
2:30 pm	N.I. Dib, R.N. Simons and L.P.B. Katehi	



Session WE3F

Open Forum I

2:30 p.m.–5:00 p.m.

Hall A5

Wednesday, May 17, 1995

Chairman: E. Rizzo—ECC International

WE3F-A1	A Comparison of Low Frequency Noise in GaAs and InP-Based HBTs and VCOs	689
	J. Cowles, L. Tran, T. Block, D. Streit, C. Grossman, G. Chao and A. Oki	
WE3F-A2	Ultra Low Noise Microwave Oscillators With Low Residual Flicker Noise	693
	J.K.A. Everard and M. Page-Jones	
WE3F-A3	Comparison of the Phase Noise Performance of HEMT and HBT Based Oscillators	697
	X. Zhang, D. Sturzebecher and A.S. Daryoush	
WE3F-A4	Power Combining of Ku-Band Active Dipoles in a Cylindrical Resonant Cavity	701
	O. Lundén	
WE3F-B1	High Efficiency Amplifier Using Rectangular Waveform	705
	S. Toyoda	
WE3F-B2	Nonlinear Analysis of $f_0/2$ Loop Oscillation of High Power Amplifiers	709
	M. Mochizuki, M. Nakayama, Y. Tarui, Y. Itoh, S. Tsuji and T. Takagi	
WE3F-B3	RF-Stressed Life Test of Pseudomorphic InGaAs Power HEMT MMIC at 44 GHz	713
	C.H. Chen, G. Zell, Y. Saito, H.C. Yen, R. Lai, K. Tan and J. Loper	
WE3F-B4	Comprehensive Experimental Investigation of Gate Current Limitation Effects on Power GaAs FETs RF Performances	717
	N. Constantin and F.M. Ghannouchi	
WE3F-C1	A Study of Class C Operation of GaAs Power HBTs	721
	F. Ali, A. Gupta, M. Salib and B. Veasel	
WE3F-C2	Performance Capabilities of the Ring Network Circulator for Integrated Circuits	725
	J.A. Weiss and G.F. Dionne	
WE3F-C3	Nonreciprocal Characteristics of Broadside-Coupled FIN Lines with Magnetized Ferrites	729
	T. Kitazawa and T. Sugano	
WE3F-C4	Microwave, Millimeter Wave and Sub-Millimeter Wave Free-Space Faraday Rotators	1665
	G.M. Smith, S. Kang, C. Unsworth, E. Puplett, D. Franklin and J.C.G. Lesurf	
WE3F-D1	Intermodulation Characteristics of High-Power Bandpass Filter Using Dielectric Rod Resonators Loaded in a High-Tc Superconducting Cylinder	733
	Y. Kobayashi, M. Sasaki, T. Senju, Y. Kasuga and K. Haginuma	
WE3F-D2	Novel Architecture and MMICs for an Integrated Front End of a Spectrum Analyzer	737
	T. Takenaka, A. Miyazaki and H. Matsuura	
WE3F-D3	A New Technique for Obtaining High Isolations in Microwave Mixers Based on the Concepts of Distributed Mixing and Transversal Filtering	741
	A.H. Baree and I.D. Robertson	
WE3F-D4	Broadband and Tunable Negative Monolithic Circuits for Microwave Active Filters Compensation	745
	A. Brucher, Ph. Meunier, C. Cenac, B. Jarry and P. Guillon	
WE3F-E1	Systematic Analysis Method of E- and H-Plane Circular Bend of Rectangular Waveguide Based on the Planar Circuit Equations and Equivalent Network Representation	749
	H. Jui-Pang and T. Anada	
WE3F-E2	Experimental Study on Spiral Inductors	753
	S. Chaki, S. Aono, N. Andoh, Y. Sasaki, N. Tanino and O. Ishihara	
WE3F-E3	Ridge Waveguide T-Junctions	757
	A. Abdelmonem, K.A. Zaki	

WE3F-E4	Efficient Analysis of a Waveguide π-Junction with an Inductive Post	761
	Z. Ma and E. Yamashita	
WE3F-F1	Non-Leaky Coplanar Waveguide Active Antenna	765
	K. Cha, Y. Liu, C.-Y. Lee and T. Itoh	
WE3F-F2	Phase Noise Reduction in Scanning Oscillator Arrays	769
	X. Cao and R.A. York	
WE3F-F3	A Microstrip-Based Quasi-Optical Polarization Rotator Array	773
	N.J. Kolias and R.C. Compton	
WE3F-F4	Monolithic Millimeter-Wave Beam Control Array	1669
	X. Qin, W.-M. Zhang, C.W. Domier, N.C. Luhmann, Jr., W. Berk, S. Duncan and D.W. Tu	
WE3F-G1	Analytic Johns Matrix and its Applications in TLM Diakoptics	777
	Z. Chen	
WE3F-G2	On the Accuracy of the Finite-Difference Method Using Mesh Grading	781
	P. Mezzanotte, L. Roselli, C. Huber, H. Zscheile and W. Heinrich	
WE3F-G3	A Rigorous Study of Wire-Bonding and Via-Hole Effects on GaAs Field Effect Transistors	785
	T. Horng	
WE3F-G4	An Improved 2D-FDTD Method for TWFET Bandwidth Characterization	789
	C. Angiolini, G. D'Inzeo, and P. Rota	
WE3F-H1	Integrated Harmonic Balance and Electromagnetic Optimization With Geometry Capture	793
	J.W. Bandler, R.M. Biernacki, Q. Cai, S.H. Chen and P.A. Grobelny	
WE3F-H2	Compact Two-Dimensional FD-TD Analysis of Attenuation Properties of Lossy Microstrip Lines	797
	M. Fujii and S. Kobayashi	
WE3F-H3	Fast Procedures for Highly Dispersive Absorbing Boundary Conditions	801
	M. Mrozowski, M. Niedźwiecki, P. Suchomski	
WE3F-H4	An Extended Complex Finite Difference Method for the Analysis of Semiconductor Lasers with Electrode Discontinuities	805
	S. Chen and R. Vahldieck	
WE3F-I1	A Numerical TRL De-Embedding Technique for the Extraction of S-Parameters in a $2^{1/2}$D Planar Electromagnetic Simulator	809
	B. Linot, M.F. Wong, V.F. Hanna and O. Picon	
WE3F-I2	Electromagnetic Analysis of Composite Coaxial Cells for Wideband Measurements of Highly Dispersive Materials	813
	J. Huang, K. Wu, P. Morin and C. Akyel	
WE3F-I3	A New Formulation for the Analysis of Non-Uniform Transmission Lines Using Frequency-Varying Basis Functions	817
	A.B. Kouki, A. Hamade and F.M. Ghannouchi	
WE3F-14	Systematic Searching for Cavity and Waveguide Modes by Making Use of Foster's Theorem	821
	A. Jöstingmeier, C. Rieckmann and A.S. Omar	
WE3F-J1	The Concept of Elementary Invariant Operand in Moment Method-Application to the Electromagnetic Optimization of Shielded Planar Discontinuities	825
	R. Gillard and J. Citerne	
WE3F-J2	Fast Wavelet Analysis of 3-D Dielectric Structures Using Sparse Matrix Techniques	829
	K. Sabetfakhri and L.P.B. Katehi	
WE3F-J3	Hybridizing FD-TD Analysis with Unconditionally Stable FEM for Objects of Curved Boundary	833
	R.-B. Wu and T. Itoh	



