Welcome South!

The world political climate and the microwave industry are changing significantly. Against that background it is a special pleasure to invite you to Atlanta for IMS '93. Our theme, "The Global Reach of Microwaves," carries with it the promise to carry on the mission started last year in Albuquerque by Jerry Hausner and his Steering Committee. They asked: "Where do we go from here?", and some of the questions found answers. But for every answered question, there seems to be another waiting just around the corner. While we may not be clairvoyant in politics, we hope to help with some answers to questions on microwave industry trends at IMS '93 in Atlanta. And what better way than with over 300 technical papers, four rump sessions, 18 workshops, three panel sessions, and a highlight Plenary Session dedicated to our conference theme: "The Global Reach of Microwaves"? To address this theme we've invited experts on microwaves in telecommunications and the 1996 Olympiad, and we hope to touch on dual-use technology. But, technical sessions and the plenary aren't the only things available during Microwave Week '93.

Again this year, we will honor those who have made significant service or technical contributions to the Society or to our profession. Too often, we take for granted the diligence of some of our creative peers and the yeoman service freely given by so many volunteers. The 1993 Awards Banquet will be the centerpiece of a gala evening which begins with the IMS/Exhibitor's Cocktail Reception in the Marquis Ballroom of the Marriott Marquis Hotel. The banquet follows in the Imperial Ballroom, then you can relax and enjoy a fast-moving musical review that projects the spirit of Atlanta.

Following the Boston precedent, the local committee has arranged for some informal diversions on Tuesday night, June 15th, for those whose technical appetites are easily satiated. A limited number of tickets have been obtained for the Atlanta Braves–New York Mets baseball game that night. The package includes escorted transportation to and from the stadium. Come out and see the Braves move to their third consecutive National League Championship!

If baseball is not your bag, you might try an evening under the stars and lasers at Stone Mountain. Arrangements have been made for buses to transport attendees and guests to the nationally acclaimed Stone Mountain Laser Show. Tickets to each of these options are quite limited, so if either of these appeals to you, make advance reservations!

In the following pages more details are given on the technical program and the guest program. There is also helpful advice on airport transportation and hotel arrangements. Room blocks and reservations for future symposia are based on history. It is important that you book rooms through the convention bureau. Rooms booked directly with hotels are not counted by the industry, and the cost to you and our society is increased. You help everyone when you reserve (early) through proper channels.

The Atlanta Steering Committee has developed a full technical and social program for the week. They are looking forward to seeing you for IMS '93, and their enthusiasm is warranted. Come, meet casually with your peers, discover the technical sense of the future and socialize. You will be glad you did, and we certainly will to.
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MTT Calendar

MTT-S Sponsored Conferences

1993

- MIOP '93
  May 25-27
  (C)
  Stuttgart-Sindelfingen
  Germany

- Microwave and Millimeter-Wave
  Monolithic Circuits Symposium
  June 14-15
  (CS)(*)
  Atlanta, GA

- MTT-S International Microwave
  Symposium
  June 14-18
  (S)(*)
  Atlanta, GA

- Automatic RF Techniques Group
  June 17-18
  (C)(*)

- International Microwave Conference/
  Brazil (SMBO)
  September 6-9
  (C)
  Sao Paulo, Brazil

- 23rd European Microwave Conference
  September 20-22
  (S)(*)
  Madrid, Spain

- GaAs IC Symposium
  October 10-13
  (CS)(*)
  San Jose, CA

- Microwaves in Medicine
  October 11-14
  (C)(*)
  Rome, Italy

- Asia Pacific Microwave
  Conference
  October 18-21
  (C)
  Hainan, Taiwan, China

- 2nd Topical Meeting on Electrical
  Performance of Electronic Packaging
  October 20-22
  (S)(*)
  Monterey, CA

- Automatic RF Techniques Group
  December 2-3
  (C)(*)
  San Jose, CA

1994

- International Conference on
  Millimeter and Submillimeter
  Waves and Applications
  January 10-14
  (S)
  San Diego, CA
  (Tentative)

- European GaAs Applications
  Conference
  April
  (C)(*)
  San Diego, CA

- Topical Meeting on Electrical
  Performance of Electronic Packaging
  May 23
  (S)(*)
  San Diego, CA

- MTT-S International Microwave
  Symposium
  May 24-26
  (S)(*)
  San Diego, CA

- Automatic RF Techniques Group
  May 26-27
  (C)(*)
  San Diego, CA

- Asia-Pacific Microwave Conference
  August
  (CS)(*)
  (C)
  (C)

- IEEE Conference on the Computation
  of Electromagnetic Fields
  September
  (C)(*)
  San Diego, CA

- European Microwave Conference
  October
  (CS)(*)
  (C)
  (C)

- IEEE GaAs IC Symposium
  December
  (C)(*)
  Affiliated

- Automatic RF Techniques Group
  December
  (C)(*)
  Affiliated

- National Radio Science Meeting
  (C)(*)

Meetings listed are those that have been officially sponsored by MTT-S (i.e.,
AdCom approved). There are many other microwave related meetings
(chapter sponsored, commercial, etc.) that are not listed.

MTT-S conference involvement:
(S) Sponsor, (CS) Co-sponsor, (T) Technical Co-sponsorship, (C) Cooperate,
(*) Continuous MTT-S involvement approved by AdCom

The MTT Newsletter staff is interested in obtaining feature articles dealing with current topics in the technical and professional areas of interest to MTT members. These articles should provide members with a general understanding of the topic and its significance in current and future activities in the microwave field. I would like to emphasize, however, that these special articles should cover topics in a broad, general sense. Specific design techniques and applications will be covered in the papers appearing at the MTT Symposium and in the Transactions.

If you know of a topic that is current and/or you are willing to contribute an article to the Newsletter, please contact:

John Eisenberg
25 Parsons Way • Los Altos, CA 94022 • (415) 941-7426

January 1993 AdCom Meeting Highlights

The rapid pace of change in our profession and in the microwave industry continues to be reflected in the Society's AdCom meeting and activities, and in IEEE activities in general. This January's AdCom meeting included new initiatives by President Peter Staecker, reports by IEEE President-Elect Troy Nagle and IEEE Division IV Director Kenneth Dawson on IEEE initiatives and long-range goals, and the normal packed agenda of budget considerations, motions and committee reports. There continues to be an expansion of cooperative sponsorship of new conferences on topics that overlap or extend traditional "microwave" coverage, of special issues of the MTT-S Transactions on Microwave Theory and Techniques, increased transnational activities and representation, and on development of a long term "strategy" or plan.

1993 MTT-S President Peter Staecker presented a summary of the MTT-S Society review that he had submitted to the TAB (IEEE Technical Activities Board) Society Review Committee last year. This comprehensive review covered all aspects of the Society's activities, and included statistics on membership and finances, number of chapters, publications, and conferences sponsored. The Society Review Committee observed that MTT-S strengths include its chapters and financial reserves. Areas suggested for increased emphasis included transnational activities and, in particular, preparation of a long range strategy or vision for the Society. Needless to say, several members felt that MTT-S definitely has a long term strategy, but it was agreed that emphasis had not been on formal documentation of said strategy!

MTT-S Treasurer R.E. "Skip" Bryan reported that, based on preliminary results, the overall budget objectives for 1992 had been met. 1992 MTT-S President Reynold Kagiwada's emphasis on conservative management of expenditures resulted in a healthy projected surplus in a time of great economic uncertainty. Skip has continually refined the presentation of budget statistics so that an accurate overview of financial matters is conveyed with great efficiency - a major contribution to AdCom meetings that is appreciated by all!

The AdCom had the unique privilege of presentations by both the IEEE President-Elect, Troy Nagle, and the newly elected IEEE Division IV Director, Kenneth Dawson. Both stressed new IEEE initiatives to increase transnational participation (new IEEE service centers are being established in Europe and in Asia) and to lead in modernization of publication services, including such novel areas as CD-ROM conference records. Troy Nagle solicited and received numerous comments and questions from the MTT-S members present. Areas covered included increasing transnational support and participation, more active solicitation of student involvement, membership satisfaction surveys, more low cost products, de-emphasis of theoretical publications in favor of "applied" material, and increased lobbying of Congress on behalf of US.

(Continued on page 35)
In Memoriam
Harry F. Cooke
1922-1993

Harry Forwood Cooke (S’46, M’55, LM’87) died March 13, 1993, at Stanford Hospital in Stanford, California, at the age of 71. His home was in Los Altos Hills, California.

Harry was born in Little Rock, Arkansas. In the early part of World War II he was in the RAF 60 Group and worked with ground and air radar systems. Following the U.S. entry to the war he became a U.S. Army Air Cadet, flying navigation training missions.

He received a B.S.E.E. degree from the University of Arkansas in 1948 and later did graduate work at Southern Methodist University. He was a member of Tau Beta Pi honorary engineering fraternity. His senior paper on locked oscillators won the Southwestern IEEE student prize. Following his graduation he was with the Department of Agriculture where he developed techniques for electronic crop testing. Later he joined AR&T Electronics, now Baldwin Electronics, designing proximity fuses and low noise vacuum tube amplifiers.

In 1957, he joined the Circuit Development Branch of the Semiconductor Research and Development Laboratory of Texas Instruments as a Senior Member of the Technical Staff. Early work at TI included the development of FM receiver circuitry and collaboration with Roger Webster on the first solid state TV receiver. Later he was a key member of the team which developed the first silicon transistors capable of microwave amplification.

Shortly thereafter, Harry was part of the team that proposed and won the development of the MERA (Molecular Electronics for Radar Applications) phased-array radar program, the pioneering work using microwave integrated circuits. Along with team members Tom Hyltin and Brit Vincent, Harry holds the basic solid-state phased-array radar patent. After the initial MERA work, he led a group of engineers in developing state-of-the-art low-noise and power silicon transistors for radar and communications applications.

From 1970 until 1979 he was manager of device design and analysis at Avantek where he developed the foundation for Avantek’s broad line of bipolar and GaAs FET transistors. While at Avantek he published a number of tutorial papers including the 1971 classic paper “Microwave Transistors: Theory and Design.”

Harry joined Varian Associates, Solid State Division (now Litton Solid State) in 1979 as a senior scientist responsible for GaAs FET design and testing. Following his 1987 retirement, he remained active as an independent consultant for several Bay Area companies designing microwave transistors and test systems for devices and amplifiers.

Harry published over 50 papers in the fields of VHF to millimeter wave devices and circuits. He was awarded 14 patents covering devices, circuits and systems. His last contribution is Chapter 5, “Thermal Effects and Reliability,” in the 1993 definitive text, High-Power GaAs FET Amplifiers edited by John L. B. Walker. In 1989, he was given the Microwave Career Prize by the IEEE Microwave Theory and Techniques Society at the annual International Microwave Symposium in Long Beach, California.

Harry was an unselfish mentor to his colleagues at Texas Instruments, Avantek and Varian in both career development and aiding their understanding of solid-state microwave circuitry. Following the 1989 award of the career prize, many of this group, including Andy Anderson, John Archer, Frank Emery, Daniel Chien, Julius Lange, Bob Myers, Masa Omori, George Pierson, Gary Policky and George Vendelin, joined with Roger Webster, Tom Hyltin, Britt Vincent, Jim Sterrett and George Bechtel to amplify the honor granted by the MTT-S with a dinner at the Stanford Faculty Club.

Harry is survived by his wife, Lavinia; two daughters, Norma Cooke Jackson of Houston, Texas, and Gaynor Cooke Nelson of Boulder, Colorado; his sister, Alice Cooke Osborne; and one grandson, Maxwell Forwood Nelson. As a memorial, the family prefers contributions to the Friends of the Los Altos Library, Los Altos Library, 135 San Antonio Road, Los Altos, CA 94022.

—Frank E. Emery
Watkins-Johnson

A. Gardner Fox: Pioneer of Microwave Radio Transmission

A. Gardner Fox, 80, former head of the Communications Research Department at Crawford Hill, died Nov. 24, 1992. Fox joined the technical staff at Bell Labs in 1936, after earning a B.S. degree in 1934 and an M.S. degree in 1935 from MIT. During his 41-year career, he participated in the early exploration of waveguides, anti-aircraft radar, the prototype radio relay system, non-reciprocal ferrite devices and lasers.

During World War II, Fox worked on microwave design problems of the SCR-545 anti-aircraft radar and microwave amplifier circuits for radio relay systems. In 1945, Fox received the Naval Ordnance Development Award for these contributions. After the war, Fox helped develop AT&T’s first transcontinental microwave relay system.

In 1959, Fox took an interest in optical research and joined with Tingye Li, who is now head, Lightwave Systems Research at Crawford Hill, in developing a basic theory of how light behaves within a laser resonator. Their analysis provided an understanding of the phenomenon and cleared the way for future development of laser technology. Virtually every modern textbook on lasers has a section on this theory and the two scientists’ calculations are used as a standard for which research results are checked. Fox and Li shared the IEEE David Sarnoff Award in 1979 for their “discovery of modes in open structures and their application to laser resonators.”

Fox held 53 patents in the field of microwaves and quantum electronics and authored several technical articles. A Fellow of the IEEE and the Optical Society of America, he was the recipient of the first Quantum Electronics Award from the IEEE Quantum Electronics and Applications Society in 1978. He received the 1978 Microwave Career Award from the IEEE Microwave Theory & Techniques Society.

Fox is survived by his wife Ellen, two daughters, two sons and five grandchildren.

—Reinhard Knerr
AT&T Bell Laboratories
In Memoriam: Octavius Pitzalis, Jr.

Octavius Pitzalis, Jr., 58, of Malibu, California, died in an automobile accident on January 11, 1993, in Malibu. To many of us in the RF and microwave community “Pitzi,” as he was known, was a friend, mentor and colleague. We who knew him will remember him for his articulate story telling, his brilliance and his enthusiasm for technical work. He was always willing to share and exchange ideas. Pitzi’s outstanding career in the solid state and microwave fields spanned over 30 years.

After graduation from the University of Missouri in 1959, Pitzi went to work in the Army’s Electronic Devices and Technology Laboratory at Fort Monmouth, New Jersey. While there, Pitzi pioneered the development of solid state RF and microwave amplifiers, authored and co-authored many papers on that subject. His design concepts and approaches for power combining and broadband matching are used routinely in many of the commercial and military power amplifiers built today.

For the past six years, Pitzi was actively engaged in device modeling at EEsof, West Lake Village, California. He was instrumental in establishing the EEsof User’s Group and became its first president. He gained international recognition for his microwave expertise and has lectured throughout the world on device modeling and broadband amplifier design.

Pitzi’s sons, William and Leonard, have established a scholarship fund in their father’s memory. Contributions in Pitzi’s name may be made to the IEEE Microwave Theory & Techniques. (See announcement, below.)

—Russ Gilson
U.S. Army Research Laboratory

Microwave Education Fund

by Barry S. Perlman

The Microwave Theory & Techniques Society is in the process of setting up a new ‘Microwave Education Fund.’ Donations to this fund would be used to help support the education and accreditation of worthy future microwave engineers and may be made to honor a deceased eminent member of the Society. Scholarship grant recipients will be selected from those who show exceptional promise in microwave engineering and related disciplines. Contributions for this purpose should be made out payable to the “IEEE Foundation - MTT Education.” A brief note may be included describing the donor’s intentions, e.g. “to be used to award a microwave education scholarship in behalf of, or in memory of . . . .”, etc. It is important to note use for MTT education purposes in order to credit the MTT Education Account. Donations should be sent to:

“The IEEE Fund” c/o IEEE Controller
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331, U.S.A.

Donations from U.S. sources would be exempt from Federal income tax under IRS guidelines. The point of contact for this effort is Dr. Barry S. Perlman, Co-Chairman, MTT Education Committee, 908-544-4024, or fax 908-544-4024.

MTT-S Meetings & Symposia Committee Report

E. D. Cohen
E. A. Rezek

The structure of the Meetings & Symposia Committee announced in 1992 has been retained in 1993. The Committee has two chairmen: One individual is responsible for the MTT-S International Microwave Symposium and the 2nd individual is responsible for the other conferences and symposia that the Society has involvement with. The committee membership has changed since the fall 1992 AdCom elections. Eliot Cohen, one of the 1992 Co-Chairmen of the Committee, has been appointed as the Chairman for 1993 and is responsible for the dealings with the IMS. Ed Rezek, 1992 Secretary, has been appointed as Vice Chairman of the Committee and is responsible for the other conference activities. Jim Crescenzi, who was the other 1992 Co-Chairman, was elected Vice President of the Society. Jim accomplished some landmark changes in the operation of the Society during his time on the Committee, most importantly the establishment of definitive criteria for IMS site selection. We thank Jim for his contributions and hard work and wish him well in his challenging new assignment.

