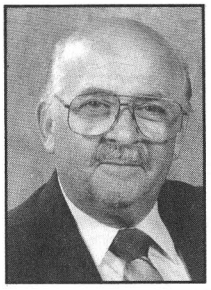
IEEE SOCIETY ON
MICROWAVE THEORY
AND TECHNIQUES

NEWSLETTER

Number 131
Spring 1992



Bienvenidos

by Jerry Hausner

As the country slowly emerges from the current recession and R&D priorities are reviewed and realigned, everyone is looking for a bargain. The International Microwave Symposium answers that call. Where else will you find almost 390 formally and interactively presented technical papers; plus dozens of panel and rump sessions, workshops and hundreds of exhibits under one roof. Not to mention the opportunity to interact with colleagues and maintain industry acquaintances. This all comes with a digest which becomes the microwave reference for many years. The price for all this is one of the lowest of any conference and this year's location, Albuquerque, New Mexico, further helps to keep the cost of housing and subsistence at a most affordable level.

This year's theme is "Discovering New Worlds Through Microwaves" and is being held in a locale that is the home of high power microwaves and radio astronomy. This is exploited by having many focus sessions and workshops on these subjects. Additionally, this year several new topics have been added to the "want to hear about" list. They include ultra wideband technology and superconductivity. The theme is supported by the radio astronomy and early rocketry work done in New Mexico. It is further expanded on at our plenary session where the speaker will be one of the world's most renowned physicists and astronomer, Roald Sagdeev. His talk will encompass applications of microwaves in space exploration.

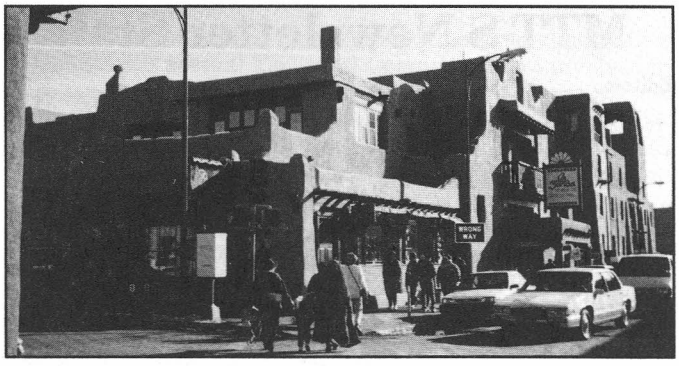
The conference is tastefully accented by the social events. These include tours to areas of New Mexico that people have long held in awe. The climax of these events is the Awards Banquet. Attendance at this event offers the opportunity to thank those that have made the most significant contributions to our industry. If seeing and meeting these people at a magnificent dinner is not enough, the diners will be rewarded with local entertainment that highlights the three cultures prevalent in New Mexico.

The conference will be housed in Albuquerque's one year old expanded convention center. It is one of the nicest you have visited. All events, except industry-hosted hospitality suites, will be held at the convention center, making it easy to attend a large number of them. This arrangement enables you to enhance your working relationships with your comrades in the microwave field. This is a very important function of any conference.

Those that are fortunate enough to afford a few extra days away from home and office will be able to enjoy a part of the world they rarely get to visit. New Mexico is a mixture of Native American, Mexican and Anglo cultures and proud of all these heritages. It is a land of indescribable beauty ranging from living deserts to dense forests and flatlands to mountains. Albuquerque is at the southern terminus of the Rocky Mountains. Its riches are equally as diverse. They extend from a wealth of minerals in the ground to the technical and artistic talents in the minds of the inhabitants.

I am frequently asked about what there is to see and do in New Mexico. Whatever kind of outdoor activity you prefer, come prepared. Being June, the only exclusion is snow skiing, but water skiing is a substitute. Sports include boating, white water rafting, hang gliding, ballooning, hiking, camping, ice skating, horseback riding, shopping and on and on. Albuquerque is a town of restaurants, over 1000 for a city of 500,000 people. With that level of competition only the best survive at prices which are a fraction of what you would expect to pay. The signtseer will not have enough time to see it all. Places of interest include Carlsbad Caverns (the world's largest caverns), Indian pueblos, archeological digs, ghost towns, America's newest museum of natural history, Chaco Canyon, many ancient ruins, national forests, White Sands National Monument, Indian rituals, Spanish ranches, the radio telescope, the art galleries of Santa Fe and Taos, old town and lots more.

This conference will be one of the most memorable from a technical, social and cultural standpoint. See you in ABQ.



La Fonda Hotel at the end of the Santa Fe Trail.

Registration forms and hotel reservation forms with a map of the hotels and Convention Center are located in the center of this Newsletter.

1991 IMS

Technical Program	Transportation .....
Special Sessions	Local Arrangements .....
Interactive Forum	Spouse's Program

Table of Contents

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Germany

Master Calendar
MTT-S Sponsored Conferences[1]

Name	Date/Location	Involvement[2]
	1992	
• Measurement Science Conference	January 30-31 Anaheim, CA	(C)
• Packaging, Interconnects, Optoelectronics for the Design of Parallel Computers Workshop	March 17-18 Shaumberg, IL	(C)
• Topical Meeting on Electrical Performance of Electronic Packaging	April 22-24 Tucson, AZ	(S)
• European GaAs Applications Symposium	April 27-29 Noordwijk, Netherlands	(C) (*)
• Microwave & Millimeter-Wave Monolithic Circuits Symposium	June 1-2 Albuquerque, NM	(S) (*)
• MTT-S International Microwave Symposium	June 1-5 Albuquerque, NM	(S) (*)
• Automatic RF Techniques Group	June 4-5 Albuquerque, NM	(C) Affiliated (*)
• 5th IEEE Conference on the Computation of Electromagnetic Fields	August 3-5 Claremont, CA	(C) (*)
• Asia Pacific Microwave Conference	August 11-13 Adelaide, Australia	(CS) (*)
• 5th Australian Millimeter and Submillimeter Wave Conference	August 11-13 Adelaide, Australia	(C)
• 22nd European Microwave Conference	August 24-27 Helsinki, Finland	(C) (*)
• IEEE GaAs IC Symposium	October 3-8 Miami Beach, FL	(C) (*)
• MM '92 (Was Military Microwaves)	October 14-15 Brighton, England	(C)
• Automatic RF Techniques Group	December 3-4 Orlando, FL	(C) (*)
	1993	
• Microwaves in Medicine	April (?) Rome, Italy	(C) (*)
• Microwave & Millimeter-Wave Monolithic Circuits Symposium	June 14-15 Atlanta, GA	(S) (*)
• 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)	July (?) Sao Paulo, Brazil	(C)
• 23rd European Microwave Conference	September 6-9 Madrid, Spain	(C) (*)
• Automatic RF Techniques Group	December 2-3 San Jose, CA	(C) (*)

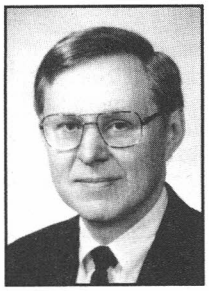
[1]Meetings listed are those that have been officially sponsored by MTT-S (i.e., AdCom approved). There are many other microwave related meetings (chapter sponsored, commercial, etc.) that are not listed.
[2]MTT-S conference involvement: (S) Sponsor, (CS) Co-sponsor, (P) Participate, (C) Cooperate, (*) Continuous.

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 flurry of activity by individuals and corporations adapting to the changes in economy and DoD spending in our industry has touched the activities of the MTT Administrative Committee. In the first meeting of the year as president, Reynold Kagiwada put forth a number of new initiatives designed to strengthen and expand the Society even in this period of economic uncertainty.

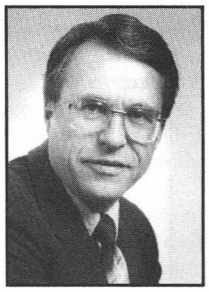
Actions summarized in the table below strike in some instances to the core issues of the Society. Indeed, the statement of the MTT-Society charter is one of the oldest in the IEEE. It is about time we examined it closely.

You may notice how many of the actions in the table are being pursued by AdCom Past Presidents (Itoh, Knerr, Tomiyasu, Rosenbaum). To them we express our thanks as we consider a move to expand the Committee to effectively address the issues of an increasingly global organization. Increasing the membership of AdCom, appointments to committee chairs, and administrative support are fundamental issues which are presently before AdCom.

Area	Action Item	Action By (Due Date)
Society	Identify technical areas of strategic importance of MTT	Itoh (June '92)
Society	Establish procedure for expansion into new growth areas	TBD (June '92)
Society	Honorary life membership eligibility	Knerr (June '92)
AdCom	Increase AdCom membership from 18 to 21	Tomiyasu (June '92)
AdCom	Study and recommend on expansion of responsibility of Nominations Committee to include committee appointment recommendations to President	Timiyasu (June '92)
AdCom	Initiate administrative support position to AdCom President	Staecker (June '92)
Budget	Prioritize 1993 budget from zero baseline	all committee chairmen (April '92)
IMS	Review and advise AdCom on Symposia site selection criteria	Rosenbaum (June '92)
IMS	Clarify details of contract to Horizon House for Symposium services	Rosenbaum (June '92)
IMS	Study format of Microwave Week and suggest changes for positive growth	Crescenzi (June '92)
Publications	Addition of Associate Editors to Transactions to reduce load of Editor	Masse (open)

(Continued on page 5)

Technical Committees



by Jorg Raue

With the focused help of Eliot Cohen, Vice Chairman, the Technical Coordinating Committee can report a number of significant accomplishments for 1991:

1. A new type of Emerging Technologies was proposed that brings together the collective efforts of several of the Technical Committees to focus on emerging multi-disciplinary technology areas of interest to MTT-S members. The first of these workshops, "Phased Arrays—A Technology Assessment," will be held at the 1992 IMS on June 5. It is under the stewardship of Dick Sparks and Barry Perlman. The collective efforts of MTT-1, 3, 6, 7, 11 and 16 are contributing to the organization and execution of this workshop.

2. MTT-8 was renamed "Filters and Passive Components" (formerly "Microwave Network Theory").

3. A recommended change to the MTT-S Bylaws sections pertaining to the charter and membership of the Technical Committees and Technical Coordinating Committee was submitted to AdCom for adoption.

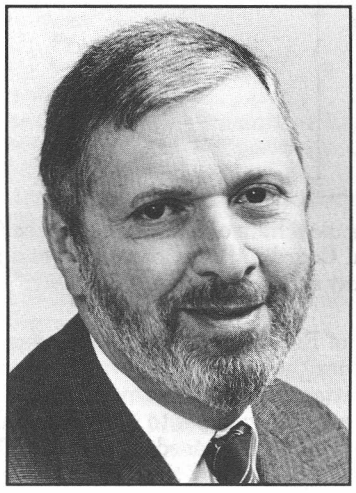
4. All Technical Committees were encouraged to publicize their activities to the general MTT membership through *MTT Newsletter* articles. Each committee agreed to write at least one article a year for the Newsletter and the Technical Coordinating Committee chairman will write two articles per year.

5. Strong emphasis was placed upon intersocietal activities. To this end several Technical Committees are involved in co-sponsorship of special journal issues, co-sponsorship of conferences and establishing closer ties with other societies. For example, MTT-3 is exploring co-sponsorship with the *Journal of Lightwave Technology* of a special issue on optical signal processing; MTT-11 is establishing closer ties with the Instrumentation and Measurement Society and MTT-12 is proposing creation of an industry-wide MMIC packaging center.