WE3F-J4	Analysis of Microstrip Filters with a Combined Mode-Matching and Method-Of-Lines Procedure	837
	P. Meyer	
WE3F-K1	A Novel Design to Reduce Losses at Dielectric Waveguide Discontinuities	841
	El.-Sharawy and P.A. Tirkas	
WE3F-K2	Characterization of a Dual-Plane Microstrip Interconnect with Reduced Pulse Distortion and Crosstalk	845
	Y. Qian and E. Yamashita	
WE3F-K3	TE Wave Properties of Slab Dielectric Guide Bounded by Nonlinear Non-Kerr-Like Media	849
	J. Ma and I. Wolff	
WE3F-K4	Low Crosstalk Characteristics of Buried Microstrip Lines	853
	T. Ishikawa and E. Yamashita	
WE3F-L1	Leakage in Coplanar Waveguides with Finite Metallization Thickness and Conductivity	857
	J. Ke and C.H. Chen	
WE3F-L3	Field Theory Analysis of Distributed Microwave Effects in High Speed Semiconductor Lasers and Their Interconnection with Passive Microwave Transmission Lines	861
	R. Vahldieck, S. Chen, H. Jin and P. Russer	
WE3F-L4	Analysis and Design of Multi-Octave MMIC Active Baluns Using a Distributed Amplifier Gate Line Termination Technique	865
	A.H. Baree and I.D. Robertson	
WE3F-M1	MMIC SSB Frequency Translators with Image-Rejection for Satellite Transponder Applications	869
	A.H. Baree, I.D. Robertson and J.S. Bharj	
WE3F-M2	A Single-Chip W-Band Transceiver with Front-End Switching Receiver for FMCW Radar Applications	873
	D.C.W. Lo, K.W. Chang, R. Lin, E.W. Lin, H. Wang, M. Biedenbender, G.S. Dow and B.R. Allen	
WE3F-M3	New Types of MMIC Circulators	877
	D. Köther, B. Hopf, Th. Sporkmann, I. Wolff and St. Koßlowski	

Session WE4A

Acoustic Filters: Performance and Applications

3:30 p.m.–5:00 p.m.

Room A1

Wednesday, May 17, 1995

Chairman: T.J. Lukaszek—U.S. Army Research Laboratory

WE4A-1	Development of Miniature Filters for Wireless Applications	883
3:30 pm	K.M. Lakin, G.R. Kline and K.T. McCarron	
WE4A-2	Thin-Film Resonator Ladder Filter	887
3:50 pm	L. Mang, F. Hickernell, R. Pennell and T. Hickernell	
WE4A-3	Design of Mobile Radio SAW Front-End Filters Based on Finite Element Modeling of Leaky SAW	*
4:00 pm	R. Weigel, D. Cohrs, G. Fischerauer, U. Rosler, W. Ruile and P. Russer	
WE4A-4	A New Balanced-Type RF-Band SAW Filter Using SAW Resonators	891
4:20 pm	Y. Taguchi, S. Seki, K. Onishi and K. Eda	
WE4A-5	An Efficient and Cost Effective SAW Device Measurement Method Based on an S-Parameter Estimation Technique	895
4:40 pm	J. Johnson and R. Weigel	
WE4A-6	A SAW Matched Filter Based Spread Spectrum Technique for Indoor Multiple Access Systems	899
4:50 pm	Z. Zhang, F. Seifert and R. Weigel	

Session WE4B

Active and Quasi-Optic Antennas

3:30 p.m.–5:00 p.m.

Room A2

Wednesday, May 17, 1995

Chairman: Z. Popovic—University of Colorado

WE4B-1	A Conformal Retrodirective Array for Radar Applications Using a Heterodyne Phased Scattering Element	905
3:30 pm	C.W. Pobanz and T. Itoh	
WE4B-2	A High Power Two-Dimensional Coupled-Oscillator Array at X-Band	909
3:50 pm	P. Liao and R.A. York	
WE4B-3	Use of the Moment Method and Dyadic Green's Functions in the Analysis of Quasi-Optical Structures	913
4:10 pm	T.W. Nuteson, G.P. Monahan, M.B. Steer, K. Naishadham, J.W. Mink and F.K. Schwing	
WE4B-4	Demonstration of an Oscillating Quasi-Optical Slab Power Combiner	917
4:20 pm	F. Poegel, S. Irrgang, S. Zeisberg, A. Schuenemann, G.P. Monahan, H. Hwang, M.B. Steer, J.W. Mink, F.K. Schwing, A. Paolletta and J. Harvey	
WE4B-5	A Dielectric Slab Waveguide with Four Planar Power Amplifiers	921
4:30 pm	H. Hwang, G.P. Monahan, M.B. Steer, J.W. Mink, J. Harvey, A. Paolletta and F.K. Schwing	
WE4B-6	A 2x2 Beam-Switching Active Antenna Array	925
4:40 pm	S.T. Chew and T. Itoh	



*Manuscript not available at time of printing.

Session WE4C

Noise Modeling

3:30 p.m.–5:00 p.m.

Room 12A,B,C

Wednesday, May 17, 1995

Chairman: S. Pritchett—Texas Instruments

WE4C-1	Simulation of Temperature Dependencies Using a New and CAD Suitable Physical GaAs-MESFET Model Including the Electron Preheating Effect	931
3:30 pm	P. Nevermann and I. Wolff	
WE4C-2	Ultra-Low Noise HEMT Device Models: Application of On-Wafer Cryogenic Noise Analysis and Improved Parameter Extraction Techniques	935
3:50 pm	J.J. Bautista, M. Hamai, M. Nishimoto, J. Laskar, P. Szydluk and R. Lai	
WE4C-3	A Novel Millimeter-Wave HEMT Noise Modeling Procedure	939
4:00 pm	M.D. DuFault, J.Z. Lin and A.K. Sharma	
WE4C-4	Improved FET Noise Model Extraction Method for Statistical Model Development	943
4:20 pm	S. Pritchett, A. Fernandez, D. Bridges and K. Whelan	
WE4C-5	Analysis of g-r Noise Upconversion in Oscillators	947
4:40 pm	T. Felgentreff, W. Anzill, G. Olbrich and P. Russer	

Session WE4D

(Joint with NTC)

Subsystems for Commercial Communications and Automotive Sensor Applications

3:30 p.m.–5:00 p.m.