(Continued on page 34)
Call for MTT-S AdCom Nominations and Committee Appointments

by Kiyo Tomiyasu, Chairman
AdHoc Nominations and Appointments Committee

This year, the nomination of candidates for election to the MTT-S Administrative Committee (AdCom) will be conducted by an AdHoc Nominations and Appointments Committee (N&A Committee) appointed by AdCom on January 11, 1993. The AdHoc N&A Committee will handle the nominations with the same procedure used in past years as specified in the MTT-S Bylaws. In addition, the N&A Committee will seek interested and qualified individuals who will be recommended to the incoming President for his consideration to serve on various MTT-S committees.

Nominations to MTT-S Administrative Committee

Each year the MTT-S holds elections at its Annual Fall Meeting to elect members to serve on AdCom. The Bylaws state that the Nominations Committee will select a slate of at least two members of the Society for each vacancy in the elected membership, which will occur on the AdCom the following January 1. The Nominations Committee shall be guided in their selections by principles of efficiency, geographical, and organizational distribution. AdCom members who have served three consecutive terms by the following January 1 are ineligible for nomination by the N&A Committee. The Bylaws provide three means by which one may be nominated for AdCom. They are as follows:

a) Nominations by the Nominations Committee
b) Nominations by petition signed by 25 MTT-S members and submitted to the Nominations Committee Chairman prior to July 1, 1993.

c) Informal Chapter nominations submitted by July 1, 1993

All nominees will be contacted to ascertain that they will accept the nomination, and will commit themselves for active participation to at least two meetings a year, held at various locations in the United States. The geographical and affiliation distribution of current AdCom members is given below:

Present AdCom (1993): Total = 18

<table>
<thead>
<tr>
<th>Region</th>
<th>Industry</th>
<th>Government</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern U.S.</td>
<td>6</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Central U.S.</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Western U.S.</td>
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<td></td>
<td>7</td>
</tr>
<tr>
<td>Europe</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
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</tr>
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</table>

The Nominations Committee needs your help in suggesting potential nominees to serve on AdCom members. Please submit your suggestions to the Chairman of the AdHoc Nominations Committee and/or your local Chapter Chairman by July 1, 1993.

Recommendations for Appointments to MTT-S Committees

The second function of the AdHoc N&A Committee is to assist the incoming MTT-S President, by identifying individuals to be recommended for his consideration for appointments to the many MTT-S committees. Anyone interested in such appointments should contact (by July 1, 1993):

K. Tomiyasu, Chairman
AdHoc Committee on Nominations and Appointments
General Electric Company
366 Hilltop Road
Paoli, PA 19301
Tel. 215-571-5740
Fax 215-644-8521

TAB Report

by Peter Staecker
MTT-S President

The Winter Technical Activities Board meeting was held from Thursday, February 25 through Sunday, February 28, 1993. Of interest to MTT were the following actions taken:

• TAB endorsed a proposal by the Components, Hybrids and Manufacturing Technology Society (CHMT) to change its name to Components, Packaging and Manufacturing Technology Society (CPMT). This change was sought to more closely represent the focus of the Society.


• TAB endorsed a change to the existing copyright policy applying to technical, educational and professional publications of the institute to include technical society/council Newsletters, but excluding section and chapter Newsletters. This change will transfer liability issues from IEEE to the authors of technical articles in Newsletters.

• The RAB/TAB Transnational Committee recommended that Societies should
  1. lead with active e-mail programs to capitalize on peer interaction world-wide,
  2. either utilize Section e-mail coordinators or appoint an e-mail coordinator for each Chapter to bring the Chapters into closer contact with Societies and allow Societies to interface with their Chapters and members more easily,
  3. be encouraged to provide electronic news and information services for their members and these should be e-mail and internet file transfer (FTP) accessible,
  4. incorporate global volunteer participation in Society administration and activities,
  5. simplify paper submission and world-wide review process.

To facilitate benchmarking of IEEE journal prices, comparative prices of our periodicals with respect to other outside journals will be reported.
What Is Happening in CAEME?

by Magdy F. Iskander
Director, CAEME Center

I think it is time to share the latest in CAEME activities and report on recent developments. To begin with, I am very pleased to welcome two new corporate sponsors of the CAEME Center: Andrew Corporation and Hughes Aircraft Company. As CAEME approaches the end of the NSF grant, the corporate support is becoming crucial to the continued activities of the Center. CAEME now has six corporate sponsors including Hewlett-Packard, Motorola, Lockheed, Texas Instruments, Andrew Corporation, and Hughes Aircraft Company.

I am also delighted to announce that as a result of the CAEME efforts, engineering educators now have a new journal that focuses on use of computers and software tools in engineering education. This multidisciplinary journal, Computer Applications in Engineering Education, is being published quarterly by John Wiley & Sons. Two issues of the journal have already been published, and many agree that the people at John Wiley have done a great job in publishing this important and timely journal. Besides including software diskettes with each issue, the journal is being published in color and on high-quality paper. Tables I and II provide lists of the papers published in the first two issues. Table III lists the software distributed with the first two issues. You are encouraged to request your complimentary copies of the first, second, or even both issues together with the associated software by simply faxing your name and address to me at 801-581-5281. I will continue to respond as long as the supply lasts. I truly believe that John Wiley & Sons has provided us with a unique opportunity to sustain our efforts in this area of computer-based engineering education. It is now up to us to nurture it, support it, and bring it to the highest level of excellence and significant professional value. Subscriptions by individuals and our institutions are a first step, but equally important are our technical contributions to the journal. I am looking forward to receiving papers from you and from colleagues at your institution. Please let me know if I can be of assistance. Subscription rates are $195 for institutions ($225 outside the U.S.); $75 for individuals in the U.S., Canada, or Mexico ($105 outside North America); and $30 for students worldwide.

I would like also to report on the third round of the CAEME funding of software development projects. We received 23 proposals, and the CAEME Policy Board decided to fund the eight projects listed in Table IV. Congratulations to the Principal Investigators of the successful proposals, and I am looking forward to working with them on the publication of the results of their projects in Vol. III of the CAEME software books.

I am delighted to report that the distribution of the CAEME Software Book, Vol. I, has been remarkably successful. Table V lists universities which have paid the membership fee in the CAEME Center. It may be seen from Table V that, in addition to the numerous universities in the U.S.A., institutions from 23 other countries have joined CAEME. The list of foreign countries includes Canada, Belgium, Brazil, Sweden, England, Switzerland, France, Germany, Korea, The Netherlands, Finland, Spain, Australia, Romania, Italy, Poland, New Zealand, Greece, Malaysia, Ireland, Austria, Portugal, and Denmark. In all, CAEME has raised over $55,000 from the sales of Vol. I of the software book. This includes the many individual copies that were distributed at cost ($125). A brief description of the contents of Volume I was published in Vol. 33, No. 6, of this magazine (December 1991). Volume II is expected to be published in early 1993. Please let me know if you need additional information.

I would like to conclude by indicating that as we approach the ending of the NSF grant, CAEME is now at the crossroads between its federal funding and the continued self-supporting status. Under the NSF grant, CAEME limited its activities to undergraduate education. To help sustain the Center, the Policy Board is considering extending these activities to cover new markets in corporate training and K-12 science and math education. The Policy Board will consider business plans along these lines in its next meeting on March 19, 1993. Your thoughts, comments, and suggestions are wholeheartedly appreciated.

Until we meet again in a future CAEME column, I wish you all success. I am looking forward to your continued collaboration.

Table 1. List of Articles in the First Issue of Computer Applications in Engineering Education

- "Interactive Computer Modules for Undergraduate Chemical Engineering Instruction," H. S. Fogler, S. M. Montgomery, and R. P. Zipp, University of Michigan
- "Multimedia-Based Educational Applications of Computer Simulations of Chemical Engineering Processes," R. G. Squires, P. K. Andersen, G. V. Reklaitis, S. Jayakumar, and D. S. Carmichael, Purdue University
- "NSF/IEEE CAEME Center: An Exciting Opportunity to Align Electromagnetic Education with the Nineties," M. F. Iskander, University of Utah
- "Simulation of Electromagnetic Radiation and Scattering Using a Finite Difference-Time Domain Technique," K. Li, M. A. Tassoudji, R. T. Shin, and J. A. Kong, Massachusetts Institute of Technology
- "Computer Use in a Multidisciplinary Control Laboratory," E. J. Mastascusa and M. F. Aburdene, Bucknell University
- "Arrays: A Software Package for Analysis of Antenna Arrays," A. Z. Elsherbeni and P. H. Ginn, University of Mississippi

Table 2. List of Articles in the Second Issue of Computer Applications in Engineering Education

- "Unconventional Engineering Teaching Tools," S. E. McCormack and R. C. Compton, Cornell University
- "A Multimedia Laboratory," M. El-Sharkawy, Purdue University

(Continued on page 29)
The CAEME Software
Book Volume 1

by Dan Swanson

Computer Applications in Electromagnetics Education (CAEME) is funded by the National Science Foundation (NSF), the AP, EMC, and MTT Societies, ACES and several industry sponsors. The goal of CAEME is to provide leadership in the area of computer-aided instruction in electromagnetics for both academia and industry. Although most students and engineers now have access to a personal computer, software for studying electromagnetics has not been widely available. With the right software we can visualize abstract mathematics, animate dynamic phenomena such as wave propagation, and provide one-on-one tutoring for difficult topics.

The first volume of CAEME software addresses these goals in some very intriguing ways. The various software packages cover five general categories: fundamentals of electromagnetics, transmission lines, waveguides, antennas and radiation, and numerical techniques. While writing this review it has been interesting to see the different approaches taken to illuminate the same problem. Although the primary audience for this work is the full-time undergraduate, working engineers may find useful material for self study.

Time and space do not allow me to cover all the software in this first volume, but I will try to touch on those chapters that may hold the most interest for MTT-S members. I apologize in advance to those authors whose worthy efforts are not reviewed here.

Fields&Operators
Martin Lapidus
Lascaux Graphics [1]

Fields&Operators is an interactive graphics program that allows users to experiment with surfaces and vector fields in two or three dimensions. In addition, there is a time variable which can be used to animate functions. And, the differential operators divergence, gradient, curl and Laplacian can also be computed and displayed as vector fields and surfaces.

The basic structure of Fields&Operators is the layer. A layer definition may be a single vector or curve, or it can be a complicated surface or vector field in three dimensions. The contents of a layer may be a function defined by the user, or it can be computed based on the contents of other layers. Functions can be displayed as surfaces, scalar fields, level curves, contour lines or vector fields.

Each layer has an operator that defines how computations in that layer depend on the functions or vector fields in other layers. The simplest operators are functional dependencies between layers. The dot product and cross product operators can be applied to vectors or vector fields in two layers and display the result in a third layer. Differential operators in one layer can also be applied to the functions in another layer. The user can work in rectangular, cylindrical or spherical coordinates, although the dot product, cross product and tangent operators are not available in cylindrical or spherical coordinates.

(Continued on page 31)
International Microwave Symposium 1993
Workshops and Panel, Rump or Focus Sessions

by Jim Wiltse
Special Session Organizer

These activities include 18 full-day or half-day workshops on Monday and Friday; four lunch-time panel sessions on Monday, Tuesday, and Wednesday; four rump sessions on Tuesday evening; and six special technical sessions on Tuesday and Wednesday. We hope you will be able to take advantage of the diverse array of topics.

Workshops—Monday and Friday

The all-day workshops include breakfast and lunch, while half-day workshops provide one meal. The cost also includes copies of handouts from the presentations. Following is a listing of workshop titles and organizers.

Monday, June 14, 1993
• High T, Superconductivity in Microwave—S. J. Fiedziusko, K. D. Breuer
• High Power Microwave Generation and Its Commercial Applications—J. Goel, D. Reid, W. C. Brown
• Ultra Low Noise Microwave Sources—B. McAvoy, R. Moore, J. Whelehan, Jr.
• Picosecond and Femtosecond Electromagnetic Pulses: Analysis and Applications—I. Wolff, Y. Yamashita
• Thermal Aspects of Microwave Device and Circuit CAD—W. Curtice, V. Rizzoli
• Mobile Communications Systems—B. McAvoy, R. Moore, J. Whelehan, Jr.
• Wireless Communications Via Lightwave—W. I. Way, H. Ogawa
• Filters and Multiplexers for Mobile Communications—R. Bonetti, A. Williams
• Electromagnetic Wave Interaction with Water and Moist Substances—A. Kraszewski
• Material Measurements—R. Ham, J. Barr
• Microwave HBTs and HEMTs: Circuit Applications and Reliability—F. Ali, A. Gupta, B. Bayraktarovglu
• Combined Self-Consistent Particle Transport Simulation and Full Wave Dynamic Field Simulation for Monolithic Solid-State Device and Circuit Calculations—C. Kroune
• Mobile Communications Systems—B. McAvoy, R. Moore, J. Whelehan, Jr.
• EM Modeling of Microwave Packages and Interconnects—K. Gupta, B. Perlman
• The Art of Designing Power MMICs—A. Shama, T. Itoh
• Civil Microwave Packaging—B. Berson, D. Maki
• System Implications of Atmospheric Transmission Effects—R. McMillan, A. VanderVorst
• Surface Mount Packaging for High Volume MMIC Components—M. Rosenstock

(by Jim Wiltse)

Guest Program

Atlanta, home of Margaret Mitchell and "Gone With the Wind," Martin Luther King and the Civil Rights movement, the Stone Mountain Laser Show and National League Champion Atlanta Braves, CNN and Coca-Cola, The Battle of Atlanta in 1864 and the Olympic Games in 1996 ... as you can see from this short list Atlanta is a many faceted city. We hope the program we have planned for you will allow you to sample her many sights, sounds and moods.

The Guest Hospitality Suite will be on the tenth floor of the Marriott Marquis and will be open Monday through Friday from 8:00 a.m. till 5:00 p.m. We think you will find this a very pleasant place to renew old acquaintances, make new friends and gather to make plans for the day. A continental breakfast will be available in the morning and coffee, tea and soft drinks throughout the day. The Marriott Marquis is within easy walking distance of most other hotels. Alternatively, guests are invited to use the shuttle bus service to and from the Georgia World Congress Center. The Guest Suite will be staffed by local people ready to assist you in any way they can. The Atlanta Convention and Visitors Bureau has a staffed, permanent information booth in the main concourse of the Georgia World Congress Center. They will be available throughout the symposium to answer any questions about the area.

Organized tours are planned for each day of the International Microwave Symposium. The first group tour will leave from the Marriott at 9:30 a.m. Tuesday. Prior to departure (at 8:30 a.m.) a representative of Guidelines Atlanta will present an overview of the city. You will then leave for a tour of CNN and World of Coca-Cola Pavilion. You will also have an opportunity to enjoy the excitement of Underground Atlanta. Lunch will be served in the Sundial Restaurant 72 stories up in Atlanta's tallest hotel, the Westin Peachtree Plaza. You will have a panoramic view of the city while you enjoy your lunch. On your return trip you will drive by future 1996 Olympic sites, Georgia State University, the State Capitol and other Atlanta landmarks.

On Wednesday you start out with a drive down Peachtree Street passing such landmarks as the Fox Theatre, Colony Square and the Woodruff Arts Center. You will stop and tour the Cyclorama, a diorama depicting the Battle of Atlanta. You will also tour Inman Park, one of the country's best preserved Victorian neighborhoods, and you will drive by the Carter Library and the Martin Luther King Memorial Center.

Lunch on Wednesday will be at one of Atlanta's finest restaurants, housed in an authentic plantation home built in 1817 in Washington, Georgia, and moved to Buckhead in the 1960's. After a delicious lunch you will take a leisurely drive through Atlanta's northwest residential area, noted for its magnificent homes and lush landscaping.

Your day will conclude with tours of the Swan House, a magnificent Anglo Palladian Villa with priceless original furnishings and Oriental rugs, and the Tullie Smith complex, an authentic antebellum plantation-plain farmhouse.

