



Incoming President's Message



by Peter W. Staecker
1993 MTT-S President

With the government cutbacks in United States defense electronics spending, times have become tough in major segments of the microwave industry. As the reductions in force strike or execute near misses, however, opportunities appear. US Defense industries are having a hard look at the growth in commercial areas such as wireless communications, lightwave, and automotive applications, where markets are growing at extremely healthy rates, led, in many instances, by international market pull. Mirroring industry trends, the Vehicular Technology Society has grown in membership by almost 20% over the last year (first place among 35 Societies).

As this change sweeps over industry, it is important to look for similar opportunities to serve the MTT membership, which itself is undergoing a professional and demographic metamorphosis. Although MTT dropped in size over the past year by 3.6%, international membership is growing: new members in Regions 7-10 are increasing at about twice the rate of those in Regions 1-6. Student members are the real growth potential of the Society, and will be getting special attention in the Membership Services Committee. International membership of the Administrative Committee is now three of eighteen, reflecting the growing effectiveness of global participation in Society affairs.

The financial status of MTT-S continues to be a strength of the Society. Over the past 5 years, the Budget and Finance Committees have done an outstanding job of responsibly planning and managing the Society's finances. With reserves equal to 75% of our annual operating budget, MTT-S has an enviable balance sheet. Because much of our annual surplus originates from our annual Microwave Symposium, which must be considered to be vulnerable to the same forces which drive the economy, however, efforts will continue to make more of our committee activities financially independent.

As applications for disciplines such as communications and signal processing require increasingly higher levels of

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Outgoing President's Message



Reynold S. Kagiwada
1992 MTT-S President

Entering 1992, our Society envisioned that the breakup of the Soviet Union would have an impact on the Microwave community. In the United States, for example, there was expected to be a substantial decrease in spending over the next couple of years. Our Society goal was to first raise the consciousness of our members about these developments and secondly to begin implementing steps to accommodate this changing environment. Our initial two objectives were to place more emphasis on commercial rather than military aspects of microwaves and to pay greater attention to the financial strength of our Society.

Our Long Range Planning Committee recommended that our Society focus on four emerging technology areas to broaden our involvement in commercially oriented activities. Three of these areas have a particularly high commercial content: Microwave Communications, Lightwave High-Speed Electronics, and Microwave Manufacturing Technology; the fourth area represents a developing technology with great potential for future microwave products: Indium Phosphide Based Microwave Devices and IC's. In order to stimulate more interest in these areas, our Long Range Planning Committee recommended that our Society hold workshops and topical meetings. These meetings would be adjacent to or together with existing conferences and would in some cases be held jointly with other IEEE societies. In addition, the Committee recommended that there be focus sessions, special sessions, and invited papers at our International Microwave Symposium, as well as *Special Transaction* issues to heighten awareness on these emerging areas. A final recommendation from the Committee was to encourage local chapters to sponsor events on these topics.

Our Budget Committee and Ad Hoc Budget Advisory Committee spent a great deal of effort formulating and recommending our Societal Budget. They scrutinized every line item and made several helpful suggestions on how to improve the financial position of the Society. In spite of the fact that

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Master Calendar

MTT-S Sponsored Conferences¹

1993

Name	Date/Location	Involvement
• Microwave and Optical Remote Sensing	March 22-25 Albuquerque, NM	(CS)
• Space Terahertz Conference	March 30-April 2 Los Angeles, CA	(C) (*)
• Microwaves in Medicine	April (?) Rome, Italy	(C) (*)
• MIOF '93	May 25-27	(C)
• Microwave and Millimeter-Wave Monolithic Circuits Symposium	June 14-15 Atlanta, GA	(CS) (*)
• MTT-S International Microwave Symposium	June 14-18 Atlanta, GA	(S) (*)
• Automatic RF Techniques Group	June 17-18 Atlanta, GA	(C) Affiliated (*)
• International Microwave Conference/ Brazil (SMBO)	August 2-5 Sao Paulo, Brazil	(C) (*)
• 23rd European Microwave Conference	September 6-9 Madrid, Spain	(C) (*)
• Asia Pacific Microwave Conference	October 18-21 Hsinchu, Taiwan	(C) (*)
• Automatic RF Techniques Group	December 2-3 San Jose, CA	(C) (*)

1994

• International Conference on Millimeter & Submillimeter Waves & Applications	January 10-14 San Diego, CA	(S)
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¹Meetings 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.

²MTT-S conference involvement:

(S) Sponsor, (CS) Co-sponsor, (P) Participate, (C) Cooperate, (*) Continuous

MTT-S Continuously Sponsored Conferences

• MTT-S International Microwave Symposium (IMS)	Annual	(S)
• IEEE Microwave & Millimeter-Wave Monolithic Circuits Symposium (MMWMC)	Annual	(CS)
• Automatic RF Techniques Group (ARFTG)	Bi-annual	(affiliated)
• European Microwave Conference (EMC)	Annual	(C)
• Asia Pacific Microwave Conference (APMC)	Annual	(C)
• International Microwave Conference/ Brazil (SBMO)	Biennial (1993, etc.)	(C)
• IEEE GaAs IC Symposium	Annual	(CS)
• IEEE Conference on the Computation of Electromagnetic Fields	Biennial (1992, etc.)	(C)
• European GaAs Applications Symposium	Biennial (1992, etc.)	(C)
• Topical Meeting on Electrical Performance of Electronic Packaging	Annual	(CS)
• Microwaves in Medicine	Biennial (1993, etc.)	(C)
• National Radio Science Meeting (with International Union of Radio Science)	Annual	(C)
• Space Terahertz Conference (Financial Sponsorship: NASA)	Annual	(C)
• Australian Millimeter and Submillimeter-Wave Conference	Annual	(C)

Conference involvement:

(S) Sponsor; (CS) Co-sponsor; (P) Participate; (C) Cooperate (Involvement may change for particular years)

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 Parson Way, Los Altos, CA 94022, (415) 941-7426

AdCom Highlights

by Peter Staecker

The 1992 election saw the retirement of Kris Agarwal, Zvi Galani, Steve Temple, and Jim Wiltse from active duty, at least for now. The contributions of these members were significant, and added greatly to the well-being of the Society and the Committee. We hope for a continued association with MTT activities. Expectations of the newly-elected members, Derry Hornbuckle, Roger Pollard, Ed Rezek, Roger Sudbury, and Glenn Thoren, are high, and given the participation in AdCom committee work of each of the new crew in activities over a long period of time, "new" misrepresents the experience of our new volunteers. They were off and running even before the new year began. Jim Crescenzi, our new Vice-President, and Barry Perlman were re-elected to the two remaining slots. In related activity, President Kagiwada asked all present AdCom members to review and update their 1992 goals to summarize their activities for the year.

Jerry Hausner projected an outstanding fiscal conclusion to the Albuquerque Symposium; he and his committee are to be congratulated on the fine job they did in hosting the 1992 IMS. In other conference activity, AdCom approved, subject to specific and detailed proposal guidelines to be worked out and re-submitted before the January meeting, the sponsorship of a millimeter-wave meeting proposed by M. Afsar. To expand the technical reach of MTT to all its membership, additional topical conferences are being investigated. Site location, exhibitor preferences, technical paper evaluation guidelines, and the structure of Microwave Week have been thoroughly researched and presented by Jim Crescenzi. More details on these events are covered in Eliot Cohen's report on Meetings and Symposium Committee activity.

Every five years, each IEEE Society participates in a Society Review process where the activities and purpose of each Society are summarized and reported at one of the TAB meetings. MTT's turn in the barrel happened late this summer; our report was given to a special TAB Society Review committee.

In activities related to education, status of the CAEME software was reviewed and external sources of funding for Fellowships was taken as an action by the Education Committee.

Membership Services reported on methods of improving our benefits to membership, including using the IEEE technical interest profile (TIP) for recruiting new members and methods of retaining members of all grades with special emphasis on students. The 1992/1993 Chapter Officer Directory is now available. Congratulations are in order to our newest chapters, the MTT joint chapter in the Cedar Rapids and Central Iowa Sections and in South Africa!

The Publications Committee is looking at a number of new proposals:

- splitting the *Transactions* into two components, one including "regular" papers, the other being "special issues."
- unbinding the *Transactions* and *Letters Journal* from the single membership fee currently used.
- co-sponsoring the new *IEEE Journal on Micromechanical Systems*.

The standards Committee reported an extremely active schedule, with activities in progress within areas of planar transmission lines, waveguides, dielectric resonators, microwave sources, filters, and superconductors, and non-linear waveguide components.

Technical Committee activity, as reported by TCC Chair Jorg Raue, continues to be strong, with individual and collec-

MTT-S Awards



Reinhard Knerr
Chairman, Awards Committee

MTT-S always has relied on its volunteers to staff various positions which we thought to be vital to our membership. It seems to become more and more difficult to retain those people, because of rapidly changing business situations. A case in point is Dr. Louis Medgyesi-Mitschang who has for many years coordinated the Awards Nominations and has done an outstanding job in administering our Distinguished Lecturers. Louis is facing new challenges and more demand on his time from his employer and cannot continue his present level of involvement. To my deepest regret, Louis resigned from his MTT position.

I want to thank Louis for his selfless efforts on behalf of MTT-S. He worked for many years with Dr. Rosenbaum and made sure that the transition between Fred Rosenbaum and me was as smooth as it possibly could be. Thank you Louis for a job well done!

The present Awards Committee structure is as follows:

- **Awards Committee**—Chairman: Reinhard H. Knerr; Fellow Nominations Committee: Harold Sobol; Microwave Prize Committee: George Heiter
- At the September 1992 AdCom meeting, the following awards for 1993 were unanimously approved:
- **Microwave Career Award**—Herbert Doring, Leonard Lewin
"For a career of meritorious achievement and outstanding contributions to the field of microwave theory and techniques"
- **Pioneer Award**—Claud E. Cleeton
"For pioneering contributions to microwave spectroscopy"
Lester Hogan
"For pioneering the application of ferrites to microwave devices"
- **Distinguished Educator Award**—Arthur A. Oliner
"For a career of distinguished service in education, research and to MTT-S"
- **Microwave Application Award**—Irv Reingold and John Carter
"For gas discharge and ferrite duplexer applications to military radar"
- **Microwave Prize**—Dr. Zoya B. Popovic, Mr. Robert M. Weikle II, Mr. Moonil Kim, Dr. David B. Rutledge
"A 100-MESFET Planar Grid Oscillator," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 39, No. 2, February 1991, pp 193-199
- **Distinguished Service Award**—Dr. Stephen F. Adam
"For his outstanding and dedicated service to the society"

tive efforts to reach the membership through workshops, topical meetings, and alliances with other Societies.

The meeting ended ahead of schedule, with all old business reviewed, and a full list of new actions for the new year.

Call for Nominations to MTT-S Awards



*Reinhard Knerr
Awards Committee Chairman*

Dear Colleagues,

I am sure that, as you read my column about the 1993 MTT-S Awards Winners, you can think of several people who, in your mind, would deserve one of the awards as well.

Please don't hesitate to get the necessary forms from me and submit your nomination! You can be sure that your candidate will be very carefully and objectively evaluated. This year's Evaluation Committee had 10 members, all senior MTT-S people, including one from Europe and one from Asia.

As a reminder, please find in the following the description of our various awards and the previous winners:

Distinguished Service Award

- Prize—Plaque and Certificate
- Eligibility—Significant contributions and outstanding service to the Microwave Theory and Techniques Society and microwave profession over a sustained period of time.
- Basis for Judging—Service to ADCOM and IEEE. Nominations considered aperiodically and awards made aperiodically.
- Award Recipients:
1983: Theodore Saad; 1984: Alvin Clavin; 1985: G.P. Rodrigue; 1986: Harold Sobol; 1987: Kiyo Tomiyasu; 1988: Fred Rosenbaum; 1989: Don Parker; 1990: H. George Oltman; 1991: Charles T. Rucker; 1992: Richard Sparks; 1993: Stephen F. Adam.

Microwave Career Award

- Prize—Certificate, Plaque and \$2,000.
- Eligibility—A career of meritorious achievement and outstanding technical contribution by an individual in the field of microwave theory and techniques; individual must be a member of IEEE.
- Basis for Judging—Publications in technical journals, presentation of lectures, contributions to the advancement of microwave technology and other technical contributions considered in conjunction with any or all of these areas of contribution; nominations are considered annually; award is made aperiodically.
- Award Recipients:
1973: W. Mumford; 1974: H. Wheeler; 1975: H. Riblet; 1976: J. Whinnery; 1977: E. Weber; 1978: A.G. Foz; 1979: S. Cohn, W. Kleen; 1980: K. Tomiyasu; 1982: A. Oliner; 1983: M. Hines; 1984: J.R. Pierce; 1985: N. Marcuvitz, H.M. Barlow; 1986: G.L. Matthaei; 1987: R. W. Beatty; 1988: Leo Young; 1989: A. Cullen; 1990: R.A. Pucel; 1991: Sogo Okamura; 1992: Theodore S. Saad; 1993: Leonard Lewin, Herbert Doring.

Pioneer Award

- Prize—Plaque and \$1,000; Feature Presentation in MTT Transactions and Newsletter. If a team is named recipi-

ent, each shall receive a plaque and the honorarium shall be shared.

- Eligibility—Publication of contribution in an archival journal, an individual or team not exceeding three persons. Deceased persons are ineligible for nomination. Preference may be given to IEEE members.
- Basis for Judging—Proposed award is to recognize an individual(s) who has made a major, lasting contribution in the field of interest of MTT-S at least 20 years prior to the year of the award.
- Award Recipients:
1990: Hatsuaki Fukui; 1991: Robert H. Dicke; 1992: Robert M. Barrett; 1993: Claud Cleeton, Lester Hogan.

Microwave Application Award

- Prize—Certificate and \$1,000.
- Eligibility—Outstanding application of microwave theory and techniques by an individual to create a new device, component or technique; novel use of a device or component; or any combination of the above.
- Basis for Judging—The most outstanding application of microwave theory and techniques by an individual; nominations must be submitted by a member of the Society; nominations are considered annually; award is aperiodic.
- Award Recipients:
1974: Dean F. Peterson, III; 1975: James F. White; 1976: Martin G. Walker; 1977: Stephen I. Long; 1978: Dale H. Claxton; 1979: Erwin F. Belohoubek; 1980: Julius Lange; 1982: Charles R. Boyd, Jr.; 1983: L. Besser; 1984: Paul Meier; 1985: James Cheal; 1986: C. Burke Swan; 1988: L.S. Napoli, M. Fukuta; 1989: Kenneth L. Carr; 1990: Allen F. Podell; 1991: Eric W. Strid, K. Reed Gleason; 1992: Bernard Hershenov; 1993: Irv Reingold, John Carter

N. Walter Cox Award

- Award Recipients:
1989: Richard Sparks; 1990: Peter Staecker; 1991: Helmut E. Schrank; 1992: Barry Spielman; 1993: J.E. Degenford.

Distinguished Educator Award

- Description and Background—The creation of 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.
- Prize—A Plaque and Honorarium of \$1,000.
- Eligibility—The candidate must be a member of IEEE and MTT-S at the time of nomination.
- Administration—The award will be administered by the MTT-S Awards Committee. Candidates will be considered each year, and a recommendation will be made to MTT-S ADCOM if a suitable candidate is identified.
- Basis for Judging—The awardee 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 publications. The candidate shall have a record of many years of service to MTT-S.
- Presentation (when presented)—at the annual IMS Awards Banquet. The award also entails a feature publication in the MTT-S Transactions.
- Awards Recipients—New Award
 - Submission Deadline for All Awards Nominations is July 1.

MTT AdCom Elections



by K. Tomiyasu
Chairman, Ad Hoc Nominations
and Appointments Committee

During its 19 September 1992 Annual Meeting, the MTT-S Administrative Committee, chaired by President Reynold Kagiwada, elected the following: 1993 President, Peter Staecker; 1993 Vice-President, E. James Crescenzi, Jr.; 1993-1995 Term Members, E. James Crescenzi, Jr., Derry Hornbuckle, Roger D. Pollard, Edward A. Rezek, Roger W. Sudbury, Glenn A. Thoren, Within-Term Vacancy (1993-1994), Barry S. Perlman.

Peter W. Staecker

Peter Staecker (S'63, M'72, SM'87) received the BS degree from MIT and the PhD degree from Polytechnic University, both in Electrical Engineering.

From 1972 to 1986 he was a staff engineer at MIT Lincoln Laboratory. In 1986 he joined M/A-COM and is presently Director of Engineering in the Corporate R&D Center. He is an associate editor of *IEEE Transactions on Microwave Theory and Techniques*, contributing editor of *Applied Microwave Magazine*, and a member of the editorial review board of the *Microwave Journal*.

Dr. Staecker has been a member of the Administrative Committee of the IEEE Microwave Theory and Techniques Society since 1985. He was chairman of the Boston MTT Chapter in 1981. He served as *MTT Newsletter* editor from 1987 to 1989. He is a member of the Technical Program Committee of the MTT-S International Microwave Symposium, and was General Chairman of the 1991 MTT-S International Microwave Symposium Steering Committee.

E. James Crescenzi

Jim Crescenzi (S'61, M'62, SM'84) received the BS degree at UC Berkeley in 1961 and MS and PhD degrees at the University of Colorado in 1962 and 1969. His advanced degree work was separated by a tour of duty as a lieutenant in the Air Force at Rome Air Development Center. He joined Watkins-Johnson Co. in 1970, where his work has ranged from solid state process development to microwave subsystems and receivers. He is currently a Principal Scientist in the Microwave Products Division of W-J. In the last several years he has been involved in the development of two microwave landing subsystems for military applications; a miniaturized 1-8 GHz Up/Down converter ESSM subsystem; and most recently high speed logarithmic/limiting amplifiers for microwave signal processing.

Jim served in various positions in San Francisco/Santa Clara Valley MTT-S Chapter including Chapter Chairman in 1981-1982. He has been on the Technical Program Committees of the MTT-S International Microwave Symposium (IMS) since 1983, and was first elected to the MTT-S Administrative Committee in 1987. He has served as chairman of the Operations and Publications Committees, and is currently Co-Chairman of the Meetings and Symposia Committee. He is also Chairman of the Steering Committee responsible for the International Microwave Symposium to be held in San Francisco in 1996.

Derry Hornbuckle

Derry Hornbuckle (M'80) received the BS degree in engineering from the California Institute of Technology in 1970 and the MS degree in electrical engineering from the University of California, Berkeley, in 1976.

From 1968 to 1973 he was employed by Executone of Southern California, serving as Chief Engineer at the time he left to return to school. At the University of California, Berkeley, he studied fabrication and microwave applications of Josephson junctions. He has been with Hewlett-Packard, Santa Rosa, CA, since 1974 in both instrument and technology development roles, and has authored a number of papers on GaAs design topics. He is currently R&D Manager of the HP Microwave Technology Division, responsible for GaAs process development, and also manages semiconductor wafer manufacturing.

Mr. Hornbuckle has been a member of the MTT-6 Technical Committee on Microwave and Millimeter-Wave IC's since 1980, organizing or co-organizing a number of panels and workshops on microwave topics, and chairing the committee from 1986 to 1988. He was a member of the Microwave and Millimeter-Wave Monolithic IC Symposium Technical Committee and Steering Committee from 1984 to 1990, serving as Finance Chairman in 1986, Technical Chairman in 1987, and General Chairman of the symposium in 1988. He chaired the MTT Subcommittee on Long-Term Technological Directions, reporting to the MTT Long-Range Planning Committee, in 1992. He is currently MTT Publications Vice Chairman, Solid State Circuits Council representative from MTT, IEEE-TAB New Technology Directions Committee Corresponding Member, and active on the MTT-6 Technical Committee, in addition to being an MTT ADCOM member.

Roger D. Pollard

Roger D. Pollard (M'77) received his technical education, graduating with the degrees of BSc and PhD, in electrical and electronic engineering at the University of Leeds, Leeds, UK. He is a Senior Member of the IEEE and is a Chartered Engineer and Member of the Institution of Electrical Engineers in the UK.