Room A3

Wednesday, May 17, 1995

Chairman: D.N. McQuiddy, Jr.—Texas Instruments, Incorporated

WE4D-1	Low Cost and Compact Active Integrated Antenna Transceiver for System Applications	953
3:30 pm	R. Flynt, L. Fan, J. Navarro and K. Chang	
WE4D-2	A Novel Uniplanar Bi-Phase(0°–180°) Modulator/Mixer	957
3:50 pm	K. Hettak, E. Rius, J.Ph. Coupez, S. Toutain, P. Legaud and E. Penard	
WE4D-3	A Miniature 17/12 GHz MMIC Receiver for Satellite Communication	961
4:00 pm	C. Yuen, E. Quiles, J.J. McFarland, M. Yung, R. Klibo, W. Findley	
WE4D-4	Coded 24 GHz Doppler Radar Sensors: A New Approach to High-Precision Vehicle Position and Ground-Speed Sensing in Railway and Automobile Applications	965
4:10 pm	P. Heide, V. Mágori and R. Schwarte	
WE4D-5	Improvement of Angular Resolution of a Millimeterwave Imaging System by Transmitter Location Multiplexing	969
4:30 pm	N. Kees, E. Schmidhammer, J. Detlefsen	
WE4D-6	A Test Target Generator for Wideband Pulsed Doppler Radars	973
4:40 pm	P. Phu, E. Adler, R. Innocenti and A. Paoletta	

Session WE4E

Passive Waveguide Components

3:30 p.m.—5:00 p.m.

Room A4

Wednesday, May 17, 1995

Chairman: E.J. Denlinger—David Sarnoff Research Center

WE4E-1	Modeling Generalized Coaxial Probes in Rectangular Waveguides	979
3:30 pm	H.-W. Yao and K.A. Zaki	
WE4E-2	Analysis and Design of Wide-Band Matched Waveguide Bends Including Discontinuities	983
3:50 pm	M. Mongiardo, A. Morini and T. Rozzi	
WE4E-3	Rigorous Analysis of Compensated E-Plane Junctions in Rectangular Waveguide	987
4:10 pm	F. Alessandri, M. Dionigi and R. Sorrentino	
WE4E-4	Field Theoretical Characterization of Microwave Cavities	991
4:30 pm	S. Xiao, R. Vahldieck and M. Guglielmi	
WE4E-5	Filter-Like Design and Optimization of NRD-Guide Mode Suppressors	995
4:40 pm	J. Huang, K. Wu, F. Kuroki and T. Yoneyama	

Session TH1B

Digital Signal Processing

8:30 a.m.—10:00 a.m.

Room A2

Thursday, May 18, 1995

Chairman: J. Tsui—Wright Laboratory

TH1B-1	2.8 GBIT/S Optical Interconnection Circuit Using d8b1c/d8b1m Coding Scheme	1003
8:30 am	Y. Uematsu, K. Murata, Y. Yamabayashi and Y. Kobayashi	
TH1B-2	A New Direct Digital Receiver Performing Coherent PSK Reception	1007
8:50 am	J. Li, R.G. Bosisio and K. Wu	
TH1B-3	A GaAs Integrated Circuit for Wideband Digital Quadrature Demodulation	1011
9:00 am	R.J. Inkol, V. Szwarc, L. Desormeaux, M. Esonu and D. Al-Khalili	
TH1B-4	A Spectral Estimation Technique to Improve the Efficiency of FDTD Method for Narrow-Band Microwave Circuits	1015
9:10 am	X.P. Lin and K. Naishadham	
TH1B-5	A Generalized Optimal Signal Processing Algorithm for Frequency-Stepped CW Data	1019
9:30 am	S.M. Wu, G.A. Ybarra and W.E. Alexander	
TH1B-6	A Microwave Model for Moisture Determination in Bulk Materials and a Maximum Likelihood Estimation Algorithm	1023
9:50 am	T. Boltze	

Session TH1C

On-Wafer Measurements

8:30 a.m.–10:00 a.m.

Room 12A,B,C

Thursday, May 18, 1995

Chairman: H.M. Cronson—The MITRE Corporation

TH1C-1	Accurate on Wafer Measurement of Phase and Amplitude of the Spectral Components of Incident and Scattered Voltage Waves at the Signal Ports of a Nonlinear Microwave Device	1029
8:30 am	J. Verspecht, P. Debie, A. Barel and L. Martens	
TH1C-2	Fully Integrated Nonlinear Modeling and Characterization System of Microwave Transistors with On-Wafer Pulsed Measurements	1033
8:50 am	J.P. Teyssier, J.P. Viaud, J.J. Raoux and R. Quéré	
TH1C-3	A Novel Computerized Multiharmonic Active Load-Pull System for the Optimization of High Efficiency Operating Classes in Power Transistors	1037
9:00 am	F. Blache, J.M. Nebus, Ph. Bouysse and J.P. Villotte	
TH1C-4	A 0.5–50 GHz On-Wafer, Intermodulation, Load-Pull and Power Measurement System	1041
9:20 am	M. Demmler, B. Hughes and A. Cognata	
TH1C-5	On-Wafer Calibration Techniques for Measurement of Microwave Circuits and Devices on Thin Substrates	1045
9:30 am	J. Plá, W. Struble and F. Colomb	
TH1C-6	2D Electro-Optic Probing Combined with Field Theory Based Multimode Wave Amplitude Extraction: A New Approach to On-Wafer Measurement	1049
9:40 am	G. David, W. Schroeder, D. Jäger and I. Wolff	
TH1C-7	High-Frequency On-Wafer Testing with Freely Positionable Silicon-On-Sapphire Photoconductive Probes	1053
9:50 am	T. Pfeifer, H.-M. Heiliger, E. Stein von Kamienski, H.G. Roskos and H. Kurz	

Session TH1D

Dual-Use and Defense Conversion: Technologies and Applications

8:30 a.m.–10:00 a.m.