On Thursday you will take a trip back in time to Covington, Georgia, one of the few areas whose magnificent plantations and townhomes were spared by Sherman on his "March to the Sea." Here you will be greeted by a local guide who will take you down historic tree shaded streets lined with antebellum homes. You will visit a charming turn-of-the-century cottage furnished throughout with antiques and a breathtaking mansion furnished with an extensive collection of fine American Empire furniture from 1800-1840 period and Victo-
Atlanta Area Information

On behalf of IEEE and, as a native Atlantan, I would like to personally welcome you to Atlanta, home of the 1991 and 1992 National League Champion Atlanta Braves, and the site of the 1994 Super Bowl and the 1996 Olympic Games.

Atlanta in the '90s is the nation's most exciting city! In addition to the tremendous activities mentioned above, Atlanta is also the home of the new Georgia Dome, the largest cable-supported dome stadium in the world. Other world firsts include: largest toll-free telephone dialing area; largest suburban office park—Perimeter Center; largest bas-relief sculpture—Stone Mountain Park; largest 10K race—Peachtree Road Race with 45,000 runners; the tallest hotel—Western Peachtree Plaza, 73 stories, 723 feet tall. And, hang on to your credit cards, the largest mall in the Southeast—Lenox Square and, for added shopping pleasure, Atlanta has more shopping space per capita than any other city except Chicago.

In mid June one can expect warm and sunny days with an average temperature of about 78 degrees.

Symposium Hotels

Room blocks have been reserved for conference attendees in eight Atlanta hotels. All are top quality and basically within walking distance of the Georgia World Congress Center where most conference events are scheduled. However, bus shuttle service will be provided during the symposium.

Hotel Registration

All hotel reservations will be handled by the Housing Bureau (Atlanta Convention and Visitors Bureau). The Conference Housing Form must be used to make hotel reservations. It is recommended that you respond early to ensure availability of one of your first choices.

Dining and Areas of Interest

All attendees will receive an Atlanta Visitors Guide in their registration packets courtesy of the Atlanta Convention and Visitors Bureau. This guide contains information on area attractions, recreation, sightseeing, dining, accommodations, etc., with several maps. Any cuisine can be satisfied by the many excellent restaurants in the city or a short ride to the "burbs" on the northside. Some outstanding attractions include: Atlanta Botanical Gardens, Georgia State Capitol, Jimmy Carter Library and Museum, CNN Center, the World of Coca-Cola, Fernbank and SciTrek—The Science and Technology Museum of Atlanta just to name a few. Almost everything is just a short ride on Atlanta's rapid transit, MARTA, including to and from the inside of the Atlanta Airport, GWCC, Peachtree Center, CNN, and Lenox Square shopping.

While you are here, we invite you to relax and enjoy Atlanta's attractions, first-rate accommodations, award-winning restaurants, stimulating cultural life, and above all, the gracious people of this diverse and wonderful city.

Transportation

Travel Agency

Williamsburg Travel Company has been selected as the official travel agency for the 1993 International Microwave Symposium. Williamsburg Travel is an Atlanta based agency specializing in associations and conventions and will assist MTT IMS travelers with reservations on Delta Air Lines, Alamo Rent A Car, and other travel arrangements. Complimentary maps, MARTA passes, and restaurant coupons will be included with tickets which will be mailed or sent by overnight courier when necessary.

Contact Williamsburg Travel at:

1-800-952-9922 or 404-952-0430
Monday-Friday, 8:00 a.m.-6:00 p.m. E.S.T.

Please indicate that you are attending the International Microwave Symposium.

Airline

The 1993 International Microwave Symposium has selected Delta Air Lines, Inc., as the official air carrier. Delta is offering 5% and 10% discounts on selected round trip fares and a 40% discount on 100 pounds or more of air cargo. Delta is an Atlanta based carrier offering over 5000 flights daily to U.S. and international destinations.

Reservations on Delta for the International Microwave Symposium can be made through Williamsburg Travel at the numbers given above or through the Delta meetings reservations desk:

1-800-241-6760
(United States and Canada)
Please refer to file number:
H0571 (if dialing direct to Delta)

Car Rental

Alamo Rent A Car, Inc., has been selected as the official car rental agency for the meeting in Atlanta, Georgia. Rates offered by Alamo for conference attendees represent a substantial discount off their normal rental rates for six car sizes. In addition, Delta Air Lines frequent flyer mileage is accumulated when renting Alamo cars.

To reserve a car at the conference rate, call Alamo at:
1-800-732-3232
and reference group number 245583
and rate code G8

Transportation Services

During the symposium, frequent shuttle bus service will be provided daily to and from the Georgia World Congress Center and symposium affiliated hotels. The service will be available for registration on Sunday, June 13, and for all workshops, technical and panel sessions, and exhibits occurring Monday, June 14, through Friday, June 18. In addition, transportation will be provided for the Microwave Journal reception Monday evening, and the reception and banquet at the Marriott Wednesday evening.

Transportation From Atlanta Airport

The distance from the airport to the Georgia World Congress Center and conference hotels is 12 miles. Taxi and shuttle bus (Atlanta Airport Shuttle, 404-524-3400) services are available from the airport at a cost of approximately $15 and $8, respectively. The Atlanta transit system, MARTA, has train service from the airport to downtown Atlanta, and free passes are provided if reservations are made through Williamsburg Travel. Almost all of the national rental car agencies are present at the airport. We recommend that you use the special rates offered by Alamo Rent A Car, Inc.
MTT Society Ombudsman

by Ed Nielenke

I have been selected by the Microwave Theory and Techniques Society Administrative Committee (ADCOM) to continue serving as your Ombudsman for 1993. It was a pleasure to serve in 1991 and 1992 and I look forward to continuing in 1993. The purpose of the Ombudsman is to receive complaints and assist members in solving problems encountered in obtaining membership services from IEEE and MTT-S.

As your Ombudsman, I have received one inquiry from an MTT-S member since the last report in the Winter 1992 MTT-S Newsletter. This inquiry concerned a member who did not receive a 1987 issue of another society's transaction. In checking with IEEE, I learned that the member did not include his 1992 MTT-S dues with his previous invoice. He was a member in 1987 of the society that published the 1987 missing issue.

I checked with the IEEE concerning the policy of receiving back issues. IEEE carries back issues for two years. In January 1993, back issues for 1991 and 1992 are available. In June 1993, back issues from January 1991 through June 1991 are removed, and then back issues are available from July 1991. If a member received a damaged issue or did not receive a particular issue, IEEE will provide that issue free of charge, providing the person was a member of that society at the time of the requested issue and the issue is available. For situations when the issue is not available or the issue is past the two-year period, IEEE carries a microfiche copy of back issues which will be provided to a member free of charge under the same circumstances, as outlined above. If a member failed to pay his dues for the previous year, he can receive the back issues by paying the previous year's dues and requesting that the back issues be provided. In checking with IEEE, Walter J. Johnson, Inc. (201-767-1303) has older IEEE proceedings and transactions for sale up to December 1985.

If a person wants to receive back issues and is not a member of that society, the issues are made available (periodical or a microfiche copy) at the subscription rate, which is higher than the member rate.

Concerning the person who made the request, I informed the member to submit his 1992 and 1993 MTT-S dues and request back issues. The 1987 periodical was not available from Walter J. Johnson, Inc., so a microfiche copy is being sent to him by IEEE.

Please feel free to contact me by letter or telephone concerning any complaint you may have or any assistance you may need in obtaining membership services from IEEE and MTT-S.

Ed Nielenke may be reached at 410-765-4573 or fax 410-993-7432.

Division IV Director's Report

by W. K. Dawson

Data without generalization is just gossip.° Robert Pirsig's admonition is, I believe, an appropriate introduction to the results of last November's IEEE elections. The basic data are Dawson 2345, Johnson 2339. Clearly, the Board had nominated two equally acceptable candidates. If seven more had voted, or four had voted differently, the result could well have changed. So the first generalization is the well known adage that every vote counts. I thank all of you who made the effort to vote and ask for your help in making the IEEE better serve our technical and professional needs as well as be a stronger voice for the profession.

There are more data and, of course, a generalization. Inside the US the count was Dawson 1701, Johnson 2086, while outside the US the count was Dawson 644, Johnson 253. In percentage terms the numbers are quite striking. Inside the US Dawson got 45% of the vote, outside 74%. This difference of opinion is significant. The President-Elect results show a similar but slightly weaker trend. Troy Nagle received 48% of the US vote and 69% of the non-US vote. In both cases the outcome was determined by the non-US vote. This was not the case in the five other Divisional elections where the preferences of voters inside and outside the US differed in only two cases and by small, possibly insignificant, amounts.

Why should this be? (Here comes the generalization!) The position statements of the candidates in both the President-Elect and Division IV elections showed a clear difference in attitude towards a transnational IEEE. The difference could well have been the major deciding issue for non-US voters while playing a much lesser role for US voters. But the difference was crucial and it determined the outcome.

What can we learn from this? We must all be sensitive to the declared goal of the IEEE to strengthen its global character. A global IEEE must try to fairly and equitably represent the needs of all its members. In order to succeed the IEEE has to adapt its programs to fit the individual needs of many national groups. For some regions of the world this may be done by establishing agreements with existing national associations concerning joint membership and programs while in other places, such as the US, the IEEE can best serve its members by also taking on the role of a national organization which presents and represents members' needs and aspirations to governmental and other national agencies. And all this diversity must be made into a coherent structure.

Within IEEE we have engineering, scientific and technical pursuits that bind us into a strong organization. These important aspects of our work are shared through conferences, publications and educational programs. I hope that these ties are strong enough to overcome any differences caused by national concerns. I will work to promote the knowledge and understanding required to deal fairly with these issues. But this cannot be done without your assistance. Together we can make the IEEE serve all its members everywhere.
The Defense R&D Policy Committee of the United States Activities Board met at the Dupont Plaza Hotel in Washington, D.C., on Monday, November 30, 1992. The Microwave Theory and Techniques Society was represented by Dr. David McQuiddy (Texas Instruments) and Dr. Glenn Thoren (Lockheed Sanders). It should be noted that over the past several years the MTT-S is the only society that has consistently had one or both of its representatives at these meetings.

With the pending change in administrations in Washington and the changing role of the Department of Defense, the issues that occupied most of the discussion at the meeting covered the Defense Conversion position paper and the Defense Reinvestment Legislation for the 103rd Congress (H.R. 5310 S.2803).

Al Nauda, with the help of several committeemen, prepared a broad-ranging position paper on Defense Conversion. Dave McQuiddy contributed revisions to be included in the final draft. The sections of the position paper recommend the following actions:

2. Cushion the Impact of Defense Budget Costs on Affected Communities and Individuals.

An important issue facing the defense industry is the availability and suitability of commercial parts for defense systems. Current DOD procurement regulations include the significant amount of accounting, paperwork and mil-spec requirements that do not facilitate the use of commercial off-the-shelf hardware or software. These barriers to the greater use of commercial products must be addressed. It is felt that a broad change in the procurement regulations will be necessary before significant, rapid insertion of commercial parts will be allowed. This will also involve a cultural change in the way commercial parts are considered for military systems. It is apparent, however, that the “six-sigma” practices of commercial operations such as Motorola do yield highly durable and reliable components. If these practices (if not the parts themselves) are migrated into a new system, the reliability of the system just may exceed the requirements for military use.

A new view of an integrated commercial and defense industrial base must emerge. Currently it appears that “commercial” companies are loath to acquire defense contractors.

(Continued on page 27)
The winter technical meeting was held on January 9, 1993, in Atlanta. This year the format was different as compared to last year, where all the sub-committees presented, and the meeting became more like a progress report rather than identifying the emerging technology. This time the microwaves.

As we are all aware, the Defense budget has declined and will continue to do so in coming years and the commercial markets are growing. It was evident by the presentations and there was a great emphasis on the commercial applications of the microwaves.

John Day was an invited speaker for Microwave and Millimeter Wave Integrated Circuits (MTT-6), who reported on the changing world economies and growing demand of microwaves in commercial applications in the U.S. and elsewhere. He explained, "As the development of digital I.C. revolutionized the computer industry in the 60's and 70's, the new developments in RF and Microwave I.C. are revolutionizing the world of communications." In the 80's, microwave activities were dominated by the military applications and the commercial communication was limited to the centralized hardwired phones. Today we are in the middle of a transition from centralized systems to systems of distributed base stations connected to a large array of wireless hand sets. This is evident by the fact that while hardwired phones have only grown at the rate of 1.8% over the last 3 years, the number of cordless phones has jumped from 6 million in 1989 to 53 million in 1992, and cellular phones have jumped from 3 million to 11.8 million during the same period.

In addition to personal communication systems, RF product requirements include satellite receivers, wireless data networks, pagers, wireless LANs, GPs and wireless cable televisions. Microwave circuits are also required for DBS receivers and for small aperture terminal for inventory control of private corporate communications networks. Microwave high-tech radar technology is being transferred from military applications to family automobiles.

Satellite services are also on a sharp increase. While presently they are expensive and are sold out of capacity, the new low earth orbit systems promise even greater low-cost services to a broader profile of our society.

The conclusion is that an array of opportunities is available. The challenge is to re-direct the resources of a technical community that has been too long servicing the military high-performance, high-cost interests into a new set of commercial and consumer applications where cost and reliability dominate performance criteria.

Another area where microwaves can make big strides is in Medical Applications (MTT-10). Arye Rosen pointed out that passive radiometry and microwave hyperthermia have been used in the past for diagnostic and therapeutic medicine. Recently the FDA has approved a study on treating benign prostatic hyperplasia using microwaves.

Conventional angioplasty, although it has become an accepted tool in cardiology, has several unresolved issues. In about 30% of patients, second or third balloon inflations are needed due to vessel recoil, dissection, or thrombus. These complications exacerbate some of the instability of the vessel and can result in acute closure.

On the other hand, microwave angioplasty offers a promise for reduced artery recoil as well as intestinal proliferation, weld dissection, and can also treat intracoronary thrombus, all of which are major problems in both balloon and laser balloon angioplasty. Other areas of ongoing microwave research in cardiology are as follows:

- Microwave Ablation of Myocardial Tissue;
- Method of Measuring Blood Perfusion in Heart Muscle by the Use of Microwave Energy;
- Lumen Measurement of Coronary Arteries Utilizing Microwave Apparatus;
- The Effect of Microwave Therapy Upon the Functional State of the Cardiovascular System in Patients with Hypertension;
- Pacemaker Protective Undershirt;
- Control of Arrhythmia in the Isolated Heart by Means of Microwaves;
- The Application of Microwaves to Acupoints for the Treatment of Coronary Heart Disease.

Several new commercial applications of High Power Microwaves (MTT-5) are getting a lot of attention. Don Reid stated that hospital waste disposal, which is a big problem, is being solved by the scientists at Los Alamos National Laboratories. The ground hospital waste is placed over a conveyor belt, where it is exposed to the electron beam with 10 KW of average beam power. This beam is generated by the electron accelerators using 5 MWatt RF pulsed power at 2.998GHz. This provides a very clean method of waste disposal without violating the EPA standards associated with the conventional incinerator.

Other areas where exciting results were reported are:

- In the Lightwave Technology area (MTT-3), Alwyn Seeds reported that optical signals modulated at microwave and millimeter wave region can be generated using coherent techniques. Wider dynamic range systems using coherent detection with optical amplifiers were also reported.

- In the Sub-Millimeter Wave area (MTT-4), Professor Gabriel Rebiez reported that using Si-S detectors (Superconducting - Insulating - Superconducting) 20°F and 50°F noise figures were reported at 100GHz and 500GHz respectively. Microshield transmission technology, which offers very low loss in sub-millimeter wave region, was also reported. This technology offers the advantage of no dielectric loss, low radiation loss, no dispersion and no air bridges or via holes.

For the MMW and sub-MMWave (MTT-7), Madhu Sudan Gupta reported that InGaAs based HEMTs on InP substrate continues to show a great promise for low noise and high power area in frequencies up to 300GHz.

(Continued on page 30)
Your NEW IEEE Press: Have You Heard the Word??

by K. K. Agarwal
IEEE Press Liaison

How well do you know today's IEEE press? IEEE Press, the book publishing arm of the IEEE since 1971, has undergone a very vigorous expansion program. Since 1990, the Press has rebuilt and expanded its editorial staff by hiring experienced professionals from several major international publishing houses. Similarly, the IEEE Marketing Department has added an aggressive and experienced staff, including a dedicated Press Marketing Manager. Together, and with the option of Society participation, an ambitious program has been developed with the goal of publishing forty or more new books a year in 1993.