He is currently a Senior Lecturer in the Department of Electronic and Electrical Engineering at the University of Leeds where he has been a faculty member since 1974. He is jointly responsible for the activities of the Microwave Solid-State Research Group which has over 30 active researchers, a strong graduate program, and has made contributions to microwave passive and active device research. The activity has significant industrial collaboration as well as a presence in continuing education through its Microwave Summer School. Dr. Pollard's personal research interests are in microwave network measurements, calibration and error correction, and large-signal and non-linear characterization. He has worked on device and system characterization, measurement fixtures, load-pull and noise; some of his work has resulted in commercial exploitation. Since 1981 he has spent about three months per year in the US as Consulting Engineer to the Hewlett-Packard Company Santa Rosa Systems Division, Santa Rosa, CA, and has contributed to their high performance microwave network analyzer products. He is author or joint author of over 50 publications and holds two US patents.

Edward A. Rezek

Edward A. Rezek (S'74, M'80) was born in Omaha, Nebraska, on July 19, 1954. He received the AB physics and the BSEE degrees from Washington University in St. Louis, MO, in 1976 and the MS and PhD degrees in electrical engineering from the University of Illinois in 1977 and 1980, respectively.

His graduate work specialized in the area of III-V compound semiconductor material growth and device physics.

He joined TRW, Inc., Redondo Beach, CA, in 1980. From 1980 to 1987 he was engaged in the development of high power InGaAsP/InP laser diodes and high-speed InGaAs/InP detectors. He served as Manager of the Semiconductor Device Department from 1985 to 1987. In 1987 he joined the TRW Advanced Microelectronics Laboratory and became involved in several insertion programs involving GaAs discrete and MMIC devices. These insertions incorporated MESFET, HBT, and HEMT technologies. In 1991 he was appointed the Manager of the Product Engineering department within the Advanced Microelectronics Laboratory. His current general activities include managing the development and insertion of MESFET, HBT and HEMT technologies into military and commercial applications.

Dr. Rezek is the author of over 40 technical papers in the diverse areas of optoelectronics, III-V compound material growth, GaAs MMIC reliability, and high performance GaAs MMIC devices. Dr. Rezek holds four patents on III-V compound material growth processes and novel optoelectronic device structures.

Dr. Rezek is a member of Eta Kappa Nu, Tau Beta Pi, and Phi Kappa Phi, and Omicron Delta Kappa. He is also a member of APS, AAAS, OAS, and the Electrochemical Society. He was a member of the Technical Program Committee for the 1985 IEDM and the 1992 MTT-S Symposium. He is currently also serving on the Finance Committee for the 1994 MTT-S Symposium and the Technical Program Committee for the 1993 MTT-S Symposium. He also served as the Secretary for the Administrative Committee of the Microwave Theory and Techniques Society for 1992.

Roger W. Sudbury

Roger W. Sudbury (S'58, M'69) was born in Blytheville, Arkansas, in 1938. He graduated from the Georgia Institute of Technology with a BEE with highest honors in 1960, where he had been a National Merit Scholar. He was an instructor at the Massachusetts Institute of Technology and received the SM and EE degrees in 1963 and 1964. While there he worked with the Semiconductor Electronics Education Committee and received the MIT TV Management Shares Teaching Award in 1963.

He was a Captain in the US Army serving from 1964 to 1966 in the Light Observation Helicopter (OH-6A) Project Office with responsibility for the development of a light-weight solid state avionics package. Mr. Sudbury worked at Texas Instruments in 1960 in the Advanced Development Group on semiconductor devices and integrated circuits. He also worked for Ion Physics Corporation on ion implantation, radiation effects, and sputtering technologies for semiconductor devices. In 1969 Mr. Sudbury joined MIT Lincoln Laboratory to pursue the development of transmit-receive modules for active element phased array radars.

Currently Mr. Sudbury is Associate Group Leader of the System Engineering Group at MIT Lincoln Laboratory working on an Airborne Measurements Platform. He is also involved in radar application of Solid State T/R Modules.

He has served on the Microwave and Millimeter-Wave Monolithic Circuits Symposium Committee as its Technical Program Committee chairman and general chairman. Working with the 1991 MTT-S Symposium Radiation Laboratory Celebration committee, Roger was responsible for carrying out the MTT-S support of the NOVA production "Echoes of War." He served as Symposium Edition Editor of "Five Years at the Radiation Laboratory" reissued for the 1991 MTT-S Symposium. He also served as Historical Exhibits chairman for the 1991 MTT-S Symposium. Currently he is serving as a MTT-S representative to the Solid State Circuits Council.

Glenn R. Thoren

Dr. Glenn Thoren (M'73) is the Director of Strategic Technology Development in the Advanced Engineering and Technology Division of Lockheed Sanders in Nashua, NH. He holds three degrees from Cornell University, a bachelors and masters in Applied and Engineering Physics and a PhD in electrical engineering. Over the past twenty years he has been an active member of the IEEE and the Microwave Theory and Techniques Society, as Chairman of the Boston Chapter of MTT-S, Chairman of the Boston Section of the IEEE, Co-Chairman of the 1991 MTT-S International Symposium Technical Program Committee, member of the Board of Directors of Electro, Chairman of the Board of the Cornell Society of Engineers and numerous other IEEE committees.

Glenn's technical interests include microwave component theory and design, IMPATT diode technology and microwave monolithic integrated circuits. He has recently completed the Strategic Technology Plan for all business areas and technologies in Lockheed Sanders and also manages the internal research and development activities for the Advanced Engineering and Technology Division. Glenn is currently the chairman of the MTT-S AdCom Publicity Committee and a representative to the Defense R&D Committee.

He was recently Director of Engineering for the Microwave Technology Center at Lockheed Sanders and has held positions in design, development and program management at Raytheon Missile Systems Division. In 1991 he was awarded the IEEE Region 1 Professional Leadership Award.

Barry S. Perlman

Dr. Perlman (M'65, SM'68, F'86) is Chief, Microwave Photonics Branch, Electronics and Power Sources Directorate, US Army Research Laboratory, Fort Monmouth, New Jersey. He is responsible for research and advanced development of microwave/millimeter wave and optoelectronic components for radar, EW, communications and smart weapons. Related responsibilities include leading development of advanced design and test automation techniques, use of computational methods for electromagnetic analysis, device and circuit modeling, performance simulation and MIMIC CAD. Prior to his current position, he was Head, Design Automation Research in the Microwave Laboratory, at the David Sarnoff Research Center (formerly RCA Laboratories) in Princeton, New Jersey.

Dr. Perlman is a Fellow of the IEEE, a member of Sigma Xi, a member of the IEEE Societies on Microwave Theory and Techniques and Circuits and Systems. He is a member of the MTT AdCom, Co-Chairman Educational Committee, Technical Program Committee and Emerging Technology Committee and Past Chairman of subcommittee MTT-1 (CAD). He is the Program Manager for the DoD initiative to develop a MIMIC Hardware Description Language (MHDL) and serves as an Army representative to the Advisory Group on Electron Devices (AGED) and the DoD Reliance Sub-Panel on Solid State RF Components. He is a member of the IEEE Advancement Committee and Princeton Chapter Awards Committee and is listed in Who's Who in Science and Technology, Who's Who in Engineering and Who's Who in the East. He is a member of the NSF Advisory Board for the MIMIC CAD Center at University of Colorado and the Policy Board for CAEME (Computer-Aided Electromagnetics Education) at University of Utah.

He holds four US patents and has published over 40 technical papers on solid-state circuits and devices, microwave networks, signal processing computer-aided design and automated testing, has received four RCA Outstanding Engineer-

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Fellow Nominations



Hal Sobol
Fellow Nominations Committee

Fellow grade nominations must be submitted by April 15, 1993. The nomination form B-27 is one of the major sources of information used by the Society and Institute Fellow candidate evaluators. Therefore, nominators should present, within the limited space provided, a very thorough, detailed case that emphasizes why their candidate deserves election to the Fellow grade. Unfortunately, an inadequately prepared nomination can lead to the failure of a worthy candidate to be elected as a Fellow. Further, since a large number of nominations are submitted each year, the Institute is very rigorous in requiring adherence to all regulations and dates published in the *IEEE Guide for Fellow Nomination* (Publication FG-1). All nominators should follow the guidelines to avoid disqualification on a procedural basis. The societies play a key role in the evaluation process. A Society Fellow Evaluation Committee composed of at least three Fellows is charged with the responsibility of technical evaluation and ranking of the nominees. The Society Committee does not consider activities or service to the Society in the evaluation. These factors are considered by the IEEE Fellow Committee. The Society Committee reaches a consensus on each candidate and considers whether or not the candidate is recognized and considered outstanding in the field activity of the Society. Contributions by practitioners and technical leadership are accorded equal recognition with technical developments.

The evaluation guidelines used by the MTT-S Fellow Committee in 1992 were:

1. Significance of technical contribution. Has work led to follow on research by others, or production of products or operations of large systems? These contributions may be individual or in the event of a technical leader may be a team-led activity.
2. Has the candidate made many significant contributions of the type discussed in 1?
3. Papers or patents related to the contributions of 1 and 2. Are the papers significant, were they the first or early papers or patents and did many others follow by other authors? Are the papers in top rated journals or conferences?
4. Have fellow workers such as subordinates, students and others gained prominence because of working with the candidate?
5. Is the individual considered a technical giant in the fields of endeavor?

Nominators should take note of the guidelines employed by the Society Committee and should attempt to structure their writeups accordingly.

New Fellows

We wish to extend our congratulations to the following MTT-S members who were elected to Fellow Grade as of January 1, 1993.

Fritz A. Arndt

"For contributions to the field theory analysis utilized in the design of passive microwave and millimeter-wave components."

Paolo Bernardi

"For contributions to microwave interaction with biological systems."

Zvi Galani

"For leadership in the development of low-noise microwave signal generation techniques for missile and radar systems."

William E. Hord

"For contributions to microwave ferrite phase control components and their application to electronically scanned phased array antenna systems."

Ferdo Ivanek

"For contributions to the development of fundamental-frequency/microwave oscillators and amplifiers and their application in analog and digital radio relay systems."

Stephen A. Maas

"For contributions to the computer-aided analysis of microwave mixers and their distortion behavior."

Koji Mizuno

"For contributions to the development of electron devices for the short millimeter- and submillimeter-wave regions."

Ervin J. Nalos

"For pioneering development and leadership in the application of high-power microwave devices."

Ken-ichi Noda

"For contributions to low-loss, millimeter-wave circular waveguides."

David B. Rutledge

"For leadership in the theory, development, and application of integrated antennas in the millimeter-wave and terahertz regimes."

Vijai K. Tripathi

"For contributions to microwave and millimeter-wave circuits and to coupled transmission-line techniques."

The 1993 Fellow Nominations kits will be available in January 1993. You may obtain a kit by contacting Ms. Delores Wright of Membership Development Services, IEEE, 345 East 47th Street, New York, NY 10017, or by calling her at 212-705-7750.

IEEE-USA Celebrates International Space Year

To help celebrate International Space Year, IEEE-USA's Aerospace R&D Policy Committee co-sponsored a session on *Space and Disaster Management* as a part of the 1992 World Space Congress. The session was video-conferenced by satellite, with panels in Washington, D.C., and Geneva, Switzerland. C-SPAN and a large number of educational and university networks provided coverage.

Other participating organizations included the International Academy of Astronautics, the International Astronautical Federation's Working Group on Space and Disaster Prevention, Preparedness, and Relief, and the Society of Satellite Professionals International. The World Space Congress, which attracted thousands of aerospace and astronautical engineers from around the world, was held in Washington, D.C.

The 1992 IEEE MTT-S International Microwave Symposium



by Jerry Hausner

The 1992 International Microwave Symposium, held in Albuquerque, New Mexico, during the first week of June, was deemed one of the most successful ever. This is based on several criteria. Foremost, a record number of 380 technical papers were presented in 48 formal sessions plus the Interactive Forum. Feedback squelched any concerns about maintaining the quality of the papers in face of the increased acceptance rate. The papers were selected from a base of 646 submissions. This year, 106 papers were presented in the interactive forum. The papers assigned to this forum were not those considered inadequate for a formal presentation but those where the author-audience interaction best suited the presentation of the material. The quality of those works paralleled that of the formal sessions. In particular, many used live computer displays to illustrate the material far better than could be achieved with slides on a screen. Additionally, some used video documentation to demonstrate results. Expansion of this media will be encouraged for future symposia.

This symposium also had a record number of special sessions, consisting of 7 focus sessions, 3 evening rump sessions, 6 lunchtime panel sessions, and 13 workshops. All in all, this made for a very busy week. Most of the focus sessions involved technology that is indigenous to New Mexico; namely high power microwaves, ultra wide band sources and radio astronomy. Others were in the rapidly growing and maturing field of millimeter and submillimeter technology. This area alone saw 31 papers presented.

The plenary session keynote speaker was Distinguished Professor Roald Sagdeev. Prior to accepting his position at the University of Maryland, Professor Sagdeev, among many other achievements, was the personal space policy advisor to Mikhail Borbachev, director of the Soviet Space Institute and a member of the Soviet Academy of Sciences. Being one of the world's most renowned physicists and astronomers, he touched on other applications of microwaves and gave a very vivid and enlightening talk on the trials and tribulations of conducting scientific research in the former Soviet Union. His talk was very well accepted and the post session questions and discussion seemed endless.

In my address at this session, I spoke of the new role for the microwave industry in the new world politics. I would like to reiterate that here. I believe that much of the resources that were channeled into defense efforts must now be redirected to produce products that are competitive in a global economy and support the betterment of mankind. The challenge to us as microwave engineers is to determine where the application of our technology is the best solution of problems. Some of the areas we have to look at are:

- Medicine

- Communications
- Manufacturing Techniques
- Transportation—nav/guidance
- Environmental Improvements
- Entertainment
- Peace Keeping—treaty verification
- Construction
- Space Exploration

Each of these areas offers great rewards for those of us that can apply our technology and turn it into operational systems.

The total registration for this conference was almost 5200, which is not a record. The economy in general and especially its effect on the microwave industry probably accounted for a 20% reduction of what it might otherwise have been. Nonetheless, this was still an excellent turnout. The workshop attendance was 884 and the on-site radio telescope workshop at the National Radio Astronomy Observatory (Very Large Array) in Socorro, New Mexico, was a sellout.

Along with the record number of presented papers was a record size digest and symposium proceedings. The total number of pages was 1760. As usual, this was divided into 3 beautifully bound volumes that will be a valuable reference for many years to come.

Another new twist at this symposium was the expansion of the Historical Exhibit to a Special Exhibits Hall. In addition to the Historical Exhibits of MTT and MIMIC, this exhibit featured

- Russian Microwave Exhibit
- British Radar Vehicular Control
- NASA Space Exhibit from Alamogordo Space Center
- Superconductivity Exhibit
- National Atomic Museum Exhibit
- Book signing—UFO Crash at Roswell
- Various historical videos being shown

In spite of the current economic conditions, the industry exhibits were excellent and occupied about 430 booths. The quality of the booths, their displays and demonstrations were superb. This exhibit was housed in the new wing of the Albuquerque Convention Center that provided 110,000 square feet of exhibit space with no interfering columns.

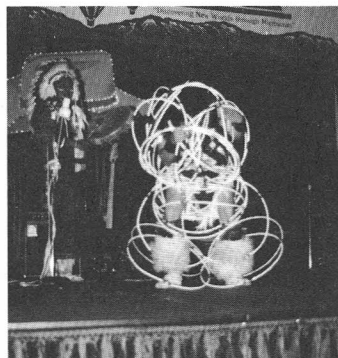
The social events that accompanied this symposium were heralded as the best ever. First, the locale exposed the attendees to a culture that they have not before encountered. This held many in awe. It appears that more than 25% of the attendees brought their spouses and added some recreation time to attending the technical sessions. The cultural aspects were emphasized at the Awards Banquet, guest programs and many other activities associated with Microwave Week. The guest programs were sellouts and the compliments are still coming. The offerings of the area provided tours to a living museum which started as a *paraje* (travelers' stopover) almost 300 years ago, the Jemez Mountains, Santa Fe, Los Alamos and a city tour of Albuquerque. There was, of course, an abundance of New Mexican food but various affairs were highlighted with Mariachi bands, Indian dancers, Country Western music, Modern Flamenco, Classical Guitar and on and on. The Indian Hoop Dancer brought the audience to their feet, as he manipulated 38 hoops into shapes that represented creatures of the earth and culminated in a globe signifying a unified world.

The Microwave Theory and Techniques Society, in choosing Albuquerque for a symposium site, gave your southwestern colleagues the opportunity to show you, the microwave community, what they could do. I have not encountered anyone who has not offered their highest praise for the efforts and results of this steering committee. Again, I thank them for their outstanding performance.

At the 1992 IMS:



Hoop dancer.



Modern Flamenco Dancers.



Mariachis.



Edl Schamiloglu, Interactive Forum Chairman;
Roald Sagdeev, Plenary Session Keynote
Speaker; Robert Hutchins, '92 TPC Chairman.



Hal Sobol; Gordon Harrison, '93 TPC Chairman.

1993 IEEE MTT-S IMS

Plan to Be Part of Microwave Week '93 in Atlanta



by Pete Rodrique
1993 IMS Chairman

The period of June 14-18 will offer unparalleled opportunities to hear the latest developments in microwave theory and practices and to see the latest in microwave systems, devices, and measurement equipment.

The keystone event is the 1993 IEEE-MTT International Microwave Symposium with technical sessions and the industry's largest microwave exhibit from Tuesday, June 15th, through Thursday, June 17th. In addition, some 15 technical workshops will be held on Monday, the 14th, and Friday, the 18th. This year's theme, "The Global Reach of Microwaves," will be the focus of a plenary session on Tuesday. The Georgia World Congress Center will be the site of all of these meetings as well as the Exhibition.

The annual Monolithic Microwave and Millimeter Wave Conference will also be held on Monday and Tuesday of Microwave Week, with several joint MTT-MMWMC sessions. The National Telesystems Conference, sponsored by IEEE's Aerospace and Electronic Systems Society, will also be co-located with the International Microwave Symposium and held on Wednesday and Thursday, June 16 and 17. The NTC focuses on microwave applications to terrestrial and space communications, radar, and remote sensing systems. On Friday, the Automatic RF Testing Group will hold their annual meeting.

A full program of evening social events is planned, including the *Microwave Journal* reception on Monday, special events on Tuesday, and the exhibitors' cocktail party on Wednesday. The MTT-S Awards Banquet will also be held on Wednesday.

A full guest program is also planned. Organized tours run on Tuesday through Thursday and will provide a taste of Atlanta and its environs. Atlanta has a clean, efficient urban mass transit system that facilitates individual or group excursions to places of special interest.

The International Microwave Symposium was previously held in Atlanta in 1974, a symposium that featured the first co-location of MTT-S, AP-S, and URSI meetings. That Microwave Exhibition attracted 19 exhibit booths. Gerald Ford was the President of the United States, and Jimmy Carter was governor of Georgia. When the guest tour stopped by the Governor's Mansion, a young woman named Rosalind came out and urged support for her husband in the upcoming election—a suggestion taken lightly by most on the tour! Atlanta's baseball team was yet to become America's team, and if anyone had suggested that this city would host the Centennial Olympic games, they would have been quickly referred to the nearest psychiatrist. The advance registration fee for that symposium for members was \$25.00—things have changed!

Come to the '93 IMS and see just how much things have changed.

A New MTT-S Award MTT-S Distinguished Educator Award

One important function of every IEEE Society is to recognize those of our peers who either show outstanding achievements in our field of expertise or distinguish themselves in serving our MTT-Society. The distinguished Microwave Educator Award honors individuals who exhibit a combination of both achievements. MTT-S is fortunate to have many outstanding educators who have been recognized as scientists and also render outstanding service to MTT-S, through ADCOM or otherwise. The untimely death of Dr. F.J. Rosenbaum, in February 1992, caused several of his friends to propose ways to keep his memory alive. The result of the deliberations of several Past Presidents is the Distinguished Microwave Educator Award which is described in detail below. Nomination forms can be obtained from Dr. Knerr.

- Deadline for submission of nominations is July 1.
- Description and Background—The creation of 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.

This award is to be presented to a distinguished educator in the field of microwave engineering and science who exemplifies the special human qualities of the late Fred J. Rosenbaum who considered teaching a high calling and demonstrated his dedication to MTT-S through tireless service.