For 1992, Zvi Galani was appointed Vice Chairman by Reynold Kagiwada, and Jitendra Goel has assumed the responsibility for planning and organizing the Emerging Technologies Meeting (see separate article in this issue).

Also for 1992, the challenge to the 18 TC chairmen is to increase their committees' involvement in transnational activities. This is particularly important as the percentage of non-US MTT members continues to increase.

In Memoriam
Dr. Fred J. Rosenbaum
1937-1992



It is with deep personal sorrow that I am documenting the unexpected, early death of my friend Fred Rosenbaum.

Dr. Rosenbaum was born in Chicago, Illinois, and received his BS, MS and Ph.D. degrees, all in Electrical Engineering, from the University of Illinois in 1959, 1960 and 1963, respectively.

He started his professional career as a Research Scientist at McDonnell Aircraft Corporation, St. Louis, Missouri. In 1965 he joined the faculty of Washington University's Electrical Engineering Department, as an Assistant Professor. In 1967 he was promoted to Associate Professor, and in 1973 he became a full Professor. Except for a two year leave of absence, 1983-1985, while he was Chief Scientist at Central Microwave Company, he taught at Washington University for 26 years. Most recently he was also the Director of the Washington University Electronic Packaging Resource Center. He trained 23 MS and 13 D.Sc. candidates, many of whom have become known scientists and successful engineers.

He published more than 50 reviewed articles, 3 book chapters, 3 encyclopedia articles and 3 patents. Prof. Rosenbaum was a well known speaker and he presented many papers at international meetings.

Dr. Rosenbaum has been an officer of the MTT-Society for more than 20 years. His name has become synonymous with MTT-S. He is known all over the world, for both his scientific contributions and his leadership in MTT-S.

Fred Rosenbaum has been honored in numerous ways: In recognition of his classroom skills, he was presented the Distinguished Faculty Award by the School of Engineering and Applied Science Classes of 1978 and 1988. He is a Fellow of the IEEE. He has received several honors from the Microwave Theory and Techniques Society, including the Distinguished Service Award (1988) and the IEEE Centennial Medal in 1984. He was the Electrical Engineering Department Distinguished Alumnus—University of Illinois in 1982; Visiting Lecturer at the Israel Institute of Technology (Technion), Haifa, Israel (1981); D. E. Evans Visiting Fellow, Department of Electrical Engineering, University of Queensland, Brisbane, Australia (1980); Member, IEEE Delegation to the USSR Popov Society (1979); Distinguished Microwave Career Award, Electro-Physics Laboratory, University of Illinois (1976).

Dr. Rosenbaum was President of the IEEE Microwave Theory and Techniques Society in 1981 and Editor of the *IEEE Transactions on Microwave Theory and Techniques* 1971-1974. He served as Chairman of the 1985 MTT-S International Microwave Symposium in St. Louis. He has been a consultant to the United Nations International Telecommunications Union and served on two missions to Brazil (1989, 1991).

Fred Rosenbaum will be remembered through his scientific contributions and the leadership role he played for many years in MTT-S but, above all, those of us who had the privilege of knowing him personally, will remember him as a kind, warm individual who will always have a special place in our hearts.

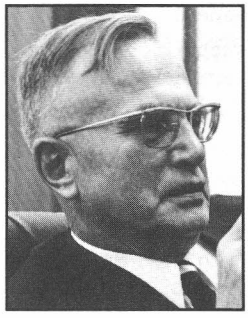
Personal Note: *Fred Rosenbaum was my friend. I will miss him very much. We worked together, we shared our ideas, we thought and celebrated together. I called him Fritz, as his father used to, and we often communicated on a daily basis. This communication will continue—Fritz will know my questions and, in my heart, I will know his answers.*

—Reinhard H. Knerr

In Memoriam
Dr. Werner J. Kleen
1907-1991

Dr. Kleen, who received the 1979 MICROWAVE CAREER AWARD, died on July 3, 1991. Born in Hamburg, Germany, he received the degree of Diplom Physiker from the University of Heidelberg, where he also received the Dr. Phil. Nat. in 1931 and Dr. Habil in 1936.

He started his career with Telefunken Research Laboratories in Berlin in 1932. He advanced to Director of Telefunken's High Vacuum Development Section. In that period, apart from numerous publications and contributions in this field, he published (together with the late H. Rothe) five volumes on "High Vacuum Electron Tubes" which, in German speaking countries, were a standard text for 30 years. In parallel to his industrial activities, Dr. Kleen had been teaching at German universities since 1936.

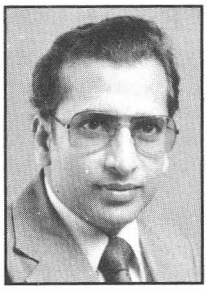


After the second World War, he joined the Companie Générale de Télégraphic Sans Fil (CSF), Paris as the leader of a most competent and successful research group in the field of microwave tubes. All three companies Dr. Kleen was associated with in a position of decisive responsibility are still leading traveling tube manufacturers (CSF-Millimeter Wave Tubes, Telefunken and Siemens-High Efficiency, Linear TWTs for Space Applications).

In the 1950s, he gave lectures on microwave tubes in Stockholm (Denmark) and Madrid (Spain) where he was professor at the Instituto Nacional de Electronica. Two books, "Introduction to Microwave Electronics" and "Trav-

(Continued on page 30)

Emerging Technologies



by Jitendra Goel

An Emerging Technology meeting was conducted in Albuquerque on January 11th. It was organized by Technical Coordinating Committee to identify emerging and advancing technologies in areas of interest to MTT. It also provided the opportunity for all the MTT technical sub-committee chairmen to learn of advancements and innovations in the other areas within the MTT field.

Sixteen of 18 Technical Committee chairmen presented synopses of their respective area. Many exciting new ideas were discussed and several outstanding results were reported. Many new applications of microwaves, both in military and commercial areas were reported. Highlights of the meeting are provided here, which by no means are claimed to be a complete summary of the presentations.

In **Computer Aided Design,** which is a rapidly growing area, the new fronts being explored are:

- EM simulation of microwave circuits
- More complex MMIC circuit analysis
- Simultaneous thermal and electrical design

Using these techniques, in the future it will be possible to simulate a complete MMIC using a full-wave, three dimensional electromagnetic technique. This approach can take into account the effects due to the housing, parasitic coupling and radiation. In the area of power amplifier design, the thermal considerations, an important aspect of the design, which often is treated as an "afterthought" in the design process, can now be incorporated in the electrical design.

In the **very high power** arena several exciting advancements are taking place. In the vacuum tubes area, 2.6 megawatts of power with 73% efficiency at 1 GHz has been achieved using a MAGNICON, and GYRATRONS can now produce very high power (500 KW) up to 110 GHz. In the solid state area silicon carbide devices can operate up to 500°C junction temperature with 20W power in X-band. Another very interesting application of high power was identified in the area of waste management. When a particle beam generated by high power microwaves is passed through hazardous waste, it can reduce the half-life by an order of magnitude.

In the **low noise** area the pseudomorphic and lattice matched HEMT have reached performance levels which are far superior to the well known big and bulky cooled parametric amplifiers. 1.2 dB noise figure at 94 GHz was reported by using a pseudomorphic HEMT on indium phosphide substrate. Indium antiminide HEMT technology is very promising for future low noise applications and has a promise of achieving 0.5 dB noise figure at 94 GHz.

In the **biological** area several emerging and useful applications being explored are:

- Cancer treatment
- Microwave balloon angioplasty
- Microwave treatment of benign prosthetic hyperplasia

A new medical procedure for treatment of tachycardia (rapid heartbeat) using microwave energy is being investigated. The technique uses a catheter which includes a flexible transmission line terminated by an antenna. This catheter is introduced into the heart and with the help of an electrocardiograph (using action potentials) is put in contact with the area to be ablated. Microwave energy is then applied and increased slowly until the desired amount of damage to the ectopic focus has been achieved.

For **commercial applications**, where cost is the prime concern, several applications are being explored. Some of them are:

- Cellular radio
- DBS
- Collision avoidance radar
- Blind spot detectors (automobiles/trucks)
- Local area networks

In most of these applications, **yields and testing of the MMIC chips** appear to be the main cost drivers. Optical noncontacting on-wafer characterization of the chips looks promising as one way to reduce the costs. (Ultrabroad band S-parameter measurements from dc to 100 GHz appear possible with this technique in the near future.) MMIC design techniques for "first pass" success and low cost packaging to mass produce these chips for approximately $1.00 per macrocell in future were mentioned.

For higher reliability and lower cost, higher order of integration on MMIC consisting of more functions, RF and optical, and RF and digital functions was also discussed.

In the **field theory** area, the main focus is on two and three dimensional analysis of complete MMICs. Several techniques such as finite element, spectral domain, integral equation, finite difference and TLM are emerging to address the computational needs.

In the **superconducting** area, which is an emerging field in itself, following high temperature super conducting components were reported:

- Resonator cavities with very high Q-values
- Low loss delay lines
- Analog signal processing circuits
- A/D converters

Work on several other more complex circuits such as 6-10 pole filters, 6-8 channel filter banks, phased array antenna feed networks and 8-10 bit A/D converters is in progress and successful demonstrations are expected in near future.

AdCom Highlights

(Continued from page 3)

Technical Committees	Reformat Technical Coordinating Committee Bylaws	Tomiyasu (June '92)

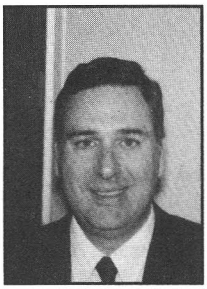
Budget issues are extremely visible, and although our present balance sheet is strong, a zero-based 1993 budget exercise is presently underway in order to preserve our fiscal position. One of our most prominent sources of income continues to be that generated from the annual International Microwave Symposium[1]. The format of Microwave Week, site selection, and the business relationship between the Society and our conference services provider, Horizon House, are therefore under close scrutiny.

These issues reflect only some of the actions discussed in January. Other AdCom and Society discussions are reported elsewhere in this issue, including reports on the IEEE Technical Activities Board (TAB), the workings of Division IV (reported by our own Martin Schneider elsewhere in this issue), the Education Committee, Membership Services, Bylaws and Procedures, and so on.

It was a busy meeting, and many commitments were made for June. Stay tuned.

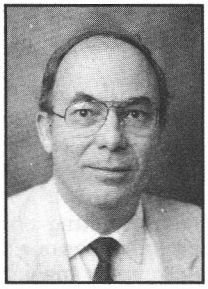
[1]This reporter recently learned that IEEE parlance reserves the word "Symposium" for meetings of up to 250 people. Since we draw around 9000 in a good year, our annual meeting is definitely ready for elevation to "Conference." This modification would cause enormous consternation within the Library of Congress, however; as we assess our position, therefore, IMS will remain IMS.