Over time, the Press had become a publisher almost exclusively of article reprint volumes. While this focus was never the explicit charter of the Press, it may have seemed an inexpensive and easy way for books of interest to be produced. Indeed, the Press continues to publish Selected Reprint books but has established much more rigorous requirements to ensure their success in today's markets.

The dramatic change is that today's Press, through its professional staff, seeks to publish a much broader range of original advanced textbooks, monographs, and practical guides or introductions to a technology. Already, good models of each type of book have been published with impressive sales.

The Press offers some clear advantages to authors:

A Close Working Relationship

Your IEEE Press provides authors with personal attention, on-line advice at any time in the writing process, and professional results. The editorial staff works as a team with authors from the day the contracts are signed. The Press also provides authors with an incomparable network of support. Besides the in-house development and production staff, the Press has access to numerous expert peer reviewers, the IEEE Press Board of leading engineers and successful authors, and IEEE Society/Council sponsorship, which entails additional technical reviews and participation in publicizing and promoting the published book.

An Author-Sponsor Partnership in Marketing the Book

Your IEEE Press works closely with its authors and sponsors to tailor a marketing plan that is right for each book. The capabilities of the Press have grown now to include direct mailings to IEEE members worldwide, professionals in related associations and industries, retail and university book-sellers, the major library wholesalers, international distributors, and the university and industry libraries. In addition, the Press and Marketing Staff sell books at attractive discounts through IEEE conference and symposia exhibits, college textbook adoptions, book clubs, the author's own workshops and sales leads, and special bulk sales to industry, government and sister associations.

Shared Revenue and Incentives for Author and Sponsor

You may have thought that IEEE Press royalty rates are low or paid only to the sponsoring Society. In fact, your IEEE Press shares financial rewards generously with its authors and with active Society sponsors. Royalty rates typically increase with sales volume on original books from 11% to a high of 23%. A good original text and reference, such as Collin's Field Theory of Guided Waves, has earned author and sponsor over $20,000 in than two years. Annual surpluses from book sales go directly to the IEEE General Fund to help hold down dues increases. In 1992, for instance, the surplus was well over $100,000.

The IEEE Press books which have been sponsored by the Microwave Theory and Techniques Society thru 1992 are shown below:

- Instrumentation and Techniques for Radio Astronomy
- Low-Noise Microwave Transistors and Amplifiers
- Medical Applications of Microwave Imaging
- Microwave and Millimeter-wave Mixers
- Modulation Doped Field Effect Transistors: Applications and Circuits
- Modulation Doped Field Effect Transistors: Principles, Design, and Technology
- Monolithic Microwave Integrated Circuits
- Planar Transmission Line Structures
- Numerical Methods for Passive Microwave and Millimeter-Wave Structures

There are two new book projects sponsored by the MTT Society in 1992:

- Quasioptical Systems by Goldsmith
- Planar Microwave Circuits by Gupta/Abouzahora

Both of these books illustrate the importance and growth of the areas of research and emphasize the directions where future research should take place. Clearly these books would be valuable reference sources for years to come with research engineers and scientists working in microwave to optical fields.

Currently MTT Society is reviewing three original proposals:

- Microwave Tube Transmitters by Leo Sivan (reviewer Dr. Don Reid, Los Alamos National Labs)
- Transform Methods for Solving Partial Differential Equations by Dean Duffy (reviewer Dr. K. C. Gupta, University of Colorado)
- Dyadic Green Functions in Electromagnetic Theory by Chen-To Tai (reviewer Dr. Kai Chang, Texas A&M University)

The review process consists of a brief review of the proposal, a more detailed review of a draft manuscript, and an in-depth review of the final manuscript. Reviewers will receive a free copy of the reviewed book, complimentary IEEE Press book(s) of their choice, and the reviewers' name(s) will appear prominently on the copyright page of the book (with reviewer's approval). In-depth reviews of final manuscripts may entail review honoraria.

Lately, the IEEE Press is emphasizing the concept of a Series Editor and Advisory Board, backed by the sponsoring Society in order to involve more people in planning subjects for new books and in stimulating the authors/editors to develop manuscripts. Series Editors earn royalty overrides for all books within the series and financial support for expenses is made available by the Press.

Microwave Theory and Techniques Society is seeking qualified Series Editors for topics in microwave engineering. Each series should consist of a cohesive set of books related to one

(Continued on page 15)
Managing Information and Automated Testing

(“Now That I Have All This Data, What Do I Do With It??”)

The 41st ARFTG Conference will be held in Atlanta, Georgia, on June 18, 1993, as part of MTT-S International Microwave Week. The theme of this one-day technical conference with concurrent manufacturer exhibits will be Managing Information and Automated Testing (“Now That I Have All This Data, What Do I Do With It??”). We live in an information-hungry world. Data generation and collection has become a major industry of its own. The proliferation of computers in both the laboratory and the field, inexpensive mass storage devices, imbedded controllers/software, and enhanced measurement speed have all played their part in the “Information Age.” In some cases, the ability to produce data has outstripped our ability to process the information. Papers are invited that identify problems and solutions to the process of turning data into information. The topic areas include Visualization of Data, Data Processing Methods, and Information Management. Some potential interest areas are: Radar Cross Section, T/R Modules, Antenna Patterns, Process Control, and Computer-Enhanced Calibrations. In addition, papers concerning all other areas of automated microwave measurements and design are welcome.

Those interested in participating should contact Conference Chair J. Greg Burns, Johns Hopkins University—Applied Physics Lab, MS-12-N381, Johns Hopkins Road, Laurel, MD 20723. Deadline for paper submissions will be approximately March 15, 1993. See the IMS-1993 registration materials for more information concerning times and location.

Along with the technical presentations, the attendees will have ample time for informal discussion among themselves during the breaks and during the provided lunch. There will be time for discussion with vendors and viewing of exhibits to see the latest in automation and measurement products. The registration fee includes technical sessions, exhibits, lunch and break refreshments, one year membership in ARFTG and a post-conference digest of the presented papers.

Looking Forward to the Future

42st ARFTG Conference—RF and Microwave Testing for Commercial Applications

The 42st ARFTG Conference will be held in San Jose, California, on December 2 and 3, 1993. The theme of this one-day technical conference with concurrent manufacturer exhibits will be RF and Microwave Testing for Commercial. For applications such as personal, cellular and satellite communications, collision avoidance and navigation, and gigabit rate processors, expectations are that production costs will be continuously reduced. To meet this challenge automatic RF measurement techniques developed for the defense industry need to be distilled and merged with manufacturing techniques developed for the commercial electronics industry. Papers are invited on such topics as optimization and reuse of test plans, design for testability, automated calibration and verification, fast test algorithms and equipment, test executives, links to computer-aided design and manufacturing, and fixturing and interconnects suitable for multiple connections. In addition, papers concerning all other areas of automated microwave measurements and design are welcome.

Those interested in participating should contact Conference Chair Kevin Kerwin, Hewlett-Packard MWTD—1 US, 1400 Fountaingrove Parkway, Santa Rosa, CA 95403. Deadline for paper submissions will be approximately September 15, 1993. See Call for Papers in the back of the Newsletter for more information.

EXCOM Activities

At the Orlando meeting elected or re-elected to three year EXCOM terms were: Gary Simpson, Mike Caldwell, Kevin Kerwin and Pat Nolan. In addition, EXCOM officer elections were held and officers elected were: Bill Pastori as President, Gary Simpson as Vice-President, J. Greg Burns as Treasurer, and Pat Nolan as Secretary.

Measurement Professional? or Just Interested in Learning More?

We will be looking forward to discussing the latest in measurement automation and accuracy with you in Atlanta or San Jose. ARFTG brings you the latest in RF, microwave and millimeter-wave analysis, design and measurement. State-of-the-art papers are presented twice a year. If you are involved in automated measurement techniques, come and join your peers and keep current with our ever-evolving technology. For more information on ARFTG or future conferences, write: John Barr, Santa Rosa System Division—3US-V, Hewlett-Packard, 1400 Fountaingrove Parkway, Santa Rosa, CA 95403.
MTT-S Bylaws Amendments

by Aditya Gupta

Changes to the Society's Bylaws approved by the Administrative Committee at the January 1993 meeting in Atlanta are summarized in this section. In accordance with Article IX, Section 2, of the MTT-S Constitution and Section VIII of the Bylaws, these amendments will take effect thirty days after they have been publicized to all MTT-S members unless objections are received from a minimum of ten percent of the members. The Constitution and Bylaws were last published in the Summer 1992 Newsletter. The proposed changes are outlined below. Changes to the MTT-S Bylaws may be requested by anyone. However, they must be approved by a two-thirds vote of the Administrative Committee members voting. Once approved, such changes take effect after the IEEE Technical Activities Board (TAB) has been notified and 30 days after the change has been publicized to the MTT-S membership.

The AdCom approved the creation of a new section of the Bylaws (VIII) to make room for a section on MTT-S Awards. In addition, since an Honorary Life Membership of the Society is an award, the entire contents of the existing Section I.B-4 have been moved to the new Section VI. All these changes are summarized in the following Bylaws amendment. The added text is underlined.

MTT-S Bylaws Change (Sections I, VI, VII and VIII)

1. Create a new section, VIII, to make room for a section on awards (as Section VI—MTT-S Awards).
2. Change the number of the current Section VI to Section VI with indicated content as follows:
   - Section (VIII) VII Miscellaneous Committee Business
     - A. Administrative Year
     - The Administrative Year of the Society shall be January 1st through December 31st of the same year.
     - The remainder of present Section VI will remain in the new Section VI. See Change 4 below.
3. Move the entire contents of existing Section I.B-4 (Honorary Life Member) to the new Section VI (see Change 4). This change is proposed since an Honorary Life Membership of the Society is an award.
4. Create a new section as Section VI and include all awards now in the present Section VI.

MTT-S AWARDS

After approval by MTT-S AdCom and IEEE, MTT-S awards are documented in this section of the Bylaws (see Section III, para. A.10).

Paragraphs of present Section VI become paragraphs of the new Sections VI and VII as follows:

- A. Administrative Year (Old Section VI)
- New: Section VII, paragraph A.
- Honorary Life Member (Old Section I.B-4)
  - A. Honorary Life Member (New Section VI)
  - B. The Microwave Prize (Old Section VI)

E. The Microwave Prize (New Section VI)
F. Distinguished Service Award
G. The Microwave Prize and Distinguished Service Award MTT-S awards as identified in Section VI—MTT-S Awards.

The AdCom approved changes to Section III—Committees, to add the duties of the Microwave and Guided-Wave Letters (MGWL) Editor and to make the MGWL Editor an ex-officio member of AdCom, if not already a member of AdCom. This privilege is currently enjoyed by the Transactions editor. These changes are summarized in the following Bylaws Amendment.

SECTION III—COMMITTEES

2. PUBLICATIONS COMMITTEE

The Publications Committee shall be responsible for publication and dissemination of technical information of interest to the Society. The Committee shall be responsible for publishing (a) the Transactions on Microwave Theory and Techniques and (b) the Microwave and Guided-Wave Letters. The Committee is also responsible for notifying the technical community of meetings, special publications and other information of interest to the Society through its publications.

(a) Transactions Editor

The Transactions Editor is responsible for the technical editorial content of the IEEE Transactions on Microwave Theory and Techniques. The Editor is also responsible for coordination with the IEEE facilities for publication. The Transactions Editor shall appoint and be Chairman of the Transactions Editorial Board. The Transactions Editorial Board shall consist of Associate Editor(s) and Reviewers as are needed by the Editor to perform his duties. The Transac-
Editors shall be Chairman of the Letters Editorial Board. The Letters Editorial Board shall consist of Associate Editor(s) and Reviewers as are needed by the Editor to perform his duties. The Letters Editor is recommended by the Chairman of the Publications Committee and approved by the Administrative Committee, nominally for a three-year term. The Letters Editor will continue to serve until such time as a successor is appointed.

SECTION II-ADMINISTRATIVE COMMITTEE MEMBERSHIP

E. Transactions and Letters Editors

The Transactions and Letters Editors, if not an Elected Member of the Administrative Committee, shall be an Executive Members of the Administrative Committee during the their tenures in that those offices and for a period to terminate on a December 31st ranging from at least one to less than two years thereafter. The Transactions and MGWL Editors shall be members of the Society.

The Distinguished Educator Award was approved by AdCom in 1992. At the winter meeting, AdCom approved the following formal description / requirements of this award to be included in Section VI.

SECTION VI-MTT-S AWARDS

G. Distinguished Educator Award

The Society shall present an award known as The Distinguished Educator Award. This award was inspired by the untimely death of Prof. F. J. Rosenbaum (1937-1992), an outstanding teacher of microwave science and a dedicated MTT-S AdCom member/contributor. It will be presented to a distinguished educator in the field of microwave engineering and science who best exemplifies the special human qualities of Fred Rosenbaum who considered teaching a high calling and demonstrated his dedication to MTT-S through tireless service.

The Distinguished Educator Award will be considered annually and may be presented if a suitable candidate is identified. The candidate must be a member of IEEE and MTT-S at the time of nomination.

The nomination of the recipient of the Distinguished Educator Award will be the responsibility of the MTT-S Awards Committee which will make its recommendation to the MTT-S AdCom at the annual meeting. The award shall consist of a plaque, an honorarium of $1000 and a feature publication in the MTT-S Transactions. The award shall be presented at the annual IMS Awards Banquet.

1. GUIDELINES FOR DISTINGUISHED EDUCATOR AWARD

The award shall be made to an individual who must be a distinguished educator, recognized, in general by an academic career. It is desirable for the candidate to have received other teaching awards. The effectiveness of the educator should be supported by a list of graduates in the field of microwave science, who have become recognized in the field. Relevant letters of support are encouraged. The candidate shall also have an outstanding record of research contributions, documented in archival journals. The candidate shall have a record of many years of service to MTT-S.

The AdCom also approved a proposal by Jorg Raue, Chairman of the Technical Coordinating Committee, to change the name of the "Emerging Technologies Workshop" to "Winter Technical Committee Meeting (WTCM)." Jorg stated that the new name more closely reflected the actual purpose of this meeting. In accordance with this amendment, the old name has been replaced by the new one where ever it appears in the Bylaws.

Bi-isotropics '93—Notes from the Novel Microwave Materials Workshop

by Ari Sihvola

During the first week of February, 1993, Helsinki University of Technology hosted a workshop on novel microwave materials. Bi-isotropics '93 was the name of the four day-and-night workshop that attracted 17 participants from six countries: Finland, Russia, Belorussia, France, United Kingdom and Germany. The focus of the talks was intended to be the theory and applications of bi-isotropic materials (chiral and nonreciprocal) in electromagnetics and microwave engineering, but it may be due to the nature of this rapidly progressing field that also results on more general, bianisotropic materials were discussed. The workshop was sponsored by IEEE MTT Society, URSI Finnish National Committee and the Electromagnetics Laboratory of Helsinki University of Technology.

Why this workshop? Well, electromagnetics and microwave technology are progressing these years with considerable pace. One of the frontiers at which major conquests are being made is that of new materials. It is only during the latest years that the microwave community has recognized the potentialities of novel, more complicated material effects in the design of new components and systems. Chiral materials may be the most popular example of these complex media, and quite a lot of time in the workshop was devoted to the theory, applications and measurement principles of chiral media.

One highlight in Bi-isotropics '93 was the lecture Covariant Methods in the Theory of Electromagnetic Waves, by 82 year-old Academician Fedor I. Fedorov from Minsk, Belorussia, who is one of the greatest physicists of the former Soviet Union, and a pioneer of the research on optical activity.

A Book of Abstracts of the workshop has been compiled. For a copy, please contact the Workshop Organizer,

Dr. Ari Sihvola
Helsinki University of Technology, Electromagnetics Laboratory, Otakaari 5 A, SF-02150 Espoo, Finland
Ph: 358-0-451-2261
Fax: 358-0-451-2267
E-mail: ari.sihvola@hut.fi
<table>
<thead>
<tr>
<th>Date</th>
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Advance Conference Registration

1993 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM
June 14-18, 1993 • Atlanta, Georgia • MTT-S • MMWMC • ARFTG • NTC

Each Conference Attendee must submit a separate registration form. A copy of this form may be used. To ensure advanced registration, this form and payment must be received by May 21, 1993.