- Prize—A Plaque and Honorarium of \$1,000.
- Eligibility—The candidate must be a member of IEEE and MTT-S at the time of nomination.
- Basis for Judging—The awardee 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 publications. The candidate shall have a record of many years of service to MTT-S.

- Presentation (when presented)—at the annual IMS Awards Banquet. The award also entails a feature publication in the MTT-S Transactions.

Incoming President's Message

(continued from page 1)

microwave content, the opportunity exists for MTT-S to share our expertise and experiences with our technical neighbors. The Technical Committees, together with the Meetings and Symposium and Long-Range Planning activity, are actively working to these goals. Topical conferences, workshops, and alliances with technical and conference activities of other societies are reaching into the technical areas where industry growth demands quality communication and information.

Every five years each IEEE Society participates in a Society audit process, where its activities and purpose are summarized and reviewed at the IEEE TAB level. Among all of the questions posed by the Review Committee, the toughest is "How do you measure the success of the Society?" MTT-S has many channels for complaints, including the MTT-S Ombudsman, an (aperiodic) "letters to the editor" column in this Newsletter, open AdCom and Chapter Officers' meetings, and

(continued on page 23)

MTT-S Membership Services Committee Report



Mario A. Maury, Jr.
Chairman

New MTT-S Chapter

We would like to welcome a new chapter which has been formed in the South Australia section. This new chapter is a joint chapter with the Antennas and Propagation Society. Should you wish additional information on this chapter, please contact its chairman listed below:

Dr. Bevan D. Bates
EWD 77 labs, DSTO
P.O. Box 1500
Salisbury, SA 5108 Australia

Membership Services Committee

The members of the 1993 Membership Services Committee are listed below:

Chairman:	Mario A. Maury, Jr.
Vice Chairman:	Roger D. Pollard
Chapter Activities:	Mike Golio
Chapter Records:	Joe Staudinger
Chapter Liaison:	Kris K. Agarwal
International Chapter Liaison:	Richard A. Sparks
Chapter Officers Handbook:	Austin Truitt
Chapter Communications:	Vijay Nair
Microwave Lecturer Program:	James C. Wiltse
Membership Development:	John T. Barr
Student Member Development:	Roger D. Pollard
Newsletter Editor:	John W. Wassel
Special Technical Articles:	John A. Eisenberg

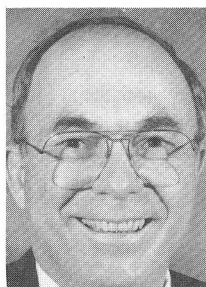
Contact information for the above members of the Membership Services Committee may be found in the 1993 IEEE MTT-S Committee Directory included in this issue.

We have expanded the committee in order to distribute the workload and hopefully provide better services to our members and chapters.

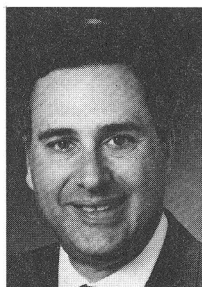
We have created two new chapter liaison functions: Kris Agarwal for Domestic Chapters (Regions 1-6) and Dick Sparks for International Chapters (Regions 7-10). They will provide our chapters with a point of contact with membership services if they have difficulty in obtaining information or assistance through conventional channels. Also, they will assist in the formation of new chapters. In addition, Dick will also provide liaison with the Transnational Committee.

Please feel free to contact any member of the committee should you require any information, assistance or have any comments relative to MTT-S activities and/or benefits.

Meetings and Symposia Activities



Jim Crescenzi



Eliot Cohen

Sometimes issues that have been discussed for several months, if not years, are resolved in one Administrative Committee (AdCom) meeting; whereas in other cases, progress is elusive. Such is the case with a democratic decision process! The meeting of last September was particularly productive regarding Meetings and Symposia activities including:

- New guidelines for distribution of the International Microwave Symposium (IMS) programs and advance (abbreviated) programs.
- IMS exhibitor survey
- Updated IMS site selection guidelines, including detailed criteria for location of future symposia.
- Sponsorship of new meetings and conferences.

Distribution of the IMS Program

The policy regarding distribution of programs for the International Microwave Symposium (the small booklet listing all papers and session information in detail) has been vigorously discussed at the last several Chapter Chairman's meetings. Chapter chairmen representing non-US chapters argued for universal distribution of the unabbreviated IMS program in a timely manner. Prior policy was a reasonable compromise which reflected the problem that costs of mailing the IMS program in Regions 8-10 was over ten times that in Regions 1-7! An abbreviated or "advance" program which was less costly to mail had been in use for several years. However, being abbreviated, it must necessarily have less information. A new policy (presented below) was proposed and adopted at the September AdCom meeting.

IMS Program Distribution Policy

Category	Unabbreviated		Abbreviated	
	Prior	New	Prior	New
MTT-S Members				
A) North American (1-7)	Y	Y	N	N
B) International (8-10)	N	Y	Y	N
IMS Registrants of Last 3 Years				
A) North American (1-7)	V	Y	N	N
B) International (8-10)	N	Y	V	N
ED/AP/IM/Ultrasonics (exclusive of MTT)				
A) North American (1-7)	Y	N	N	Y
B) International (8-10)	N	N	Y	Y

*Y = Yes, N = No, V = Policy Varied

This new policy gives priority to MTT-S members and registrants of the last three IMS, with a timely mailing of the full IMS program. It compensates for some of the increased costs by sending the less expensive advance (abbreviated) program to members of other IEEE technical societies who might logically wish to attend the IMS. The new policy will

be in effect in 1994, and a variation of this will be used for 1993 (the 1993 budget had been set prior to this change in program distribution policy). The new policy will have a net effect of adding approximately \$9,000 in program mailing costs. We certainly hope that some of this cost will be compensated by increased attendance by the members affected.

Survey of IMS Exhibitors

There was an excellent response by IMS exhibitors to a new MTT-S questionnaire distributed in the exhibition registration package in Albuquerque. Almost 100 responses were received, and the detailed statistics were reported at the September AdCom meeting. Questions included:

- How successful were this year's IMS Exhibits?
- Compared to participation in other conferences, how would you rate the return-on-investment of IMS exhibits?
- Do you favor extending the IMS exhibits by one day (from the current 3 days to 4 days, assuming concurrent expansion of the technical program)?
- How would you rate location as a factor influencing your company's participation in the IMS Exhibits (including the number of people representing your company)?
- Is it desirable to locate the IMS in a major center of microwave industry?
- Rating of specific locations as sites for locating future IMS.

The strongest responses were in favor of location of future IMS in major centers of microwave industry, and against extending the exhibits from 3 to 4 days. As to how we rate, the exhibitors generally gave us a "B", which is probably a good grade for the current state of the economy. We would like to do better, of course, and always strive to improve the symposium for all participants. Of particular importance, we intend to continue the exhibitor survey activity, and to continue our effort to improve communications with our exhibitors.

Updated IMS Site Selection Guidelines

Why revise IMS site selection criteria? This effort started as an attempt to write down the criteria which had evolved over many years such that they could be made available to members who might wish to propose hosting future IMS. The effort got a large boost by action of the Past President's Council at the May 1992 AdCom meeting, in which the AdCom was advised to place increased emphasis on locations with concentrations of industry (the quantitative aspects were recognized as difficult to resolve). The Meetings and Symposia Committee was then tasked by our President with recommending IMS Site Selection Criteria so that the issue could be resolved at the Fall Adcom meeting.

It is appropriate to note that this is an area of passionately held convictions! Respected past presidents, for example, are on both sides of the question of limiting IMS to the major commercial areas, and most AdCom members cherish the scientific-event atmosphere they recall from the "early days". On the other side of the issue, revenue from our symposium now exceeds that derived from membership dues, and it is imperative that we support a strategy of long-term commercial success if the current breadth of MTT-S activities is to continue to be funded. Given these issues, the AdCom voted overwhelming approval of the following guidelines.

Site Selection Guidelines for the IMS

1. Site location should be central to microwave industry. Consideration should be given to the percent of MTT-S membership residing within commuting distance.
2. The location should have a positive reputation with IMS exhibitors.

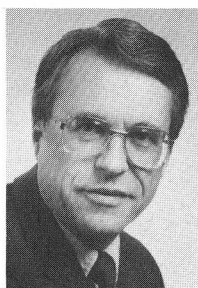
3. The proposed steering committee shall possess the leadership and management skills necessary to assure that the event meets professional and financial objectives.
4. The following physical aspects shall be satisfied:
 - A. The proposed site shall have adequate hotel capacity. It shall commit (to IMS usage) convenient hotel accommodations on a peak-room-night basis of approximately 40% of the average full-event (excluding one-day) registration of the three most recent IMS.
 - B. Convention facilities shall be conveniently accessible from hotels, and shall support co-located technical sessions and exhibits.
 - 1) Meeting Room space: At least one room with seating capacity (theater style) for approximately 3/4 of recent or expected MTT-S registrations. The facility shall support up to five parallel sessions with total seating capacity of approximately 125% of MTT-S registration at the three most recent IMS, with individual room capacities that will accommodate recent IMS session formats.
 - 2) Exhibit Space shall be available immediately adjacent to technical sessions. Exhibit space shall be sufficient to support approximately 125% of the average number of 10x10 booth spaces used in the three most recent IMS.
 - C. The proposed site shall have convenient access by air travel for both domestic and international travelers. Surface travel between the airport and the proposed site shall be readily available and of moderate cost.
5. A proposed IMS site may also be evaluated for additional specific criteria, at the discretion of the IMS Site Selection Committee. Results of the IMS Site Selection Committee evaluation shall be reported to the MTT-S Administrative Committee, which shall vote final approval of a proposed IMS site.

It is important to note that this policy is definitely not intended to exclude participation of chapters outside the areas of concentrated membership and industry in the overall MTT-S meetings and symposia activities. Per the Past President's Council's recommendations, these chapters are encouraged to sponsor topical meetings in the spirit of smaller IMS's of early years. The new policy does recognize that the current IMS has grown to the point that it has taken on a commercial dimension best supported by location in areas of concentrated membership.

New Meetings and Conferences

A significant new technical meeting was voted sponsorship by the MTT-S—the International Conference on Millimeter and Submillimeter Waves and Applications, scheduled for January 8th & 9th, 1994, in San Diego. Mohammed Afsar organized the proposal for the new conference, and he will serve as the Steering Committee Chairman for the first event. Others involved in the preparations for the conference include Ralph Levy as Technical Program Committee Chairman and Roger McMillan as Treasurer. The conference is also being coordinated with organizers of the Symposium on Space Terahertz Technology by Tatsuo Itoh to minimize overlap of the two meetings, both of which are sponsored by the MTT-S. The proposal was the subject of extended discussion during the September 1992 AdCom meeting, and it was clear that a primary objective of the organizing activity is to involve many MTT-S members active in the millimeter and sub-millimeter waves area to help assure the long term success of this important new conference. Those interested in participating in the conference organization and technical program committees are invited to contact Mohammed Afsar or Ralph Levy.

Technical Coordinating Committee



by Jorg Raue

I would like to bring you up to date on who is currently leading the various MTT-S Technical Committees. A number of changes have occurred in the last 6 months. Incidentally, while we are tallying changes, my affiliation with TRW ended with my retirement effective 1 November. However, I plan to continue to be active in the MTT Society. My new address and phone number are:

Jorg Raue
28813 Rothrock Drive
Rancho Palos Verdes, CA 90274
Telephone: (310) 377-2599

Technical Coordinating Committee

Chairman:	Jorg Raue
Vice Chairman:	Zvi Galani
TC Coordinator:	Frank Bayuk
Coordinator, January 1993	
Technical Committee Meeting:	Jitendra Goel

Technical Committee Chairs/Co-Chairs

MTT-1 Computer-Aided Design: K.C. Gupta, Ingo Wolff
 MTT-2 Microwave Acoustics: Bruce McAvoy, Robert A. Moore
 MTT-3 Lightwave Technology: Norman R. Dietrich
 MTT-4 Submillimeter-Wave Techniques: Fawwaz T. Ulaby
 MTT-5 Microwave High-Power Techniques: Jitendra Goel, Don W. Reid
 MTT-6 Microwave & Millimeter-Wave Integrated Circuits: Frank Sullivan
 MTT-7 Microwave & Millimeter-Wave Solid-State Devices: H.J. Kuno
 MTT-8 Filters and Passive Components: Jerry Fiedziuszko, H.C. Bell
 MTT-9 Digital Signal Processing: Robert Bayruns
 MTT-10 Biological Effects and Medical Applications: Ayre Rosen
 MTT-11 Microwave Measurements: Stephen F. Adam, Ronald E. Ham, and John T. Barr IV
 MTT-12 Microwave & Millimeter-Wave Packaging: Bert Berson, Doug Maki
 MTT-13 Microwave Ferrites: William E. Hord, John M. Owens
 MTT-14 Microwave Low-Noise Techniques: James Whelehan, Jr.
 MTT-15 Microwave Field Theory: James W. Mink, Wolfgang Hoefler
 MTT-16 Microwave Systems: Klaus D. Breuer, George L. Heiter
 MTT-17 Manufacturing Technology: Charles Huang
 MTT-18 Microwave Superconductor Applications: Martin Nisenoff

MTT-5 High Power Microwaves



Jitendra Goel
MTT-5 Co-Chairman



Don W. Reid
MTT-5 Co-Chairman

Due to the end of the cold war and crumbling of the Berlin wall, Eastern block countries have opened up. They are openly exchanging technical information with the Western countries. This is also evident by the number of papers we received for the MTT-Symposium. In the last two symposiums, we received seven papers from the former Soviet Republic, and three of them were accepted for regular presentations and one in the open forum. Some of their attendees also actively participated in our workshops.

Recently, our co-chairman, Don Reid, visited Russia as a part of a DoD technology assessment team. One of the objectives of this excursion was to look for compact, high-power microwave devices. Don was interested in their work on multiple beam klystrons because they had presented two papers on the subject with outstanding results. A multiple-beam klystron¹ had been described in the 1991 symposium in Boston and a multiple-beam TWT² had been described in the 1992 symposium in Albuquerque. The work on both devices had been done at Istok, a company which makes a variety of devices and instruments for the commercial market.

A visit was arranged with Dr. Batygin, the chief engineer, and Dr. Pobedonostsev, who did most of the MBK design work. It was interesting to learn that they had been working on MBK's since 1955. Many of you will remember that work was being done in the US at that time on MBK's but was abandoned in the early 1960's with the belief that it had no future. With their continued work the Russians have proved that it is a viable device which offers the advantage of smaller size, provides wider bandwidth, and operates on lower voltage compared to the conventional klystrons.

Istok had on display a multiple-beam S-band tube and a multiple-beam C-band tube. The output power of the S-band tube was 1 MW pulse with pulse length of a few tens of micro seconds and 1% duty cycle. It operates with only 29 kV of cathode voltage. The tube had just under 50 dB gain. The tube was obviously intended for radar applications because it had a published 3 dB bandwidth of about 5%.

This tube had 24 beams. Dr. Pobedonostsev said that they had used as many as 100 beams. Each beam was about 3 mm in diameter and the emitting cathode was flat. The tube obviously ran confined flow and the beams did not interact with each other except in the cavity gap. Each cathode has a solid metal grid made from a single piece of copper. The beam channel between cavities was made by inserting a copper rod, about 3 cm in diameter, between the cavities. The copper rod had 24 holes drilled in it for beam transmission. The ends of the copper rod were flat and the edges were not shaped. They had grooved the ends of the rods to suppress multipaction. They also had a 6 beam cathode on display where each cathode had a concave shape. Dr. Pobedonostsev said that

the magnetic field shaping associated with this cathode was much more difficult.

Apparently there are many MBK's in service in Russia. Istok also makes a TV version which runs at about 50 kW cv. They also indicated that they could build a 500 kW tube in the UHF frequency ranges at about 60% efficiency.

Besides the exciting high power generation work going on in Russia, we here on the home front are emphasizing the applications of the high power in several interesting areas. Two of them are briefly summarized here.

Hospital Waste

Due to the onset of AIDS and many other diseases, hospital waste disposal is getting a lot of attention. Currently it is disposed of by burning in an incinerator. Many small local hospitals have their own incinerator which, in most cases, does not meet the strict EPA standards for incineration and are being shut down. Los Alamos National Laboratory is investigating the possibility of using an electron accelerator using pulsed power at 130 MHz from a conventional RF tube to sterilize hospital waste with the electron beam prior to grinding and disposal in a landfill. This approach has the distinct advantage of being environmentally benign; i.e., there are no effluents, either liquid or gaseous, there would be no activation of any material by the electron beam and as soon as the machine is turned off, immediate access would be possible. We hope to report in more detail on this new application of microwave power in a later newsletter.

Nuclear Waste

The methods of nuclear waste disposal, which is a major problem in the U.S., are also being investigated at Los Alamos National Laboratory. Accelerated transmutation of nuclear waste using beam of protons at 1.6 GeV with several hundred megawatts of CW power at 700 MHz is being tried out. It is expected that it will alter the natural decay path, which has typical half life of 1000 years, to an accelerated decay path which will only take 100 years.

¹Gelvich, E. A., et al, "A New Generation of Power Klystrons on the Base of Multiple-Beam Design." *IEEE-MTT Symposium Digest*, 1991, pp. 1319.

²Lopin, M. I., et al, "High-power Multiple Beam TWT's and the TWT Based Amplifying Chains." *IEEE-MTT Symposium Digest*, 1992, pp. 145.

Workshop Microwave-Absorbing Materials for Accelerators

A Workshop on Microwave-Absorbing Materials for Accelerators will be held at the Continuous Electron Beam Accelerator Facility (CEBAF), Newport News, VA, February 22-24, 1993. Abstracts are due December 1. Topics include microwave-absorbing materials in accelerators, microwave-power tubes, and other applications; manufacturing methods; ceramic, ferrite, dielectric, and artificial dielectric materials; microwave, structural, thermal, and vacuum properties and their characterization; and absorber design. A tour of the CEBAF accelerator—which is based on 338 superconducting microwave cavities at 2K—is planned for those interested. Contact Paul Wheeler, MS58B, CEBAF, 12000 Jefferson Ave., Newport News, VA 23606-1909; telephone 804/249-7407, fax 804/249-7658.

Video Tutorial Review Microwave Opto-electronics

Developed and Presented by
Alwyn Seeds

Department of Electronic and Electrical Engineering
University College, London

by Professor Peter R. Herczfeld
Drexel University

Microwave electronics and photonics are among the fastest growing areas in electrical engineering. The interface of these two areas, microwave opto-electronics, represents a new, emerging technology with significant applications in optically fed phased array antennas, antenna remoting, delay lines and sub-carrier multiplexed CATV distribution. Because microwave opto-electronics is a new field and because it brings together experts from essentially two different fields, microwaves and photonics, there existed a real need for a tutorial. Professor Seeds' videotape presentation fills this need splendidly.

The organization of the tutorial is excellent. The brief, well-conceived introduction is followed by a systematic presentation of high speed fiber optic link starting with the basic components, optical transmitters and receivers, followed by a thorough discussion on the link performance (gain, noise) and ending with some well chosen examples of key applications. The section on components is clear, thorough and illuminating, even for the experts. The characterization of the fiber optic link is equally clear and most useful in providing an understanding of the subtle differences between a conventional microwave transmission system and the one using fibers. The section on applications is carefully constructed to give an intriguing view of the type of systems that may utilize microwave opto-electronics. The potential advantages of these applications are also emphasized.

It is truly remarkable that Dr. Seeds was able to compress so much material into a relatively short tutorial and to cover such complicated issues as optical-microwave interfaces with such ease and clarity.

Dr. Seeds' delivery is smooth and clear; the accompanying slides are well designed and executed. The tape is accompanied by a booklet which contains all the slides as well as a most useful, albeit too short, list of references.

To order this video tutorial, "Microwave Opto-electronics," Product Number HV0268-3, call the IEEE toll free (in USA) 1-800-678-IEEE, fax: 908-981-9667, phone: 908-981-0060, or write:

IEEE Customer Service Dept.
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331

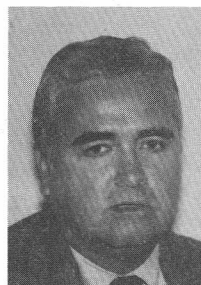
For more information regarding continuing education videos and self-study courses, call IEEE Educational Activities at 908-562-5499.