MTT-S Meetings & Symposia Committee Report



by Eliot D. Cohen
Co-Chairman

E. James Crescenzi,
Co-Chairman



New Committee Structure

Mario Maury has completed an active four years as chairman of the Meetings & Symposia Committee. We wish him luck in his new endeavors with Membership Services. This year the committee is co-chaired by Eliot Cohen and Jim Crescenzi. In order to encourage clear channels of communication, our responsibilities have been divided into "Sponsorship" (Cohen) and "Operations" (Crescenzi). With a slight risk of oversimplification, if it involves the International Microwave Symposia, contact Jim. If it involves sponsorship of an event other than the IMS, it is appropriate to start with Eliot.

The focal points for the specific International Microwave Symposia are the individual Steering Committee Chairmen, acknowledged below.

Future MTT-S International Microwave Symposia

- 1992—Albuquerque, New Mexico, June 1-5, 1992
  Jerry Hausner, Chairman
  R&D Associates
  (505) 842-8911
- 1993—Atlanta, Georgia, June 14-18, 1993.
  Pete Rodrigue, Chairman
  Georgia Institute of Technology, E.E. Dept.
  (404) 894-2994
- 1994—San Diego, California, May 23-27, 1994.
  Don Parker, Chairman
  Hughes Aircraft Co.
  (310) 615-2576
- 1995—Orlando, Florida, May 16-18, 1995
  Keith Huddleston, Chairman
  Martin Marietta Corp.
  (407) 356-7201
- 1996—San Francisco, California, June 17-21, 1996
  Jim Crescenzi, Chairman
  Watkins-Johnson Co.
  (415) 813-2506
- 1997—Denver, Colorado
  Hussain A. Haddad, Chairman
  Ball Aerospace
  (303) 460-2114
- 1998—Baltimore, Maryland
  Steve Stitzer, Chairman
  Westinghouse Electric Corp. (Def. & Elec. Cntr.)
  (301) 765-7348

The International Microwave Symposium— A "Can't Afford to Miss" Event

The breadth and vitality of the MTT-S International Microwave Symposium makes it a unique and special event. There is so much new information presented in the scientific papers, special sessions, workshops and exhibits, that one usually ends the week both excited ("pumped up") and exhausted. We often hear the complaint that: "There's just too much crammed into one week!"—which, when one reflects on it, is really quite a compliment.

What's the secret of success? There are, of course, many aspects. Three fundamental components are particularly noteworthy:

1. A tradition of abundant volunteer service in planning and supporting the Symposium.
2. An open Call-For-Papers, rigorous scientific paper review, and demanding acceptance criteria.
3. Open and generally balanced representation of diverse technical and commercial interests, including outstanding industrial exhibits.

The 1992 International Microwave Symposium is sure to continue the tradition of excellence. We gratefully acknowledge the dedication and extraordinary efforts of Jerry Hausner and Bob Hutchins and their many committee volunteers. Thanks for your many hundreds of hours of service!

1993 International Microwave Symposium

by Pete Rodrigue

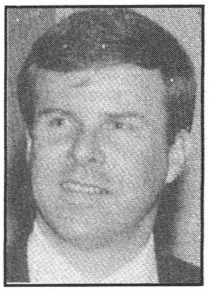
Atlanta, Georgia, will host the 1993 International Symposium during the week of June 14th to 18th. The theme, "The Global Reach of Microwaves," is appropriate to this city which is fast developing as a telecommunications capital. The site of the technical sessions and exhibits, the Georgia World Congress Center, is contiguous to the CNN Center whose global reach we have all come to know.

Atlanta has enjoyed enormous growth since the last IMS was held there in 1974. The '74 meeting pioneered the concept of joint MTT, AP, and URSI meetings. That '74 symposium featured sixteen exhibitors. The Atlanta hotel scene has developed almost as explosively as has our exhibit program. The Marriott Marquis has been designated as the headquarters hotel with additional blocks of rooms at the Hyatt Regency, the Peachtree Plaza, the Omni, and the Ritz Carlton. All are an easy walk from the Congress Center. (Shuttle buses will be provided anyway.)

Technical sessions and exhibits will be held on Tuesday, June 15th, through Thursday, June 17th. The Microwave and Millimeter-Wave Monolithic Circuits Symposium will open on Monday, June 14th, and the ARFTG meeting will be held on Friday, June 18th. A number of special events are in the works, including a guest program designed to display the legendary Southern hospitality.

So mark your calendar for Microwave Week (June 14-18) in 1993. We look forward to having you all in Atlanta.

AdCom Elections Part 2



by Glenn Thoren
Chairman Publicity

The final installment of your introduction to the MTT-S AdCom Members is included below. I hope by reading this issue and the Fall 1991 issue (which I'm sure you've kept in a handy place) it will be apparent that the MTT-S AdCom and all the volunteer committees that support their work are dedicated to making your society the best it can be. Now that you've met each AdCom member and know a little about their work and achievements, I would urge you to express your concerns, suggestions or appreciation to them. For your convenience we've reproduced all their names again. Each year the Newsletter publishes a pocket guide and directory to all the AdCom officers and committee members. You can use this directory to contact your AdCom committee.

AdCom Members 1992

1992	1993	1994
K. K. Agarwal	R. E. Bryan	R. H. Jansen
E. J. Crescenzi	E. D. Cohen	R. S. Kagiwada
Z. Galani	S. A. Maas	M. A. Maury
B. S. Perlman	R. A. Moore	D. G. Swanson
S. J. Temple	J. E. Raue	J. W. Wassel
J. C. Wiltse	P. W. Staecker	E. Yamashita

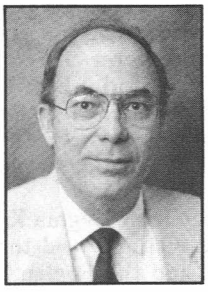
Eastern U.S.	7	Industry	13
Central U.S.	2	Government	2
Western U.S.	7	University	3
Europe	1		
Japan	1		

Past Presidents
F. Ivanek—1991
T. Itoh—1990
V. G. Gelnovatch—1989

Newly Elected Members for 1992-1994

Rolf H. Jansen	Industry, Europe
Reynold S. Kagiwada	Industry, West-U.S.
Mario A. Maury	Industry, West-U.S.
Daniel G. Swanson	Industry, West-U.S.
Eikichi Yamashita	University, Japan
John W. Wassel	Industry, Central-U.S.

E. James Crescenzi, Jr.



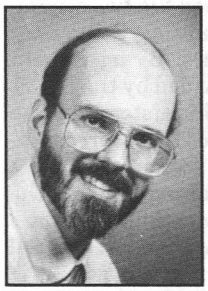
Dr. Crescenzi received the B.S. degree (1961) from the University of California at Berkeley, and the M.S. (1962) and Ph.D. (1969) degrees from the University of Colorado. He currently holds the position of Principal Scientist, engaged in the development of microwave subsystems and devices at Watkins-Johnson Company in Palo Alto, California.

Jim served as a lieutenant in the Air Force from 1962-65. He joined Watkins-Johnson in 1970, initially working on a wideband collection receiver. He has, at various times, served as Manager of the Solid State R&D and Microwave Amplifier Departments, and currently heads a small development section. He was responsible for the early development of an AMRAAM RF Processor, various microwave amplifier products, and GaAs MMICs and MICs and MIC-based subassemblies. Recently, he has completed development of a receiver module for a high performance US Navy microwave landing system (MMR Program) and a miniature downconverter for an Air Force microwave landing system application. He is also engaged in the development of wideband receiver subsystems and a new series of high-speed microwave logarithmic/limiting amplifier products. He has published 15 technical papers, and holds one patent.

Dr. Crescenzi has served on the MTT-S Administrative Committee since 1988, and has chaired the Operations and Publications Committees, and is currently co-chair of the Meetings and Symposia Committee. He has served on the IMS Technical Program Committees since 1983, and is Chairman of the Steering Committee for the 1996 International Microwave Symposium in San Francisco.

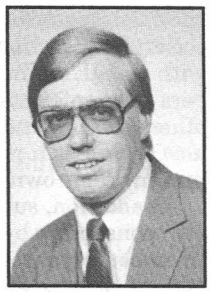
Stephen A. Maas

Although he hardly remembers the experience, Stephen A. Maas was born (or so he is told) in Quincy Massachusetts, normally considered part of the USA, in 1949. Toward the end of an unusually long childhood, he emerged from the University of Pennsylvania with MSEE and BSEE degrees, followed somewhat later by a Ph.D. from UCLA. Sobered by the prospect of eventual employment, he took refuge at the National Radio Astronomy Observatory, working on the low-noise receivers for the Very Large Array (VLA) in Soccorro, NM. He subsequently worked as an itinerant laborer in the aerospace industry, stopping for a few years each at Hughes Aircraft, TRW, and The Aerospace Corp., developing the usual collection of microwave hardware and a progressively greater fascination with progressively less useful theory. At present, he survives on the income from two books, *Microwave Mixers* and *Nonlinear Microwave Circuits*, and on the forbearance of the UCLA Department of Electrical Engineering, where he is an Associate Professor. He also begs a little consulting work and edits the *IEEE Transactions on Microwave Theory and Techniques*. In his spare time he enjoys torturing small animals (most of whom are graduate students) and going to AdCom meetings.



[Prose unedited as submitted by Dr. Maas]

Steven J. Temple



Mr. Temple received the BSEE and Master of Engineering degrees from Cornell University. Following graduation he joined Raytheon Company's Missile Systems Division in 1974. Mr. Temple was involved in development of GaAs FET Power Devices, Amplifiers and Transmitters as well as Microwave Sources. Since 1981, Mr. Temple has been involved in the development of GaAs MMICs, and their application to a variety of system applications including phased array T/R Modules. He led company-wide efforts in advanced Package

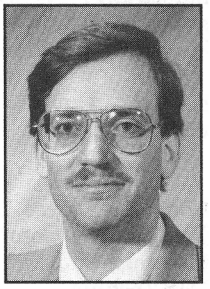
(Continued on next page)

The Journal of Lightwave Technology
Is there light in your future?

by Norman R. Dietrich and

Paul J. Stabile

MTT-S Representatives to the JLT Steering Committee



History

The *Journal of Lightwave Technology* began publishing in early 1983. During its nearly ten years it has become recognized as the major monthly journal for lightwave technology. The Journal is a joint publication by the IEEE and the Optical Society of America. In the broadest sense its existence is governed by a Letter of Agreement between the two organizations which is administered by a Coordinating Committee consisting of both IEEE and OSA members. By agreement the actual publication of the Journal is provided by the IEEE. Publication and operating activities are administered by the IEEE Steering Committee which consists of two representatives from each of seven sponsoring IEEE Societies. The two representatives share one vote on matters brought before the Steering Committee at its semi-annual meeting. They are appointed by the society presidents to two-year, staggered terms, and may be reappointed.

Sponsorship by Seven IEEE Societies

Sponsorship by an IEEE Society is detailed in a Letter of Agreement signed by the president of each of the societies. They include: Aerospace and Electronic Systems, Communications, Electron Devices, Instrumentation and Measurement, Lasers and Electro-optics, **Microwave Theory and Techniques**, and Ultrasonics, Ferromagnetics and Frequency Control Societies. These societies, with a common interest in lightwave technology, have agreed to underwrite the operation of the JLT. The Journal has become self-supporting: operating with a balanced budget and with a small reserve in the event of a budget shortfall.

Benefits to MTT Members

Subscribing MTT-S members receive monthly regular and special issues of the JLT, as well as any other sponsoring society Transactions special issues which are published jointly with the JLT. Thus the JLT provides a forum for our members to be informed of lightwave technology developments in other societies and those occurring in the MTT community. It also serves as a multidisciplinary forum for our members to present their own lightwave work.