On-site fees will be approximately 30% higher.

NAME
Last First

AFFILIATION
Company, Etc.
Mail Stop

ADDRESS
Street
City State Zip Code

TEL. NO.

IEEE MEMBER □ Yes □ No IEEE Membership No. □

Check ☑ each function for which you wish to register.

MTT-S Symposium
Tue., Wed. & Thur.
☐ All MTT-S Sessions ☐ $210 ☐ $295 ☐ $—
☐ Single-Day Registration ☐ $100 ☐ $140 ☐ $—
☐ Student, Retiree, Life Member ☐ $25 ☐ $25 ☐ $—

MMWMC Symposium
Mon. & Tues., (Includes MMWMC Reception and Digest)
☐ $85 ☐ $110 ☐ $—

Automatic RF Techniques Conference
Fri., (Includes breakfast, lunch, and ARFTG Digest)
☐ ARFTG Member ☐ $125 ☐ $125 ☐ $—
☐ ARFTG Non-member ☐ $150 ☐ $150 ☐ $—

National Telesystems Conference
Wed. & Thurs., (Includes NTC Digest)
☐ $145 ☐ $175 ☐ $—

Additional Digests
MTT-S Qty @ ☐ $80 ☐ $75 ☐ $—
MMWMC Qty @ ☐ $35 ☐ $50 ☐ $—
ARFTG (Member) Qty @ ☐ $20 ☐ $20 ☐ $—
ARFTG (Non-member) Qty @ ☐ $20 ☐ $20 ☐ $—
NTC Digest Qty @ ☐ $25 ☐ $30 ☐ $—

Panel Sessions
See reverse side for complete titles, schedules and locations.
☐ PSMA: PCN IDs Mon. Lunch ☐ $—
☐ PSTA: DBS Tues. Lunch ☐ $—
☐ PSTB: MMICs Commercial Weds. Lunch ☐ $—
☐ PSWA: Multi-Function MMIC ☐ $—

Awards Banquet
Wed. Evening, Marriott Marquis Qty @ ☐ $45 ☐ $—

Workshops (See reverse side for complete titles & locations)
Student/Retiree Fees
Full Day (AM & PM) ☐ $75 ☐ $40 ☐ $—
Half Day (AM or PM) ☐ $40 ☐ $20 ☐ $—

(A.M includes continental breakfast, PM includes box lunch.)

Category

IEEE MEMBER □ Yes □ No IEEE Membership No. □

Check ☑ each fee and enter the fees in the Remittance column.

MTT-S Symposium
☐ All MTT-S Sessions ☐ $210 ☐ $295 ☐ $—
☐ Single-Day Registration ☐ $100 ☐ $140 ☐ $—
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MMWMC Symposium
☐ $85 ☐ $110 ☐ $—

ARFTG Symposium
☐ ARFTG Member ☐ $125 ☐ $125 ☐ $—
☐ ARFTG Non-member ☐ $150 ☐ $150 ☐ $—

National Telesystems Conference
☐ $145 ☐ $175 ☐ $—

MTT-S Qty @ ☐ $80 ☐ $75 ☐ $—
MMWMC Qty @ ☐ $35 ☐ $50 ☐ $—
ARFTG (Member) Qty @ ☐ $20 ☐ $20 ☐ $—
ARFTG (Non-member) Qty @ ☐ $20 ☐ $20 ☐ $—
NTC Digest Qty @ ☐ $25 ☐ $30 ☐ $—

Guest Programs (*Lunch is included, transportation is included)
See reverse side for complete information.
GA: Atlanta Hit (Tues.) Qty @ ☐ $40 ☐ $—
GB: Around the Town (Wed.) Qty @ ☐ $40 ☐ $—
GC: The Old South (Thurs.) Qty @ ☐ $40 ☐ $—
GD: Baseball Game (Tues. Evening) Qty @ ☐ $18 ☐ $—
GE: Laser Show (Tues. Evening) Qty @ ☐ $18 ☐ $—

The only acceptable forms of payment are cash, check, money order, MasterCard, or VISA.

Make your check or money order (U.S. $ ONLY on a U.S. Bank or Travelers Check) payable to:
“1993 IEEE MTT-S Symposium” or charge your MasterCard or VISA: □ MasterCard □ Visa

Card Number Expiration Date Signature

Written requests for refunds will be honored if received by May 21, 1993. A $25 cancellation fee will be charged for processing.

MAIL COMPLETED FORM AND PAYMENT TO:
1993 IEEE SYMPOSIUM, c/o LRW Associates, 1218 Balfour Drive, Arnold, MD 21012, USA
Fax Number: (410) 647-5136. If this form is sent by FAX do NOT also mail; a Credit Card Number must be included.
### Workshops

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<tr>
<td>WSMA</td>
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<td>High Power Microwave Generation and Its Commercial Applications</td>
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<td>WSMC</td>
<td>8AM/5PM</td>
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<td>8AM/5PM</td>
<td>Picosecond and Femtosecond Electromagnetic Pulses-Analysis and Applications</td>
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<td>8AM/5PM</td>
<td>Thermal Aspects of Microwave Device and Circuit CAD</td>
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<td>WSMH</td>
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<td>Filters and Multiplexers for Mobile Communications</td>
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<td>WSMI</td>
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<td>Electromagnetic Wave Interaction with Water and Moist Substances</td>
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<td>8AM/5PM</td>
<td>Critical Issues in Experimental Validation</td>
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<td>8AM/5PM</td>
<td>Microwave HBTs and HEMTs: Circuit Applications and Reliability</td>
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<td>WSFB</td>
<td>8AM/5PM</td>
<td>Combined Self-Consistent Particle Transport Simulation and Full Wave Dynamic Field Simulation for Monolithic Solid State Device and Circuit Calculations</td>
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<td>EM Modeling of Microwave Packages and Interconnects</td>
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<td>The Art of Designing Power MMICs</td>
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<td>WSFG</td>
<td>1PM/5PM</td>
<td>Surface Mount Packaging for High Volume MMIC Component</td>
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### Panel Sessions • World Congress Center

**12:00 Noon to 1:30PM**

- **PSMA** Monday: What MMIC Technology Will Win The PCN Race?
- **PSTA** Tuesday: Direct Broadcast Satellite (DBS) Market Technology and Trends
- **PSTB** Tuesday: MMICs in Commercial Markets
- **PSWA** Wednesday: Multi-Function MMIC Design: Issues and Trade-offs

### Guest Programs

**9:30 AM to 3:30 PM Unless Otherwise Noted**

- **GA** Tuesday: Atlanta Hits - Tour Includes Coca Cola, CNN, Underground Atlanta
- **GB** Wednesday: All Around the Town - Peachtree Street, The Cyclorama, MLK, Carter Center, Swan House and Buckhead
- **GC** Thursday: The Old South - Ante-bellum Homes of Covington and Social Circle, Georgia
- **GD** Tuesday Evening: Baseball Game - Braves vs. New York Mets
- **GE** Tuesday Evening: Stone Mountain Laser Show
CONFERENCE HOUSING
1993 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM
June 15-17, 1993 • Atlanta, Georgia
MTT-S • MMWMC • ARFTG • NTC

SEND COMPLETED FORMS TO:
IEEE MTT-S 93 Housing Bureau
233 Peachtree St., N.E.
Suite 2000
Atlanta, GA 30303

COMPLETED FORMS MUST BE RECEIVED AT THE HOUSING BUREAU BEFORE MAY 14, 1993

SEND NO CHECKS OR MONEY TO THE HOUSING BUREAU

Hotel locations and rates are shown on the reverse side of this form.

INSTRUCTIONS AND HOUSING BUREAU POLICY
1. Please print or type all data requested.
2. All room reservations must be made by mail. No telephone calls will be accepted.
3. All reservations will be processed on a first-come, first-served basis.
4. Hotels will confirm reservations directly.
5. Before 5/14/93 contact MTT-S Housing at the above address in writing to arrange cancellations and changes.
6. After 5/14/93 contact the hotel which confirms the reservations to arrange cancellations and changes. Cancellations must be received by confirming hotel at least 72 hours prior to arrival to qualify for refunds.
7. Copies of this form may be used to reserve more than the three rooms for which it provides.
8. Send no checks or money to the housing bureau!

HOTEL PREFERENCE
(Please write full name of hotel and show at least three choices.)

First choice ____________________________  Third Choice ____________________________
Second choice ____________________________  Fourth Choice ____________________________

Confirmations for all rooms reserved will be sent to:

NAME ____________________________ Last ____________________________ First ____________________________
COMPANY ____________________________
ADDRESS ____________________________
CITY ____________________________ STATE ____________ ZIP ____________
COUNTRY ____________________________ PHONE (__________) ____________________________

To guarantee, provide the following credit card information: (Do not send any money to the Housing Bureau)
CARD NAME: □ AM. EXP.  □ M/CARD  □ VISA  □ OTHER ____________________________
CARD HOLDER NAME ____________________________
CARD NO. ____________________________ EXP. DATE ____________________________

ROOM OCCUPANTS
1. Print or type names of persons occupying each room. If more than 3 rooms are required, attach a list providing the information requested below for each additional room.
2. Select room type desired, indicate arrival and departure dates and arrival time.

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* A small number of rooms at reduced rates are available at this hotel for bona-fide Government employees. Valid identification will be required at check-in to claim reservations for these rooms.
T
he Automatic RF Techniques Group (ARFTG) is an independent professional society that is affiliated with MTT-S as a conference committee. ARFTG's primary interests are in computer-aided microwave analysis, measurement and design. ARFTG holds two conferences each year, one in conjunction with the MTT-S International Microwave Symposium and a second later in the fall of the year.

40th ARFTG Conference Measurement and Design of Packages and Interconnects

The 40th ARFTG Conference was held in Orlando, Florida, on December 3 and 4, 1992. The theme was Measurement and Design of Packages and Interconnects. In attendance were 71 paid technical attendees. There were 11 tables in the concurrent exhibitors' room. The conference focused on design, measurement and test of microwave and high speed digital packages. A wide variety of packages are being used including MCM, MHMIC, Flip Clip, LTCC and traditional MMIC packages. Speakers addressed package effects, multiconductor PCB effects and transitions to/from circuits in the packages. Below is a list of the presented papers:

• **Planar Resistors for Probe Stations**, D. K. Walker
• **Surface Wave Phenomenon in Wafer Probing Environments**, E. M. Godshalk
• **Accuracy Considerations in Internal Node Timing Measurements of High-Performance MCMs**, Reed Gleason
• **Coplanar Versus Microstrip Measurements of Millimetre Wave Devices**, P. C. Walters
• **Modeling, Simulation and Design of Dissipative, Dispersive Uniform and Nonuniform Multiconductor Interconnects**, V. K. Tripathi
• **Accurate Modeling of MHMIC Passive Elements Yields a Successful Design and Packaging of a 20 GHz to 5 GHz MHMIC/MMIC Low-Noise Downconverter**, J. Fikart
• **Automating Test Operations to Improve Quality and Productivity**, S. Williamson
• **T/R Models for Automated Assembly and Test Using Flip Clip and LTCC Packaging**, D. K. Sakamoto
• **A Frequency Domain Analysis of Multi-Conductor Transmission Line Interconnect Topologies**, T. Rahal-Arabi
• **Using Microwave Coupled Resonator Filter to Characterize Thick Film Interconnects for High Frequency Signal Propagation**, R. R. Gryzbowski
• **Measuring Package and Interconnect Model Parameters Using Distributed Impedance**, B. Junko
• **Interconnection Transmission Line Parameter Characterization**, R. B. Marks
• **Time Domain Measurements and Characterization and Modeling of Interconnects**, V. K. Tripathi
• **Frequency Domain Characterization of High Speed Digital Circuit Interconnects in a Multilayer Printer Circuit Board**, A. P. Agarwal

**ARFTG Highlights Spring '93**

by John T. Barr, IV

- Save the "Thru" in ANA Calibration, A. Ferrero
- Calibrating Microwave Probes to the Probe Tips, D. F. Williams
- Characterizing Blind Mate Connectors, W. Oldfield
- Temperature Dependent Characterization of GaAs MESFETs, L. P. Dunleavy
- Microwave Characterization of Microshield Lines, R. F. Drayton
- An Efficient Temperature-Dependent S-Parameter Calibration Routine, J. R. Martin
- Extracting the Required Reflection to Compensate the Sealed Connector of a Microstrip Fixture, H. Stinehelfer
- Measurement of Dynamic Current in Switching CMOS Buffer, O. Pedersen

**Special Issue Distribution**

by N.R. Dietrich

A copy of the Institute of Electronics, Information and Communications Engineers (IEICE) Transactions on Electronics including a special issue titled "Optical/Microwave Interaction-Devices, Circuits and Systems" was recently distributed to all MTT members who have expressed an interest in lightwaves on their IEEE membership interest profile. The distribution has been arranged by MTT-3, the MTT Technical Committee on Lightwave Technology. It is financed through the support of the MTT Administrative Committee, AdCom.

A limited number of extra copies is available free of charge (while they last) to any additional MTT members who may also have an interest in the topic. Written, faxed or e-mail requests (one copy per request, include IEEE membership number, please) should be directed to:

Ms Marsha Tickman
IEEE Technical Activities
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
tel: 908-562-1571
fax: 908-562-1571
e-mail: m.tickman@ieee.org

We hope you find the issue interesting and informative, and that you will continue to support the growing interest in lightwave technology within the microwave community.
**Viewpoints**

The following correspondence and response were noted in the IEEE Instrumentation and Measurement Society Newsletter, issue No. 118, Winter 1993 and is reprinted with the kind permission of the editor, Tom Garver.

Dear Editor,

During discussions with friends and colleagues, questions concerning video display terminal emissions have been raised. Professor Ashley has written recent articles in the I & M Society Newsletter on this subject. If possible, it would be helpful and informative to have Prof. Ashley address some of the following topics, possibly in a future issue of the I & M Newsletter.

In the Summer 1992 I & M newsletter, Prof. J. Robert Ashley discussed emissions from computer monitors. In his article, Prof. Ashley did not discuss the Swedish standards that are sometimes referenced in advertisements. How do the Swedish standards compare to the IEEE standards that were discussed?

Since many keyboards, CPU cases and work stations are constructed of ferrous and nonferrous materials and from plastics, will these materials and their placement effect measurements? If these materials influence the measurements, will they also effect the fields to which the computer users are exposed?

The statement "A suitable method for measuring the AC electric field near CRT faceplate has not been published" seems strange considering all the TV and computer monitor research. In the Winter 1991 Newsletter, Ashley discussed the IEEE Standards Project P1140. What is his criticism of those measurement methods?

Finally, would Prof. Ashley comment on what defines a low radiation monitor and how this is achieved by manufacturers. Is it worthwhile to purchase low radiation monitors based on low radiation specifications? When would it be recommended to replace existing equipment with low radiation monitors? Do liquid crystal displays (LCD) have the same levels of emissions as VDTs and would these be a viable alternative to low emission VDTs?

Sincerely,

Dennis Destefan
Broomfield, CO

**Video Display Terminal Political Science**

by J. Robert Ashley

**Introduction**

The provocative letter from I & M member Dennis Destefan in the Fall 1992 I&M Society Newsletter raises questions which are essentially "political" in nature. Although the term "politics" has some unpleasant connotations, I think the definition "the total complex of relations between men in society" has merit here. The men and women involved in this issue include reporters, lawyers, government officials, labor union leaders, etc.—most of whom have no formal education or skill in college level physics. If students in EM theory classes consider the study of fields and waves as deep as the ocean, how can we hope that those without their several courses in calculus and physics can comprehend the issue of power line or appliance electrical safety?

The factor I personally find most frustrating is that engineers are not respected for their ethics. People are pleased to use the computer monitors we have provided; yet, when some tabloid journalist makes a claim about monitor safety, other reporters dismiss engineering replies debunking that claim as "bought by the industry."

Another public relations problem in this issue is a natural instinct for engineers and other workers in "hard" science not to be "dogmatic." Such a tendency is taken as "being uncertain" or "not understanding" by non scientists. Those who have an ax to grind or an ego position to justify take advantage of us here. Thus, in my current writing for 5 non-engineering people, I tend to be dogmatic. I will do so here and if anyone wants to challenge my science, my choice of weapon is a Poynting Vector at one meter.