Room A3

Thursday, May 18, 1995

Chairman: F. Ali—Westinghouse ESG

Co-Chairman: E. Cohen—ARPA

TH1D-1	Dual-Use and Defense Conversion: A View from the Second Tier	1059
8:30 am	G.C. DiPiazza	
TH1D-2	The PCN-Smart Munition Connection	*
8:50 am	R. Goldwasser	
TH1D-3	MMIC Radar Transceivers for Industrial Sensors	1063
9:10 am	S.F. Paik	
TH1D-4	MSAG®-Lite: GaAs IC Process Technology Addressing Defense Conversion	1067
9:30 am	C.E. Lindberg and D.G. Fisher	

*Manuscript not available at time of printing.

Session TH1E

Simulation and Design Techniques

8:30 a.m.–10:00 a.m. Room A4 Thursday, May 18, 1995

Chairman: R. Goyal—Mentor Graphics Corporation

TH1E-1	Accurate Prediction of the Small-Signal Gain of the HBT Dual-Fed Distributed Amplifier	1073
8:30 am	I.A. Botterill and C.S. Aitchison	
TH1E-2	Modeling and Electrical Characterization of Parasitic Effects for GaAs Integrated Circuits.	1077
8:40 am	Experimental Validation and CAD Formulas	
	N. Hassaine, M. Lecours and G.Y. Delisle	
TH1E-3	Modeling and Simulation of Switching Noise Including Power/Ground Plane Resonance for High Speed GaAs FET Logic (FL) Circuits	1081
8:50 am	J.-M. Jong and V.K. Tripathi	
TH1E-4	Heterogeneous Parallel Yield-Driven Electromagnetic CAD	1085
9:00 am	J.W. Bandler, R.M. Biernacki, Q. Cai, S.H. Chen, P.A. Grobelny and D.G. Swanson, Jr.	
TH1E-5	The Use of Hopf Bifurcations Loci for Spurious-Free Nonlinear Microwave Circuit Design	1089
9:20 am	V. Rizzoli and A. Neri	
TH1E-6	The Role of MHD in Microwave System and Subsystem Design	1673
9:40 am	R.G. Hicks and D.L. Rhodes	



Session TH2A

(Joint with NTC)

Phased and Active Array Technologies

10:30 a.m.–12:00 p.m. Room A1 Thursday, May 18, 1995

Chairman: D. Zimmerman—Texas Instruments

TH2A-1	W-Band Active Transmit and Receive Phased Array Antennas	1095
10:30 am	B.J. Edward, D.R. Helms, R.S. Webb and S. Weinreb	
TH2A-2	An 18 GHz Circularly Polarized Multilayer Active Microstrip Antenna Subarray Using MMIC Amplifiers	1099
10:50 am	D. Sánchez-Hernández, M. Gillick and I. Robertson	
TH2A-3	Demonstrated 60 GHz Active Phased Array	*
11:00 am	D. Bates, D. McPherson, D. Helms, W. Kopp, B. Cleveland, B. Edward, J. Komiak, R. Brown and R. Csongor	
TH2A-4	X-Band Receiver Protector Using Glass Technology	1103
11:20 am	R. Keenan and E. Higham	
TH2A-5	MMIC Antenna Front End for Optically Distributed MMW Antennas	1107
11:30 am	D. Sturzebecher, X. Zhang and A.S. Daryoush	
TH2A-6	True Time-Delay Fiber-Optic Control of a Phased-Array Transmitter with Three-Octave Bandwidth	1111
11:40 am	R.D. Esman, M.Y. Frankel and M.G. Parent	

*Manuscript not available at time of printing.

Session TH2B

Low Noise Receivers

10:30 a.m.–12:00 p.m.

Room A2

Thursday, May 18, 1995

Chairman: J. Whelehan—AIL Systems, Incorporated

TH2B-1	A Monolithic W-Band High-Gain LNA/Detector for Millimeter Wave Radiometric Imaging Applications	1117
10:30 am	D.C.W. Lo, G.S. Dow, B.R. Allen, L. Yujiri, M. Mussetto, T.W. Huang, H. Wang and M. Biedenbender	
TH2B-2	Q- and E-Band Cryogenically-Coolable Amplifiers using AlInAs/GaInAs/InP HEMT's	1121
10:50 am	M.W. Pospieszalski, W.J. Lakatos, L.D. Nguyen, M. Lui, T. Liu, M. Le, M.A. Thompson and M.J. Delaney	
TH2B-3	A C-Band 4-Stage Low Noise Miniaturized Amplifier Using Lumped Elements	1125
11:00 am	Y. Tsukahara, S. Chaki, Y. Sasaki, K. Nakahara, N. Andoh, H. Matsubayasi, N. Tanino and O. Ishihara	
TH2B-4	Low-Noise High-Power Heterojunction Bipolar Transistors for Mixed-Mode Applications	1129
11:20 am	T. Jenkins, D. Barlage, J. Barrette, R. Lee, L. Liou, C. Bozada, R. Dettmer, R. Fitch, M. Mack and J. Sewell	
TH2B-5	Q- and V-Band MMIC Chip Set Using 0.1 μm Millimeter-Wave Low Noise InP HEMTs	1133
11:30 am	R. Isobe, C. Wong, A. Potter, L. Tran, M. Delaney, R. Rhodes, D. Jang, L. Nguyen and M. Le	

Session TH2C

Microwave Measurements

10:30 a.m.–12:00 p.m.

Room 12A,B,C

Thursday, May 18, 1995

Chairman: S.F. Adam—Adam Microwave Consulting, Incorporated

TH2C-1	A Microwave Circuit Electric Field Imager	1139
10:30 am	T.P. Budka and Gabriel M. Rebeiz	
TH2C-2	GaAs MMIC Thermal Modeling for Calculation of Accurate Channel Temperatures	1143
10:50 am	V.J. Ferrara, A. Garnett, S. Park and A.B. Solan	
TH2C-3	Moisture Measurement in Walls Using Microwaves	1147
11:10 am	F. Menke, R. Knöchel, T. Boltze, C. Hauenschild, W. Leschnik	
TH2C-4	Characterization of Planar Resonators by Means of Integrated Schottky Diodes	1151
11:20 am	A. Stiller, M. Singer, K.M. Strohm, E.M. Biebl	
TH2C-5	A High Performance MM-Wave Electron Spin Resonance Spectrometer	1677
11:30 am	G.M. Smith, J.C.G. Lesurf, R.H. Mitchell and P.C. Riedi	
TH2C-6	Calibrated Measurements of Nonlinearities in Narrowband Amplifiers Applied to Intermodulation and Cross Modulation Compensation	1155
11:40 am	T. Van den Broeck	
TH2C-7	A Miniature Magnetic Field Probe for Measuring Fields in Planar High-Frequency Circuits	1159
11:50 am	Y. Gao and I. Wolff	

Session TH2D

Lightwave Systems and Subsystems

10:30 a.m.–12:00 p.m.