In addition, subscribing members benefit from **their** society sponsorship by qualifying them to subscribe to the JLT at "member" (sponsor) rates, currently $32 per year, rather than non-member rates, currently $350. MTT has the third largest number of subscribing members among the sponsoring societies, with 250 regular and 26 student subscribers of a total of 2800 IEEE subscribers, or about ten percent.

The Journal is published monthly and is planning to publish a ten-year index and commemorative issue at the end of 1992.

Lightwave Technology's Significance to MTT Members

Lightwave technology continues to grow in importance to MTT members. It is in some cases replacing, and in other cases supplementing functions and applications previously involving only microwave technology. The MTT-S AdCom has identified lightwave technology as an emerging technology of strategic technological significance to the MTT-S membership and to the Society. Thus, it has co-sponsored the JLT, and continues to support the activities of MTT-3, the Technical Committee on Lightwave Technology, which actively continues to organize sessions, special sessions, and workshops at the annual IMS, and special issues of the Transactions. Interested members are urged to take advantage of these activities, and to consider subscribing to, as well as publishing in the *Journal of Lightwave Technology!*

AdCom Elections Part 2

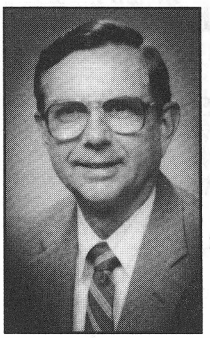
(Continued from previous page)

technology and Computer-Aided Design. In 1986, Mr. Temple was involved in the formation of the Raytheon/TI Joint Venture and served as Joint Venture Program Manager for the MIMIC Phase 1 program. He is currently program manager for the MIMIC Phase 2.

Mr. Temple has published more than 20 papers in the areas of Monolithic Technology, Power FETs, CAD and Engineering Education. He is the recipient of Raytheon's Outstanding Author Award, and received the IEEE/Microwave Theory and Techniques Society's (MTT-S) "Keys to the Future" Award as part of the IEEE Centennial Celebration. Mr. Temple is a member of the Administrative Committee of the MTT-S and is past Chairman of the Central New England Chapter of MTT-S. He is a graduate of Raytheon's Engineering Management and Advanced Management Programs.

James C. Wiltse

James Wiltse received the B.E.E. and M.E.E. degrees from Rensselaer Polytechnic Institute and his Ph.D. from Johns Hopkins University. Currently, he is a principal research engineer at Georgia Tech Research Institute, where he has worked since 1978. From 1979 to 1990, Wiltse also served as associate director and later as the director of professional development and academic interaction. Prior to coming to Tech, he spent 14 years with Martin Marietta Corporation, where he served as director of research and technology at the Orlando Division. He has published some 90 technical articles, six books, and several patent disclosures, and has made numerous presentations at technical meetings and symposia in the U.S. and overseas.



Dr. Wiltse has served on several IEEE editorial boards and participated in many technical program committees for conferences and symposia. He was General Chairman for the 1984 National Radar Conference and the MTT-S Distinguished Lecturer from 1979 to 1980.

Dr. Wiltse is a Fellow of the IEEE, a member of Sigma Xi, Tau Beta Pi and Eta Kappa Nu. He has also received the IEEE Outstanding Engineer of the Year and the Region 3 Outstanding Service Award.

Call for MTT-S AdCom Nominations and Committee Appointments

by Kiyo Tomiyasu, Chairman
AdHoc Nominations and
Appointments Committee

This year, the nomination of candidates for election to MTT-S Administrative Committee (AdCom) will be conducted by an AdHoc Nominations and Appointments Committee (N&A Committee) appointed by AdCom on January 13, 1992. The AdHoc N&A Committee will handle the nominations with the same procedure as in past years specified in the MTT-S Bylaws. In addition, the N&A Committee will seek interested and qualified individuals in serving on various MTT-S committees who will be recommended to the incoming President for his consideration.

Nominations to MTT-S Administrative Committee

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

The Bylaws provide three means by which one may be nominated for AdCom. They are as follows:

a) Nominations by the Nominations Committee

b) Nominations by petition signed by 25 MTT-S members and submitted to the Nominations Committee Chairman prior to July 1, 1992

c) Informal Chapter nominations submitted by July 1, 1992

All nominees will be contacted to ascertain that they will accept the nomination and will commit themselves for active participation to at least three meetings a year, held at various locations in the United States.

The geographical and affiliation distribution of current AdCom members is given below:

Present AdCom (1992): Total = 18

Eastern U.S.	7	Industry	13
Central U.S.	2	Government	2
Western U.S.	7	University	3
Europe	1		
Japan	1		

The Nominations Committee needs your help in suggesting potential nominees to serve our membership as AdCom members. Please submit your suggestions to the chairman of the AdHoc Nominations Committee and/or your local Chapter Chairman by **July 1, 1992.**

Recommendations for Appointments to MTT-S Committees

The second function of the AdHoc N&A Committee is to assist the incoming MTT-S President, by identifying individuals to be recommended for his consideration for appointments to the many MTT-S committees. Anyone interested in such appointments should contact by **July 1, 1992:**

K. Tomiyasu, Chairman
AdHoc Committee on Nominations and Appointments
General Electric Company
P.O. Box 8048
Philadelphia, PA 19101 USA
Tel. 215/531-5740
Fax 215/531-3698

1993 IEEE Microwave Theory and Techniques Society Undergraduate Scholarships

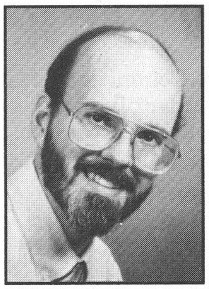
- For children of MTT-S members
- Not limited to engineering
- $1,000-$2,500 each
- Renewable for 4 years
- Given to meritorious students based on PSAT/SAT test scores, academic record, GPA, class rank, leadership, career goals, significant extracurricular and community activities.
- Application forms for the IEEE Microwave Theory and Techniques Undergraduate Scholarships can be obtained from the Citizens' Scholarship Foundation of America (CSFA).
- Requests for application forms should be made in writing before December 1, 1992, and refer to the MTT-S Undergraduate Scholarship.
- Complete applications must be sent to CSFA and postmarked before February 1, 1993.

Citizens' Scholarship Foundation of America
1505 Riverview Road
P.O. Box 297
St. Peter, Minnesota 56082
Telephone: (507) 931-1682

For further information on the Scholarship, contact:

Mr. Daniel G. Swanson
Watkins-Johnson Co.
3333 Hillview Avenue
Palo Alto, CA 94304-1204
Telephone: (415) 813-2036

Report on the *MTT-S Transactions*



S. A. Maas, Editor

As of the July 92 issue I've finally handed the reins of the *Transactions* to a new editor. It's been a wild ride, and I'm both glad it's over and a little sorry to see it go. I'm confident, however, that our new editor, Dan Masse, will ride those broncs at least as well as I did. I wish him my best.

Several important things have happened since I took over the *Transactions* from Rod Tucker in December of 1989. The most recent (and the one at the moment I'm happiest about) is that those of us on the Publications Committee successfully sweet-talked our first choice for a new editor into taking the job. Many of you know Dan for his long-term involvement in the development of IMPATT technology at Raytheon; you may also know that he is a technological heavyweight, and a highly respected and very literate individual. I think he's ideal for the job.

And it is a very big job. As our industry has grown, so has the *Transactions*. The annual number of published pages has increased from about 1000 in 1978 to 2300 in 1991 (see Figure 1). Our budget for 1992 is 2300 pages, but it is likely that this will be insufficient, and we will need more pages next year. During 1991 we received 411 new manuscripts and "disposed" (i.e., accepted, rejected, transferred, or returned for revision) 456. 271 papers were accepted, 113 were rejected, and 36 were transferred to another journal (either before or after review). 36 papers were returned (without acceptance) for revision. At the end of the year 111 papers were in review; an additional 124 were on file, awaiting final or revised versions.

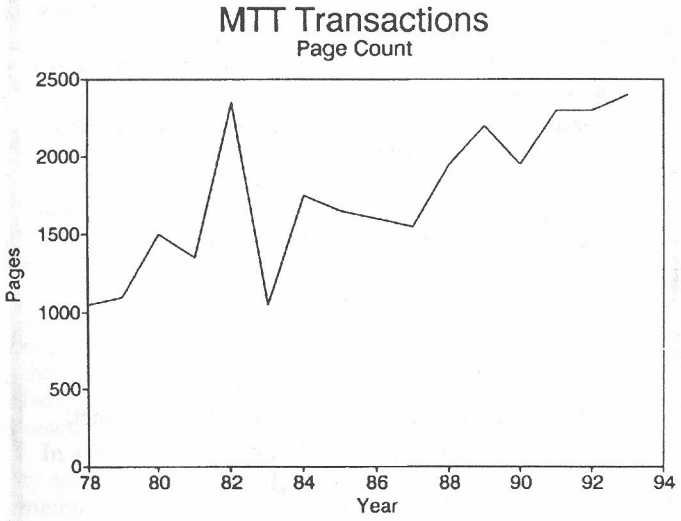


Figure 1.
The MTT Transactions' annual page count, from 1978 to the present. The value for 1993 is an estimate.

In spite of the growing number of submitted papers, the time required to review papers has consistently decreased. The median time to first disposition is around 75 days (see Figure 2). As recently as two years ago it had been considerably greater; around 95 days. (This should embarrass those of our sister IEEE journals that often require a year for review. You know who you are.) Much of this improvement is directly attributable to the use of computers for tracking manuscripts and generating the hundreds of forms and form letters that we use each month. Computers were introduced by Tatsuo Itoh when he was editor in the early 80s; his original dBase II program served us admirably until 1990. At that time I completely rewrote the software, adding greater capabilities and eliminating some notorious dBase bugs. Ironically, Dr. Itoh is now using this same program to track manuscripts for the MTT's letters journal, *Microwave and Guided-Wave Letters*.

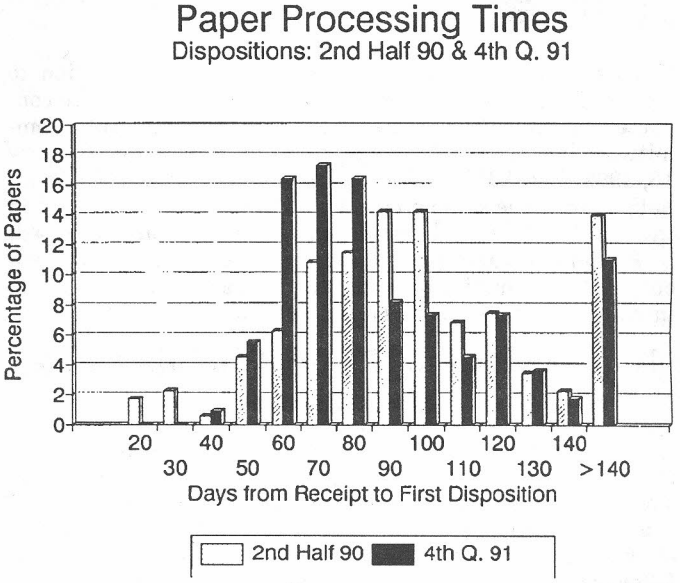


Figure 2.
Paper processing times. This figure compares the last quarter of 1991 to the earliest for which we have data. The improvement is largely attributable to our new manuscript-management software, which was fully installed in early 1991.