**Jargon vs. True Science**

The "questions concerning video display terminal (VDT) emissions" are first answered by correcting terminology. I first read of VDTs in the entertainment magazine, The New Yorker. I now consider "VDT" the terminology of the enemy and if anyone wants to challenge my science, my choice of weapon is a Poynting Vector at one meter.

We know how to control CRT voltage and glass composition to make this a truly negligible health hazard. Thus, I dogmatically state the following:

1. There is no radiated or emitted ELF or VLF electromagnetic wave from any cathode ray tube display (CRTD).
2. The fringing ELF and VLF magnetic field is caused by the deflection yoke. The magnitude is so low that a biological interaction with human tissue is physically impossible. CRTD magnetic fields are harmless.
3. The fringing ELF and VLF electric field is caused by the high voltage power supply "ripple" found on the CRT face plate. The only situation where the magnitude is sufficient to cause concern is for a child putting finger prints on the face plate of a 25 inch console TV.
4. The ELF and VLF magnetic fields near any computer monitor cannot cause a miscarriage, cancer, or any other health effect.
5. Epidemiology cannot determine if magnetic fields or electric fields alone are a public or occupational health risk.
6. The epidemiology studies I have read are seriously flawed in determining exposure—that is, in making decent electronics measurements!
7. There are no peer reviewed papers to give a physics basis for what you might read about VDTs in the entertainment media or trade press.
8. Electromagnetic fields near CRTDs and power lines are harmless because they are non-existent.
9. The theory of power line fringing fields is totally different than for CRTD fringing fields. There is no way to relate power lines, CRTDs, cellular telephones, police radars, etc., in terms of health hazard. The amazing thing is that none of the above are hazardous.

In the past, the knowledge above has led to the kind of a statement by engineers "CRTDs have not been proved to be
hazardous." This is commendable engineering science but poor political science. One must be dogmatic CRTDs are electrically safe!

**CRTDs Do Not Have Emissions**

Now for the questions raised by Dennis Destefan. First, "How do the Swedish standards compare with the IEEE Standards that were discussed?" There are two Swedish documents involved in the media phobia about "low radiation VDTs." The methods for making measurements are discussed in "Test Methods for Visual Display Units". I will comment later on the measurements in answering the questions about P1140. The use of the measurements is discussed in "User's Handbook for Evaluating Visual Display Units". There is much good material about visual ergonomics in these documents. However, the material on "Emission Characteristics" is the source of what you usually read about the Swedish Standards.

The word "emission" is the start of the troubles. CRTDs or VDUs DO NOT emit or radiate! In the measurement methods, the documents do correctly speak of alternating electric field and magnetic field with the correct SI units of volts per meter and microtesla. But, by using this word emission synonymously to "radiation," fears and phobias related to X-radiation and H bombs are stirred up.

In the BACKGROUND section of [2], we read:

The work environment debate on visual display units (VDUs) started in earnest during the first half of the 1980s. It was concerned not only with stress and monotonous work, but also with visual ergonomics and the effects of electromagnetic fields. The symptoms of poor work environment that were raised in the debate were mainly the possible risks of an increased number of miscarriages by pregnant women, skin problems associated with VDU work and hypersensitivity to various types of light sources. There was then, as now [1990] no scientific proof of any of these effects.

The part we see quoted in the entertainment media is the GUIDELINES section of [2] which gives the results of measurements on the "best" VDUs available in 1990. The actual numbers are for the magnitudes of the fields about 50 cm in front of the screen of a CRTD. No assertion in [2] can be interpreted to indicate the magnitudes given are harmful, "standard," or needed as performance limits.

**CRTD Magnetic Fields Are Harmless**

The magnetic field guidelines are illustrated by Fig. 2.04A of [2]. The illustration is accurate in that the magnetic fields do originate in the deflection yoke near the center of a CRTD. The part lacking is that there are both "vertical direction" lines as shown and "horizontal direction" lines that are not shown. Ironically, the laws of electron optics tell us the vertical direction lines are related to the horizontal deflection of the beam in a CRT—and would be in the 3 to 300 kHz VLF spectrum. Also, the waveshape is sawtooth. The horizontal direction lines are related to the 3 to 3000 Hz ELF vertical deflection.

The figure is accurate in indicating that the presence or absence of the human operator makes no difference in the magnetic field shape or geometry. However, the popularized interpretation of this theory is that magnetic lines "cut" the human body and penetrate the interior regions to have an effect. Of course, the "effect" is assumed to be harmful. Maxwell's laws debunk this assumption. The point form of Maxwell's curl equations tells us nothing about current flowing in the human tissue. The integral forms must be used; specifically, Faraday's law is needed for computing the electric fields and current densities. We sketched the theory in [3]. Doing the computations correctly leads to my dogmatic assertion that a fetus will not feel the CRTD fringing magnetic fields. Although the magnetic field does cut the fetus, it cannot in any way contribute to the mother having a miscarriage.

![Figure 2.04A, The low-frequency magnetic field around a VDU.](image)

Those who understand the physics of using a magnetic loop to measure a time varying magnetic field can appreciate how the difficulty of making this measurement indicates how negligible the currents in tissue must be. Consider using a 10 cm (4 in) diameter pickup coil located where a fetus might be located. To obtain sufficient ELF signal to view on a modern digital oscilloscope (say a few millivolts peak-to-peak), that pickup coil needs to have about 10,000 turns! If one integrated the CRTD ELF magnetic field around the contour of a first trimester fetus, the resulting electric field would be in the order of nanovolts per meter—totally negligible!

Consider a hypothetical experiment for measuring magnetic fields. Build a pick-up coil with a ferrite core and closely located operational amplifier integrator. Such a coil could comfortably fit in a person's mouth. Carefully and firmly mount this coil near a CRTD and check the output with an oscilloscope. Now, have a person carefully open his/her mouth and enclose the coil therein, without moving the coil. There will be absolutely no change seen on the oscilloscope. Since the magnetic field has not changed, there has been no loss of energy density in the surrounding human tissue. Again, ELF magnetic fields near CRTDs and under power lines DO NOT have a biological effect, good or bad, on human tissue.

The numbers given in [2, p. 57] are 25 nT at VLF, 250 nT at ELF. To indicate the absurdity of the media propagated phobia, the 250 nT number has been interpreted as a "Swedish 2.5 milligauss standard for power lines." Such possible misinterpretation is the consequence of a "political" based standard. As a result of this and the even more serious financial consequences of the "prudent avoidance" basis of the Florida EMP Rule [4], I am firmly opposed to any other than health (physics) based EMF standards for maximum exposures or for measuring methods.

**Television Electric Fields**

I first learned of CRTD electrical field measurements in connection with the P1140 Working Group which is trying to adapt [1] to be an IEEE measurement standard for VDTs. My first reaction was "bullfeathers—there ain't no ELF electric field from the vertical deflection electronics!" However, I have learned NOT to publish such reactions until I have tried a measurement. What a surprise I received when I used the E-field sensor from a commercially available power frequency equipment with my old Tektronix 647A oscilloscope. There is all sorts of E field "garbage" in front of my 1976 Heathkit 25 inch console color TV. There are two sources: 1) power supply
ripple applied to the face plate; and, 2) the 50-50 chance that the power cord plug is inserted to put 120 V, 60 Hz on the CRT face plate. Yes, that is a "crude and uncalibrated" measurement. I did learn enough to state "A suitable method for measuring the AC electric field near a CRT face plate has not been published" which rightfully seemed "strange" to Dennis Destefan. The criticisms of the Swedish methods [1] are essentially: 1) A time domain indication is not used; 2) No variation of the field change with distance is obtained; 3) The effect of the keyboard on VDU electric fields is ignored. I stick to my Poynting Vector about electric field measurements!

IEEE Standards Project P1140

My previous criticism of P1140 in the Winter 1991 Newsletter was technically based on the measurement factors just discussed. In answer to Dennis Destefan's request for information about P1140, I will try to bring you up to date. A strong minority on the working group made it apparent that the document would never be completed with the "Appendix to my Poynting Vector about electric field measurements!"

Destefan. The criticisms of the Swedish methods [1] are essentially: 1) A time domain indication is not used; 2) No variation of the field change with distance is obtained; 3) The effect of the keyboard on VDU electric fields is ignored. I stick to my Poynting Vector about electric field measurements!

The magnetic field measurement technique given in [1] is essentially the use of two separate commercially available instruments, one for ELF and one for VLF. Each instrument has a three-axis pick-up coil assembly and uses baseband filters to separate ELF and VLF. The equipment itself is of reasonable design. The problem is possible misuse by those who have inadequate knowledge of magnetic field and CRTD theory. Practically, I fear that technicians supporting epidemiology studies will take repeatable data that will be considered useful because the measurements are in accordance with "a Standard." At this stage of medical and epidemiological research, the methods of [3] are quite adequate and give much more information to the researchers.

The real problem I see with the P1140 DRAFTs is in regard to the electric field measurements. Neither [1] nor [2] contains an illustration for alternating electric fields corresponding to the illustration for magnetic fields near a VDU. After 14 years of university level teaching of EM theory, I doubt that a single one of my many fine students could come up with a sketch to illustrate the measurement withOUT first hitting the books for a couple days. The classroom snow about Laplace's equation, tangential and normal displace-

Figure 2. Suggested sketch of E fields

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IEEE MTT-S Newsletter   Spring 1993   Page 26
tell you it’s do or die!” The voice of Leary McFly boomed toward me. It was early Monday morning and I had just walked into the building (without having had any coffee, I might add). I just wasn’t ready for this. McFly was talking at someone in the hallway and they were standing directly in front of the door to my office. I thought about turning back then and I should have. But I didn’t. As I got closer to my office I recognized the person McFly was with. It was Bo Cambert. In the most recent reorganization-to-end-all-reorganizations (or was it in the mother-of-all-reorganizations) Bo had been made Vice President of Strategic Stuff and Principle Power Broker. It seems that last year Bo had been given spending authority over a huge amount of money and had managed not only to spend it all, but to go it, budget by a record amount. Naturally, this qualified him for promotion.

“Do or die!” McFly was repeating himself. I was now standing face to face with Cambert so I initiated a conversation: “What kind of new and exciting programs have you got planned for us, Bo?” As soon as I asked I knew that it was a mistake, but it was too late.

Bo responded immediately. “You know, Mike, I wanted to talk to you about launching an effort to combine what we know about microwave devices with recent scientific advances in other areas—keeping in mind the nature of the global economy and our corporate initiatives to protect the environment.” McFly was nodding agreement. “The fact that Bo had said this with a straight face should have tipped me off that he was serious. Unfortunately, I decided to carry what I had perceived to be a joke to a higher level of absurdity. “Perhaps we could develop a room temperature superconducting microwave device that would convert air pollution into raw energy while beaming a message of tranquility throughout the planet.”

McFly recognized an opportunity to provide us with his opinion. “My philosophy is that tranquility is good, but not as good as low VSWR,” he said.

“Thank you,” I said looking at McFly. I have learned that thanking McFly for his “philosophy” often keeps him from explaining it to you. The strategy seemed to work this time because McFly only grunted and looked away.

But McFly was the least of my worries. Bo was becoming seriously excited. “Great,” he said handing me a sheet of paper with a meeting agenda printed on it, “have a status report on that program ready for presentation to the Company Steering Committee by 3:00 PM this afternoon.” As if that wasn’t bad enough, Bo went on, “I realize that this program may be on very shaky technical ground and we will probably lose a significant sum of money on it, but focus on the positives for this presentation. Oh ... and by the way, try to come up with a catchy program title.” As Bo turned and walked away briskly, I wondered just what positives I could possibly focus on—maybe a catchy title was the best bet.

My attempts to develop a presentation that morning were thwarted at every turn. First, our computer network went down. Then, the air conditioning to the building went out. When they finally fixed these problems, the only thing my computer seemed to do was adjust the temperature of the lab next door. Finally, late in the morning I discovered that by cleverly adjusting the thermostat in my office, I was able to prepare vu-foils.

That afternoon, as I struggled to complete a presentation that would satisfy Bo without causing personal embarrassment, I received additional discouraging information. A call from our legal department informed me that the patent committee had approved one of the disclosures I had submitted while working on Government contract. That sounded like good news at first. It seems, however, that the idea was conceived while I was working on proposal preparation charge numbers. “Thinking of new ideas while charging these accounts is strictly forbidden by government regulations,” the secretary informed me. “In fact, thinking in general is discouraged when these numbers are being charged.” She went on to inform me that although I would probably receive a patent bonus, I might have to spend 3 to 5 years in jail. At this point in the afternoon I wondered if it would be possible to incarcerate me before I had to go to the Steering Committee Meeting.

By late afternoon I was beginning to think I might never recover from the day. But then I remembered that tonight was the night of our local MTT chapter meeting. The thought was at least a little uplifting. I would go to the meeting, listen to a stimulating presentation, share stories with colleagues and feel better about everything. I tried it and it worked for me. You might want to try it too.

Defense R&D Policy Committee

(Continued from page 12)

while some defense companies such as Martin-Marrietta are bolstering their defense capabilities (note: the GE Aerospace Acquisition).

A second area of discussion was presented by an IEEE Congressional Fellow, Ken Wagner, on the Defense Workers Economic Reinvestment Act (official title: A Bill to Mitigate the Adverse Effects on Defense Contractors and Defense Workers or Reductions in Defense Spending). Key aspects of this proposed legislation are:

1. Alleviation of adverse economic effects on defense contractors and workers.
2. Investments in advanced technology projects to benefit the national technology infrastructure.
3. Creation of critical technology consortia.
4. Commercially available systems, supplies, and services.
5. Retraining, placement, and transition assistance.

The funding and implementation of these programs is not yet specified except to say that the intent to promote a conversation to a more competitive commercial industrial base from a highly funded defense industrial base is clear.

The Defense R&D Policy Committee joined the Engineering R&D Policy Committee at lunch for an informative discussion with Jim Turner, a staff member on the House of Representatives Science and Technology Committee. Jim described the same proposed legislation that Ken Wagner had presented to us earlier, but from the perspective of one responsible for drafting the document. It is clear that Congress is serious about transitioning the primary R&D investment focus from the defense sector to the commercial sector. There is still a major debate concerning the best way to accomplish this. Jim was non-committal in his response to several questions concerning speculation about Clinton’s plans (policies, organizational changes, staff reductions, etc).
IMS Workshops, Panels . . .  
(Continued from page 9)

Panel Sessions

Monday, June 14; Tuesday, June 15; and Wednesday, June 16. These are held at lunch time.

- Which MMIC Technology Will Win the PCN Race?—Monday—S. Moghe
- MMICs in Commercial Markets: More Than a Viewgraph Projection—T—F. Ali, M. Golio, D. Maki

Rump Sessions

Held Tuesday Evening, June 15

- High Efficiency MMIC Power Amplifiers—Watt’s Up?—F. Sullivan, F. Ali
- Commercial and Consumer Markets, and Application of Microwave Digital and DSP Circuits—R. Bayruns
- Computer-Based Education and Corporate Training—M. Iskander

Special Technical Sessions

Tuesday, June 15, and Wednesday, June 16

These sessions are interspersed in the main technical program and provide focused presentations on specific topics of interest. A brief summary of titles follows.

- Intelligent Vehicle Highway Systems (IVHS)—T—R. A. Sparks
- Microwave Power Modules (MPM)—T—R. K. Parker
- Status of Microwave Ferrite Technology—T—J. E. Pippin
- Developments in Global Communications—W—G. L. Heiter
- Wireless Local Area Networks—W—J. B. Horton
- Selected Russian Microwave Technologies—W—G. W. Ewell

Guest Program

(Continued from page 9)

arian and Empire Revival furniture from the 1870-1885 period. There is a marvelous collection of antiques and fine porcelain.

You will enjoy a delicious southern buffet lunch amid the splendor of the Blue Willow Inn, an antebellum home converted into a wonderful restaurant.

On the drive back to Atlanta you will be able to sit back, relax, sip a glass of wine and relive the high points of an exciting day.

All three group tours should be over between 3:00-3:30 p.m. In addition to these tours, guest suite personnel can help you to locate other attractions which you may wish to visit privately, such as Zoo Atlanta, the Botanical Gardens, Fernbank Museum of Natural History, or the shopping malls, such as Phipps Plaza and Lenox Square. Atlanta’s rapid transit system, MARTA, offers clean, safe, convenient and economical transportation to most of Atlanta’s attractions.

The weather in Atlanta is apt to be hot and humid in June, but everything is comfortably air-conditioned, so discomfort is minimal.