Room A3

Thursday, May 18, 1995

Chairman: H. Sobol—University of Texas at Arlington

TH2D-1	A Fiber-Optic Link Utilizing Subcarrier Transmission and Reception of Microwave Signals	1165
10:30 am	G.K. Gopalakrishnan, K.J. Williams, R.P. Moeller, W.K. Burns and R.D. Esman	
TH2D-2	Characterization of Fiber Optic Microwave Link with Monolithic Integrated Optoelectronic Upconverter	1169
10:50 am	Q.Z. Liu, R. Davies and R.I. MacDonald	
TH2D-3	Signal and Noise Analysis of External Modulation Fiber Optic Link with Optical Component and Arbitrary Lossless Matching Circuits	1173
11:00 am	E.I. Ackerman, J.L. Prince and J.A. MacDonald	
TH2D-4	Application of Semiconductor Optical Amplifiers to Microwave Signal Processing	1177
11:20 am	H. Ogawa, K. Horikawa, H. Kamitsuna, O. Kobayashi, Y. Imaizumi and I. Ogawa	
TH2D-5	Design of Clock Recovery MMIC Using Large-Signal Computer-Aided Analysis	1181
11:40 am	J.Y. Lin and A.S. Daryoush	



Session TH2E

Field Theory Based CAD

10:30 a.m.–12:00 p.m.

Room A4

Thursday, May 18, 1995

Chairman: I. Wolff—Duisburg University
Co-Chairman: S.M. Saad—Andrew Corporation

TH2E-1	Modelling of Passive Elements for Coplanar SiGe MMIC's	1187
10:30 am	R. Doerner, J. Gerdess, C. Rheinfelder, F.J. Schmückle, W. Heinrich, K. Strohm, F. Schäffler and J.-F. Luy	
TH2E-2	A Generalized Electromagnetic Optimization Procedure for the Design of Complex Interacting Structures in Hybrid and Monolithic Microwave Integrated Circuits	1191
10:50 am	M.A. Schamberger and A.K. Sharma	
TH2E-3	Elliptic Filter Rigorous Design and Modelling Applying the Finite Element Method	1195
11:00 am	D. Baillargeat, S. Verdeyme and P. Guillon	
TH2E-4	Electromagnetic Synthesis of Overlap-Gap-Coupled Microstrip Filters	1199
11:20 am	O. Fordham, M.-J. Tsai and N.G. Alexopoulos	
TH2E-5	An Alternative Way of Computing S-Parameters via Impulsive TLM Analysis Without Using Absorbing Boundary Conditions	1203
11:30 am	M. Righi, C. Eswarappa, W.J.R. Hoefer and P. Russer	
TH2E-6	Analysis of Waveguide Components Using H_0-Curl Hexahedral Edge Elements in MSC/EMAS	1207
11:40 am	J.F. DeFord and P. Saladin	
TH2E-7	Simulation of Multi-Chip Module Package Resonance Using Commercial Finite Element Electromagnetic Software	1211
11:50 am	R. Clark, A. Agrawal and S. Miller	

Session TH3A

(Joint with NTC)

Phased Array Antennas and Systems

1:30 p.m.–3:00 p.m.

Room A1

Thursday, May 18, 1995

Chairman: J. Bruder—GTRI/SEAL

TH3A-1	Active Phased Arrays for the Globalstar Satellite System	*
1:30 pm	M.H. Yam	
TH3A-2	High-Resolution Adaptive Nulling Performance for a Lightweight Agile EHF Multiple Beam Antenna	1217
1:50 pm	A.J. Fenn	
TH3A-3	Active Antenna Array with Optical Interaction for Application in Radar System	1221
2:10 pm	S.T. Chew, D.T.K. Tong, M.C. Wu and T. Itoh	
TH3A-4	A C-Band Beam-Forming Matrix for Phased-Array Antenna Applications	1225
2:30 pm	G. Estep, R. Gupta, T. Hampsch, M. Zaharovits, L. Pryor, C. Chen, A. Zaghloul and F. Assal	

Session TH3B

Nonlinear Transistor Modeling

1:30 p.m.–3:00 p.m.

Room A2

Thursday, May 18, 1995

Chairman: J.C.M. Hwang—Lehigh University

TH3B-1	A Heterojunction Bipolar Transistor Large-Signal Model for High Power Microwave Applications	1231
1:30 pm	A. Samelis and D. Pavlidis	
TH3B-2	A Novel Extraction Method for Accurate Determination of HBT Large-Signal Model Parameters	1235
1:50 pm	D.-W. Wu, M. Fukuda and Y.-H. Yun	
TH3B-3	Waveform Characterization of Microwave Power Heterojunction Bipolar Transistors	1239
2:10 pm	C.J. Wei, Y. Lan, J.C.M. Hwang, W.J. Ho and J.A. Higgins	
TH3B-4	A Vector Corrected Waveform and Load Line Measurement System for Large Signal Transistor Characterisation	1243
2:30 pm	J.G. Leckey, A.D. Patterson and J.A.C. Stewart	
TH3B-5	Modeling MESFETs for Intermodulation Analysis of Resistive FET Mixers	1247
2:40 pm	R.S. Virk and S.A. Maas	
TH3B-6	Resolving Capacitor Discrepancies Between Large and Small Signal FET Models	1251
2:50 pm	M.V. Calvo, A.D. Snider and L.P. Dunleavy	

*Manuscript not available at time of printing.

Session TH3C

Non-Linear and Lossy Mechanisms in Guided Waves

1:30 p.m.–3:00 p.m.

Room 12A,B,C

Thursday, May 18, 1995

Chairman: M. Dydyk—Motorola

TH3C-1	Electron-Wave Interaction in Submicrometer Gate Field-Effect Transistors	1257
1:30 pm	M.A. AlSunaidi and S.M. El-Ghazaly	
TH3C-2	Finite Element Analysis of Microstrip Line on Ferroelectric (Ba-Sr)TiO ₃ Substrate	1257
1:50 pm	Y.C. Sung, S. Choi and S. Nam	
TH3C-3	Full-Wave Nonlinear Analysis of Microwave Superconductor Devices: Application to Filters	1265
2:00 pm	M.A. Megahed and S.M. El-Ghazaly	
TH3C-4	Field Analysis and Design Criteria for T-Gate TW-FET's with Positive Gain	1269
2:20 pm	M. Farina, L. Pierantoni and T. Rozzi	
TH3C-5	Full-Wave Analysis of the Influence of Conductor Shape and Structure Details on Losses in Coplanar Waveguide	1273
2:30 pm	W. Schroeder and I. Wolff	
TH3C-6	Non-Perturbative Fullwave Analysis of Lossy Planar Circuits	1277
2:50 pm	S. Amari and J. Bornemann	

Session TH3D

Microwave-Optical Devices and Circuits

1:30 p.m.–3:00 p.m.