Nevertheless, many aspects of the review cycle are not yet satisfying. Figure 2 shows that, although most papers are reviewed promptly, fully ten percent of the submitted papers are "disasters"; i.e., they remain in review more than 140 days. The fundamental reason for these disasters is that reviewers fail, for one reason or another, to respond to a request to perform a review. In some cases the reasons are relatively good: the reviewer is out of the country, on sabbatical, sick, or moved to a new job; sometimes mail is lost. Although we have over 800 reviewers on file, our resources are barely adequate for the number of papers we receive; when a reviewer has received three or four papers in one year, he is understandably tired and may not respond quickly. Finally, our records of reviewers' areas of specialization have not always been accurate, and many papers are returned by the reviewers; we then lose at least a couple weeks of valuable time.

We have tried in several ways to ameliorate this problem. Recently we began polling the reviewers to update the information in our database. We discovered that many reviewers had moved, several had retired, a few had died, and a surpris-

(Continued on page 12)

Call for Nominations for 1993 MTT-S Awards

Microwave Career Award
Description of the Award:
Prize: Certificate, a 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: Publication 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.
Presentation (when presented): At the annual MTT-S Symposium. (**Note:** Travel allowance of up to $1,000 is granted on a need basis for travel to the Symposium.)

Distinguished Service Award
Description of the Award:
Prize: Plaque and certificate.
Eligibility: Significant contributions and outstanding service to the Microwave Theory and Techniques Society and the microwave profession over a sustained period of time.
Basis for Judging: Service to AdCom and IEEE. Nominations considered aperiodically and awards made aperiodically.
Presentation (when presented): At annual MTT-S Symposium.

Microwave Application Award
Description of the 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.
Presentation (when presented): At annual MTT-S Symposium.

Microwave Prize
Description of the Award:
Prize: Plaque and Certificate.
Eligibility: Authors of papers making significant contribution to the MTT-S field of interest published in any IEEE publication during the year ending June 30th preceding the award; the author need not be a member of IEEE.
Basis for Judging: The most significant contribution in the previous year in the field of interest of the MTT Society.
Presentation (when presented): At annual MTT-S Symposium.

Pioneer Award
Description of the Award:
Prize: Certificate, a plaque and $1,000; feature publication in *MTT Transactions* and *Newsletter*. If a team is named recipient, 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.
Presentation (when presented): At the annual MTT-S Symposium. Upon request, travel and living expenses for the recipient for attendance at the presentation ceremony shall be reimbursed.

Please send the completed nomination form to:
Dr. Reinhard H. Knerr
AT&T Bell Laboratories
Room 3F-100
Route 222
Breinigsville, PA 18031

MTT-S Membership Services

by Mario A. Maury, Jr.
Chairman

Membership Services Committee

At the January 13, 1992, AdCom meeting, the following MTT-S members were appointed to the Membership Services Committee:

Chairman	Mario A. Maury, Jr. Tel: (714) 987-4715 Fax: (714) 987-1112
Vice Chairman	Kris K. Agarwal Tel: (214) 205-8563 Fax: (214) 272-8144
Chapter Activities	Mike Golio Tel: (602) 897-5947
Chapter Records	Joe Staudinger Tel: (602) 732-2803 Fax: (602) 732-2148
Microwave Lecturer Program	Louis Medgyesi-Mitschang Tel: (314) 233-2504 Fax: (314) 777-1328
Membership Development	John T. Barr Tel: (707) 577-2350 Fax: (707) 577-4090
Student Member Development	Roger D. Pollard Tel: (44) 532-332080 Fax: (44) 532-332032
Newsletter Editor:	John W. Wassel Tel: (214) 995-3216 Fax: (214) 995-3347
Special Technical Articles	John A. Eisenberg Tel: (415) 941-7426

It is the objective of this committee to review and improve the services that we provide MTT-S members and chapters. I have listed above all committee members' phone and fax

(Continued on page next page)

Report on the *MTT-S Transactions*

(Continued from page 10)

ing number had changed their areas of technical interest. Another aid is in our new software; we now keep records of reviewers' performance, and make sure that we assign at least two reviewers to each paper. Occasionally we simply drop notoriously unreliable reviewers from our list. Finally, we have begun to make use of new technologies, especially fax and electronic mail, to expedite the review process. I plan to work with Dan, as he sees fit, to help improve the speed of our reviews.

Aside from the numbers, I've had a few experiences that have varied from the amusing to the downright disturbing. Last year the *Transactions* received its first "crackpot" paper, proving conclusively that we engineers need not feel inferior to physicists and astronomers. The paper, in case you're interested, came from a place calling itself the "Scientific Research Institute" (just up the street, I presume, from the Unscientific Research Institute). It purported to show that all the theory on which digital circuits are based is wrong. Before you ask, I have no idea why they sent it to us.

We had a couple "near misses" in the business of unethical publication practices; fortunately, all but one of these papers were caught before they were published. The one paper, published in a special issue, was identical to a previous publication in the European Microwave Conference. Another (which wasn't published) appeared in identical form in a trade journal. A couple of pairs of papers were virtually identical; in one case two papers, received a few months apart, entitled "TE modes in . . ." and "TM Modes in . . ." had nearly identical text and figures, but different equations. As one might expect, we received several papers having egregious technical errors, one even claiming that pulses can propagate faster than light. Problems like this underscore the need for an editor to be genuinely involved in the work of the journal; otherwise, many of these could easily sneak through.

A major change in the character of the *Transactions* will result from a vote at the last AdCom meeting. At that meeting the MTT AdCom authorized, for the first time, the use of associate editors. Over the next year, we will begin to select a few (perhaps two or three) associate editors to assist the editor, and to strengthen the overall operation of the journal. We do not envision a whole army of associate editors, as has Circuits and Systems, Electron Devices, or other societies; instead, we expect to retain as much as possible the "small-town" single-editor flavor of the *Transactions'* operation, while doing what is necessary to accommodate its inevitable growth. We feel that this is a responsible middle course, which will strengthen the editor's ability to deal with the current paperwork avalanche, yet not dilute the responsibility for maintaining the quality of the *Transactions*.

So, that's where we stand. As for me, I've had a lot of the best kind of fun: lots of challenges, lots of work, and a chance to accomplish something worthwhile. I'm grateful to two Publications chairmen, Jim Crescenzi and Martin Schneider, for their support, and to two UCLA secretaries, Miriam Sabin and Joan Renner, for their assistance. I am especially grateful to the AdCom for giving me the opportunity to do this job, and I hope my efforts justified their confidence.

MTT-S Membership Services

(Continued from previous page)

numbers so that you can communicate with any of us if you need any information, assistance or have any comments relative to MTT-S activities or benefits.

MTT-S Chapter Chairpersons' Meeting

We are preparing for the Chapterpersons' Meeting which will be held at the International Microwave Symposium in Albuquerque, New Mexico. Registration forms and applications for travel funds have been mailed to applicable MTT-S chapter officers. Should you require additional information on this meeting, please contact the coordinator for this event:

Vijay Nair
MTT-S Chapter Officers' Meeting Coordinator
Motorola, Inc.
2100 E. Elliott Road, Mail Drop EL508
Tempe, AZ 85284 U.S.A.
Tel: (602) 897-5922
Fax: (602) 897-5934

MTT-S Chapter Officers' Handbook

We have a new Chapter Officers' handbook in preparation and we plan to mail these out in March of 1992.

New MTT-S Chapters

We would like to welcome our newest Chapter in Greece. This is a joint chapter with Electron Devices and the interim chairman is Professor G. Kiriakidis. Any members that are interested in joining this chapter, please contact:

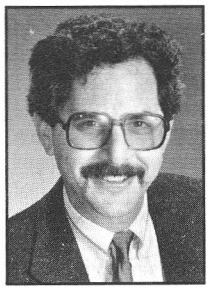
Professor K. Kiriakidis
Foundation for Research and Technology—Hellas
Institute of Electronic Structures and Laser
P.O. Box 1527
Heraklion 71110, Crete, Greece
Tel: (081) 239779

There are a number of other chapters being formed including one in Moscow, Russia. I hope to report on their successful formation in my next newsletter article.

I am looking forward to meeting many of the chapter officers at the Chapter Chairpersons' Meeting in Albuquerque and in working with them to improve communication and service for all MTT-S members. Please feel free to contact me:

Mario A. Maury, Jr., Chairman
MTT-S Membership Services
Maury Microwave Corporation
2900 Inland Empire Blvd.
Ontario, CA 91764 U.S.A.
Tel: (714) 987-4715
Fax: (714) 987-1112

1992 MTT-S Distinguished Microwave Lecturer



Paul F. Goldsmith

Quasioptical Components and Systems for Millimeter Wavelengths (Lecture No. 1)

Quasioptical propagation means transmission of electromagnetic radiation in free space, with beams only a relatively few wavelengths in transverse extent. Diffraction is thus an important issue, but systems are generally analyzed using the elegant and impressively accurate theory of Gaussian beams. A wide variety of components have been developed, including filters, polarization processors, ferrite devices, and focusing elements, which permit much higher performance than can be obtained with guided-wave propagation at millimeter and submillimeter wavelengths. This has led to an increasing use of quasioptics in low-noise radiometers, antenna feed systems, materials measurement, and plasma diagnostics. In this talk basic elements of quasioptical propagation and passive component design are reviewed. Recent development of active quasioptical components including oscillators, mixers, and multipliers are covered, and the constraints and possibilities for integration of active and passive components into quasioptical millimeter-wave systems are described.

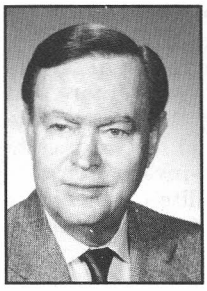
Radiometric Imaging Systems and Applications (Lecture No. 2)

Radiometric systems are designed to measure the thermal emission of sources ranging from nearby objects to the entire universe in an early stage of its evolution. Consequently, a high premium is placed on sensitivity, which has encouraged development of a variety of low noise receivers. Imaging refers to obtaining a measurement of the distribution of radiation as a function of incidence angle. Ideally, thermal imaging is performed by an array of sensitive radiometers operating simultaneously. In this talk, development of radiometers is discussed and the requirements that imaging imposes on the system optics and feeds are addressed. Several different millimeter-wavelength imaging systems which employ multiple receivers will be described. These systems are designed for synthetic vision in conditions of poor optical visibility, remote sensing of the atmosphere, and astronomical study of giant interstellar molecular clouds.

Paul Goldsmith performed his Ph.D. research developing a sensitive heterodyne receiver for the 1.33mm wavelength range and using it for some of the earliest observations of the J=2–1 transition of carbon monoxide and its isotropic variants. This research into the structure of molecular clouds continued at Bell Laboratories where he was also involved in designing the quasioptical millimeter wave feed system for the 7-m offset Cassegrain antenna. In 1975, he moved to the University of Massachusetts where he studied the thermal balance of interstellar clouds and their physical conditions. He also initiated development of cryogenic mixer receivers at

(Continued on next page)

1992-1994 MTT-S Distinguished Lecturer



by Ferdo Ivanek

"Progress and Change in Microwave Radio Communications"

Invitations have started coming in early, even before the announcement has been disseminated through the *MTT-S Newsletter* (page 14 of Number 130, Fall 1991). My local Chapter (Santa Clara Valley/San Francisco) wanted to schedule my first lecture for February, but I was not yet ready, and we agreed to schedule for autumn.