We feel we have planned an exciting program to entertain you, and we are looking forward to showing you our city and extending our hospitality.

See you in June.

1993 MTT-S Symposium: Open Forum

by Horton Prather  
Open Forum Chairperson

This year’s Open (Interactive) Forum promises to be one of the best yet! The Technical Program Committee has carefully selected 99 excellent technical papers providing interest ranging from highly analytical subjects to very practical hardware and systems. The interactive format includes computer simulations, hardware demonstrations, and video presentations along with easy-to-view presentation layouts. The opportunity for a one-on-one discussion with the author makes this format highly effective.

We have tried to make the Open Forum as effective as possible by providing an open, spacious layout and common areas to promote discussion among attendees. The Ballroom at the World Congress Center is easy to find and it’s worth the walk to participate in these presentations. Knowing that it is often difficult to schedule time around multiple parallel sessions, we have decided not to have any opening speakers. Come at the time best for your schedule; you won’t miss anything!

The individual papers in the Open Forum will be grouped together in sessions, and related sessions will be held on the same day. We hope this will improve interaction with other attendees and authors, making the Open Forum one of the most valuable you can attend. There will be a generous amount of wine, cheese and snacks to stimulate your thinking!

January Technical Programs Meeting

Pictured above: Howard Ellowitz, Pete Rodrigue, and Harland Howe. At left: Larry Whicker and Gordon Harrison.
What's Happening in CAEME?
(Continued from page 7)

- “Interactive Video Lessons for Electromagnetic Education,” M. F. Iskander, T. Reed, and J. Breen III, University of Utah
- Using Current Artificial Intelligence Techniques to Advise Students,” J. R. Mallory, Rochester Institute of Technology
- Using Student Projects to Develop Instructional Applications and Teach Computer Graphics Programming,” K. Mink, Cornell University

Table 3. List of Software Distributed With the First Two Issues

<table>
<thead>
<tr>
<th>Software Project</th>
<th>Description</th>
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<tr>
<td>“Interactive Video Lessons for Electromagnetic Education,” M. F. Iskander, T. Reed, and J. Breen III, University of Utah</td>
<td>Using Student Projects to Develop Instructional Applications and Teach Computer Graphics Programming,” K. Mink, Cornell University</td>
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</tbody>
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Table 4. List of EM Software Development Projects Funded by CAEME in 1992

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>Radiation Characteristics of Phased Array Antennas and Mutual Coupling of Microstrip Antennas—A. Kishk, University of Mississippi</td>
<td>Application of the Finite Element Method for Quasi-Static and Dynamic Analysis of 2D Arbitrarily Shaped Inhomogeneous Anisotropic Multiconductor and Multidielectric Waveguiding Structures Utilizing the Classical Elements and Edge Elements—M. Salazar-Palma, Polytechnic University of Madrid</td>
</tr>
<tr>
<td>Reflectant Antenna Analysis Software: An Educational Approach—Y. Rahmat-Samii, University of California, Los Angeles</td>
<td>Analysis and Design of Antenna Arrays—A. Elsherbeni, University of Mississippi</td>
</tr>
<tr>
<td>Use of Matlab to Solve EM Problems—J. Lebaric, Rose-Hulman Institute of Technology</td>
<td>Development of Interactive Video Lessons—M. Iskander, University of Utah</td>
</tr>
</tbody>
</table>

Table V. List of Universities Who Have Joined CAEME

<table>
<thead>
<tr>
<th>University Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Force Academy</td>
<td>California State University-Chico</td>
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<tr>
<td>California State University-Northridge</td>
<td>California State University-Sacramento</td>
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<tr>
<td>Carleton University, Canada</td>
<td>Case Western Reserve University</td>
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<tr>
<td>Catholic University of Louvain, Belgium</td>
<td>CETUC-PUC/Rio, Brazil</td>
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<tr>
<td>Chalmers University of Technology, Sweden</td>
<td>Clemson University</td>
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<tr>
<td>Colorado State University</td>
<td>Communications Research Centre, Canada</td>
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<tr>
<td>Concordia University, Canada</td>
<td>Cooper Union</td>
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<tr>
<td>Corning Community College</td>
<td>Dartmouth College</td>
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<tr>
<td>Ecole Polytechnique Federale de Lausanne, Switzerland</td>
<td>Ecole Polytechnique de Montreal, Canada</td>
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<tr>
<td>Ecole Superieure D'Electicite, France</td>
<td>Ecole de Technologie Superieure, Canada</td>
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<tr>
<td>Eindhoven University of Technology, The Netherlands</td>
<td>Electronics &amp; Telecommunications Research Inst., Korea</td>
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<tr>
<td>Florida International University</td>
<td>Florida State University</td>
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<tr>
<td>Forsvarets Forskningsanstalt, Sweden</td>
<td>Fraunhofer-Inst. fur Natur.-Tech. Trendanal., Germany</td>
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<tr>
<td>Gannon University</td>
<td>George Mason University</td>
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<tr>
<td>Georgia Institute of Technology</td>
<td>Georgia Tech Research Institute</td>
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<tr>
<td>Gonzaga University</td>
<td>Hampton University</td>
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<tr>
<td>Hamilton University</td>
<td>Hellenic Air Force Technology Center, Greece</td>
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<tr>
<td>Helsinki University of Technology, Finland</td>
<td>Howard University</td>
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<tr>
<td>Illinois Institute of Technology</td>
<td>Illinois Wesleyan University</td>
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<tr>
<td>Indiana University-Purdue University, Fort Wayne</td>
<td>Instituto Maua de Tecnologia, Brazil</td>
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<tr>
<td>Instituto Superior Tecnico, Portugal</td>
<td>Iowa State University</td>
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<tr>
<td>Johns Hopkins University</td>
<td>King's College, University of London, England</td>
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<tr>
<td>Loyola Marymount University</td>
<td>Massachusetts Institute of Technology</td>
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<td>McGill University, Canada</td>
<td>Michigan Technological University</td>
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<td>Michigan State University</td>
<td>Monash University, Australia</td>
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<td>Monash University, Australia</td>
<td>Naval Postgraduate School</td>
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<td>New Mexico Techonical University</td>
<td>North Carolina A&amp;T State University</td>
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<td>North Carolina State University</td>
<td>North Dakota State University</td>
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<td>Northern Arizona University</td>
<td>Northern Arizona University</td>
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<td>Northern Arizona University</td>
<td>The Numerical Methods Laboratory, Romania</td>
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<td>Oklahoma State University</td>
<td>Oregon State University</td>
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<tr>
<td>Parks College, St. Louis University</td>
<td>Politecnico di Torino, Italy</td>
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<td>Politecnico di Torino, Italy</td>
<td>Polytechnic College</td>
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<td>Polytechnic University</td>
<td>Purdue University</td>
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<tr>
<td>Queen's University, England</td>
<td>Rochester Institute of Technology</td>
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<tr>
<td>Royal Melbourne Institute of Technology, Australia</td>
<td>Rutgers University</td>
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<tr>
<td>San Jose State University</td>
<td>South Dakota State University</td>
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<tr>
<td>Southern Illinois University-Carbondale</td>
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In the Microwave Measurements (MTT-11) area, John Barr discussed several techniques with their advantages and disadvantages. This field faces several problems, but precision algorithms show promise to solve some of them.

Ed Neihenke of Microwave & Millimeter Wave (MTT-12) discussed the important issues of packaging. Now that the MMIC chips offer multiple functions on a single chip, low cost packing is the next issue for making the commercial communications or military systems affordable. Several new materials to solve the problem were discussed. Metal matrix composite as well as low temperature cofired ceramics, show great promise.

Microwave and Communication Systems (MTT-16) made four different presentations.

- In the area of technology insertion, Klaus Breuer projected that emergence of high temperature superconductors will open doors for ultra sensitive receivers and GHz processing will result in ultra fine resolutions. These receivers will advance the technology of deep-space Communication and Radio Astronomy.

- For Global Communications, George Heiter stated that emergence of MMIC, integrated antennas and miniature filters technology will result in smaller and low cost spacecraft, which can be used for low earth orbiting satellites (1000km - 3000km).

- For phased and optical arrays, David Rudledge summarized that the passive array technology is well developed and active array technology, which has the advantage of graceful degradation, is emerging.

- Another important commercial application of microwaves is in the Intelligent Vehicle Highway Systems (IVHS), which is defined as the advanced communications, navigation, sensor control systems, and information systems. Dick Sparks pointed out that these systems can be used to increase throughput on existing roadways, improve the safety of the traveling public, and improve the productivity of commercial vehicle operations. Microwave is finding its way into all the above mentioned applications.

The words most often heard in this meeting are clearly the common denominator that point to the future; MMIC, packaging, low cost and microwave communication.

We would like to thank Dr. Bert Berson for moderating the meeting.
CAEME Software
(Continued from page 8)

**Example.**

\[ Z_R = (39 - j 49) \Omega \]
\[ Z_0 = 58 \Omega \]
\[ Z_G = \overline{Z_0} \]

For example, for:
\[ Z_R = (39 - j 49) \Omega \]
\[ Z_0 = 58 \Omega \]
\[ Z_G = \overline{Z_0} \]

Solutions for single-stub matching are:

\[ 1 : DS = 0.2983 \times WL \]
\[ LS = 0.3864 \times WL \]

\[ 2 : DS = 0.9417 \times WL \]
\[ LS = 0.1136 \times WL \]

**Fig. 3.** An example of single-stub transmission line matching from Companion to Elements of Engineering Electromagnetics.

**ElectroCard and SilverHammer**

*Rodney Cole, David Krull, Monica Sweitzer, Steven Finch and Terry Palmer*

*University of California, Davis*

While some programs merely automate calculations, these two programs for the Apple Macintosh present material in a very clever and appealing fashion. ElectroCard is a set of HyperCard Stacks which cover electrostatics, dynamics, circuits and radiation. These topics serve as a tutorial introduction to SilverHammer which is a 2-D field mapping program for charges at rest (statics) or accelerating charges (radiation). The program is based on the Lienard-Wiechert potentials for a point charge with the restriction that all accelerations start at \( t=0 \). The resulting radiated fields can be plotted using contour plots, 3-D surface plots, pseudo-color plots, and field line plots.

**Fig. 4.** One figure from the tutorial on Faraday's Law. Created by ElectroCard.

ElectroCard uses animated sequences of moving particles and animated derivation of equations much like those in the popular PBS series "The Mechanical Universe." In Fig. 4, the student can move the bar magnet in and out of the coil while observing the ammeter. In Fig. 5, the analogy between a mechanical system and a resonant circuit is developed.

**Electromagnetic Waves—A Video Tutor Graphics Package**

*Warren L. Stutzman, Alison Garrett and Michael Cerny*

*Virginia Polytechnic Institute and State University*

This program is an excellent example of using the computer in a tutorial fashion. The topics covered fall into two areas: traveling-wave behavior and wave behavior at interfaces. Under traveling-wave behavior, the topics are: forward and backward waves, electric and magnetic fields, attenuation, velocity, and polarization. Figure 6 is one of the tutorial screens from the unit on polarization. Under wave behavior at interfaces, the topics are: interference, reflection and refraction. This logical progression of topics follows closely my own experience in my first two courses in fields and waves.

**Fig. 6.** One of the tutorial screens on polarization from Electromagnetic Waves—A Video Tutor Graphics Package.

Each topic is covered in a tutorial section and an exercise section. The tutorial introduces the student to terms, concepts and notation. Animated graphics are used very effectively to illustrate concepts. The exercises are used to reinforce what has been learned in the tutorial. Many of the exercises include interactive graphics where the student has control of the parameters. It is also possible to freeze the animation and print a copy of the screen to a graphics printer. I was again put off by low-resolution graphics (CGA), but in the end it did not seriously detract from the presentation of the material.
The intrinsic impedances are $n_1 = 377$ Ω and $n_2 = 188.5$ Ω. Then $r = -1/3$ and $t = 2/3$. Stop the motion to verify the continuity of the fields at $z=0$.

$$E_{1,x} \cos(\omega t) - 1/3 E_{1,x} \cos(\omega t) = 2/3 E_{1,x} \cos(\omega t)$$

---

**Fig. 7.** One of the tutorial screens on reflection at a dielectric interface from Electromagnetic Waves—A Video Tutor Graphics Package.

**Electromagnetic Software for Solving Static and Dynamic 2-D Field Problems on a Personal Computer**

*Mark Melton, Jens Engel and Jovan Lebaric*

*Rose-Hulman Institute of Technology*

ROSEM (ROSe-Rulman ElectroMagnetics software) is undoubtedly one of the more ambitious programs in this collection. ROSEM uses the finite difference method to explore 2-D electrostatic and magnetostatic problems. It also uses the finite difference time domain method to explore 2-D transient problems.

ROSEM has a sophisticated user interface which allows the user to draw the desired 2-D cross section and display the results on top of the same drawing. The other software packages in this collection that allow an arbitrary geometry require the user to define the desired geometry in a file of XY locations. I believe there is more potential here for "what if" types of exploration by the user.

---

**Fig. 8.** Electric potential lines around a microstrip line created by ROSEM.

My biggest disappointment with ROSEM is that there is no facility for computing an integral around a path. The user can create field plots around various transmission line structures but there is no easy way to compute impedance and phase velocity information.

**Antenna Software**

Although I will not review them here, there are several chapters in the CAEME Software Book dedicated to antennas. There is one package for linear array theory and design, a package for displaying three-dimensional equations and a copy of MININEC, a moment method code for antenna design.

**Computational Electromagnetics—Software for an Introductory Course**

*Magdy F. Iskander and Octavio M. Andrade*

*University of Utah*

This software provides interactive exercises to students in an introductory course on computational electromagnetics. The finite difference method is used to demonstrate the differential formulation while the moment method is used to present the integral formulation. The mathematical basis for both methods is presented in a well written tutorial. By using high-resolution graphics (VGA), the authors were able to include equations and figures in a quite legible format.

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**Fig. 9.** One of the figures on applying the finite difference method to microstrip lines from Computational Electromagnetics—Software for an Introductory Course.

After viewing the introductory material on the finite difference method, the student has the option of calculating the characteristic impedance and velocity of propagation in microstrip or analyzing the propagation characteristics of ridged waveguide. The method of moments examples include the charge distribution on and the capacitance of a parallel-plate capacitor and two-dimensional scattering by an inhomogeneous dielectric object.

**Simulation of EM Phenomena Using a Finite Difference-Time Domain Technique**

*K. Li, M. A. Tassoudji, R. T. Shin and J. A. Kong*

*Massachusetts Institute of Technology*

This program is a two-dimensional finite-difference time-domain code (FD-TD) and is one of my personal favorites in the CAEME collection. The FD-TD technique is very useful for visualizing electromagnetic phenomena, since fields are calculated everywhere in the desired domain as a function of time. This code assumes a two-dimensional geometry superimposed on a rectangular grid with second-order absorbing boundary conditions. The scattering objects may be dielectric, magnetic and conducting materials, while the sources are sinusoidal plane wave, Gaussian pulse plane wave, and single or multiple line currents. This program can be used to generate color animations of various electromagnetic phenomena including: leading edge, trailing edge, and slit diffraction, creeping waves, cavity mode excitation, propagation through dielectric and lossy media, and radiation patterns of arrays of line current sources.
Fig. 10. A Gaussian pulse plane wave striking a metallic plate. Created by the MIT FD-TD code.

Figure 10 is one frame of an animation created by the MIT FD-TD code. A Gaussian pulse plane wave is traveling from right to left and strikes a metallic plate. In the original, the incident wave is shaded in red while the reflected energy is shaded in blue, which indicates a change in polarity. The original animation is quite striking; it is difficult to do it justice with a B&W representation.

Experimental Demonstrations for Teaching Electromagnetic Fields and Energy
Markus Zahn, James R. Melcher and Hermann A. Haus
Massachusetts Institute of Technology

While not strictly software, this collection of lecture demonstrations on video tape sets a high standard for others to follow. The experiments are quite clever in their design and presentation. Any engineer who is getting involved in math and science education in his local school system can find a wealth of ideas here for demonstrations or science fair projects.