Room A3

Thursday, May 18, 1995

Chairman: A. Gopinath—University of Minnesota

TH3D-1	Demonstration of Photonically-Controlled GaAs Digital/MMIC for RF Optical Links	1283
1:30 pm	A. Brunel, S.-L.G. Chu, S.E. Davis, A. Kelsey, M. O'Connell, J.A. Ruiz, R.C. Sharp, I.W. Smith and K. Tabatabaie-Alavi	
TH3D-2	Optical Control of MMIC Oscillators and Model Parameter Analysis of an Illuminated FET at the Ka- and V-Band	1287
1:50 pm	S. Kawasaki, M. Kimura, H. Shiomi, T. Wakabayashi, M. Funabashi and K. Ohata	
TH3D-3	Reduced Phase Noise in Microwave Oscillators Due to Optical Signal Injection	1291
2:00 pm	S.M. Genco and A.R. Mickelson	
TH3D-4	Dynamic Characterization of Optical-Microwave Transducers	1295
2:20 pm	T. Berceli, B. Cabon, A. Hilt, A.H. Quoc, É. Pic and S. Tedjini	
TH3D-5	Coherent Power Combining of Ultra-Wideband Pulsed Radiation in Free Space	1299
2:30 pm	E.E. Funk, S.E. Sadow, L.J. Jasper, Jr. and C.H. Lee	
TH3D-6	Microwave Phase Conjugation Using Antenna Coupled Nonlinear Optically Pumped Surfaces	1303
2:40 pm	Y. Chang, D.C. Scott and H.R. Fetterman	
TH3D-7	Real Frequency Method Applied to Broad-Band Laser Command Circuit Design with Lumped and Distributed Elements	1307
2:50 pm	D. Le Berre, A. Perennec, N. Julien, S. Toutain, R. Lefevre, D. Lemaillet and R. Soares	



Session TH3E

Frequency Conversion Circuits

1:30 p.m.–3:00 p.m.

Room A4

Thursday, May 18, 1995

Chairman: C. Buntschuh—Microwave Engineering Services

TH3E-1	Miniaturized Stripline Dual-Mode Ring Resonators and Their Application to Oscillating Devices	1313
1:30 pm	H. Yabuki, M. Matsuo, M. Sagawa and M. Makimoto	
TH3E-2	High Efficiency Free Running Class F Oscillator	1317
1:50 pm	M. Prigent, M. Camiade, G. Pataut, D. Reffet, J.M. Nebus and J. Obregon	
TH3E-3	A K-Band Monolithic CPW Oscillator Co-Integrated with a Buffer Amplifier	1321
2:10 pm	K. Maruhashi, M. Madihian, L. Desclos, K. Onda and M. Kuzuhara	
TH3E-4	A MIC X7 DHB T Frequency Multiplier with Low Spurious Harmonics	1325
2:20 pm	D.F. Filipovic	
TH3E-5	Novel Design Topology for Ultra Low Power Down Converters with Broadband on Chip Matching Network	1329
2:30 pm	M.L. Schmatz	
TH3E-6	A Single Chip Monolithic Integrated S-Band Frequency Discriminator	1333
2:50 pm	K.-E. Schmiegner	

Session TH3F

Open Forum II

2:30 p.m.–5:00 p.m.

Hall A5

Thursday, May 18, 1995

Chairman: E. Rizzo, ECC International

TH3F-A1	Temperature Dependent Functional Small-Signal and Noise Model of GaAs FET Z. Nosal	1339
TH3F-A2	The Hot-Electron Microbolometer as an Ultrasensitive Detector for Millimeter Wavelengths K. Farooqui, P.T. Timbie, G.W. Wilson, J.-W. Zhou and M. Nahum	1343
TH3F-A3	Monolithic Silicon Bolometers as Sensitive MM-Wave Detectors J.-W. Zhou, K. Farooqui, P.T. Timbie, G.W. Wilson, C.A. Allen, S.H. Moseley and D.B. Mott	1347
TH3F-A4	High Accuracy Digital Quadrature Demodulation R.J. Inkol, M. Herzig and R. Saper	1351
TH3F-B1	Rigorous Mode-Matching Method for the Modal Analysis of the T-Junction Circular to Sidecoupled Rectangular Waveguide P. Krauss and F. Arndt	1355
TH3F-B2	Modal Analysis of Arbitrarily Shaped Irises in Waveguides by a Hybrid Contour-Integral Mode-Matching Method F. Giese, J.M. Reiter and F. Arndt	1359
TH3F-B3	Coupling Characteristics Between Dielectric Disk and Ring Located in an Eccentric Configuration Q. Han, Y. Kogami, Y. Tomabechei and K. Matsumura	1363
TH3F-B4	Multilayer Aperture-Coupled Broadside Microstrip Lines S. Kunasani and C. Nguyen	1367
TH3F-C1	Composite Fan-Shaped SAW Transducers E.V. Bausk and I.B. Yakovkin	1681
TH3F-C2	Analysis of End Effects in SAW IDTs using the Finite Difference Method D. Jatkar and B. Beker	1371
TH3F-C3	Analysis of GaAs MESFET Spectrum Regeneration Driven by a $\pi/4$ -DQPSK Modulated Source J.F. Sevic and M.B. Steer	1375
TH3F-C4	Combined Monte Carlo Simulation and Ray Tracing Method of Indoor Radio Propagation Channel T. Schöberl	1379
TH3F-D1	Self-Consistent Multi-Mode Time Domain Analysis of Gyrotrons A. Jöstingmeier, C. Rieckmann and A.S. Omar	1383
TH3F-D2	Micromachined Conformal Packages for Microwave and Millimeter-Wave Applications R.F. Drayton and L.P.B. Katehi	1387
TH3F-D3	An Advanced Co-Channel Operation Method for Multiple Wireless Gate K. Konno, T. Kojima and Y. Iitsuka	1391
TH3F-D4	A Novel Clock Extraction Circuit Using a New NRZ-to-PRZ Converter and a Dielectric Resonator Filter for 10Gbit/s Optical Receiver T.W. Yoo, J.H. Song, M.S. Park and C.S. Shim	1395
TH3F-E1	Uniplanar De Ronde's CPW-Slot Directional Couplers C.-H. Ho, L. Fan and K. Chang	1399
TH3F-E2	Active Low Noise Transition from Rectangular Waveguide to Microstrip Line W. Grabherr and W. Menzel	1403