My first lecture will take place in Atlanta at the invitation of Keith Edenfield, Chairman of MTT/AP Chapter. We scheduled it for April 1, the night before the IEEE TAB meeting which I had already planned to attend. This will help to reduce the travel expenses to be covered out of the MTT-S budget for Distinguished Lectures.

Dick Snyder, Chairman of the North Jersey MTT/AP Chapter, invited me for April 23, and I am trying to accommodate him. The outcome depends on whether I shall be able to again save MTT-S travel funds, which are very limited, by combining this lecture with another one in the same area, or with travel on other business.

In conjunction with a business trip to Europe I am firmly planning on two lectures, and possibly a third one. May 22 is the preferred date of Istvan Frigyes, Chairman of the Hungary MTT/AP/COM/ED Chapter. Victor Fouad Hanna, Chairman of the France MTT Chapter, expressed preference for a mid-June date which remains to be determined.

For autumn of this year I have been invited to Chicago by Piergiorgio Uslenghi, Chairman of the MTT/AP Chapter. This and the lecture to my local chapter would complete the annual plan of six lectures per calendar year. I am ready to present more if my business, MTT-S and other IEEE commitments permit, and if the limited MTT-S travel budget can be stretched by combining travel as indicated above. In some cases it may be possible for the host Chapter Chairmen to obtain financing from other travel funds for such purposes (e.g., from their IEEE Sections). The most convenient participation by local sponsors may be in providing accommodation.

In response to my solicitation of projection material for use in my lecture I have already received a substantial quantity of excellent contributions from leading microwave communications companies and research organizations around the world. This enabled me to expand my list of topics to include the following microwave communications applications and the corresponding range of microwave technology:

- Terrestrial point-to-point and point-to-multipoint radio
- Vehicular and personal mobile radio, terrestrial and satellite-based
- Wireless PBX and wireless LAN
- Wireless local loop
- VSAT

(Continued on page 15)

the Five College Radio Astronomy Observatory, developing a system which had very low noise as well as exceptional calibration accuracy as a result of the extensive use of quasioptical technology for single sideband filtering and input switching. In 1981, he led a team which performed the first submillimeter astronomical observations with a laser local oscillator heterodyne system. At the University of Massachusetts, Dr. Goldsmith's astronomical research has addressed questions of the relationship of molecular clouds to young stars and detailed studies of molecular material near the center of the Milky Way. A professor at the University of Massachusetts since 1986, Dr. Goldsmith is one of the co-investigators for the Submillimeter Wave Astronomy Satellite (SWAS). His research in technology has focused on Gaussian optics, quasioptical system design, and imaging systems. He was one of the founders of Millitech Corporation in 1982, where he is Vice President for Research and Development. He works primarily in the area of millimeter wavelength imaging, and quasioptical component and system design. Dr. Goldsmith is a Fellow of the IEEE, and is a member of the American Astronomical Society, Sigma Xi, and URSI. He was named MTT-S Distinguished Lecturer for 1992-1994.

Chapters interested in inviting the MTT-S Distinguished Lecturer may contact him directly: Professor Paul F. Goldsmith, Five College Radio Astronomy Observatory, University of Massachusetts, 619 Lederle Graduate Center, Amherst, MA 01003, Telephone: (413) 545-0925, Fax: (413) 545-4223.

MTT Society Ombudsman

Ed Niehenke
Westinghouse Electric Corporation
P.O. Box 746, MS-75
Baltimore, MD 21203
(410) 765-4573
(410) 993-7432 Fax

As your Ombudsman, I have received one inquiry from an MTT-S member since the last reporting in the Fall 1991 *MTT-S Newsletter*. This inquiry was from a European MTT-S member who had trouble getting his 1991 IEEE and MTT-S dues paid. I contacted IEEE membership and requested payment be made (credit card) and past issues of *Spectrum, MTT-S Transactions*, and *Guided Letters* be sent. I checked back with IEEE and the transaction was completed.

As your Ombudsman for 1991, I have received 6 inquiries, and to my knowledge all members have been satisfied. After receiving an inquiry, I contact the person for additional information, if required, and acknowledge the receipt of the complaint. I then act on the request and take the necessary action. Finally, I send a letter to the member delineating my action.

I have enjoyed being your Ombudsman for 1991 and look forward to continuing in 1992. 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.

1992 MTT-S SYMPOSIUM Technical Program

byRobert Hutchins
& Robert Antinone
(photo unavailable)
1992 TPC Chairmen

The Technical Program Committee (TPC) for the 1992 MTT-S International Microwave Symposium met in Albuquerque on a snowy day in January to review papers submitted and to establish the technical program for the "Microwave Week." We were pleasantly surprised by the number and quality of the candidate presentations.

The TPC reviewed 646 papers including 313 from the U.S. and 333 from 27 other countries. We chose a record number of 380 for presentation. Because of this record number of presentations, we had to increase the number of parallel sessions from 4 to 5 during part of the program. The distribution of papers included 139 long (20 minutes), 124 short (10 minutes) and 117 interactive forum presentations.

The "Microwave Week" begins on Monday, June 1, with the Microwave and Millimeter Wave Monolithic Circuits (MMWMC) Symposium. The MTT-S Symposium continues on Tuesday through Thursday, June 2-4. Finally the Automatic RF Testing Group (ARFTG) conference will be held on Friday, June 5. All technical sessions for the MMWMC and the MTT-S will be held at the Albuquerque Convention Center, while the ARFTG sessions will be conducted at the Holiday Inn Pyramid.

We have organized several sessions that highlight new microwave applications as well as microwave applications supported by various laboratories in New Mexico. Our local interest sessions include radio astronomy, very high power microwave sources and impulse or ultra-wideband radar technology. Other special sessions are devoted to microwaves for vehicle communications and control, millimeter wave technology, sub-millimeter wave technology, and monolithic thin film resonators on MMIC structures.

Our plenary session speaker is Professor Roald Sagdeev, former head of IKI (Russian equivalent of NASA) and present Distinguished Professor at the University of Maryland, who will speak on the new and changing trends in research and development.

Fourteen workshops are scheduled including 10 full-day and 4 half-day sessions. The topics span both traditional subjects as well as new technologies such as superconductivity and high power photoconductive switches. A special workshop will present microwave technology used in radio astronomy. This session will be hosted by the staff of the Very Large Array located about a two-hour drive from Albuquerque.

Six lunch-time panel sessions are planned to provide a less formal forum on key topics such as MMIC, process technology and future commercial applications in vehicle control and communication. The special panel session addresses technology transfer from government funded research to commercial applications. This panel will have the leaders of key laboratories, industries and government organizations involved in this process.

(Continued on next page)

Finally we are trying a new communication forum with three evening "rump sessions" where one can discuss the selected topics with experts in an informal setting with beverages and snacks.

We have 15 student papers, also a record number, that will be presented in the technical session appropriate to their topic. Each student presentation will be reviewed at the conference for superior paper awards.

Finally our invited speakers from the European microwave community will also present their papers in technical session appropriate for their topic. These speakers and their topics include:

- H. H. Meinel (Deutsche Aerospace AG, Muenchen, Germany), *Applications of Microwaves and Millimeterwaves for Vehicle Communications and Control in Europe,* paper P-1.
- A. J. Seeds (University College, London), *Microwave Optoelectronics in Europe,* paper V-1.

We look forward to an excellent attendance, outstanding papers, unique special sessions and many reported breakthroughs. Early June is a pleasant time to visit New Mexico. We hope you will come and join us at the MTT-S Symposium.

1992-1994 MTT-S Distinguished Lecturer

(Continued from page 13)

As I pointed out in the initial announcement *(MTT-S Newsletter* Number 130), I have opted for a flexible presentation framework with regard to topic selection and length of presentation. This enables the host Chapters to specify in advance what would best serve their needs and interests. The initial reactions indicate that the 2nd, 3rd and 4th topics listed above, which cover the general area of mobile and personal communications, seem to be of most widespread interest at this time.

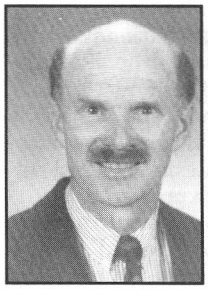
Tatsuo Itoh gave me the opportunity for a preview of what I may be expected to deliver to MTT-S audiences. He invited me as introductory speaker in the 1992 UCLA Electrical Engineering Research Symposium "Technologies for Personal Communications," which he chaired on February 3. The speaker group included Dr. Viterbi, Chief Technical Officer of Qualcom, San Diego, and Dr. Furuhama, President of ATR Optical and Radio Communications Research Laboratories, Kyoto. The challenging overflow audience was representative of the best MTT-S Chapter meetings. This event made it quite clear that Tatsuo's topic selection addressed very well the interest of a large number of key microwave engineers.

This experience was most useful in reaching a better understanding of what MTT-S audiences will expect from my lecture. The Chairmen of the host Chapters can greatly help by identifying the range of interest of their memberships and by giving me their suggestions for optimum topic selection and presentation.

Since scheduling involves extensive coordination which can be quite time consuming, may I recommend that interested Chapters start planning as early as possible. It is by no means premature to start planning for 1993 and even for 1994, because I have already a few trips on my 1993 and 1994 calendars.

Chapters interested in inviting the Distinguished Lecturer may contact him directly: Dr. Ferdo Ivanek, Communications Research, 1646 Madrono Ave., P.O. Box 60862, Palo Alto, CA 94306, Telephone: (415) 329-8716, Fax: (415) 328-8751

1992 MTT-S IMS Transportation



by Michael Harrison

Airlines

The 1992 International Microwave Symposium has two official air carriers: Delta Airlines which provides service to Albuquerque via their Dallas-Ft. Worth and Salt Lake City hubs, and America West Airlines which provides extensive service from the West Coast. Both carriers are offering 45% discount off unrestricted (Y/YN) fares or a 5% discount off any published fare in effect when tickets are purchased. Delta has the following exceptions: The discount on travel from Canadian cities is 40% and the discount on travel on Delta connection carriers is 35%.

Tickets must be purchased seven days in advance to qualify for these discounts. Both airlines are allowing travel during the period May 24-June 14, 1992, to provide an opportunity for extra sight-seeing in the Southwest.

Reservations on Delta should be made through the Meetings Reservation Desk: 1-800-241-6760 (United States and Canada). Please refer to the File Number: H0571.

Reservations on American West should be made through their CAMS Desk at: 1-800-548-7575 (Select Option 1). Please refer to CAMS Code: 10307XD.

Rental Cars

Hertz Rent-A-Car has been selected as the official car rental agency for the 1992 International Microwave Symposium. Rates offered by Hertz for conference attendees represent a substantial discount off their normal rental rates for five car sizes and four different rental periods. The number to call for reserving a car at the conference rate is 1-800-654-2240; reference Meeting #10202 to obtain the conference rate. All hotels offer parking which is free at other than the Hyatt ($4/day). There is a special convention parking rate at the Convention Center of $2.50 per exit (no daily rate).