Summary
I believe the goals of the CAEME project have been met and exceeded by this first set of software. The educators and students who have shared their talents with us are to be commended. I have tried to give the readers of this article a feeling for what is available in this software collection within the limits of B&W printing technology. All of the software reviewed here uses color very effectively and I encourage you to examine this software for yourself in order to appreciate its full impact. There are also three articles related to CAEME in the new Computer Applications in Engineering Education journal. Also, CAEME has recently been involved in the development of multimedia lessons. Some of these lessons will be included in Volume II of the CAEME Software Book which will be published soon.

Individual MTT-S members interested in purchasing this software should contact Dr. Magdy Iskander. The price for MTT-S members is $150.

References
1. Lascaux Graphics (800) 338-0993
7601 N. Calle Sin Envidia—#31
Tucson, AZ 85718

IEEE MTT-S Newsletter Spring 1993 Page 33
January 1993 AdCom Meeting

Following is a summary of the Committee business concluded at the January 10-11, 1993, AdCom meeting in Atlanta, Georgia.

- Final sponsorship of the 1994 International Conference on Millimeter and Submillimeter Waves and Applications was denied, reversing the conditional approval granted in September 1992 in Albuquerque, NM. Approval was denied due to the inability of the conference organizers to produce the financial and technical documentation required by the Society and the IEEE. This event in no way diminishes the active interest of the Society in the millimeter and submillimeter waves technical area.

- Cooperative sponsorship was approved for the 1993 International Semiconductor Device Research Symposium (ISDRS-93) to be held in Charlottesville, Virginia, on December 1-3, 1993. The ISDRS is an exploratory, university-oriented device research conference which emphasizes new semiconductor devices, including microwave, millimeter wave and photonic devices. The first ISDRS was held in 1991 and drew ~300 attendees from 12 countries. The deadline for submission of extended abstracts for ISDRS-93 is September 20, 1993. The deadline for receipt of late news abstracts is November 15, 1993. The point of contact for all correspondence and additional information is Michael Shur, University of Virginia, at (804) 924-6109, Fax (804) 924-8818, email: mshur@virginia.edu.

- The fee structure for the IMS was reviewed and compared with that of 12 similar conferences. The data summary showed that the approved 1993 IMS fees are very close to the average fees of these other conferences.

- Anaheim, California, was approved to be the site for the 1999 IMS. This decision is highlighted below.

- Initial discussions on the site for the 2000 IMS were held. Barry Perlman discussed ongoing activities of the New Jersey Coast and New Jersey Chapters to prepare a joint letter of intent for the Symposium. In addition, the Philadelphia Chapter is in the process of preparing a letter of intent. Other sites are also expected to be considered (see discussion of 2000 MTT-S Symposium site proposals below).

1999 MTT-S Symposium

The location of the 1999 MTT-S International Microwave Symposium was approved at the January 1993 meeting of the Society Administrative Committee. Excellent proposal packages were submitted by both the cities of Long Beach, CA, and Anaheim, CA. After due deliberation, Anaheim was selected as the host city for 1999. Mario Maury, Jr., is the Chairman of the 1999 IMS, which will be held from June 14-18, 1993. If you are interested in obtaining further information, please contact Mario at the address below:

Mario A. Maury, Jr.
Maury Microwave Corporation
2900 Inland Empire Blvd.
Phone (909) 987-4715, x201
Fax (909) 987-1112

Special thanks to George Oltman, Chairman of the Negotiating Committee, and the rest of his team for doing another outstanding job in supporting this important site selection process.

Future MTT-S Symposium

Following is a listing of the International Microwave Symposium sites through 1998 with their chairmen. If you are interested in participating please contact the chairman directly; they can always use the help and this is a good way to actively support your Society.

- 1993—Atlanta, Georgia, June 14-18, 1993
  Pete Rodrigue, Chairman
  Georgia Institute of Technology, EE Dept., (404) 894-2994
- 1994—San Diego, California, May 23-27, 1994
  Don Parker, Chairman
  Hughes Aircraft Co., (310) 615-2576
  Keith Huddleston, Chairman
  Martin Marietta Corp., (407) 356-7201
- 1996—San Francisco, California, June 17-21, 1996
  Jim Crescenzi, Chairman
  Watkins-Johnson Co., (415) 813-2506
- 1997—Denver, Colorado
  Hussain Haddad, Chairman
  Ball Aerospace, (303) 460-2114
- 1998—Baltimore, Maryland
  Steve Stitzer, Chairman
  Westinghouse Electric Corp., (301) 765-7348
- 2001—East
  St. Louis, MO
  B. Spielman
  June 30, 1993
- 2003—Middle
  East
  3094
  June 30, 1996

Chapters wishing to host any of these Symposia are encouraged to submit their proposals to:

Eliot D. Cohen
MTT-S Meetings & Symposia Committee Chairman
DARPA
3701 North Fairfax Drive
Arlington, VA 22203-1714
(703) 696-2214
Fax (703) 696-2203

Electronics Engineer

The U.S. Army Research Office is seeking an individual to aid in the administration of an extramural research program in the field of electronics engineering with emphasis on MIMIC’s and electromagnetics. Duties include analyzing and evaluating proposals and reports; maintaining liaison with contractors; analyzing contractor performance; maintaining familiarity with the status of research programs relevant to Army needs; and disseminating program policies, procedures and results to interested parties. This is a Federal civilian position at the GS-12 grade level ($40,298 - $52,385 per annum). Applicants must possess a doctoral degree in electronics-engineering or a closely related field. For further information and application forms, contact U.S. Army Research Office, ATTN: AMXRO-CP, P.O. Box 12211, Research Triangle Park, NC 27709-2211, Ph. 919-549-4212. An Equal Opportunity Employer. U.S. Citizenship Required.
AdCom Meeting Highlights
(Continued from page 3)

members! Ken Dawson gave an informal presentation which included a perceptive evaluation of IEEE services and publications from the member’s viewpoint. He strongly advocated increased use of e-mail for affordable access to IEEE services, and emphasized the need to improve our technical society’s coverage of “applied” material of practical value to members. He challenged the MTT-S AdCom to place more emphasis on services rendered to members than is currently allocated to the budgeting process. These presentations by such distinguished IEEE officers were thought provoking, enlightening and appreciated.

Pete Rodrigue (1993 IMS Steering Committee Chairman) and Gordon Harrison (1993 IMS Technical Program Committee Co-Chairman) presented up-to-the-minute reports on preparation for the Atlanta International Microwave Symposium in June, 1993. Clearly, members can anticipate an outstanding event with exceptional facilities and organization in Atlanta. Continuing the tradition of excellence, Don Parker presented the 1994 IMS report for San Diego, California. The 1994 Steering Committee is hard at work to finalize facilities arrangements and initiate planning of the technical program. A brief 1995 IMS report was given by Rudy Henning (Steering Committee Co-Chairman with Keith Huddleston) on the preparations in Orlando, Florida.

Ed Niehenke showed justifiable pride in reporting conclusion of last minute editing and publication of a new MTT-S International Microwave Symposium Guidelines and Procedures Manual. Contributors included fourteen consultant staff members with previous experience organizing successful IMS. Fifty manuals were printed, and nearly all have been distributed. The manual will be of great assistance for future organizers of our symposia.

The AdCom is clearly supportive of increased meetings sponsorship. Cooperative sponsorship of two conferences was proposed by Derry Hornbuckle, including the 1993 Topical Meeting on Optical Microwave Interactions (LEOS sponsored) and the February, 1994 Workshop on Microwave Electronic Circuits. Ed Rezek proposed cooperative sponsorship of the ISDRM Conference (sponsored by URSI and the University of Virginia). Elliot Cohen proposed (on behalf of MTT-16 Technical Committee Co-Chairmen Klaus Breuer and George Heiter) support of a Workshop on Digital Receivers. These proposals for cooperative sponsorship were all passed, after some debate regarding the virtues of expanding sponsorship beyond the cooperative (non-financial) level. John Horton also presented a status report on discussions with the organizers of the AES-S sponsored National Telesystems Conference regarding possible future co-sponsorship by MTT-S. The 1993 National Telesystems Conference will be co-located with the MTT-S in Atlanta this year. A proposal for sponsorship of the proposed 1994 International Conference on Millimeter and Submillimeter Waves and Applications (approved on a tentative basis in September) was not passed after considerable deliberation (based in part on concerns regarding the financial viability of the specific proposal).

An enthusiastic proposal for hosting the 1999 IMS (International Microwave Symposium) in the greater Los Angeles area was presented by Mario Maury as Chairman of the proposed 1999 IMS Steering Committee. George Oltman, Site Negotiating Committee Chairman, presented an overview of the attributes of the competing sites of Long Beach and Anaheim (followed by Convention Bureau presentations from both cities). The AdCom voted to accept the proposal, and specifically selected Anaheim, California as the 1999 IMS site. Richard Snyder made an informal presentation of the North Jersey Section’s efforts to encourage selection of a site in their area (potential sites include Philadelphia and Atlantic City) for the IMS in the year 2000. It is understood that Boston will also propose for the year 2000, and selection is scheduled for the June 1993 AdCom meeting in Atlanta (contact Eliot Cohen, Meetings and Symposia Committee Chairman for more information).

Dan Masse, MTT-S Transactions Editor, proposed a May 1995 special issue on “Microwave and Millimeter-Wave Photonics”, Peter Staecker proposed continuation of MTT-S sponsorship (with seven other IEEE societies) of the Journal of Lightwave Technology.

Technical Coordinating Committee Chairman Jorg Raue presented an updated MTT-S Field of Interest statement. He also reported on an especially successful Winter Technical Committee Meeting held two days prior to the AdCom meeting (before the TPC meeting). An amendment to the By-Laws was offered by Jorg Raue to change the meeting name from the prior Emerging Technologies Workshop to Winter Technical Meeting. Operations Chairman Bob Moore presented motions to amend the MTT-S By-Laws to reflect current committee structures, incorporate the Distinguished Educator Award in the By-Laws, and to include the Microwave and Guided Wave Letters Editor. John Wassel presented a motion for streamlining the IEEE Press sponsorship decision and approval process, for the purpose of increasing IEEE Press publications. These motions were all adopted by the AdCom.

Ferdo Ivanek, Chairman of the Long Range Planning Committee, presented an outline of the committee’s intended activities. Membership of the committee includes one European, one Asian and three US representatives. This year’s agenda includes a number of far-reaching policy areas, and the deliberations will be instrumental in shaping the MTT-S strategic plan and vision of its future.

Dan Swanson, Co-Chair of the Education Committee, presented a proposal for a new Outstanding Young Author Award, which received strong support from the AdCom. “Young” in this case means 35 years old or less, and the intent of the award is clearly to increase acknowledgment of the contributions of our members in the initial period of their careers. Several steps remain in the process of formalizing this new award, and the earliest implementation is projected to be in 1994. Barry Perlman, Education Committee Co-Chair, reported organizing activity to facilitate establishment of a new scholarship fund with the means to accept member contributions, to potentially increase financial support of students in the microwave field.

Rolf Jansen presented the Transnational Liaison report, and reviewed the numerous activities in the transnational area. There is a particular need to encourage MTT-S and IEEE participation by members in Eastern Europe and Russia. Financial obstacles are clearly a major problem, and Peter Staecker asked Rolf Jansen to head an Ad Hoc committee to formulate specific actions. This objective, increased representation from these areas, is very much in line with IEEE policy.

Ed Niehenke presented the Ombudsman’s report. Although the number of inquiries to the ombudsman have been limited, Ed’s response has been prompt and effective. He continues to bring to AdCom’s attention the problems and concerns voiced by members through this effective avenue of communication. The January 1993 meeting of your society’s administrative committee adjourned after ten active hours of deliberation.
ANNOUNCEMENT

EXHIBITION

XXIVth GENERAL ASSEMBLY
OF
THE INTERNATIONAL UNION
OF RADIO SCIENCE

Kyoto International Conference Hall (Event Hall), Kyoto, Japan
August 30 - September 1, 1993

Areas Covered by the Exhibition:
- Radio Science
- Telecommunications
- Electronics

Period of General Assembly:
25 August - 2 September, 1993

Organizer:
Japanese Organizing Committee
for XXIV General Assembly of URSI
Chairperson: Prof. T. Okoshi

Address for Correspondence:
Dr. Yoji Furuhama
Chairperson of the Exhibition Committee
ATR Optical and Radio Communications
Research Laboratories
Seika-cho, Soraku-gun, Kyoto, 619-02 Japan
TEL: +81-7749-5-1511, FAX: +81-7749-5-1509
Hot Lines

Beware...

New Tax Rules Affect 401(k) Funds

Planning a job change in 1993? Be aware that new tax rules will affect your 401(k) funds distribution. Under the new rules, if you change jobs or retire and take a lump sum distribution, instead of leaving the funds with your old employer or doing a trustee-to-trustee transfer into a new Individual Retirement Account or new 401(k), 20 percent of your funds will be withheld.

Why the new rule? The government's official word is that the new taxes collected will be used to extend jobless benefits and that discouraging spending will ensure that an individual's pension is protected. The unofficial word is that this rule may be an easy way to raise taxes. Many people will not even be aware of the rule change. If job changes are involuntary, workers may overlook the new rule while trying to deal with lay-offs or forced retirements. The rule could lead to more people losing pensions instead of saving them.

Many employers are establishing procedures to handle trustee-to-trustee transfers. If you are changing jobs or retiring, consult a financial adviser about the best way to handle your 401(k) funds.

USAB Chairman Promotes U.S. Competitiveness

USAB Chairman Charles K. Alexander recently wrote a letter to the U.S. Department of Commerce (DOC) endorsing DOC's investigation into the national security implications of U.S. dependence on foreign imports of integrated circuit (semiconductors) ceramic packages. The investigation is being conducted in accordance with Section 232 of the Trade Expansion Act of 1962.

Alexander urged efforts to promote the competitiveness of the U.S. ceramic packaging industry. "Ceramic packaged semiconductors are incorporated in almost every U.S. defense system employing modern electronics and play a critical role in ensuring our national security," he said. Further, Alexander expressed IEEE-USA's belief that national security in the technological age requires the maintenance of strong, competitive domestic capabilities to meet U.S. defense needs in the event foreign supplies are disrupted.

Tort Reform Needed to Help Boost U.S. Economy

Citing critical insurance problems, frivolous lawsuits, and excessive jury awards, IEEE-USA is urging federal and state lawmakers to enact significant tort reform legislation. In a recently approved position statement, IEEE-USA said that if such legislation is not enacted, the entire economy of our nation will be affected.

Engineers are seriously affected by these concerns, especially those in private practice, due to excessive costs and inability to obtain adequate liability insurance. These problems are threatening to reduce engineers' ability to provide services needed to help sustain the nation's economic growth. Not only are insurance premiums increasing significantly each year, but also such important services as the cleanup of hazardous waste and the removal of asbestos are being excluded from any coverage.

IEEE-USA believes that our nation's legal system should provide prompt, just, and full compensation to injured victims at a reasonable cost. In order to have such a legal system, IEEE-USA recommends eliminating joint and several liability, so that defendants pay damages only in proportion to their responsibilities. In addition, comparative negligence should be revised, so that plaintiffs cannot receive awards if they are more responsible for their injuries than the defendants. IEEE-USA recommends returning to a rational—not arbitrary—basis for distribution of punitive damages.

USAB Approves Position Statements

IEEE's United States Activities Board recently approved these position statements. Copies are available from the IEEE-USA Office in Washington, D.C.

Human Exposure to Radio Frequency Fields from Portable and Mobile Telephones and Other Communication Devices

Recognizing public concern about the safety of exposure to radio frequency (RF) energy, IEEE and such organizations as the American National Standards Institute, the National Council on Radiation Protection and Measurements, and the International Radiation Protection Association, have published guidelines outlining safe limits for human exposure to RF fields. Based on present knowledge, prolonged exposure to RF fields from portable and mobile telephone devices at or below the recommended levels is not hazardous to human health, according to IEEE-USA and its Committee on Man and Radiation.

Energy Efficiency

IEEE-USA concludes that energy efficiency must form an integral component of a comprehensive national energy policy designed to ensure a reliable, economical, and environmentally sound energy supply. Further, IEEE-USA recommends that the government and the energy-consuming public give a high priority to promoting aggressive research, development, commercialization, and use of efficient energy conversion technologies.

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Journal of LIGHTWAVE TECHNOLOGY

THE JOURNAL OF LIGHTWAVE TECHNOLOGY is published by the Optical Society of America and the following seven societies of the IEEE:

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January Technical Programs Meeting
Glen Hopkins, Tatsuo Itoh, and Theresa Brunaso.