MTT AdCom Elections

(continued from page 6)

ing Achievement Awards, was elected to the Hall of Fame of INTEREX, a computer users group, and received the Automated Measurement Technology Award from ARFTG. He received a BEE degree from the City College of New York in 1961 and an MSEE and PhD degree in electrophysics from the Polytechnic Institute of New York in 1964 and 1973, respectively.

Technical Committee on Microwave and Millimeter Wave Integrated Circuits (MTT-6)



Frank Sullivan
MTT-6 Chairman

MTT-6 activities have focused on advances in all aspects of integrated circuits for microwave and millimeter applications. These have included device and packaging technologies as they relate to circuit integration and reliability. Several activities have been sponsored jointly with other technical committees. This emphasis will continue with additional focus on integration of optics with conventional microwave and millimeter ICs and an increased emphasis in commercial applications.

At the 1992 Symposium in Albuquerque, three panel sessions (Millimeter-Wave Monolithic ICs, MMICs for Commercial Market—Fact of Fantasy?, Process Technology & Testing Challenges for High Volume Commercial MMICs), a workshop (Module Integration Technology), and a focus session (Advanced Millimeter-Wave Technology) were sponsored by MTT-6. Jointly, MTT-6 sponsored a rump session with MTT-7 (HBT Reliability), and jointly participated with MTT-1, MTT-3 and MTT-11 in a workshop (Phased Arrays: A Technology Assessment).

The following activities are planned for the 1993 Symposium in Atlanta:

- High Efficiency MMIC Power Amplifiers—Watt's Up! (rump session)
- Microwave & Millimeter Wave HBTs & HEMTs—Circuit Applications and Reliability (joint workshop with MTT-7)
- Multifunction MMIC Design (panel session)
- MMICs in Commercial Markets (panel session)

Two topical meetings covering emerging technology are being proposed with MTT-6 joint or cooperative sponsorship. The proposals for the January 1993 AdCom meeting cover one of the top focus areas recommended by the Long-Term Technological Directions Subcommittee. They are:

- Topical Meeting on "Microwave Fiber Optics," to be held with the Optical Fiber Communications Conference, February, 1994; jointly sponsored by MTT-3 and MTT-6
- Topical Meeting on "Microwave Optical Interactions," to be held with Laser & Electro-Optics Topical Meetings, August, 1993; cooperatively sponsored by the Lasers & Electro-Optical Society (LEOS), MTT-3 and MTT-6

The MTT-6 contact regarding these proposed topical meetings is:

Mr. Derry Hornbuckle
Hewlett-Packard Company
Microwave Technology Division ILS
1412 Fountaingrove Parkway
Santa Rosa, CA 95401
(707) 577-3658, Fax (707) 577-2036

Report of the Division IV Director



Martin Schneider

Activities of the New Technology Directions Committee

Since the beginning of this year, Derry Hornbuckle and I have been serving on the TAB New Technology Directions Committee whose mission is to identify emerging technologies and distribute information on significant technical advances to our members. Our committee meets every two months at the IEEE Service Center in Piscataway, New Jersey, where we benefit from the active participation of IEEE staff members and have immediate access to existing technical data bases and other relevant information. Our team has been action oriented, which means that we have been focusing our efforts on finding and promoting fields with the strongest prospects for steady economic growth. These technical fields are compiled in our new document entitled *Portfolio of Emerging Technologies*, which has been made available to the *IEEE Spectrum* and a number of IEEE magazines and newsletters. Our publication was reviewed by the IEEE 2002 Task Force of the Transnational Committee, whose members were impressed by the quality and content of the document. They recommended distributing it to all IEEE Sections worldwide. If you wish to receive your own copy please give a call to Derry Hornbuckle on (707) 977-3658 or dispatch a note to my internet e-mail address: m.schneider@ieee.org, or mvs@hoh-1.att.com.

Benefits From Interactions With Other IEEE Societies

In the last annual report of our division, a proposal was made to enhance the communication between Societies by encouraging visits of officers to each other's administrative meetings. More specifically, it was suggested that the Vice President of a Society attend the AdCom meeting of another Society to establish contacts and learn from the experiences of other groups. Peter Staecker volunteered to serve as the pioneer of this program by attending the June 1992 AdCom meeting of the Electron Devices Society at MIT in Boston. In his written report he listed a number of successful ED-S activities which could be readily adopted by the Societies in Division IV. For example, a periodic examination of new technical developments will facilitate the inclusion of emerging technologies in the IEEE key document which describes the field of interest of each Society. Peter was also impressed by an excellent summary prepared by Ranuka Jindal on statistics related to the publication of the *IEEE Transactions on Electron Devices*. He recommends that we should use the summary as a model for presenting *MTT Transactions* data to our AdCom members. He also suggests publishing relevant parts of it in the *MTT Society Newsletter* for the benefit of our members. He concludes the report by saying: "I only stayed

three hours, but the time was well spent. I advise all members and officers to attend an occasional ADCOM meeting of other Societies when they have the chance."

A New Concept for Creating IEEE Standards

The importance of creating and maintaining standards was already emphasized in the Division IV report of the Summer 1992 issue of the *MTT Society Newsletter* and can be summarized as follows:

- Standards create employment.
- They enable manufacturers to enter the business without fear of making incompatible products.
- The field of standards is not boring (compare the work of great French chefs and their recipes).
- The key factor in the development of a standard is to reach a consensus on how to create useful products and services which are affordable.

Since the publication of the last report, the IEEE Standards Department and the International Electrotechnical Commission (IEC) have shown a strong interest in facilitating the introduction of global standards through new mechanisms which are simpler than the lengthy and traditional consensus procedure. I participated in discussions with Andrew Salem and Judy Gorman, Staff Directors at the IEEE Standards Department, on how to establish a new route that will enable us to reach new standards. In concurrence with the General Policy Committee of the IEC, we propose to publish a series of documents which are midway between a technical paper and a standard. The documents would be similar to existing application notes widely used by successful engineers and might be called *IEC/IEEE Emerging Technical Practices and Procedures*. They would serve as source documents which could later evolve into new standards.

Our team is looking for pioneers who will help us in implementing this proposal. If you have material for an application note, get in touch with the MTT Standards Chief Jerry Fiedziuszko on (415)852-6868, or give a call to Judy Gorman, IEEE Standards Department, in Piscataway, New Jersey, phone (908)562-3820.

Highlights of the August 1992 IEEE Board Meeting

The IEEE Board of Directors met in Sparks, Nevada, on August 3 and 4, 1992. The meeting was held in conjunction with TAB to enhance interactions between our Society Presidents and members of the major IEEE Councils and Boards. The highlights of the board meeting were as follows:

- A 1992 General Fund deficit of \$505K was anticipated. A \$189K deficit for the 1993 Operating Budget was approved.
- The 1993 membership dues were increased by \$5 to \$78.
- The first 1993 board meeting will be held near Piscataway, New Jersey. The Singapore meeting was canceled.
- Drastic measures were taken to reduce the costs for attending board meetings. IEEE volunteers and staff people will meet in places which are cost effective. In addition, alcoholic beverages will no longer be served at IEEE functions.
- A revised IEEE Bylaw which will permit the nomination of one or more candidates for the Office of President-Elect was approved.

The final board meeting in 1992 will be held in Phoenix, Arizona, from December 6 to 7. In 1993 the number of meetings will be reduced from four to three. The consensus of our IEEE officers is clearly that costs have to be curtailed and that we have to become more productive.

ARFTG Highlights Winter 1992/93

by John T. Barr, IV

The 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.

40th ARFTG Conference— Measurement and Design of Packages and Interconnects

The 40th ARFTG Conference will be held in Orlando, Florida, December 3 and 4, 1992 (due to the *Newsletter* lead-time, you will probably be reading this after the conference has occurred). The theme of this two-day technical conference with concurrent manufacture exhibits will be *Measurement and Design of Packages and Interconnects*. As microwave and digital designs increase in complexity and speed, while they decrease in size, the difficulty of realizing packages and interconnects is becoming a choke-point in design and measurements. The increased difficulty leads to lack of accurate data, which, in turn, can lead to catastrophic design costs and lead-time.

While the conference agenda is still shaping up, the following papers have been accepted:

Surface Wave Phenomenon in Wafer Probing Environments, E. Godshalk

Time Domain Measurements, Characterization and Modeling of Interconnects, V. Tripathi

Interconnection Transmission Line Parameter Characterization, D. Williams

Using Microwave Coupled Resonator Filters to Characterize Thick Film Interconnects for High Frequency Signal Propagation, R. Gryzbowski

Modeling, Simulation and Design of Dissipative, Dispersive, Uniform and Non-uniform Multiconductor Interconnects, V. Tripathi

Save the "THRU" in the ANA Calibration, A. Ferrero

Coplanar vs Microstrip Measurements of Millimeter-wave Devices, P. Walters

Calibrating Microwave Probes to the Probe Tips, D. Williams

Automating Test Operations to Improve Quality and Productivity, S. Williamson

The Conference Chair will be James C. Rautio, Sonnet Software, Inc., 135 Old Cove Road, Suite 203, Liverpool, NY 13090-3746, phone (315) 453-3096; Conference TPC is Bert Berson, Berson and Associates, 655 Castro Street, Suite 3, Mountain View, CA 94010, phone (415) 968-2101. A post-conference digest will be available—contact Henry Burger, ARFTG, 1008 East Baseline Road, No. 955, Tempe, AZ 85283-1314. Cost is \$20.00 for an ARFTG member and \$35.00 for a non-member. An additional \$9.00 is requested for airmail outside the USA.

41st ARFTG Conference— Information Management and Automated Test ("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 two-day technical conference with concurrent manufacture exhibits will be *Information Management and Automated Test* ("Now That I Have All This Data, What Do I Do With It?"). As automated test now generates more and more data, how do we use this data? What can be learned from analyzing large amounts of data? How do we present to the user the raw or analyzed data? How do we store and retrieve this information in the future? Papers are invited which identify problems and/or solutions in this area. In addition, papers concerning all other areas of microwave measurements and design are welcome.

Those interested in participating should contact Conference Chair: J. Greg Burns, John Hopkins Univ.—Applied Physics Lab, MS-12-N381, John Hopkins Road, Laurel, MD 20723. Deadline for paper submissions will be approximately March 15, 1993.

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.

Join ARFTG

We will be looking forward to discussing the latest in measurement automation and accuracy with you in Orlando or Atlanta. 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 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, Hewlett-Packard, 1400 Fountaingrove Parkway, Santa Rosa, CA 95403.

Portable Pensions and You

US engineers may want to contact their Senators to comment on Senate Bill S.3184. This bill has the purpose of improving the portability of earned pension benefits when workers change jobs. Electrical engineers in the 80s (and 90s) have been forced to switch companies at least once a decade to further their career. The present pension laws result in very little retirement income for the "average" engineer who has changed employers every seven years. Such changes are dictated in the last decade more by national economy and government purchasing decisions and less on the engineer's search for higher cash flow. These job changes are part of the "efficient market" that puts skilled labor where it is needed most. Unfortunately, the current pension laws only work for the rare case where an engineer can work 35 years for one company, something seldom found outside of civil service anymore.

In this election year, a note to your 2 Senators will help them take action. Send your opinion to: Senator _____, United States Senate, Washington, DC 20510.

Update on 1992-1994 MTT-S Distinguished Lecture

Progress and Change in Microwave Radio Communications



by Ferdo Ivanek

I started with the April 1 lecture in Atlanta, invited by Keith Edenfield, Chairman of MTT/AP Chapter. Next came four lectures in Europe, which I was able to combine with a business trip that covered the transatlantic flight. Two of those had been planned earlier (refer to my first progress report in the Spring 1992 *Newsletter*, Number 131, pp. 13, 15), and two more were added at the invitation of Dr. Ingeborg Hochmair-Desoyer, Chairperson of the IEEE Austria Section, which included funding of local travel and lodging. These two lectures were co-hosted by the International Institute of the Technical University of Vienna and by the Austrian Electrotechnical Association.

I started with the May 20 lecture in Vienna, hosted by Prof. Ernst Bonek, Past Chairman of the IEEE Austria Section. He gave me a tour of his Institute for Communications and High Frequency Techniques. I was indeed impressed by their original contributions in the area of mobile radio communications, which have been published at recent conferences. This visit was of special personal interest because the Technical University of Vienna is my alma mater.

Next was the May 22 lecture in Budapest, at the invitation of Prof. Istvan Frigyes, Chairman of the MTT/COM/ED/AP Chapter. In Hungary I also attended the May 25-28 IEEE International Workshop on Personal, Indoor and Mobile Radio Communications, which has been jointly organized by the MTT/COM/ED/AP Chapter and the Hungarian Scientific Society for Communications. There I presented the tutorial "Evolution and Standardization of 2nd and 3rd Generation Systems" which complemented my Budapest lecture.

On June 1, I presented my lecture in Innsbruck, hosted by Prof. Erwin Hochmair. I found of great interest their pioneering work in hearing research and hearing aid implants. From there, I proceeded to Geneva for a CCIR meeting and after that to Paris. On June 11, Dr. Victor Fouad Hanna, Chairman of the France MTT Chapter, hosted my lecture at the Centre National d'Etudes des Telecommunications (CNET), the French equivalent of the former Bell Laboratories. This visit was also of special personal interest due to my extensive past working contacts with colleagues from the CNET. Dr. Fouad Hanna helped to defray MTT-S costs by arranging for the Chapter to cover the local lodging expenses.

Prof. Masami Akaike, Past Chairman of the MTT Tokyo, Chapter invited me to deliver the Keynote Address at the 1992 Microwave Workshops and Exhibition (MWE '92) in Tokyo, September 16-18. He also arranged for joint funding of local expenses and half the round-trip travel by the Chapter,

the MWE '92, the Advanced Telecommunications Research Institute International (ATR) and the Murata Mfg. Co., Ltd. This arrangement was implemented by the MTT Tokyo Chapter under Prof. Tsukasa Yoneyama, Chairman, and Prof. Yoshio Kobayashi, Vice Chairman. The organizational details were expertly handled by Dr. Hiroyo Ogawa, Secretary/Treasurer.

I started with the September 11 visit to ATR near Kyoto, hosted by Dr. Yoji Furuhashi, President, ATR Optical and Radio Communications Research Laboratories. He gave me a tour of the impressive laboratories, which are well known through extensive publications, after which I delivered an abbreviated version of my lecture. On September 14, I repeated the presentation at nearby Murata, hosted by Dr. Kikuo Wakino, recently elected IEEE Fellow, by Dr. Toshio Nishikawa, Director, Yokohama Research and Development Center, and by Mr. Yohei Ishikawa, General Manager, Microwave Components Development Department I.

MWE '92 was sponsored by the IEICE APMC National Committee, and co-sponsored by the IEICE Technical Group on Microwaves and the MTT-S Tokyo Chapter. It consisted of the Keynote Address, the Special Lecture: Microwave Technology in Radio Astronomy, five tutorials and twelve workshops. In the *MWE Digest*, all papers except the tutorials are printed in English although only two workshops were actually presented in English. All sessions were very well attended. I suggested that a special report on MWE '92 be printed in the *MTT-S Newsletter* and that the *Digest* be made available for purchase by interested MTT-S members outside of Japan because the papers are of very high quality.

My lecture schedule for the remainder of 1992 is as follows:

- Denver-Boulder MTT/AP/GRSS Chapter on October 29;
- Santa Clara Valley/San Francisco Chapter on November 12;
- Orlando MTT/AP Chapter on December 9;
- Florida West Coast MTT Chapter on December 10.

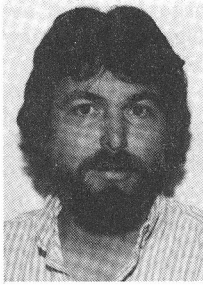
The total number of my 1992 lectures will thus be twelve, which is double the expected six lectures per year funded by the MTT-S. This became feasible due to the substantial additional funding from the Tokyo Chapter, the Austria Section, the France Chapter and my consulting business. My "backlog" of invitations for 1993 is thirteen lectures and I shall again do my best to present as many as possible within the given funding limitation.

Interestingly, two of the invitations (one each from Europe and Latin America) also include the lecture "Electronics Industry Challenge in Newly Industrializing Countries," which was originally intended for the IEEE Colloquium '92 (announced in the Fall 1991 *Newsletter*, Number 131, page 12). I would therefore like to mention that I have already presented, jointly with my co-authors from the World Bank, a paper on the same subject (at the 1992 Conference of the International Communications Society, Sophia Antipolis, France, June 14-17). Furthermore, at the Europa TELECOM '92, organized by the International Telecommunication Union in Budapest, Hungary (October 12-17), we presented the more focused version "Telecommunication Development in Central and Eastern Europe: A Domestic Industry Perspective."

In both these presentations I covered the effect of technological progress and business climate on telecommunication equipment manufacturing in newly industrializing countries. I am therefore ready to add a lecture on this subject at request. Since this subject is of broader interest, it may be particularly appropriate for joint meetings of two or more Chapters, or for Section meetings.

(continued on next page)

Wealth, Happiness and Health



by Mike Golio
IEEE MTT-Society Chapter Activities
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Tempe, AZ 85284
(602) 897-5947

As the deadline for another *MTT-Society Newsletter* approached, I became anxious to find an appropriate topic for this column. I decided to seek advice from some of my colleagues who attend local chapter meetings on a regular basis. My first opportunity to accomplish this came when I spotted four IEEE regulars congregated informally in the hall. The member of the group nearest me as I approached was Jimmy Maxwell, an independent consultant. Jimmy was talking to Jill and Edward Forsythe as well as to Nick Webber—all top-notch microwave designers. The group seemed to be trying to ignore a fifth person (and not a regular attendee at local chapter events, I might add) Leery McFly. As I approached, I was greeted by Jimmy, who complimented me on my last *Newsletter* column. Jimmy's financial success depended on keeping customers satisfied, so he was really good at kissing up—even to the likes of me. Jill, Edward and Chuck all politely agreed that the question my column had raised concerning the prehistoric Salado and free Pizza had caught their interest and stimulated their thoughts. Although their paychecks do not depend on paying undue compliments to me, they are all really nice people and quite capable of providing undeserved flattery. I thanked them all for their praise.

McFly looked up and grunted, "I see what you do, and it makes me sick." This was a fairly typical comment for McFly. He had a finely honed talent for saying the most socially unacceptable thing possible in any occasion. I thanked him for the criticism and turned back to the rest of the group.

The conversation moved toward local chapter activities. I was looking for stories that might provide motivation for others to attend chapter events. Jimmy jumped in. "Several years ago, I attended a local chapter meeting where the MTT-Society Distinguished Lecturer was speaking. He introduced me to a new subject which I studied and eventually based my whole business on." This was indeed an impressive story. Jimmy had done well, and seemed to be giving much of the credit for that success to attendance at an IEEE chapter meeting.

I was excited. "This will make a great column," I said.

McFly snorted, "My philosophy is that I know more about microwaves than any so-called expert lecturer. I would never waste my time attending some IEEE meeting."

Lucky for us, I thought. McFly had a habit of telling anyone who was unfortunate enough to be within hearing range what his "philosophy" was. His droning eventually dwindled and after a polite pause, Jill spoke up. "Edward and I first met at an IEEE workshop sponsored by the local chapter."

"We got married less than a year later," Edward added. They both smiled.

"I didn't know that," Jimmy exclaimed. "Now there's a real story for your column."

"Yea, that's great," I said. "It's going to be hard to top that."

McFly belched.

Nick Webber had been quiet throughout the conversation. "What about you, Nick?" I asked. "Have you got an IEEE chapter story to tell?"

Nick paused. "Well," he began, "before I started coming to chapter meetings, I used to just go to the gym every night. I enjoyed the workouts, but had developed this case of athlete's foot that lingered on for months. When I hurt my knee, I started looking for other things to do and began to attend chapter meetings on a regular basis. Before long, my athlete's foot rash had cleared up entirely. I go to all the meetings now, and my rash has never come back. I guess you could say I owe that to the chapter meetings."