TH3F-E3	Investigation of Coupling Structures for Coplanar Bandpass Filters W. Menzel, W. Schwab and G. Strauss	1407
TH3F-E4	A Novel Single Device Balanced Resistive HEMT Mixer K. Yhland, N. Rorsman and H. Zirath	1411
TH3F-F1	New Simple Procedure for the Computation of the Multimode Admittance Matrix of Arbitrary Waveguide Junctions A. Alvarez and M. Guglielmi	1415
TH3F-F2	Stability Diagnosis of Microwave Recursive Structures Using the NDF Methodology L. Billonnet, B. Jarry, P. Guillon	1419
TH3F-F3	On the Optimum Design of Microwave Active Frequency Doublers P. Colantonio, F. Giannini, G. Leuzzi and E. Limiti	1423
TH3F-F4	Adaptive Frequency Sampling Algorithm for Fast and Accurate S-Parameter Modeling of General Planar Structures T. Dhaene, J. Ureel, N. Faché and D. De Zutter	1427
TH3F-G1	Low-Frequency Noise in Millimeter-Wave Si/SiGe Heterojunction Bipolar Transistors R. Plana, B. Van Haaren, J.P. Roux, L. Escotte, A. Gruhle, H. Dietrich and J. Graffeuil	1431
TH3F-G2	Order Recursive Gaussian Elimination and Efficient CAD of Microwave Circuits K. Naishadham and P. Misra	1435
TH3F-G3	Model for a Novel CPW Phase Shifter C.M. Jackson, T. Pham, Z. Zhang, A. Lee, C. Pettiette-Hall	1439
TH3F-G4	Cost-Driven Physics-Based Large-Signal Simultaneous Device and Circuit Design J.W. Bandler, R.M. Biernacki, Q. Cai and S.H. Chen	1443
TH3F-H1	Three-Dimensional Passive Circuit Technology for Ultra-Compact MMICs M. Hirano, K. Nishikawa, I. Toyoda, S. Aoyama, S. Sugitani and K. Yamasaki	1447
TH3F-H2	A Novel Amplitude and Phase Linearizing Technique for Microwave Power Amplifiers M. Nakayama, K. Mori, K. Yamauchi, Y. Itoh and T. Takagi	1451
TH3F-H3	Aggressive Space Mapping for Electromagnetic Design J.W. Bandler, R.M. Biernacki, S.H. Chen, R.H. Hemmers and K. Madsen	1455
TH3F-H4	A New Model of Step Recovery Diode for CAD J. Zhang and A. Räisänen	1459
TH3F-I1	Withdrawn by author	
TH3F-I2	Microwave Characterization of Flip-Chip MMIC Interconnections R.B. Marks, J.A. Jargon, C.K. Pao and C.P. Wen	1463
TH3F-I3	Microwave Measurement of Density Profiles in Fluidized Bed Reactors with Improved Spatial Resolution T. Hauschild and R. Knöchel	1467
TH3F-I4	Development of Broadband Coaxial Components for a 0.04 to 110 GHz Measurement System B. Oldfield	1471
TH3F-J1	Comparison Between Beryllium-Copper and Tungsten High Frequency Air Coplanar Probes J.L. Carbonero, G. Morin and B. Cabon	1475
TH3F-J2	On-Wafer Testing of a W-Band HEMT Image-Rejection Downconverter MMIC E.W. Lin, D.C.W. Lo, H. Wang, T.W. Huang, M. Biedenbender, G.S. Dow and B. Allen	1479
TH3F-J3	Dynamic Measurement of the Temperature Characteristic of Dielectric Material for Microwave Application using Photo Thermal Dielectric Microscope Y. Cho, K. Yokoyama, T. Kumamaru and A. Kirihara	1483

TH3F-J4	An Experimental and Theoretical Comparison of the Electric Fields Above a Coupled Line Bandpass Filter	1487
	T.P. Budka, E.M. Tentzeris, S.D. Wacławik, N.I. Dib, L.P.B. Katehi and G.M. Rebeiz	
TH3F-K1	Theoretical & Experimental Study of Single Mode Fiber Optical Ring Resonators for Microwave Applications	1491
	S. Tedjini and A. Ho-Quoc	
TH3F-K2	Microwave-Modulated Transmitter Design for Hybrid Lidar-Radar	1495
	L. Mullen, A. Vieira, P.R. Herczfeld and V.M. Contarino	
TH3F-K3	Bandwidth Improvements for Loaded-Line Traveling Wave Electro-Optic Modulators	1499
	C.L. Goldsmith and R. Magnusson	
TH3F-K4	The Analysis of Photoparametric Amplifying Devices and Characteristics	1503
	A. Khanifar, R.J. Green, A. Khosrowbeygi, N.T. Ali and M. Milovanovic	
TH3F-L1	Phase Control of a Micropatch Antenna Element Designed for Monolithic Phased Arrays	1507
	R.M. Hsu and M.H. Thursby	
TH3F-L2	Predicting the Onset of Instabilities in Frequency Multipliers	1511
	S. Basu, S.A. Maas and T. Itoh	
TH3F-L3	Temperature and Dispersion Effect Extensions of Chalmers Nonlinear HEMT and MESFET Model	1515
	I. Angelov, L. Bengtsson and M. Garcia	
TH3F-L4	Simulation of the Accurate Near-Carrier Phase Noise in Microwave MESFET Oscillators	1519
	C.-L. Chen, X.-N. Hong and B.-X. Gao	
TH3F-M1	Pulsed I-V and Temperature Measurement System for Characterisation of Microwave FETS	1523
	R.J. Donarski, A.K. Jastrzebski and J.E. Barnaby	
TH3F-M2	MESFET Linearity Improvement by Channel Doping Control	1527
	J.C. Pedro	
TH3F-M3	A Low-Loss 20 GHz Micromachined Bandpass Filter	1531
	C.-Y. Chi and G.M. Rebeiz	
TH3F-M4	A High Q Factor Microwave Cavity	1535
	R. Comte, S. Gendraud, S. Verdeyme, P. Guillon, C. Boschet and B. Theron	
TH3F-N1	A Miniaturized Dielectric Monoblock Duplexer Matched by the Buried Impedance Transforming Circuit	1539
	H. Matsumoto, T. Tsujiguchi and T. Nishikawa	
TH3F-N2	Micromachined Self-Packaged W-Band Bandpass Filters	1543
	S.V. Robertson, L.P.B. Katehi and G.M. Rebeiz	
TH3F-N3	A Two-Path Multimode Bandpass Filters Using the Nonradiative Dielectric (NRD) Waveguide Technology	1547
	J. Huang and K. Wu	

Session TH4B

Nonlinear Devices and Circuits

3:30 p.m.–5:00 p.m.