Transportation Services

Shuttle bus service will be provided daily to and from the Albuquerque Convention Center from all the Symposium affiliated hotels that are not in the immediate vicinity of the Convention Center. The service will be available at either 20 or 30 minute intervals at the following times:

Dates	Time
Monday, June 1-Friday, June 5	7:30 a.m.-5:30 p.m.

In addition to the above services, for those attending the Microwave Journal cocktail reception at the NM Museum of Natural History during the evening of Monday, June 1, transportation will be provided from the Convention Center and back to the hotels. Shuttle service will also be available on Tuesday evening for those attending the awards banquet at the Convention Center. Detailed route and schedule information will be available in the registration area of the Albuquer-

que Convention Center as well as in the hotels served by the shuttle.

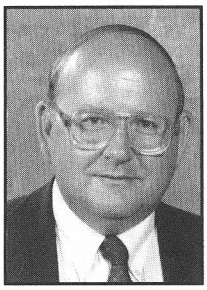
Transportation From Albuquerque Airport

Most of the hotels affiliated with the International Microwave Symposium offer courtesy pickup and dropoff at the airport. The distances range from one half mile to 11 miles. Some of the hotels can be reached through a courtesy phone in the airport terminal; all can be reached through the numbers supplied with the Symposium registration material. Almost all the national rental car agencies are present near the airport. We recommend that you check the special rates offered by Hertz Rent-A-Car as the official car rental agency. There is a ShuttleJack bus service to and from the center of Santa Fe for those who might arrive early or stay later for sight-seeing. For those who may be staying in a hotel without a courtesy pickup, several taxi companies serve the airport. Sun Tran, the Albuquerque bus line, serves the airport every 20 minutes on week days, hourly on Saturdays and no service on Sundays. During most hours of the day, there is an information booth in the baggage area to assist travelers.

Getting Around Albuquerque

Albuquerque is a spread-out city occupying over 100 square miles not counting the nearby towns of Rio Rancho and Corrales. The major city street grid is covered very well by the Sun Tran bus line which runs most routes three or four times an hour. Fares are $0.75 ($0.25 for students or seniors). The Symposium hotels will be served by a set of four free shuttle routes. There is a hotel adjacent to each of the two major shopping centers and a hotel next to the Old Town area. Symposium attendees can use the shuttles to reach these destinations. Bus routes and schedules will be available at the registration area at the Convention Center. Rental cars are quite useful to reach sites such as the Sandia Peak Tram, the Sandia Peak Ski Area and the Sandia Crest viewing area which have no bus service. There is a special convention parking rate at the Albuquerque Convention Center of $2.50 per exit. Details should be obtained at the registration area.

1992 MTT-S Local Arrangements



by Dennis Martin

Albuquerque Area Information

New Mexico, "The Land of Enchantment", is the ancient homeland of the Pueblo Indians and former outpost of Spain and Mexico. It is the land of Kit Carson and the painter Georgia O'Keefe; where colorful hot-air balloons soar high across the mesas. A place that you can still enjoy the unspoiled beauty of a special corner of the United States.

Albuquerque, the largest metropolis in New Mexico, is a beautiful and historic city. It is bounded on the east by the Sandia Mountains, on the west by extinct volcanoes, and divided by the Rio Grande river. Albuquerque is at an altitude of over 5,000 feet and enjoys a mild, dry climate without temperature extremes, but with four distinct seasons. In early June one can expect warm and sunny days with an average high temperature of 88°F. It cools down in the evening and mornings with an average low temperature of 55°F and hence a light jacket or sweater is recommended.

Symposium Hotels

Room blocks have been reserved for conference attendees in twenty five Albuquerque hotels. This many is required because Albuquerque hotels have smaller room capacities compared to those found in larger cities. All twenty five hotels are top quality. The Hyatt Regency, Doubletree, La Posada, and Friendship Inn are all within a very short walking distance of the Albuquerque Convention Center where most conference events are scheduled. The other twenty one hotels will be served by shuttle bus service during the symposium. Five different sets of bus routes are planned for better service.

Hotel Registration

All hotel reservations will be handled by the Housing Bureau (Albuquerque Convention and Vistors Bureau). The Conference Housing form must be used to make hotel reservations. Please be sure to indicate at least ten hotel preferences on the form. It is recommended that you respond early to ensure availability of one of your first choices.

Dining and Areas of Interest

All symposium attendees will receive a Albuquerque Visitors Guide in their registration packets courtesy of the Albuquerque Convention and Visitors Bureau. This guide contains information on area attractions, recreation, sightseeing, dining, accommodations, etc., with several maps.

Albuquerque has many excellent restaurants, serving many different cuisines. Of course, the speciality is New Mexico's own brand of Southwestern, based partly on the native green chiles grown in the southern part of the state, and unique from Mexico, California, and Texas Mexican dishes. Have it mild or hot, its your choice! Many cafes and restaurants are located within short walking distances from the Convention Center. Stop by the Tourist Information Table in the Registration Area of the Convention Center for suggestions, listings, and directions.

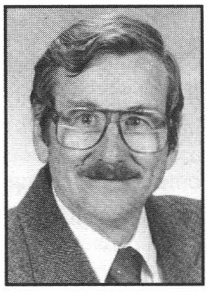
Some of the attractions you may want to visit include historic Old Town Plaza, which features many shops and restaurants, and two nearby museums; the Museum of Natural History and the Albuquerque Museum. One of our conference hotels, The Albuquerque Sheraton Old Town Hotel, is located only one block from Old Town.

Other suggestions include the Indian Cultural Center and the Rio Grande Nature Center, or you may wish to ride the World's Longest Tramway to Sandia Peak and dine at the fine restaurant on top. The list goes on and on . . .

Albuquerque's attractions combined with the excellent technical program that has been prepared for this symposium prove that this conference will be the best ever!

Spouse's Program

Wanda &
Robert O'Nan



Saddle up Ol' Paint, brush up on your Spanish, get your shots, get your passport in order and head to New Mexico in June. No, not really, New Mexico is a part of the United States. It has been since 1920, but enough people don't know that a book has been written about the funny questions otherwise literate Americans have asked. It is called *One of Our 50 Is Missing*. It is a collection of actual quotations often made by business people, like "What is the rate of exchange for American Money" or "We cannot ship to a foreign country."

We have tried to put together a guest program which will give you a view and a taste of the varied geography and cultures that make up Albuquerque and New Mexico.

The guest hospitality suite will be staffed with one of our local Kachina Greeter Volunteers as well as family and friends of the local MTT-S chapter. They will be happy to assist you with information about the area. Also available will be the free Albuquerque Visitors' Guide, as well as menus from our local restaurants, local attraction brochures and phone books. It will be open Monday through Friday, 7:30 a.m. to 5:00 p.m. Breakfast will be served until late morning, with light snacks, soft drinks, tea and coffee throughout the day. From an adjacent room you will have a view of the entire [vendor] exhibit area.

Our tours have been selected to give you a broad view of New Mexican scenes and cultures. Daytime dress in the Southwest is casual. As Albuquerque is one mile above sea level a hat and/or sun screen is advisable on the tours. Comfortable walking shoes will also be necessary.

On Tuesday, June 2, you will have a chance to go back in time to visit Spanish colonial New Mexico in the 1700s. El Rancho De Las Golondrinas is one of the living museums. The ranch depicts life as it was in Spanish Colonial New Mexico in the 1700s. Museum docents will present special demonstrations of the crafts of the era, such as spinning, weaving, bread making, adobe making, rope making, and blacksmithing. Old water mills are still operational and rustic territorial-style furniture fills the adobe homes. A gourmet box lunch will be served under the cool shade of cottonwood trees. On the return trip we will travel along the Turquoise Trail, passing through near ghost towns which were once mining villages that attracted the rich and famous to this area.

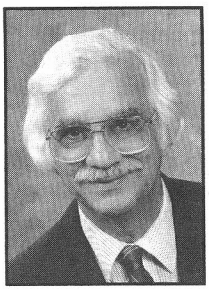
The tour on Wednesday covers the multicultured city of Albuquerque, a city rich in variety and hospitality. Your guided tour will take you on a journey that includes the one-of-a-kind Pueblo-style campus of the University of New Mexico, established in 1889. You will also take a driving tour past the UNM Sports Complex, along historic Route 66, and through nearby residential areas such as Huning Highland Historic District and Albuquerque Country Club. The shops in Old Town are situated in the preserved homes of the original Spanish settlers. A highlight of the tour is the Indian Pueblo Cultural Center, a living tribute to New Mexico's 19 Pueblo Indian communities. Here you can shop for the finest Indian jewelry, pottery, rugs, painting and other crafts to be found anywhere. Native American life and history are presented in the museum and via Indian-made videos. Here you will enjoy a tasty Southwestern or American lunch served by the New Mexican Indians.

On Thursday, you may travel to legendary Santa Fe by way of the majestic Jemez (pronounced "hay-mus") Mountains. You'll view Indian pueblos which have been inhabited since before the first Spanish explorers visited this area, a dam formed by mineral deposits from the volcanic hot springs, a rock the size and shape of a battle ship, and skirt the rim of an extinct volcano caldera. On the way up there will be a brief stop at the ruins of a mission, constructed of stone by the Indians under the direction of the friars. Coming down the mountain you will pass through the "Atomic City," Los Alamos, on the way to Santa Fe.

Under the veranda of the Palace of the Governors you can barter for jewelry from the Indian craftsmen of the area. Your guide will take you to see the oldest church and oldest house in the U.S. as well as the Miraculous Staircase in the Loretto Chapel. Your tour will include a Mexican or American lunch in one of Santa Fe's famous restaurants.

Sidewalk vendors are popular at the Plaza in Albuquerque and Santa Fe.

International Microwave Symposium 1992 Special Sessions



by Shyam Gurbaxani

A Smorgasbord of Enticing Workshops, Panel Sessions, Focus Sessions, and Rump Sessions

When it comes to "Crown Jewels" of the IMS, they are to be found in the Special Sessions. These sessions, consisting of Panels, Workshops, Focus, and Rump Sessions, evolve after long and hard negotiations by the MTT Technical Committees, Organizers, and the IMS Special Sessions Committee. The IMS 1992 has gone all out to present a record number, that is, thirty-two such Special Sessions as described below:

The Thirteen Workshops on Monday and Friday

With its fabled reputation of tricultural excellence: the Native American, the Hispanic, and the Anglo, Albuquerque, New Mexico, is an excellent setting to sample the emerging research in Microwave Theory and Techniques.

The neighboring National Laboratories and universities in the pristine atmosphere (known to be the cleanest in the contiguous forty-eight) stimulates the appetite for learning the new.

Do we have a smorgasbord for you! Thirteen workshops on Monday and Friday with topics from gentle ICs to work horses like filters and amplifiers to brute force HPM and UWB technology.

Take your pick. There is enough to satisfy all appetites—even the software addicts.

Of the 13 workshops, one is even set at the remote location of Very Large Array—the largest in the world. This unusual remote site workshop is the proud presentation of the IMS '92 steering committee. It is a full-day affair with transportation provided to and from the site of the telescopes. Crackers and sherry on the return trip if you learned anything at the magnificent VLA.

All the workshops have been sponsored by appropriate MTT-S Technical Committees. The organizers have worked hard alongside the Special Sessions Committee in enlisting outstanding speakers. We are confident that the quality of the workshops will be superior.