McFly grunted something about his "philosophy" as it related to exercise and waddled away.

But, there you have it. Regular attendance at local chapter events will make you wealthy, bring marital bliss and cure athlete's foot. I just wish it could do something for McFly.

By the way, if you have an IEEE chapter story to tell, let me know. I'm listed in your committee directory.

Announcement

1993 IEEE MTT-S Distinguished Microwave Lecturer

- Distinguished Lecturer: Professor Tsukasa Yoneyama. Address: Research Institute of Electrical Communication, Tohoku University, Katahira 2-1-1, Sendai 980, Japan; Fax +81-22-211-9341
- Lecture Title: Nonradiative Dielectric Waveguide and Its Applications
- Content: This lecture is concerned with the nonradiative dielectric waveguide (NRD-guide) which has been proposed as a transmission line to be used in millimeter-wave integrated circuits. The NRD-guide is featured by its capability to suppress unwanted radiation at curved sections and discontinuities of circuits as well as its inherently low loss nature. Fundamental characteristics of the NRD-guide will be explained based on theoretical and experimental results. Some practical devices and subsystems such as frequency converters, transceivers, and radars will be discussed. Some topics on millimeter-wave planar antennas fed by leaky NRD-guides are also included in the lecture.
- Travel Plan: Three times a year for Region 10 (China, India, Korea, Taiwan, Singapore, Australia, Indonesia, Thailand, Japan, etc.). Once a year for USA and Europe.
- Budget: International travel expense is paid by MTT Society and Tohoku University. Domestic expense should be prepared by local MTT-S Chapters or local IEEE Sections.

Progress and Change in Microwave Radio Communications

(continued from previous page)

Last, but not least, I would like to draw your attention to the importance of advance planning. Experience shows that it can take anywhere from a few months to over one year to schedule a lecture at a mutually convenient time. Please write, call or fax at your earliest convenience, even for 1994! Mailing address: P.O. Box 60862, Palo Alto, CA 94306; phone: 415/329-8716; fax: 415/328-8751.

New Technology Directions Committee of the IEEE Technical Activities Board

by Ronald J. Pogorzelski
Division IV Representative, NTDC

The New Technology Directions Committee (NTDC) is a standing committee of the IEEE Technical Activities Board (TAB). Its charter is to identify emerging technology areas not currently addressed by IEEE entities and to encourage and facilitate the formation of appropriate ad-hoc intersociety committees in such areas.

The Committee currently consists of a maximum of seventeen members. They are the Chair, the immediate Past Chair, a representative of each of the ten IEEE Divisions, and five Members-at-Large which are to broaden the representation by including other professional societies, government, etc. Recently, at the suggestion of the TAB Structure Review Ad-Hoc Committee, each of the IEEE Societies and Technical Councils was invited to appoint a corresponding member to the NTDC. These corresponding members provide a key technical link between the NTDC and the Societies. Because of this new linkage, the 1993 committee will consist of five standing members and the 37 corresponding members.

The current activities of the NTDC include the development of a set of "Grand Challenges" in electrotechnology. They are:

1. To be or not to be reachable anytime, anywhere (wire-free and fiberless communication).
2. To have instant access to all information (databases, high-speed links, flat panel displays and interfaces).
3. To be present or absent anytime, anywhere (virtual presence and reality).
4. Abundant, clean, safe and affordable energy.
5. Intelligent highways and transportation systems (personal global navigation).
6. The paperless office (flat panel displays, pen and tablet).
7. The cashless society (electronic purse and wallet).

In addition to these lofty goals, the committee is considering a number of near-term activities in support of new technologies. For example, an Ad-Hoc Committee of NTDC is exploring the possibility of co-sponsoring, with the IEEE Atlanta Section, an interdisciplinary New Technologies Conference with the possible emphasis on environment, health, and safety issues.

NTDC is also compiling a list of video tapes on emerging technologies currently in production. Several of the Societies have indicated interest in expanding production of such tapes.

In the interest of preparing a "portfolio" of emerging technologies, NTDC has solicited from each Society a summary of emerging technologies related to its technical purview. Several fascinating summaries have been received and will form the basis of the portfolio.

NTDC recognizes that as engineers we must emphasize that the new technologies which we promote must be incorporated into new products which fulfill the needs of humanity. Thus, we must not merely study new phenomena but must

MTT Society Ombudsman



by Ed Niehenke
Westinghouse Electric Corporation
P.O. Box 746, MS-75
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(301) 993-7432 Fax

As your Ombudsman, I have received six inquiries from MTT-S members since the last reporting in the Summer 1992 *MTT-S Newsletter*. Five of the inquiries involved members who had not received *MTT-S Transactions*, including some who also did not receive other IEEE publications. I contacted IEEE, and they will be sent missing publications. The last inquiry involved a member who was not able to attend the 1992 International Microwave Symposium (IMS) and would like to receive the 1992 *IMS Digest*. In previous years, a special pre-publication offer was made to MTT-S members in a special mailing. In 1992, people could order the *IMS Digest* from their advanced program. For those who missed the opportunity, the 1991 and/or 1992 *IMS Digest* will be made available to MTT-S members while supplies last at a reduced price over the IEEE amount as outlined in this newsletter. The 1993 *IMS Digest* will be made available next year and in future years to MTT-S members. Look for the ordering information in a future *MTT-S Newsletter* for 1993.

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.

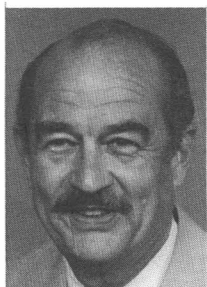
study their application for the good of mankind. Interestingly, the fastest growing IEEE Society is currently the Vehicular Technology Society. This rapidly growing area is certainly among those having a positive impact on society. This growth has spread to the related areas of signal processing, information theory, and communications, all of which are areas of interest to specific IEEE Societies.

As mandated by its charter, the NTDC has formed an Ad-Hoc Committee on "Energy" chaired by Thomas Pinkham, our Division VII Representative. This Committee is to include representation from a number of Societies. This relates to the fourth "Grand Challenge" listed above.

NTDC also recognizes its relationship to lifelong learning in that practicing engineers must be encouraged to become proficient in the emerging technologies identified by the committee. Educational materials must be made available by the IEEE through its cognizant Societies and through IEEE Press. Communication is paramount, both intersociety and with the lay public, which must be made aware of the engineers' contribution to the quality of life.

NTDC continues to meet and plan promotion of new technologies within IEEE and welcomes your suggestions in this regard.

MTT-S Bylaws Amendments



Aditya Gupta
(photo not available)
and
Robert McMillan

Recent changes to the Society's Bylaws approved by the Administrative Committee are summarized in this section. In accordance with Article IX, Section 2, of the MTT-S Constitution and Section VII 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.

Section 1—Nominations, Elections and Appointments

The following requirements for the chair of the Nominations Subcommittee were approved by AdCom during the Fall 1989 meeting (added text is underlined):

A. Nominations

1. Nominations Subcommittee

On or before February 1 of each year, the President of the Administrative Committee shall ascertain that the Nominations Subcommittee has been appointed in accordance with Section III.A of these Bylaws, which shall consist of a Chairman and four or more members of the Society not more than half of whom may be members of the Administrative Committee. The Chair shall be a Past President of the Administrative Committee or an Honorary Life Member of the Society not currently serving as an Elected Member of the Administrative Committee. Preference shall be given to an individual who will not be eligible to vote in the election.

Section III—Committees

A. Standing Committees

At the September 1989 meeting, AdCom voted to change the status of the International Liaison Committee from a subcommittee of the Membership Services Committee to a separate Standing Committee named Transnational Committee. A

description of the duties of this committee, approved at the Fall 1992 AdCom meeting, is as follows:

12. Transnational Committee

The Transnational Committee shall be responsible for promoting non-US international activities to be essentially an outreach and extension of the domestic services and support provided by the Society so that the specific needs of the non-US membership are taken care of and that this part of the membership is adequately represented in all facets of the Society.

The Transnational Committee shall report on and recommend those non-US activities considered beneficial to the Society. One of the Committee's major objectives is to promote formation of new chapters or joint chapters in concert with the Membership Services Committee. The Transnational Committee shall foster communications between non-US chapters and the Society by appointing coordinators in Regions 7-10. It cooperates with the national microwave societies in technical activities of mutual interest and, in particular, shall identify, promote, support and sponsor technical programs, conferences, workshops, seminars, meetings, etc. in coordination with the Meetings and Symposia Committee.

Section VI—Miscellaneous Committee Business

At the September 1989 meeting, AdCom approved the formation of the Pioneer Award. The text describing this award was further modified at the Fall 1992 AdCom meeting and is as follows:

F. Pioneer Award

The Society shall present an award known as the Pioneer Award. The award shall be considered annually but not necessarily presented annually. The award shall be made to an individual or a team not exceeding three persons having made outstanding pioneering technical contributions that advance microwave theory and techniques, and described in an archival paper published at least 20 years prior to the year of the award.

Recommendation of the recipient of the award will be the responsibility of the MTT-S Administrative Committee at its annual meeting. Nominations may be made by any member of the Society. The award shall consist of an engraved plaque, an honorarium of \$1000, and a feature publication in the *"IEEE Transactions on Microwave Theory and Techniques."* The president of the Administrative Committee shall inform the recipients of the Pioneer Award as soon as possible after the Administrative Committee has approved the award. Upon request, travel and living expenses for the recipients to attend the award ceremony may be reimbursed.

1. Guidelines for the Pioneer Award

The award shall be made to an individual or a team having made outstanding pioneering technical contributions that advance microwave theory and techniques, including novelty, timeliness, impact, significance, duration, and extent of usage. Eligibility requirements include development or creation of a new theory, device, component, and/or technique.

The MTT-S Constitution and Bylaws were published in the MTT-S Newsletter, issue number 132, Summer 1992, pp. 28-35.

TAB Periodicals Council and PUB



by Tatsuo Itoh
Division IV Representative

The third and last meeting of the TAB Periodicals Council (PC) was held on October 30, 1992, at Palm Beach Airport Hilton of West Palm Beach, Florida. This meeting was followed by the PUB (Publications Board) meeting on the subsequent day in the traditional format. I have participated in these meetings as your Division IV Representative.

TAB PC started with adoption of agenda and a consent agenda of endorsement of minutes for June 6 meeting. This year, PC meeting used a new format. Several unfinished 1992 operating plans needed critical attention. Therefore, after several action items were taken care of, the group consisting of volunteers and IEEE staff was divided into three task forces and conducted two-hour break-up sessions. Chairs of three break-up sessions subsequently summarized their progress.

The action items passed as is or with minor amendments:

1. Endorsement of proposal from CHMT (Components, Hybrids and Manufacturing Technology) to initiate a new publication, *IEEE Trans. CHMT, Part B: Advanced Packaging*, and rename the existing *CHMT Transactions* as *Part A* without a subtitle;
2. Endorsement of request from IEEE Social Implications of Technology Society's special circumstance and waive the usual IEEE requirement to meet the 64 pages per issue for their *Technologies and Society Magazine*;
3. Endorsement of request that the *Transactions on Speech and Audio Processing* be permitted to assess a mandatory charge of \$110 per page for each page beyond eight.

Also endorsed, after considerable discussions, in endorsement of proposal change of IEEE Policy which would open an avenue to provide copyright protection for newsletters. This provision would be important for many newsletters which publish technical articles. Bill Hagen of IEEE Publications Department can assist in the copyright matters. A new grievance procedure was recommended to resolve disputes between authors and editors which could not be resolved at the societal level. A mediator will be appointed by the Vice President, Publications Activity, to resolve the disputes.

New Policy 6.22—Guidelines for IEEE Newsletter Publications was not endorsed as submitted. Most of the discussions were centered around the fact that there are thousands of newsletters published by some IEEE entities including Sections, Chapters, Student Branches as well as Societies and Councils, and that to what level downward this new policy be applied. These newsletters are serving many different purposes. The new policy may not apply to these varieties of newsletters equally. The policy intends to protect the IEEE Logos and preferred postal privileges. The Council decided that further work was needed and that revised documents be presented at the next meeting.

The three break-out sessions were:

1. Review and Oversight of Society/Council Periodicals;

2. Policies and Procedures for New Society/Council Periodicals; and
3. Staff/Volunteer Issues Concerning Publication Services Interaction with the Periodicals Council and TAB.

Under 1, "Total Quality" of the periodicals was emphasized, including the reduction of the turn-around time of articles from submission to publication. Self-evaluation by each society/council was emphasized. Under 2, stimulation of more application-oriented papers for publication in society/council periodicals was addressed. Some of the discussion items on this subject were readability, practical contents, timeliness, subject, and some review process discouraging these papers. Fast start-up of new periodicals was discussed with recommendations for implementation of advisory group and for consideration of start-up not necessarily in January. Under 3, most of the discussions were on the electronic publications which are well underway.

As a New Business item, a word of caution was introduced not to publish articles outside the scope for which a particular IEEE periodical is intended.

IEEE Publication Board met on the following day, November 1, at the same site. This is a policy-making body. The items endorsed by TAB PC are brought to this body for formal actions. The meeting started with an announcement and recognition of retiring *Spectrum/Institute* Editor, Donald Christiansen, who has served under this capacity for a quarter century. Under his leadership the *Spectrum* was recognized as one of the best technical publications, with several awards. A resolution was introduced and unanimously approved by the PUB that the position of Editor-Emeritus be created and Christiansen occupy this position.

New and exciting news, to be released soon, was announced by IEEE Staff on the initiation of Document Delivery System. By calling an 800 number of IEEE, E-mail or fax, any IEEE as well as non-IEEE technical materials could be received by members and nonmembers with appropriate fees.

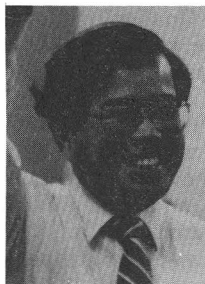
The IEEE Press reported a new joint venture with TAB to produce three book series—Emerging Technologies, Design and Applications, and Tutorials. Each series will have an editor-in-chief as member of the Book Series Committee. Each book will be targeted to meet the continuing education needs of IEEE members. Topics will be suggested by Societies/Councils, IEEE Press, Marketing, the TAB New Technologies Direction Committee, the TAB Education Committee, and the Design & Manufacturing Steering Committee. For each selected topic, a society sponsor will be sought and potential editors for the book will be identified. The editors will then organize a workshop on the topic. The purpose of the workshop is to bring together potential contributors who are expert in the field. They eventually create a table of contents and identify potential authors for each chapter.

Several action items have then been acted upon. The New Policy 6.22—Guidelines for IEEE Newsletter was withdrawn in concurrence with the discussions at TAB PC as described above. Request from the Signal Processing Society to levy page charges for *IEEE Transactions on Speech and Audio Processing* was approved. Guidelines for IEEE Magazines, and Requirements for Starting New Publications were also approved. The new author grievance procedure was approved. *CHMT'S Transactions Part A* without title and *Part B: Advanced Packaging* were approved.

Due to changes to Bylaws and Policies for Publications Board Restructuring, the current ten Division Representatives of the TAB PC will no longer occupy seats on the Publication Board. They will be replaced by three additional members-at-large appointed by the Board of Directors.

The next TAB PC and PUB meetings are scheduled to be at the end of February 1993.

Sandy Kakihana



Sanehiko Kakihana—"Sandy" for all his American friends—died in Palo Alto, California, on September 9, 1992. For many of us who had known him from the early days at Hewlett-Packard, or—even further back—from graduate school in Berkeley, something in our own life is coming to an end. He was a leader and a friend, someone you could always count on, in the difficult moments, to share your burden with you. It always seemed to be easier for him to give than to accept, to help than to ask. One of the last times I saw him, he reminded me of how often I had complained about this, and he added, managing a smile: "But I am changing now; I am learning to appreciate people's kindness."

In graduate school he was regarded as a general resource: you had the library, you had the adviser, you had this and that, but finally, if everything failed, you had Sandy. And he seemed to be there at any hour, any day of the week. Besides device physics, he was interested in a lot of things. He loved painting, drawing, and music. He took drawing classes off and on most of his life. He regularly

attended concerts: when he was younger, Beethoven was his favorite; later he preferred Mozart.

The next time I saw him after his PhD, he was at Hewlett-Packard, and had just succeeded in developing the very first microwave bipolar, which was the fastest device in the world at that time. His comment was both self-assertive and shy, so typical of him: "None of the senior scientists wanted to touch this project; they knew it could not be done. But when they asked me, I didn't know better and I took it." By the early 70's he was R&D Manager of the Microwave Technology Center. He introduced GaAs devices; first the Gunn diodes, then the FET's. Hewlett-Packard was the first major company to use them in the States.

Then came the decision to move the Technology Center to Santa Rosa. He seemed to have a very hard time in deciding, but finally his ties to the Bay Area were too strong . . . maybe the entrepreneurial bug had already got hold of him. He transferred to another division but shortly afterward, in 1976, he joined a group of friends in founding Dexcel. The new company, of which he eventually became president, was well-known in the microwave community, especially for its GaAs FET's and TVRO. It was a small, very close community: The people that worked at Dexcel in the early years will never forget Sandy. The company grew and was acquired by Gould in 1982, but Sandy did not seem as happy as a V.P. of a large corporation. A few years later he was back at the start-up game with Menlo Industries. As usual, he gave all of himself. But time was running short for him.

The last time I went to see him, two of his old lab assistants from Dexcel were visiting as well. When they left I commented on how many people had been affected by the news of his illness. He said: "Yes, I was surprised . . . Then maybe I have done something good, after all."

—Marina Bujatti

Outgoing President's Message

(continued from page 1)

the Albuquerque International Microwave Symposium yielded a record surplus, our Society undertook additional steps to control our spending in these uncertain times. Through the excellent management of our Budget Committee, our financial status will remain extremely sound.

On the administrative side, we can say that the Society has had a very productive year, accomplishing many key objectives. Due to the diligent work of Eliot Cohen, an agreement has been executed with the Electron Devices Society for mutual co-sponsorship of the Microwave and Millimeter Wave Monolithic Circuits Symposium and the GaAs Integrated Circuits Symposium. The Society also approved continual co-sponsorship of two topical conferences during the past year: the annual Space Terahertz Conference and the Conference on Electronic Performance of Electronic Packaging. Our Society has accelerated its ongoing efforts to broaden its transnational emphasis. With Roger Pollard's election to AdCom for 1993-1995, three of the 18 elected AdCom positions now represent international members. In addition, Jorg Raue has increased the international membership in the Society Technical Committees to nearly 30%. In the area of chapter activities, Mario Maury has added 4 chapters in 1992; three of the new chapters represent Regions 8-10. We also anticipate extension into the former Soviet Union in the near future. 1992 also saw the completion of an updated membership brochure as well as a complete revision to the Chapter Chairman's Handbook. The highly regarded Microwave Distinguished Lecturer Program has been updated this

past year through the efforts of Jorg Raue and Zvi Galani. Mario Maury has also made great advances in the area of membership services. A Student Membership Committee has been established specifically to recruit students into the Society and to maintain them as members upon graduation. In addition, a variety of activities and incentives have been structured to increase the general membership of our Society. As a final note, an MTT-S Distinguished Educator Award has been established in the memory of Fred Rosenbaum, a long-time active member of AdCom, friend and supporter who passed away this year after many years of service to our Society. Fred will be missed but will not be forgotten.

Working this year with the MTT-S Administrative Committee has undoubtedly been the most rewarding experience of my life. Never have I seen so many talented and dedicated people working so hard for the good of our Society. I am truly indebted to Ed Rezek for his support and hard work. He did an outstanding job in handling the day-to-day business of our Society. I am also grateful to Ferdo Ivanek for the operating policies and Society infrastructure that he created during his tenure as President. These have made my task significantly easier and will continue to help our Society in the future years. Finally, it is always a pleasure to work with Peter Staecker, who is extremely well organized and efficient. He has the uncanny ability to work potential issues before they materialize. Under Peter Staecker, 1993 should be an outstanding year for our Society.

—Viewpoints—

Some Comments on Electromagnetic Dimensionality

by James C. Rautio
Sonnet Software, Inc.