Room A2

Thursday, May 18, 1995

Chairman: J.W. Bandler—Optimization Systems Associates Incorporated

TH4B-1	A New Large-Signal Model Based on Pulse Measurement Techniques for RF Power MOSFET	1553
3:30 pm	J.M. Collantes, J.J. Raoux, J.P. Villotte, R. Quere, G. Montoriol and F. Dupis	
TH4B-2	Empirical Modeling of Low-Frequency Dispersive Effects Due to Traps and Thermal Phenomena in III-V FETs	1557
3:50 pm	F. Filicori, G. Vannini, A. Santarelli, A. Mediavilla, A. Tazon, and Y. Newport	
TH4B-3	Enhancing the Linearity of Digital Communication Channels Using IQ Predistortion Based Upon an Inverse VIOMAP	*
4:10 pm	F. Verbyst and M. Vanden Bossche	
TH4B-4	Computer-Aided Noise Analysis of Integrated Microwave Front-Ends	1561
4:20 pm	V. Rizzoli, D. Masotti and F. Mastri	
TH4B-5	Phase Noise Minimization of Microwave Oscillators by Optimal Design	1565
4:30 pm	W. Anzill, O. von Stryk, R. Bulirsch and P. Russer	
TH4B-6	Analysis of Chaotic Behaviour in Lumped-Distributed Circuits Applied to Practical Microwave Oscillators	1569
4:40 pm	E.A. Hosny, A.A.A. Nasser and M.I. Sobhy	

Session TH4C

Microwave Packaging and Interconnect Technology

3:30 p.m.–5:00 p.m.

Room 12A,B,C

Thursday, May 18, 1995

Chairman: T. Kemerley—USAF—Wright Laboratory

TH4C-1	Aluminum Silicon Carbide for High Performance Microwave Packages	1575
3:30 pm	J.L. Bugeau, K.M. Heitkamp and D. Kellerman	
TH4C-2	A Study of Hermetic Transitions for Microwave Packages	1579
3:50 pm	J.-G. Yook, N.I. Dib, E. Yasan and L.P.B. Katehi	
TH4C-3	A Compact 8–14 GHz LTCC Stripline Coupler Network for High Efficiency Power Combining with Better than 82% Combining Efficiency	1583
4:10 pm	J. Gipprih, L. Dickens, B. Hayes and F. Sacks	
TH4C-4	3D FDTD Analysis of a SOT353 Package Containing a Bipolar Wideband Cascode Transistor Using the Compression Approach	1587
4:30 pm	M. Rittweger, M. Werthen, J. Kunisch, I. Wolff, P. Chall, B. Balm and P. Lok	
TH3C-5	Reducing the Effects of the Mounting Substrate on the Performance of GaAs MMIC Flip Chips	1591
4:50 pm	R. Sturdivant	

*Manuscript not available at time of printing.

Session TH4D

High Power Sources and Control Components

3:30 p.m.–5:00 p.m.

Room A3

Thursday, May 18, 1995

Chairman: J. Goel—TRW Space and Electronic Group

TH4D-1	94 GHz Power Amplifier Using PHEMT Technology	1597
3:30 pm	L. Marosi, M. Sholley, J. Goel, A. Faris, M. Siddiqui, D.I. Stones and K. Tan	
TH4D-2	22-KW Next Generation Low Cost S-Band Solid State Transmitter for Surveillance and Air	
3:50 pm	Traffic Control Radars	1601
	M. Kumar, M. Hanczor, H. Voigt, G. Cambigianis, R. Sachs and C. Bonilla	
TH4D-3	400W X-Band GaAs MMIC CW Amplifier	1605
4:10 pm	M. Knox, R. Youmans, M. Kumar, L. Forker, H. Voigt, P. Brand, F. Marcotte and A.S. Hughes	
TH4D-4	High Power Amplifier Harmonic Output Level Measurement	1609
4:30 pm	R.M. Perez, D.J. Hoppe and A.R. Khan	
TH4D-5	TE ₁₁ to TM ₁₁ Compact Mode Converter for Circular Waveguide	1613
4:50 pm	T.U. Haq, K.J. Webb and N.C. Gallagher	

Session TH4E

Transmission Line, Amplifiers and Control Devices

3:30 p.m.–5:00 p.m.

Room A4

Thursday, May 18, 1995

Chairman: J.A. Pierro—AIL Systems

TH4E-1	An MMIC Low-Distortion Variable-Gain Amplifier Using Active Feedback	1619
3:30 pm	K. Nishikawa and T. Tokumitsu	
TH4E-2	A Miniaturized Ka-Band MMIC High-Gain Medium Power Amplifier in Coplanar Line	
3:50 pm	Technique by Using a Conventional 0.5 μ m MESFET Technology	1623
	Y. Kalayci, R. Tempel, W. Lütke, M. Akpınar and I. Wolff	
TH4E-3	Broadband, Low-Loss 5- and 6-BIT Digital Attenuators	1627
4:00 pm	D. Krafcsik, F. Ali and S. Bishop	
TH4E-4	77 GHz Monolithic MMIC Schottky- and PIN-Diode Switches Based on GaAs MESFET and	
4:10 pm	Silicon SIMMWIC Technology	1631
	A. Klaassen and J.-M. Dieudonné	
TH4E-5	Design Methodology, Measurement and Application of MMIC Transmission Line	
4:20 pm	Transformers	1635
	M. Engels, R.H. Jansen, W. Daumann, R.M. Bertenburg and F.J. Tegude	
TH4E-6	51 GHz Frontend with Flip Chip and Wire Bond Interconnections from GaAs MMICs to a	
4:30 am	Planar Patch Antenna	1639
	G. Baumann, H. Richter, A. Baumgärtner, D. Ferling, R. Heilig, D. Hollman, H. Müller, H. Nechansky and M. Schlechtweg	
TH4E-7	An Inverted Microstrip Line IC Structure for Ultra High-Speed Applications	1643
4:40 pm	S. Yamaguchi, Y. Imai, T. Shibata, T. Otsuji, M. Hirano and E. Sano	