The dimensionality of electromagnetic analyses are usually described as being 2-D, 2.5-D, or 3-D. Unfortunately, it seems there are different ideas of what each dimensionality means. This open letter to the microwave community is to express my personal opinion as to their meaning and to invite the presentation of alternative meanings and justifications. Perhaps, in a few years, we can all, with a little give-and-take, agree.

Many of the differences in meanings are caused by the different way in which microwave engineers and electromagnetic researchers look at problems. I have spent nearly a decade in each of these fields and have seen several interesting situations arise because of these differences. Here, the important difference is that a microwave engineer looks at the current while an electromagnetics researcher often looks at the fields.

For example, take an analysis of planar 2-D circuits, the problem on which I did my dissertation. At that time, I found that microwave engineers would immediately describe it as a 2-D analysis because it includes only two dimensions of current. If you say 2-D to an electromagnetics researcher, he immediately thinks of things like infinite lengths of coax and waveguide. Given the same problem, the electromagnetics researcher sees 3-D fields and describes the analysis as 3D. This was the situation during my dissertation. Since I respect the opinions of both groups and since I had just been introduced to chaos theory, I decided a compromise was in order and I took the average: 2.5-D. This was in 1985, and, as far as I know, it was the first time that fractional dimensionality was used to describe an electromagnetic analysis.

Now take as an example an analysis of 3-D planar circuits in layered dielectric. Current flowing in the third dimension can be used to represent, for example, vias. This happens to be the problem we solved in 1989. However, because the term 2.5-D has become popular and because the analysis allows only layered dielectric, it is now sometimes described as 2.5-D. While initially quite satisfying (the layered dielectric requirement makes it, somehow, less than an analysis of 3-D arbitrary circuits, and 2.5 is less than 3), such a change in definition creates several problems. For example, if we now choose to describe a 3-D planar circuit embedded in layered dielectric as 2.5-D, what do we call problems involving a 2-D circuit embedded in layered dielectric? Another problem is the numerous scattering and antenna analysis codes which allow arbitrary 3-D structures in, sometimes, only one (layer of) dielectric, i.e., free space? The authors of these codes will be vigorous in the defense of the 3-D description of their codes. The free space problem is a special case of the (unshielded) layered dielectric problem. We cannot justify calling layered dielectric 2.5-D while we call a special case of layered dielectric 3-D.

In my opinion, it is best to keep the 2.5-D description for analyses which do not allow a single, specified field component, for example, $J_z=0$. But we still want to make sure that there is no confusion between the kind of 3-D analysis which requires layered dielectric and that which can handle arbitrary dielectric.

In the past we have described the 3-D layered dielectric problem as "3-D predominantly planar." This is a real mouthful and has not caught on. Recently, it was suggested that we simply call this kind of analysis "3-D Planar." Then we can call the 3-D arbitrary dielectric analysis "3-D Arbitrary." If a 3-D analysis allows only filamentary current, we can call it "3-D Wire." It kind of says it all, doesn't it?

To illustrate the above ideas, I classify a few popularly known electromagnetic analyses as follows:

- MININEC, NEC (public domain)—3-D Wire (used for arbitrary wire antenna analysis).
- EMSim (EEsof)—2.5-D Planar (includes an approximation for 3-D Planar).
- PMESH (UC Boulder)—2.5-D Planar.
- em (Sonnet Software/EEsof)—3-D Planar.
- LINMIC+ (Jansen Microwave)—3-D Planar.
- Compact/Microwave Explorer (Compact Software)—3-D Planar.
- HFSS (HP/Ansoft)—3-D Arbitrary.

In addition, I think we should also specify what we mean by "approximate" and "exact" in reference to electromagnetic analysis. My suggestions:

- exact—Describes an analysis whose approximations are a discretization (meshing) of the problem and the use of finite precision arithmetic. All other approximations are of equal or less significance than the use of finite precision arithmetic. As the discretization is refined, an exact analysis must converge to the exact answer as far as the numerical precision of the arithmetic used permits.
- approximate—Describes an analysis whose approximations are of significance equal to or greater than the discretization of the problem. If, as the discretization is refined, an analysis does not converge to the exact answer as far as is permitted by the finite precision arithmetic used, it is necessarily approximate.

I welcome comments and suggestions (no rotten apple throwing, please!) on the issues I have raised.

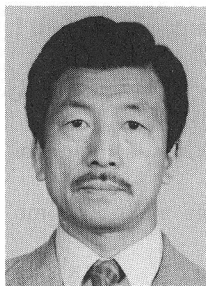
Incoming President's Message

(continued from page 10)

occasional questionnaires which are distributed through the *Newsletter* and at meetings. Measurement? Certainly membership is one metric, and a clear challenge for the near future. Quality of the *Transactions*, measured by reference citations, shows MTT-S in a positive light, ranking first among 38 telecommunications journals, and in the top 10% among electrical engineering journals, while displaying a positive time-derivative in these metrics. We offer scholarships and fellowships, and although the numbers have been reduced recently, the Education Committee has taken the challenge to obtain outside support for these activities so that it may serve more of our future membership.

In the last 10 years the vision of the Society has taken a number of forms, from establishing a firm financial planning and reporting structure, to reaching out to a truly global membership. The elected volunteers of the MTT Administrative Committee, including the immediate Past President, Reynold Kagiwada, are to be acknowledged for their efforts in these areas. As MTT now looks to expanding services and technical influence to broader applications in commercial microwave markets, the opportunity for growth extends to each of us as individuals to participate in the process—join us!

MTT-S Region 10 Chapter Activities



by Eikichi Yamashita
Co-Chairperson
Transnational Committee

As Co-Chairperson and Region 10 Coordinator of the MTT-S Transnational Committee, I would like to describe the committee's major objectives. The first objective is to promote the formation of new chapters or joint chapters in Region 7-10 in concert with the Membership Committee. The second is to foster communications between non-US chapters and the MTT Society by appointing coordinators in these Regions. The third is to cooperate with the national microwave societies in technical activities of mutual interest and, in particular, to identify, promote, support, and sponsor technical programs, conferences, workshops, seminars, meetings in coordination with the Meeting and Symposium Committee.

The following reports on chapter activities in Region 10 were recently submitted upon my request:

New South Wales Chapter Report

by Carol Wilson, Chairperson

- On 17 October 1991, Dr. John Archer, from the CSIRO Division of Radiophysics, a recently elected Fellow, and a former staff member of NRAO Charlottesville, presented a lecture on "GaAs Technology and its Applications to Communications and Industrial Sensing" to 48 members of the two joint chapters—Antennas and Propagation/Microwave Theory and Techniques, and Communications/Signal Processing. Dr. Archer explained his group's developing research over the past six years, leading to world-class mm-wave HEMTs and Schottky diodes, and related MMIC amplifiers, oscillators, mixers and frequency multipliers. Finally, applications of this technology to wireless LANs at 60 GHz and to temperature measurement in the steel industry were described.
- On 11 June 1992, Dr. John Ness, Managing Director of Mitec LTD. in Queensland, gave a talk entitled "Mitec—The Growth of an Australian Microwave Company" to a group of 28 joint chapter members and guests. Dr. Ness gave a brief overview of Mitec, from its beginning as the Microwave Technology Development Centre at the University of Queensland to its current position as a leading Australian technical company. He described some of the major product lines developed at Mitec, discussed the interdependency of engineering, marketing and quality assurance, and outlined the company's strategy for future growth.

Establishment of South Australia Chapter

by Bevan D. Bates

The petition to establish the South Australia MTT/AP Chapter has recently been submitted to the IEEE for approval.

Beijing Chapter Report

by Wei-chia Huang, Secretary

During the past two years several meetings were held jointly with the Society of Microwave, Chinese Institute of

Electronics. These joint meetings have proved to be effective and successful. The topics and speakers at the meetings are as follows:

- Special Report Forum in Shanghai, on May 5, 1991. 42 attendees. "Cad for VLSI" by Prof. J.Y. Lee, National Cheng Kung University, Taiwan.
- 1991 National Conference on Microwaves in Xian on October 11-14, 1991. 329 attendees. "New Advancements in Microwaves" by Prof. Wei-gan Lin, University of Electronic Science and Technology. "Developments of New Technologies of Communication Networks in 1991" by Prof. Yun-ruo Zong, Research Institute of Posts and Communication, Beijing.
- 1992 International Conference on Microwaves and Communications in Nanjing. 126 attendees. Papers presented were: "Rectangular Coaxial Lines for High Power Transmission" by Prof. Wei-gan Lin, University of Electronic Science and Technology; "Problems and Solutions of Non-uniform Transmission Lines" by Prof. J.Y. Lee, S.C. Wong, National Cheng Kung University, Taiwan; "Gain Enhancement for Microstrip Patch Antenna" by Prof. G.C. Huang, K.L. Wong, Kaosuing Institute of Technology, Kaosuing, Taiwan; and "On Vulnerability of Radio Communication Link" by Prof. D.N.C. Wang, Northwestern Polytechnic University, USA.
- The 4th National Conference on MIC and Technology in Chungqin. 98 attendees.

Taipei Chapter Report

by Tzu-hwa Hsu, Chairperson

The Taipei Chapter has been active in the stimulation of interest in the profession by organizing relevant technical activities. The microwave profession in Taiwan is growing in both academic and industrial sectors in terms of teaching, research and commercial output.

For the past year the following major activities have been successfully planned and carried out:

- 1991 Trans Pacific Electronic Warfare Symposium, September 12-14, 1991, World Trade Center, Taipei, Taiwan, ROC. Organizer: AOC Taipei Chapter & AOC Golden Gate Chapter; Co-organizer: IEEE MTT-S Taipei Chapter, AFCEA, ROC Chapter.
- 1991 Workshop on Microwave Communication Technologies, September 24-26, 1991, National Chiao Tung University, Hsinchu, Taiwan, ROC. Organizer: National Chiao Tung University; Co-organizer: IEEE MTT-S Taiwan Chapter.
- Seminars on Microwave and Millimeter-Wave Monolithic Integrated Circuits, December 23-24, 1991, National Taiwan University, Taipei, Taiwan, ROC. Organizer: Institute of Electrical Engineering, National Taiwan University; Sponsor: IEEE Taipei Section, IEEE MTT-S Taiwan Chapter.

Singapore Chapter Report

by Mook-Seng Leong, Chairperson

The following technical talks have been organized:

- A technical talk by Prof. Lin Deyun of Tsinghua University, People's Republic of China, on "Microwave and Electromagnetic Research in Tsinghua University" was held on 6 August 1992, EE Dept., NUS.
- Dr. Robert M. Bevensee, Senior Research Fellow, EE Dept., NUS, (on leave from Lawrence Livermore Laboratory, U.S.A.) "Antenna Theorems and Their Interesting Consequences", 3-5 pm, 28 September 1992, NUS.
- Prof. Dr. R.H. Jansen, ADCOM MTT-S, Co-Chairperson, Transnational Committee, University of Duisburg, EE Dept., Germany, "Advanced CAD Methodologies and Design Examples of MICs and MMICs for Communication Systems", 3 pm, 4 December 1992, NUS.

Indonesia Chapter Report

by *Safwan Natanagara, Chairperson*

Early this year I was elected Chairperson of the Joint Communications Chapter, IEEE Indonesia Section, to replace Mr. Djiwatampu.

Tokyo Chapter Report

by *Tsukasa Yoneyama, Chairperson*
and *Hiroyo Ogawa, Secretary*

As listed below, Tokyo chapter held seven meetings with 24 speakers this year. The most marvelous event was the 1992 Microwave Workshops and Exhibition (MWE'92) in which Tokyo Chapter played an important role and whose opening ceremony was started with the keynote address by Dr. F. Ivanek, MTT-S Distinguished Microwave Lecturer. The MWE'92 was well accepted as a highly technical microwave-oriented meeting in Japan.

- January 20, 1992, 96 attendees. "Circuit Miniaturization Approaches for Multifunction MMICs," T. Tokumitsu, NTT.
- February 14, 1992, 39 attendees. "Summary of the 1991 Microwave Workshop and Exhibition (MWE'91)," M. Akaike, ATR
- April 16, 1992, 69 attendees. "Electro-Optic Devices using High T_c Superconductor," T. Kobayashi, Osaka University.
- July 24, 1992, 23 attendees. "Recent Topics of Electromagnetic Wave Absorber," "A Report on 1992 IEEE MTT-S International Microwave Symposium Workshop," Y. Naito, Tokyo Institute of Technology, and five other members.
- September 16, 1992:
100 attendees. "Progress and Change in Microwave Radio Communications," F. Ivanek, Communication Research.
246 attendees. "Workshop: Radio Frequency Circuit Technologies for Mobile Communications," J. Fukaya, Fujitsu, and three other members.
66 attendees. "Workshop: Optical/Microwave Interaction Integrated Circuit Technologies," M. Izutsu, Osaka University, and three other members.
64 attendees. "Workshop: Microwave Applications of High-T_c Superconductors," A. Enokihara, Matsushita, and four other members.
19 attendees. "Workshop: Microwave Ferrite Film Technology," M. Tsutsumi, Kyoto Institute of Technology, and four other members.
- September 17, 1992:
231 attendees. "Tutorial Lecture: Microwave Parameters and Their Measurements," T. Iwasaki and T. Inoue, Electrotechnical Laboratory.
191 attendees. "Tutorial Lecture: Evaluation and Usage of Microwave FET," Y. Hirachi, Olympus.
175 attendees. "Workshop: Present Status and Trends of MMICs and Their Applications," S. Kamihashi, Toshiba, and three other members.
47 attendees. "Workshop: a Dreamful Future of Personal Communications," M. Akaike, Science University of Tokyo, and four other members.
156 attendees. "Workshop: Millimeter-Wave and Its Application to Sensing Systems," Y. Takimoto, Advanced MMW Tech., and four other members.
105 attendees. "Tutorial Lecture: Microwave Dielectric Materials and Their Measurement Techniques," H. Tamaura, Murata, and two other members.
55 attendees. "Temperature Stable and Low Loss Dielectric Materials Application to Microwave Devices," and "A Report on 1992 IEEE MTT-S International Microwave Symposium," K. Wakino, Murata, and eight other members.
- September 18, 1992:
249 attendees. "Tutorial Lecture: Microwave Circuit Design," H. Iwakura, University of Electro-Communica-

tions, and I. Ichitsubo, Giga Science.

57 attendees. "Tutorial Lecture: Topics of Electromagnetic Compatibility," Y. Shimizu, Tokyo Institute of Technology, and M. Taki, Tokyo Metropolitan University.

71 attendees. "Microwave Technology in Radio Astronomy," K. Morita, National Astronomical Observatory, and three other members.

144 attendees. "Workshop: SAW Devices and Dielectric Filters for Mobile Communications," M. Hikita, Hitachi, and two other members.

50 attendees. "Workshop: Satellite Communications Technology, VSAT," S. Salamoff, Orion Satellite, and three other members.

50 Attendees. "Workshop: III-V Compound Semiconductor Materials," A. Okamoto, NEC, and three other members.

116 attendees. "Workshop: Microwave and Millimeter-Wave Transistors," N. Shiga, Sumitomo Electric, and three other members.

80 attendees. "Workshop: DBS Reception Technology," A. Takahashi, Yagi Antenna, and three other members.

Korea Chapter Report

by *Jung-Su Myung, Chairperson*

- Microwave Measurement Workshop. September 15, 1992. 16 attendees. At Institute of Defense Information Systems. "Test and Measurement Solution for Defense/Aerospace" by Joe Gattuso, Hewlett Packard.
- Microwave Symposium '92. October 17, 1992. 30 papers presented. At HyunDae Research Institute, HyunDae Electronics Co. Guest Speaker: Jae Bong Lim, Korea National University.

India Chapter Report

by *Shiban K. Koul, Chairperson*

The MTT-S India Chapter completed its 18th year of operation with the calendar year ending 1991. The chapter activities were tailored to meet the technical needs of the engineering and scientific community in India. The chapter presents a forum for technical discussions at the lecture meetings, workshops and symposia within the country and from abroad. This year the chapter arranged four lecture meetings. Details of these are given below:

- 26 December 1991. Prof. G.P. Srivastava, Dayalbagh College, Agra, India, "Microwave Studies on Superconductors."
- 26 December 1991. Prof. G.P. Srivastava, Dayalbagh College, Agra, India, "Microwave Studies on Dilute Magnetic Semiconductors."
- 15 May 1992. Mr. Graham Spicer, Marconi Instruments, UK, "Microwave Measurements."
- 14 September 1992. Prof. Shiela Prasad, Northeastern University, MA, USA, "Microwave Characterization of Heterojunction Bipolar Transistors."

Besides, the chapter office bearers met three times to discuss various activities. In addition, IEEE MTT-S has agreed to co-sponsor the 4th International Symposium on recent advances in Microwave Technology (ISRAMAT-93) to be held in India in December 1993.

MTT-S Region 10 Chapter Chairpersons' Meeting

The meeting was held at Colony Room, Grosvenor Hotel, Adelaide, Australia, 12:45-14:45 on August 11, 1992. The attendees were:

Prof. and Mrs. S.T. Peng (Taiwan Chapter); Prof. Jung-Wong Ra (Korea Chapter); Ms. Carol Wilson (NSW Chapter); Dr. Bevan D. Bates (New Chapter, South Australia); Prof. G. P. Srivastava (India Chapter); Dr. Don Sinnott (Guest, Chairperson of APMC'92); Mr. Richard Sparks (Membership Service Committee); Prof. Tatsuo Itoh (Past MTT-S President); Prof. Eikichi Yamashita (Region 10 Coordinator of MTT-S

Transnational Committee, and Tokyo Chapter).

The following agenda items were discussed:

- 1993 Distinguished Microwave Lecture plans in Region 10.
- IEEE MTT-S support for Chapters to hold the Asia-Pacific Microwave Conference.
- Cooperation of Chapters in Region 10.

Region 9 Chapter Activities— Late 1991 and 1992



Denise Consoni
Region 9 Coordinator
MTT-S Transnational Committee

During the last MTT-S International Symposium in Albuquerque, I was nominated as Region 9 Chapter Coordinator. MTT-S Region 9 consists of two chapters in Brazil and one in Venezuela, and we hope to increase this number in the future.

Though few, these Chapters are very active, as can be seen from this first report summarizing recent technical meetings, many of them conducted in healthy collaboration with local scientific societies and involving IEEE student branches. I would like to thank the existing Chapter's Chairman for cooperating in composing this report, and to encourage IEEE MTT-S members from other countries in Region 9 to create new Chapters, and provide any interesting information on what is going on in the area of microwaves in Latin America.

Venezuela (MTT/COMM)

Chairman: Aldo Bianchi

Technical Meetings:

- 11.11.91—"Research on Radio Propagation," Dr. Mario Petrizelli. Number of attendees: 12
- 15.11.91—"An Experience With Novel LAN's: The CID-UC," Alejandro Dirgan Loreto. Number of attendees: 40
- 12.02.92—Video presentations on telecommunication topics, Cable Columbus, Intelsat, TVRO, Modulation. Number of attendees: 12
- 26.03.92—Reception of Video-conference VC46: "Making High Performance Optoelectronic Datacommunications Work." Number of attendees: 10
- 05.05.92—"The Privatization of Telecommunications in Latin America," Rubén Kustra (Argentina), and Enzo Pittari (CANTV, Venezuela). Number of attendees: 50
- 14.05.92—"A 2000 Km Optical Fiber Network," Rubén Kustra (Stet Telecom). Number of attendees: 24
- 26.05.92—"Telecommunications: Bridge to the Future," Aldo Bianchi. In association with the IEEE Student Branch of IUPFAN, Maracay. On this occasion, a 2400 baud modem was delivered to the Student Branch. Number of attendees: 35

- 17.07.92—"IEEE: The Best Alternative Against Obsolescence," Aldo Bianchi. Number of attendees: 80

Rio de Janeiro/Brazil (MTT/AP/ED)

Chairman: José Ricardo Bergmann (CETUC-PUC/RJ)

Technical Meetings:

- 10.05.91—"Antenna and Propagation Activities at the TELEBRAS R&D Center," Dr. Emilio Abud Filho (CPqD/TELEBRAS). Number of attendees: 36; duration: 3 hours
- 03.06.91—"Prediction of Multipath Fading Distribution on Terrestrial Links," Dr. T. Tjelta (Norwegian Telecom). Number of attendees: 13; duration 1½ hours
- 04.06.91—"Clear-Air Propagation Effects Study Program at CETUC," Dr. L. Silva-Mello (CETUC). Number of attendees: 13; duration 1½ hours
- 06.06.91—"Angular and Space Diversity Improvements," Dr. T. Tjelta (Norwegian Telecom). Number of attendees: 13; duration 1½ hours
- 07.06.91—"Rain Attenuation in Tropical Regions," Prof. Marlene Pontes (CETUC). Number of attendees: 14; duration 1½ hours
- 25.07.91—"Non-linear Characteristics of Transmission Lines on Semiconductor Substrates with Applications to MMICs," Prof. D. Jager (University of Duisburg, Germany). Number of attendees: 16; duration 1 hour
- 27.07.91—"Site Shielding," Dr. M. Al-Nuami (Polytechnic of Wales, UK). Number of attendees: 17; duration: 1 hour
- 29.07.92—"Numerical Analysis of Two Solitons Collision in Optical Fibers," Mr. Hugo Figueroa (Imperial College, UK). Number of attendees: 8; duration: 1 hour
- 30.07.91—"Finite Element Solution of Microwave and Optical Waveguide," Prof. J. B. Davies (University College London, UK). Number of attendees: 8; duration: 1 hour
- 30.09.91—"Earth Station Technology for Satellite Data Transmission," Mr. Lincoln Oliveira (Embratel). Number of attendees: 21; duration 1½ hours
- 18.11.01—"Physical Modelling of MESFETs With Applications in Microwave Power Amplifier," Dr. J. C. Araujo dos Santos (IME). Number of attendees: 11; duration: 1 hour
- 02.06.92—"Recent Developments in Microstrip Antennas," Prof. F. Gardiol (Ecole Polytechnique Federale, Lausanne). Number of attendees: 34; duration: 2 hours

Other activities of this Chapter include the re-activation of the IEEE Student Branch at the Pontificia, Universidade Católica, Rio de Janeiro.

South Brazil (MTT)

Chairwoman: Denise Consoni (LME-EPUSP)

Technical Meetings:

- 29.07.91—"Advancements in the Analysis of Non-Linear Microwave Circuits," Prof. M. I. Sobhy (University of Kent, UK). Number of attendees: 17
- 30.07.91—"Chaos in Microwave Circuits," Prof. M. I. Sobhy (University of Kent, UK). Number of attendees: 15
- 15.08.91—"Microwave Packaging," Prof. E. Rosenbaum (Washington University). Number of attendees: 16
- 14.07.92—"Hybrid Microwave Optical Devices," Prof. P. Herczfeld (Drexel University). Number of attendees: 13
- 15.07.92—"Applications of Photonics to Microwave Systems," Prof. P. Herczfeld (Drexel University). Number of attendees: 9
- 25.09.92—EESOF Seminar: "CAD for Microwaves: Circuits and Systems." Number of attendees: 21
- 27.10.92—"3rd Meeting on Microwave and Optical Measurements."

Other activities of this chapter include collaboration in organizing the "1993 SBMO International Microwave Conference/Brazil," which will take place in São Paulo, Brazil, from 2nd to 5th of August next year.

Region 8 MTT-S Chapter News



by Rolf H. Jansen
MTT-S Transnational Committee
Region 8 Chapter Coordinator

Region 8 Chapter Activities and Workshops in Late 1991 and 1992

The MTT-S Transnational Committee, established about two years ago to take care of the growing non-US membership, is now well represented in each of the Regions 8, 9 and 10 by an individual regional Chapter Coordinator. In parallel to the Region 8 report given here, there are two further reports in this issue describing activities in Region 9 and 10. In addition, the number of non-US members serving in the Technical Program Committee for the coming MTT-S International Microwave Symposium has been doubled during the last 8 months, from 8 to 16. Also, it is recognized with satisfaction that an increasing number of IEEE awards are being presented to our members in Europe and Asia.

Particularly in Region 8, we are faced today with challenges and chances. Global political and economic changes have a strong effect on the industrial applications of microwave technology, our field of interest; now we will have to look more than ever for commercial success. Membership development has to take care of the drastic changes seen in Southern and Eastern Europe. At the same time, Chapters in Western Europe are banding together on a higher level of identity through the organization of joint technical workshops within Region 8. This kind of activity is particularly encouraged by the Society and truly reflects the transnational character of IEEE. The following summary of activities throughout Region 8 shows unbroken membership life in a changing world, a wide range of recently conducted activities and some planned for the coming years.

Bulgaria

Prof. H. D. Hristov and Dr. S. V. Savov, Technical University of Varna

A meeting was organized this summer at TU Varna with the goal to create a Bulgarian Section of the IEEE. The meeting was attended by 30 participants, 4 of these being IEEE members. It was decided to formally apply for legalization of this group in the Bulgarian court (responsible for such formal issues), which is now in progress. The situation is not easy as there are less than 50 IEEE members in Bulgaria, which is not enough for a regular section formation procedure. Also, there are less than 12 MTT and AP members, respectively, which is insufficient for a regular petition for Chapter formation. The group has urgently asked for support and advice regarding this situation and this problem will be addressed jointly by MTT-S and IEEE Region 8 in the near future.

Czechoslovakia

Dr. Frantisek Harnicko, TESLA Company, UVR Opocineh

There are about 35 IEEE members in Czechoslovakia and it was hoped that this number would gradually move up to 50—a requirement for the formation of an IEEE section. Accordingly, at Prague, some activities headed by V. Stepar were conducted in order to initiate the establishment of an IEEE section. Some support was organized for 10 IEEE members with considerably reduced membership fees. The chapter organizer is in contact with V. Stepar and Prof. Zehentner, the Section initiators. According to these initiators, establishment of the IEEE Section can be expected to happen very soon and the respective petition was also signed by MTT chapter organizer and his group at TESLA company. However, the present economic and political situation in Czechoslovakia is very difficult and the chapter organizer was not even able to get support from his company for attending the European Microwave Conference at Helsinki and the parallel MTT-S Chapter Chairpersons meeting.

Central and South Italy

Chairman: Prof. P. Lampariello, University La Sapienza, Rome

The Technical Activities of the MTT/AP Societies Joint Chapter of the Central and South Italy Section, in the mid 1991 to mid 1992 period, is focused on the following meetings and workshops.

- November 18, 1991—Firenze—Prof. Prabhakar H. Pathak, Ohio State University, Columbus USA: "Asymptotic High Frequency Techniques for EM Antenna & Scattering Analysis."
- February 11, 1992—Firenze—Prof. Per-Simon Kildal, Chalmers University of Technology, Gothenburg, Sweden: "Artificially Soft and Hard Surfaces in Electromagnetics and Their Applications."
- March 12, 1992—Roma—Prof. Nader Engheta, Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia USA: "Electromagnetic and Photonic Hand-edness: Chiral Materials and Their Novel Applications."
- May 13, 1992—Roma—Prof. Erwin Schanda, University of Bern, Switzerland: "Millimeter-wave Spectro-radiometry for the Detection of Minor Constituents of the Atmosphere."
- June 18, 1992—Roma—Dr. V. Ralchenko, Russian Academy of Science, Russia: "Laser Smoothing of Diamond Films: Applications to Heat-Sink Fabrication for Powerful Microwave Devices."

Further steps have been taken in the organization of the international meeting "Microwave in Medicine 1993," jointly organized by the MTT Society and by Commission K (Electromagnetics in Biology and Medicine) of the International Union of Radio Sciences (URSI). The meeting will be held in Roma, Italy, on 11-14 October 1993.

In April 1992, the 3rd International Workshop on Millimeter-Waves was held in Orvieto (Italy), and co-chaired by Prof. P. Lampariello and Prof. R. Sorrentino. Like the two previous editions held in Roma (1986) and Perugia (1989), the workshop was a three-day event. Unlike the previous editions, which were organized by the Central and South Italy Chapter alone, Orvieto's workshop was the result of a joint effort of the French, German and Italian MTT chapters. This is the first time European Chapters have worked together for organizing an international event and this is the beginning of a new era of cooperation among them.

The aim of this workshop series is to assess the state of the art of millimeter-wave technology and applications. A welcome address was given by one of the "fathers" of the Italian microwave engineers, Prof. Nello Carrara, who is credited to

be the inventor of the term "Microwaves," which was used for the first time in 1932 in the Proceedings of IRE.

Afterwards, internationally recognized experts have been invited to give survey lectures followed by discussion with the audience. They were:

- H. Meinel: "Millimeter-Wave Applications and Technology Trends"
- M. Aikawa: "MMIC Technology for Communication Systems"
- R. Funck: "New Integrated Subsystems for Millimeter-Wave Applications"
- D. Pons: "New Millimeter Wave Devices: Realization and Performance"
- G. Salmer: "Field Effect Transistors for the Millimeter-Wave Range: Physical Analysis, Modelling and Expected Performance"
- J. Freyer: "Two-Terminal Millimeter-Wave Devices"
- H. L. Hartnagel: "Technology Developments Towards Nanometric Structures"
- T. Itoh: "Optical Control of Millimeter-Wave Circuits"
- T. Yoneyama: "Recent Developments of NRD-Guide Technology"
- R. H. Jansen: "Advanced Design Techniques for Linear and Non-linear MMIC's Into the Millimeter-Wave Region"
- V. Fouad Hanna: "CAD of Millimeter-Wave Passive Components in Suspended Microstrip Technology"
- N. Alexopoulos: "3D Modelling of Millimeter-Wave Circuits and Antennas"

This part of the workshops took the first two days. The last day was devoted to contributions from the participants. A panel discussion with T. Itoh, H. L. Hartnagel, H. Meinel, R. Funck, V. Dainelli on the future of millimeter waves concluded the workshop. Parallel to the workshop, a small exhibition on microwave and millimeter-wave products from EEsosf, Hewlett-Packard, Varian, and Wiltron was organized in the same Congress Center.

The social program was as exciting as the technical one. It included a recital of the baritone T. Goudie and the pianist D. Lawton from Canada, who played Italian, French, German and Spanish arias; as well as an original concert of two flutes (E. Casularo and G. Trovalusci) accompanied by electronically synthesized music performed in the 12th century church of S. Giovenale.

The workshop was greatly successful with a participation of one hundred people from the various European countries, and a significant participation of students. Compared to the regular conferences, such small and less formal meetings respond to the need for more open, lively and interacting participation.

In addition to the efforts made by the Chapter Chairmen, Dr. Victor Fouad Hanna, Prof. Hans L. Hartnagel, Prof. Paolo Lampariello, the workshop was made possible thanks to the generous contributions of the CNET (France), the European Research Office of USARDSG (UK), the Italian Research Council (CNR), MTT-Society, the University of Perugia, Contraves Italiana S.p.a., EEsosf, Elettronica S.p.a., Hewlett-Packard Italiana, Varian and Wiltron.

A special issue of the French Journal *Annales des Télécommunications* devoted to the 1992 International Workshop on Millimeter Waves will be published in December 1992.

France

Chairman: Dr. V. F. Hanna, CNET-France Telecom

Six meetings were conducted by the French chapter in the period from September 1, 1991, to September 20, 1992:

- October 1, 1991, a half-day technical meeting was organized by the Chapter. It included the MTT-S Speakers

Bureau Lecture of Dr. Daembkes: "Microwave and Millimeter Wave HEMT Devices," the lecture of Dr. Gamand (Philips Microwaves): "Millimeter Wave HEMT Based MMIC's—Examples and Impact on Performance," and a round table.

- The MTT-S France Chapter organized a workshop on Millimeter Components. It was held on November 21 and 22, 1991, at Carry-le-Rouet which is a small village near Marseille. The Conference Center is directly on the Mediterranean seashore. The number of participants was 60. There were 16 participants from government agencies, 24 participants from universities, and 20 participants from private industries. 28 papers were selected by a technical committee. The topics treated in the workshop were: MMIC's circuits, quasioptical components, passive components, characterization of transmission lines and discontinuities and active components and amplification. Three invited papers were presented: Millimetric Functions for Space Application, by C. Trnche from Alcatel-Espace; Millimetric Radars, by G. Cachier from Thomson-CSF; Millimetric Low Noise Reception, by G. Beaudin from CNRS (National Scientific Research Center).
- The MTT-S France Chapter participated in the organization of a workshop on Microwaves and Space. The other partners were: CNES (National Center for Space Studies); CNET (National Center for Telecommunication Studies); Microwave Laboratory of ENSEEIHT (Engineering School at Toulouse). The workshop was held on January 14 and 15, 1992, at Toulouse. The number of participants was 220. 72 papers were presented. The MTT-S Distinguished Lecture of Prof. Whinnery on "Some Relations Between Microwaves and Optics" was included in the workshop program.
- The MTT-S France Chapter participated with Italian and German MTT-S Chapters in the organization of the 3rd International Workshop on Millimeter Waves that was held at Orvieto, Italy, on April 22-24, 1992. Four invited papers were given by French experts: "New Integrated Subsystems for Millimeter Wave Applications," by R. Funck (Dassault Electronique); "New Millimeter Wave Devices: Realization and Performance," by D. Pons (Thomson CSF); "FET's for the Millimeter Wave Range: Physical Analysis, Modeling and Expected Performance," by G. Salmer (University of Lille); "CAD of Millimeter Wave Passive Components in Suspended Microstrip Technology," by V. Fouad Hanna (CNET).
- June 11, 1992, a half-day technical meeting was organized by the Chapter. It included the MTT-S Distinguished Lecture, "Progress and Change in Microwave Radio Communications," given by Dr. F. Ivanek; "Satellite Mobile Communications," "Towards New Technologies," given by Eng. Fraise (Alcatel-Espace), and a round table.
- September 18, 1992, the general assembly for our chapter was held. The meeting included a technical conference given by Prof. H. Baudrand (ENSEEIHT) on Education of Microwaves in France and the election of the new chapter officers for the coming mandate.

Germany

Past Chairman: Prof. H. Hartnagel, TU Darmstadt

The German Chapter activities concentrate on the organization of workshops which proved to represent an essential means of scientific exchange and professional continued education. Regarding the period from mid 1991 to mid 1992, 6 workshop events were held by or under sponsorship of the German Chapter.

In October/November 1991, a total of 3 workshops were organized, each of them with an attendance of about 50 and

international participation. Titles and topics covered were as follows:

- "Microwaves Measurement Techniques." This two-day workshop took place at Ratingen under sponsorship of HP on October 10-11. It was organized by Prof. R. H. Jansen and Prof. B. Schiek. Papers on noise measurements, calibration procedures, probing techniques, and network analyzing concepts were presented. Those topics, of course, play a fundamental part in any MTT and AP related work.
- "Discrete Time Domain Modelling of Electromagnetic Fields and Networks," a joint effort of the MTT/AP and the CAS Chapters, organized by Prof. P. Russer and Prof. J. Nossek (Munich, October 24-25). The time-domain analysis is of growing importance in many areas of high-frequency electronics. The workshop program reflected that broad range of applications extending from field-theoretical methods such as Finite-Difference and TLM to cellular automata theory. Due to the sponsorship of the US Army European Research Office (ERO), it was possible to invite also several non-European experts (Prof. L. B. Felsen, Prof. W. J. R. Hoefer, Prof. T. Itoh).
- "Heterostructure Technology" at Reimsburg, near Ulm, on November 4-6, organized by Prof. E. Kohn and Prof. H. Schumacher. Heterostructure devices are becoming the key active elements for future microwave and mm-wave circuits. This workshop covered basic topics like heterostructure epitaxy (III-V and silicon) as well as device technology (HBT's, HEMT's, and novel structures, e.g. quantum wires). Also, special problems related to patterning, passivation, etc., were treated.

In April 1992, two European events made the time schedule a very busy one: The "1992 International Workshop on MM-Waves" at Orvieto, Italy, and the "European GaAs Application Symposium GaAs '92" at Nordwijk, The Netherlands. The German Chapter was involved in both meetings that, by the way, form the beginning of a series of European-wide events planned for the future. The Italian, French, English, and German MTT Chapters have agreed upon organizing one common workshop per year, the first one with the subject "CAE, Modelling and Measurement Verification" to be held in 1993 in conjunction with the MIOP conference. The organizer will be Prof. Schünemann of the Technical University of Hamburg-Harburg.

The most recent activity to be mentioned in this report represents, in some regard, the most innovative one as well: It was the first IEEE MTT/AP event in the eastern part of Germany, the former GDR, held at the Technical University of Ilmenau and organized by Prof. M. Kummer and H. Loele. The topic "Mobile Microwave Radio Services" points at a field that has emerged only recently. Nine presentations focusing on microwave and mm-wave traffic applications documented both state-of-the-art and future developments and perspectives. As a matter of fact, this area appears to be one of the most promising applications regarding microwave and mm-wave circuits. With an attendance of about 40, the meeting was a rather successful one. Beside the purely technical content, the Ilmenau workshop provided an excellent opportunity to bring together engineers from both parts of Germany and to promote the reputation and benefits of the IEEE in the eastern federal states.

Greece

Interim Chairman: Prof. G. Kiriakidis, FORTH and University of Crete, Heraklion, Crete

Following a successful petition organized last year, the new Electron Devices/Microwave Theory and Techniques ED/MTT Chapter in Greece has been approved by the IEEE general management. The effective date of this chapter formation was backdated to December 26, 1991.

The members of this chapter are university faculty, senior research center administrators, free-lands engineers, researchers and students with a distinct interest and participation to IEEE initiatives and activities.

We have established a very cooperative collaboration with the new Greek section Chairman Prof. G. I. Stassinopoulos, who has helped us with the preparation to hold our first constitutional meeting in Athens towards the end of October in order to elect the legal representatives of our chapter. During this meeting we expect to have an invited speaker from the Greek Navy Research Center (Dr. C. Fimerelis) who will present to our members the recent developments on the "Applications of High Frequency Devices Utilized in Advanced Communication Systems." The meeting will also be a social event providing a forum for our members during which they would enhance interaction on technical matters. Finally, we expect to have the opportunity to enroll a significant number of new members for which inquiries and expression of interest already have been filed.

Hungary

Chairman: Dr. Istvan Frigyes, Budapest Technical University

In September 1991, a meeting was organized with Prof. Rizzoli, MTT-S Distinguished Lecturer, as speaker. The title of his talk was "Modeling and Design of Nonlinear Microwave Circuits." Besides most of the chapter members, several professors and researchers from university and industry attended. The talk, followed by several comments and interesting discussions, was a great success.

The next meeting was in May, 1992, with past president Dr. Ferdo Ivanek, 1992 MTT-S Distinguished Lecturer, giving an excellent overview on new aspects of radio communications. This report was extremely interesting for industry (and also university) people, taking the difficulties and also the involvement of Hungarian electronics industry in microwave communications into account. Both meetings were held at Budapest Technical University.

The main event of the reported period was an International Workshop on Personal Indoor and Mobile Communications (26-27 May, 1992). It was organized in the Hungarian countryside in Siofok, a town at the shore of Lake Balaton. The number of attendees was above 80, coming from 14 countries besides Hungary. There were 9 tutorial talks dealing with various aspects of the subject and about 25 contributed papers. These dealt with theoretical, system, networking, and equipment problems. The subject was very well tailored to the joint chapter's activity with the emphasis on communications aspects and microwave and propagation topics. The workshop was organized by the chapter and sponsored by ComSoc, Region 8, and the United Kingdom/Republic of Ireland Section.

South Africa

Chairman: Dr. A. J. Booysen, EM-Lab, Pretoria

The chapter activities during the period July 1991 to June 1992 included 4 chapter meetings, as well as chapter involvement in the annual national AP/MTT Symposium jointly presented by the IEEE and the SAIEE. Please note that the South African chapter is a joint AP/MTT-S chapter.

The following meetings were held in the period stated above:

- July 31, 1991—45 attendees—"The Future of the Electronics Engineer and Industry in a Changing South Africa"—Mr. Sybrand Grobbelaar, Managing Director, Grinaker Electronics Ltd.; Ms. Madeleine Rose, Editor, Electronics News; Prof. Calie Pistorius, Head, Dept. Electronics Engineering, Univ. Pretoria

- November 20, 1991—11 attendees—"An Introduction to Time-Domain Techniques"—Dr. J. C. Olivier, Aerotek, CSIR; "Time-Domain Analysis of Antennas and Wire Scatterers"—Mr. J. Boonzaaier
- January 22, 1992—34 attendees—"Approaches to Radar Target Recognition"—Dr. Eric Walton, Ohio State Univ.
- March 26, 1992—32 attendees—"Microstrip Antennas"—Mr. Bob Munson, Ball Aerospace
- The annual South African AP/MTT Symposium was held on August 29, 1991. Approximately 45 papers and posters were presented, with an attendance of roughly 150.

Sweden

Chairman: Dr. Thomas Lewin, Ericsson Radar Electronics, Molndal

A regular, about monthly, schedule of meetings was conducted by the Swedish Chapter, most of them at Chalmers University of Gothenburg. In addition, a two-day symposium on microwave techniques and high speed electronics was held at Linköping, Sweden. The following is a detailed list of the events conducted between June 1991 and June 1992:

- August 21, 1991—19 attendees—"Array Error Effect in Adaptive Beamforming"—Hans Steyskal, Rome Laboratory, Hanscom AFB, MA, USA
- November 13, 1991—15 attendees—"Asymptotic High Frequency Techniques for EM Antenna and Scattering Analysis"—Prabhkar H. Pathak, Ohio State University, Columbus, OH, USA—"The Complex Source Point Technique in Beam Diffraction by Reflectors"—Edward V. Jull, University of British Columbia, Vancouver, Canada
- December 13, 1991—8 attendees—"Bifurcated Waveguide Slot Array Antennas"—Prof. Alan J. Sangster, Heriot-Watt University, Edinburg, UK
- January 23, 1992—12 attendees—"Application of High T_c Superconductors at Microwaves"—Prof. O. G. Vendic, Technical University of St. Petersburg
- January 28, 1992—9 attendees—"Mathematical Models and Results for Open Slot Lines and Antennas"—Prof. Youri V. Shestopalov, Moscow State University
- February 3, 1992—15 attendees—"Installed Antenna Performances: Problems and Possibilities"—Dr. Pat Foster, Antenna Software Ltd., Great Malvern, Worcestershire, UK
- February 12, 1991—12 attendees—"IC for High Speed Logic With Applications to Optical Fibers"—Mehran Mokhtari, Institute for Mikroelektronik, Kista, Stockholm
- March 25-26, 1992—ca. 100 attendees—Two-Day Symposium on "Microwave Techniques and High-Speed Electronics" at Linköping, Sweden—Regular Sessions and Poster Sessions
- April 14, 1992—12 attendees—"Combined Optical Microwave Techniques"—Prof. Tibor Bercei, Technical University of Budapest, Hungary
- May 14, 1992—14 attendees—"Artificially Soft and Hard Surfaces in Electromagnetics and Their Applications"—Prof. Per-Simon Kildal, Chalmers University of Technology, Gothenburg, Sweden
- June 1, 1992—7 attendees—"Beam Diffraction by Apertures and Reflectors"—Edward V. Jull, University of British Columbia, Vancouver, Canada
- June 1, 1992—13 attendees—"Radio Applications of Diffraction Gratings"—Edward V. Jull, University of British Columbia, Vancouver, Canada
- June 15, 1992—22 attendees—"Computer-Aided Design Methodology of Microstrip Antenna Arrays"—Prof. David C. Chang, University of Colorado, Boulder, Colorado, USA

Switzerland

Past Chairman: Prof. Dr. A. Bauder, Swiss Federal Institute, Zurich

The Chapter has about 90 members. Two meetings had been organized in 1991.

The first one on May 10 was a visit of ABB Infocom, Baden. Several contributions concerning essentially transmitter technology such as pulse level modulation, digital signal processing, TV-filters, baluns and tubes were presented. A visit of the transmitter section of ABB closed the meeting.

The second meeting took place in Zurich on January 17, 1992, and was a full-day meeting. The topics presented were:

- "Microstrip Circuit Analysis: The Fourier Integral Approach"
- "MAFIA Electromagnetic Design Codes"
- "RF and Microwave Calibration Services in Switzerland and Europe"
- "Monolithic Integrated Transmitters in GaAs Technology for a Spread Spectrum Transceiver"
- "Analysis of a MM-Wave Mixer Using Simulation Software"
- "Microwave Signature of the Earth's Surface"

During that meeting new Chapter Officers were also elected.

Currently the chapter has organized the visit of Prof. A. Ephremides (University of Maryland) on November 24 in Berne, who will give a lecture about "Wireless Communication Networks" in the frame of IEEE COLLOQUIM '92.

The chapter is worried about the situation of the RF and microwave industry in Switzerland, which is not as healthy as one would wish. In the future it might be difficult to find good contributors and organize the meetings.

United Kingdom/Ireland

Chairman: T. H. Oxley, TREMONT, Neward, UK

The Chapter AdCom consists of thirteen members representing the interests of the MTT-S, ED-S and AP-S joint chapter membership in the UK and RI. Activities are planned accordingly and consider the mutual interests of the IEEE and IEE.

The following three events, held August to November 1991, were reported in the Fall 1991 *MTT-S Newsletter*:

- 23-27 September—Co-sponsorship of the University of Leeds "Microwave Subsystem Design" Summer School.
- 25 September—Lecture by Dr. Andrew Stove on "Microwave & Millimetre-Wave for Vehicle Control"
- 2 October—One-day technical meeting on European papers presented at the IEEE MTT-S 1991 IMS Boston.

The seven events held December 1991 to July 1992 are briefly summarized below:

- 18 December—Lecture on "Radiolocation: The Slide Rule Days," co-operatively supported by the IEE; held at King's College, London. Professor Alex L. Cullen, OBE, discussed the development of microwave radar during the second world war from a personal recollection basis.
- 25 March—Lecture on "Electronics Technology in the DRA," co-operatively supported by the IEE; held at King's College. Discussed the structure and role of the DRA electronics activity and described the current research programs.
- 8 April—Lecture on "Your Body and Electromagnetic Fields: Science, Medicine and Politics," jointly sponsored with the Ulster Biomedical Engineering Society; held at the Medical Biology Center, Belfast. This was presented by Professor Ross Adey, Loma Linda University, California.
- 23 April—Lecture on "Some Printed Antenna Developments"; held at King's College, London. Professor Daniel Schaubert, University of Massachusetts at Amherst, presented some recent developments in printed antennas

discussing design procedures and results data.

- 3 June—Lecture on "Propagation of Long Electromagnetic Waves in the Earth-Ionosphere Space," co-operatively supported by the IEE; held at King's College, London. Dr. James R. Wait, Consultant, University of Arizona, presented his talk from the AP-S Distinguished Lecturer Program. The occasion included the presentation to Dr. Wait of the 1992 IEEE Heinrich Hertz Medal.
- 24 June—Lecture on "Modern Phased Array Antenna Systems," co-operatively supported by the IEE; held at King's, College London. Dr. George Hockham, Technical Director, Sensors Division, Thorn-EMI Electronics, reviewed the current state of the art of phased array antenna technology, including active and conformal arrays, and discussed design procedures.
- 8 July—One-day technical meeting on European papers from the 1992 IEEE MTT-S IMS and MTT-S/ED-S MMWCS, co-operatively supported by the IEE; held at the University of Leeds. UKRI engineers who were unable to attend the Symposium in the USA enjoyed the program of approx. twenty papers given by speakers from UKRI, France, Germany, and The Netherlands.

Four further events are organized for 1992. The 1993 program is currently being planned. All activities are publicized in the *Region 8 News*.

Energy Policy Committee Supports Developments of Advanced Energy Technologies

IEEE-USA's Energy Policy Committee submitted a statement to the House Appropriations Subcommittee on Energy and Water Development on the FY 1993 DOE budget request for energy supply R&D. A similar statement was also submitted concurrently to the Senate Appropriations Subcommittee on Energy and Water Development.

Strongly supporting the aggressive development of advanced energy technologies to satisfy future growth in demand for electricity, IEEE-USA urged DOE and Congress to support research and development of the full range of solar and renewable energy technologies. IEEE-USA also called for increased investment in advanced nuclear energy technologies, a timely demonstration of fusion as a viable power service source for base load power generation, and increased research into electric energy systems.

Further, IEEE-USA asked that Congress and DOE consider continued development of energy storage technologies for both utilities and transportation applications. In addition, the statement supported increased research into the potential health effects of power frequency electric and magnetic fields.

Legislation making Fiscal Year 1993 appropriations for energy and water development was passed by Congress in September and signed into law by the President in October. Despite a tight DOE budget, increased funding was made available for key energy technology programs supported by IEEE-USA, including \$254 million for research and development of solar, geothermal, hydropower, electric energy systems, and energy storage technologies. More than \$311 million was provided for advanced nuclear energy technologies. Magnetic fusion research received funding of \$340 million, a cut of \$20 million from the President's request.

Bi-isotropics '93 Electromagnetics of Novel Microwave Materials Workshop in Espoo, Finland February 1993

IEEE MTT/AP Finland Chapter and the Electromagnetics Laboratory of the Helsinki University of Technology will organize a workshop on the theory and applications of novel microwave and millimeter-wave materials. Among these media, one may classify today's hot topics in the microwave field, chiral media, as well as magnetic and bi-isotropic materials. The workshop will be held 1-4 February 1993 at the Electrical Engineering Department of the Helsinki University of Technology, Espoo, Finland.

The workshop consists of invited reviews of representatives from different groups in mornings and discussions and planning of joint research in the afternoons. There will be no registration fee. Special emphasis will be devoted to inviting Russian and Belorussian experts in the field of optical activity to come to the workshop. Excellent research has been performed over there, but unfortunately mostly published in Russian which makes it difficult for the Western scientists to follow the results.

As a special guest, the grand old man of ex-CCCP electromagnetics, Academician Fedor Fedorov from the Belorussian Academy of Sciences in Minsk, has promised to participate.

You are welcome to take part in the workshop. Review presentations and also specific papers about the research on new materials in microwaves are also invited.

Contact:

Workshop Organizer, Ari Sihvola
Helsinki University of Technology
Electromagnetics Laboratory
SF-02150 Espoo, Finland

Tel. (358)-0-4512261, Fax (358)-0-4512267

E-mail ari.sihvola@hut.fi

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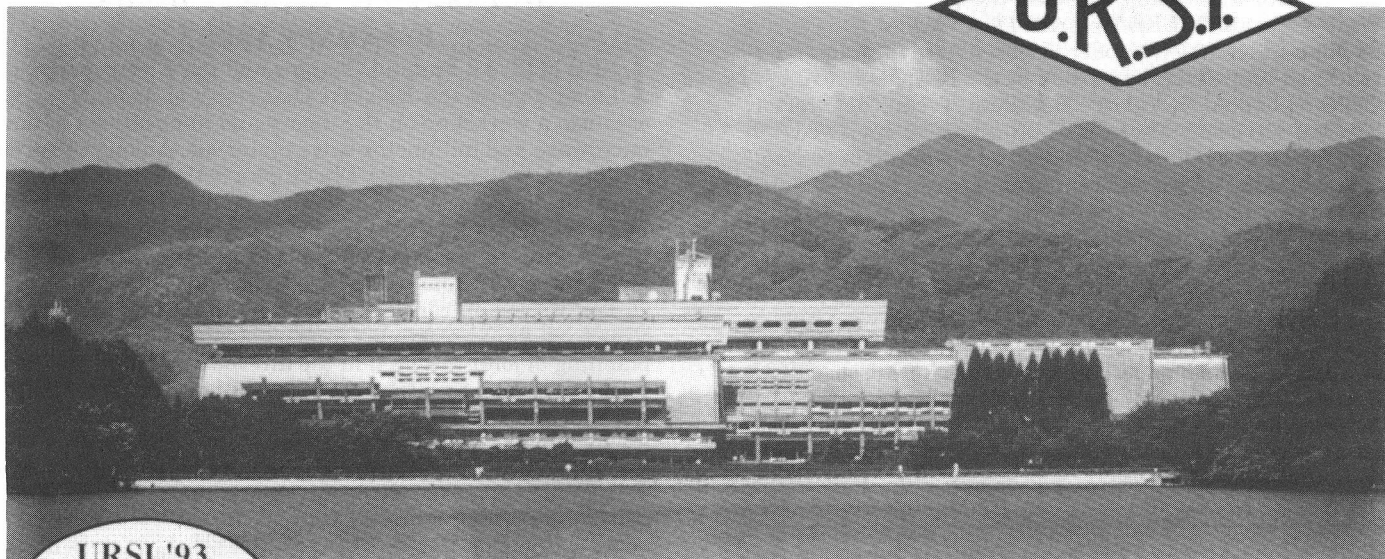
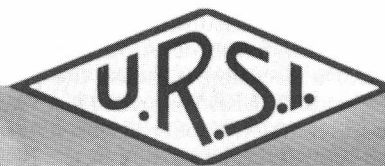
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ANNOUNCEMENT



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. Furuhami
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



CALL FOR PAPERS

The Fourth

INTERNATIONAL SYMPOSIUM ON PERSONAL, INDOOR AND MOBILE RADIO COMMUNICATIONS

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**Yokohama, Japan
September, 9-11, 1993**

September 9, Pannels : Invited Lectures on Overview of Technology
September 10-11 : Technical Sessions: Papers describing, research,
development and new concepts are invited for technical sessions. The
following topics are suggested but not limited to:

- ♦ coding and modulation techniques
- ♦ spread spectrum techniques
- ♦ signal processing and VLSI applications
- ♦ antennas and RF subsystems
- ♦ equalization and diversity techniques
- ♦ multiple access techniques
- ♦ propagation study results
- ♦ frequency management techniques performance studies
- ♦ novel network & switching architectures
- ♦ security and privacy
- ♦ experiments, trials and services
- ♦ land-mobile satellite communications
- ♦ satellite navigation (GPS)

Those wishing to offer a contribution should submit three copies
of the full manuscript of 3000 words before April 1, 1993 to:

Pacific Asia Submissions

Dr. S. Kato
NTT Radio Communi.
Systems Labs, I-2356
Take Yokosuka, 238-03
JAPAN
Tel : +81-468-59-3470
Fax: +81-468-59-8022

American Continent Submissions

Dr. K. Pahlavan
Electrical Eng. Dept.
Worcester Polytechnic
Institute
Worcester, MA 01609
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Fax: (508)831-5491
Email: kavehn@ce. wpi.edu

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King's College Lodon,
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London, WC2R 2LS,
Tel : +44-71-873-2898
Fax: +44-71-876-4781

Requests for further information should be sent to, Dr. S. Kato.

Note : PIMRC'93 is scheduled just (6 days) after URSI
General Assembly in Kyoto, Japan.



Announcement and Call for Papers IEEE AP/MTT-S Philadelphia Section Eleventh Annual Benjamin Franklin Symposium

on
**Antenna and Microwave
Technology in the 1990's**

Saturday, May 1, 1993

The Philadelphia Chapter of the IEEE AP/MTT-S will hold the 11th Annual Benjamin Franklin Symposium on Saturday, May 1, 1993, from 8:30 a.m. to 5:00 p.m. This one-day symposium will consist of two sessions:

Morning Session: Plenary Session of Invited Papers

Afternoon Session: Parallel Sessions of Contributed Papers on the following:

- Antennas and Propagation: Phased Array Technology, Antenna Design, Radiating Elements and Phase Shifters, Antenna Application, Imaging and Radiometry, Remote Sensing, Scattering and Diffraction, and Wave Interaction with Complex and Chiral Materials.
- Microwave Theory & Techniques: Microwave Networks and Filters, Solid State Devices and Circuits, Millimeter Waves and Monolithic Technology, Ultrafast Optoelectronics, Optical Technologies applied to Microwave, and Microwave Applications.

Place:

Valley Forge Hilton
251 West DeKalb Pike (Route 22)
King of Prussia, PA 19406

Papers: Authors are invited to submit papers in either field. Please send a camera-ready summary (one to four 8.5" x 11" pages, one inch margins) by March 1, 1993, to:

Professor Afshin Daryoush
Department of Electrical and Computer Engineering
Drexel University
Philadelphia, PA 19104
e-mail: daryoush@ece.drexel.edu

For Further Information

Please call Afshin Daryoush, Drexel University, (215) 895-2362; Andrew Ochdlick, NAWC, (215) 441-1993; or Ahmad Hoorfar, Villanova University, (215) 645-7223.

Announcement and Call for Papers 2nd Topical Meeting on Electrical Performance of Electronic Packaging

Sponsored by:
The IEEE Microwave Theory and Techniques Society
With Participation of:
The IEEE Components,
Hybrids and Manufacturing
Technology Society

**October 20-22, 1993
Monterrey, California**

Co-Chairs: G. Arjavalingam, IBM T. J. Watson Ctr., and A. Cangelaris, University of Arizona.

The general subject of the meeting is the electrical design, analysis, and characterization of interconnections and packaging for performance-drive, high-speed/high-complexity electronic systems. A forum will be provided for the discussion of the following topics as they relate to chip-to-chip and on-chip interconnections in electronic and microwave systems:

- Electrical requirements, limits of performance.
- Novel designs, design methods, wire placement and routing programs.
- Package analysis, including numerical methods and algorithms; electromagnetic analysis tools; advances in transmission-line techniques.
- New and innovative interconnect and packaging structures and their electrical performance; packaging considerations for parallel computers.
- Experimental characterization techniques and testing procedures.
- EMC/EMI effects; prediction and measurement of radiation from interconnect structures.
- Optoelectronic packaging; structures and system applications.

This is the second meeting in this topical series. The first was held in Tucson, Arizona, during April 22-24, 1992. Additional information may be obtained from G. Arjavalingam (phone 914-945-1359, fax 914-945-2141) or A. Cangelaris (phone 602-621-4521, fax 602-621-8076).

Authors are invited to submit papers describing new technical contributions in the areas broadly covered above. The original and three copies of a **35-word abstract** and a **summary** not to exceed **three pages**, including illustrations, are required for paper selection. All papers must be written in English. The title of the paper and the names and affiliations of all the authors including complete mailing address, telephone and fax numbers (if available) must appear on the abstract and the first page of the summary. If the paper is accepted, the summary will be reproduced, as is, in the meeting's digest. **An IEEE transfer of copyright, found in most IEEE journals, must accompany each submission.**

Submission should be sent, no later than **June 14, 1993**, to:

EPEP '93
Engineering Professional Development
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Box 9 Harvill Building, Room 235
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1993 SBMO INTERNATIONAL MICROWAVE CONFERENCE/BRAZIL

CENTRO DE CONVENÇÕES REBOUÇAS
SÃO PAULO, 2-5 AUGUST

ANNOUNCEMENT

The **1993 SBMO International Microwave Conference/Brazil**, organized by the Brazilian Microwave & Optoelectronic Society (SBMO) and Escola Politécnica da USP, in cooperation with the IEEE MTT-S, URSI, IEE, IEEE Seção Sul-Brasil, IMT and the support of FAPESP, CNPq, FINEP, CAPES, TELEBRAS and The British Council, will be held in **August, 2-5, 1993** at the **Centro de Convenções Rebouças**, São Paulo, Brazil.

This Conference will provide a major international forum for the exchange of information on research and development in the fields of RF, Microwaves, Millimeter Waves, Antennas, Propagation and Optics.

A technical industrial exhibition, entitled "RF, MICROWAVES AND OPTICS EXHIBITION", will take place in conjunction with the Conference.

The Conference Program will be available by April 1993. If you wish to receive the Conference Program, please indicate in the Registration Form. Traveler checks

or nominal checks in US dollars (payable to SBMO - Sociedade Brasileira de Microondas) can be mailed for payment of Registration and Hotel Reservation fees, till May, 1st, 1993. After this date, only cash or traveler checks (no nominal checks) will be accepted, at the Registration Desk. No credit cards will be accepted.

Limited URSI funds are available for travel expenses of young scientists wishing to attend the Conference. For information, please contact the Secretary. All mail should be sent to:

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Steering Committee Secretary
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Estrada das Lágrimas, 2035
09580 - S. Caetano do Sul - SP - Brazil
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1993 SBMO INTERNATIONAL MICROWAVE CONFERENCE/BRAZIL

CENTRO DE CONVENÇÕES REBOUÇAS - SÃO PAULO, 2/5 AUGUST

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