The all-day workshops include breakfast and lunch, while half-day workshops provide one meal as indicated in the program. The cost of the workshop also includes handouts and/or viewgraphs, etc. Would you believe all this for just 65 bucks or less. In short, whatever turns you on microwave-wise—we've got it. Only one regret: with such a variety in the 13 workshops, it may be hard to decide which two, three or four (half-day) you may wish to attend.

Following is a short version of the 13 workshops scheduled for Monday and Friday:

MONDAY, JUNE 1, 1992

Title	Organizers
Simulation of Hybrid and Monolithic Microwave and Millimeter-Wave Components Using Full Wave Approaches	C. M. Krowne
Improving efficiency and Linearity in Communication Amplifiers Module Integration Technology	J. Goel C. Buntschuh & E. Niehenke
Cryogenic Microwave/MM-Wave Devices	P. H. Carr & K. B. Bhasin
Generation and Control of High Power EM Radiation Using Optical Switches	G. M. Loubriel
Tunable Filters Revisited—An Update	R. V. Snyder
Techniques and Procedures for Testing Modern Communications Systems	M. Grace & S. West

FRIDAY, JUNE 5, 1992

Title	Organizers
Role of Concurrent Design Engineering in Microwave Systems Design	R. Goyal & J. Goel
MMIC Design Techniques for First-Pass Success	A. K. Sharma & T. Itoh
CAD of Nonlinear Microwave Circuits Using Field Theoretical Methods	K. C. Gupta, C. Snowden & I. Wolff
Visit to the Very Large Array Radio Telescope	P. Napier & S. Gurbaxani
Phased Arrays: A Technology Assessment	R. A. Sparks & B. Perlman
Cost and Producibility of Ferrite Components	W. Hord & A. Beyer

The Five Panel Sessions

Panel Sessions with differing viewpoints provide another platform for understanding contemporary research, development and engineering. Held at lunch time (with lunch provided), the panelists or the attendees will not hold back due to lack of energy.

Three panels are addressed to the MMIC area—covering various aspects as indicated in the program. The remaining two attack two other areas, i.e., "Issues in Experimental Validation" and the "Intelligent Vehicle Highway System (IVHS) for the USA." The last topic is an emerging field for sowing the peace dividends.

Below is an abridged menu of the panels:

TUESDAY, JUNE 2, AND WEDNESDAY, JUNE 3

Title	Day	Organizers
Millimeter-Wave Monolithic Integrated Circuits	T	G. E. Brehm
Critical Issues in Experimental Validation	T	J. C. Rautio
MMICS for Commercial Market —Fact or Fantasy?	T	R. Gupta & F. Ali
Process Technology and Testing Challenges for High Volume Commercial MMICs	W	G. Norris, M. Gollo & F. Ali
IHVS in America	W	J. Constantino

(Continued on page 23)

Advance Conference Registration

1992 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM

June 1-5, 1992 • Albuquerque, New Mexico • MTT-S • MMWMC • ARFTG

Each Conference Attendee must submit a separate registration form. A copy of this form may be used.
To ensure advanced registration, this form and payment must be received by May 15, 1992.
On-site fees will be approximately 30% higher.

NAME ____ (Last) ____ (First)

AFFILIATION ____ (Company, Etc.) ____ (Mail Stop)

ADDRESS ____ (Street)

____ (City) ____ (State) ____ (Zip Code)

____ (Country)

TEL. NO. ____

IEEE MEMBER ☐ Yes ☐ No Membership Number ____ (Required for membership discount)

JOB CATEGORY
A. Gen. Mgmt.
B. Res./Engr. Mgmt.
C. Res./Engr.
D. Des./Proj. Engr.
E. Manufacturing
F. Mkt./Sales/Purch.
G. Teaching
H. Student
I. Government
J. Consulting
K. Guest
L. Other

Check ☑ each function for which you wish to register. Check ☑ the appropriate fees and enter the fees in the Remittance column.

	IEEE Member	Non-Member	Remittance
• MTT-S Symposium			
☐ All MTT-S Sessions (Includes MTT-S Digest)	☐ $185	☐ $245	$_____
☐ Single-Day Registration (No Digest)	☐ $90	☐ $125	$_____
☐ Student, Retiree, Life Member (No Digest)	☐ $25	☐ $25	$_____
• MMWMC Symposium (Includes MMWMC Reception and Digest)	☐ $75	☐ $95	$_____
• Automatic RF Techniques Conference (Includes breakfast, lunch, and ARFTG Digest)			
☐ ARFTG Member	☐ $110	☐ $110	$_____
☐ ARFTG Non-member	☐ $135	☐ $135	$_____
• Additional Digests			
MTT-S Qty____ @	☐ $60	☐ $75	$_____
MMWMC Qty____ @	☐ $25	☐ $30	$_____
ARFTG (Member) Qty____ @	☐ $20	☐ $20	$_____
ARFTG (Non-member) Qty____ @	☐ $35	☐ $35	$_____

• Panel Sessions
(Check only one per set) *$15 each Includes lunch
**$15 each Includes Wine & Cheese

☐ PSA: Millimeter Wave Monolithic Integrated Circuits ☐ PSB: Critical Issues in Experimental Validation ☐ PSC: MMICs for Commercial Market - Fact or Fantasy	Tues. Lunch $_____*
☐ PSD: Processing Tech & Testing - Challenges for High Volume ☐ PSE: IVHS for USA	Wed. Lunch $_____*
☐ RSA: High-Tc Superconductivity Applications ☐ RSB: Are All FET Noise Models Equal, Are ....? ☐ RSC: Heterojunction Bipolar Transistor Reliability	Tues. Evening $_____**

• Awards Banquet
Wed. Evening Qty____ @ $40 $_____

• Workshops		Attendee	Student/Retiree Life Member
Full day workshops include continental breakfast and lunch	Full Day	$65	$30
	Half Day+	$40	$20

Monday

☐ WSA: Full Wave Simulation of Microwave Components	$
☐ WSB: Improving Efficiency & Linearity in Amplifiers	$
☐ WSC: Module Integration Technology	$
☐ WSD: Cryogenic Microwave/mm-Wave Devices	$
☐ WSE: Generation and Control of HPM Using Optical Switching AFTERNOON only - includes lunch	$ +
☐ WSF: Tunable Filters Revisited - An Update MORNING only - includes continental breakfast	$ +
☐ WSG: Communication Testing AFTERNOON only - includes lunch	$ +

Friday

☐ WSH: Concurrent Design Engineering in Microwave System Design	$
☐ WSI: MMIC Design Techniques for First Pass Success	$
☐ WSK: CAD of Non-linear Microwave Circuits Using Fields	$
☐ WSL: Very Large Array Workshop - Includes busing to VLA Site	$
☐ WSM: Phased Array: A Technology Assessment	$
☐ WSN: Cost and Producibility of Ferrite Components MORNING only - includes continental breakfast	$ +

• Guest Programs (Lunches are included)

GA: Rancho De Las Golondrinas (Tues)	Qty____ @ $35	$_____
GB: Tour of Albuquerque (Wed)	Qty____ @ $30	$_____
GC: Tour of Santa Fe (Thurs)	Qty____ @ $45	$_____

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

• Make your check or money order (U.S. $ ONLY on a U.S. Bank or Travelers Check) payable to:
"1992 IEEE MTT-S Symposium"

TOTAL REMITTANCE $_____

• Or charge your MasterCard or VISA: ☐ MasterCard ☐ VISA

PAYMENT MUST ACCOMPANY FORM

Card Number _____ Expiration Date _____ Signature _____

• Written requests for refunds will be honored if received by May 22, 1992. A $25 cancellation fee will be charged for processing.

MAIL COMPLETED FORM AND PAYMENT TO:
1992 IEEE SYMPOSIUM, c/o LRW Associates, 1218 Balfour Drive, Arnold, MD 21012, USA

CONFERENCE HOUSING

1992 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM

June 1-5, 1992 • Albuquerque, New Mexico

MMWMC • ARFTG

SEND COMPLETED FORMS TO:

Albuquerque Convention and Visitors Bureau
P.O. Box 26866
Albuquerque, New Mexico 87125

COMPLETED FORMS MUST BE RECEIVED AT THE HOUSING BUREAU BEFORE MAY 1, 1992

SEND NO CHECKS OR MONEY TO THE HOUSING BUREAU

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

INSTRUCTIONS AND HOUSING BUREAU POLICY

1. Please print or type all data requested.
2. All room reservations must be made by mail. No telephone calls will be accepted.
3. All reservations will be processed on a first-come, first-served basis.
4. Hotels will confirm reservations directly.
5. Before 5/1/92 contact MTT-S Housing at the above address to arrange cancellations and changes.
6. After 5/1/92 contact the hotel which confirms the reservations to arrange cancellations and changes. Cancellations must be received by confirming hotel at least 48 hours prior to arrival to qualify for refunds.
7. Copies of this form may be used to reserve more than the three rooms for which it provides.
8. **Send no checks or money to the housing bureau!**

HOTEL PREFERENCE

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

First choice _____ Third choice _____

Second choice _____ Fourth choice _____

Confirmations for all rooms reserved will be sent to:

NAME _____
Last First

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

COUNTRY _____ PHONE (_____) _____

To guarantee, provide the following credit card information: (Do not send any money to the Housing Bureau)

CARD NAME: ☐ AM. EXP. ☐ M'CARD ☐ VISA ☐ OTHER _____

CARD HOLDER NAME _____

CARD NO. _____ EXP. DATE _____

ROOM OCCUPANTS

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

	Occupants (last name first)	
ROOM NO. 1	1. 2.	Check one: ☐ Single ☐ Double ☐ Twin ☐ King Arr. Date _____ Dep. Date _____ ☐ Smoking ☐ Non-smoking ☐ Handicap
ROOM NO. 2	1. 2.	Check one: ☐ Single ☐ Double ☐ Twin ☐ King Arr. Date _____ Dep. Date _____ ☐ Smoking ☐ Non-smoking ☐ Handicap
ROOM NO. 3	1. 2.	Check one: ☐ Single ☐ Double ☐ Twin ☐ King Arr. Date _____ Dep. Date _____ ☐ Smoking ☐ Non-smoking ☐ Handicap

To ensure advanced registration, form and payment must be received before May 15, 1992. Written requests for refunds will be honored if received by May 22, 1992. A $25 cancellation fee will be charged for processing.

Registration Checklist

____ 1. Make copies of this form if needed for other registrants; use a separate form for each registrant.

____ 2. Clearly print or type the following information in the top portion of the form:
- Your name (last, first)
- Your affiliation (i.e. company, school)
- Your address (include zip code and country for foreign registrants)
- Your telephone number (including area code)
- Your job title (reference the letter codes)

____ 3. Check the appropriate "yes" or "no" box to indicate IEEE membership and include your membership number. You must provide this information to receive the IEEE membership discount.

____ 4. Check the appropriate boxes to indicate all events for which you are registering.

____ 5. Enter the applicable fee for each selection on the remittance line.

____ 6. Total all fees and enter the total on the Total Remittance line.

____ 7. Make out a check or money order for the total remittance amount to:

1992 IEEE MTT-S Symposium

- Payments must be in U.S. dollars only (check or money order).
- Personal checks must be encoded at the bottom with the bank number, account number, and check number.
- Bank drafts are unacceptable.

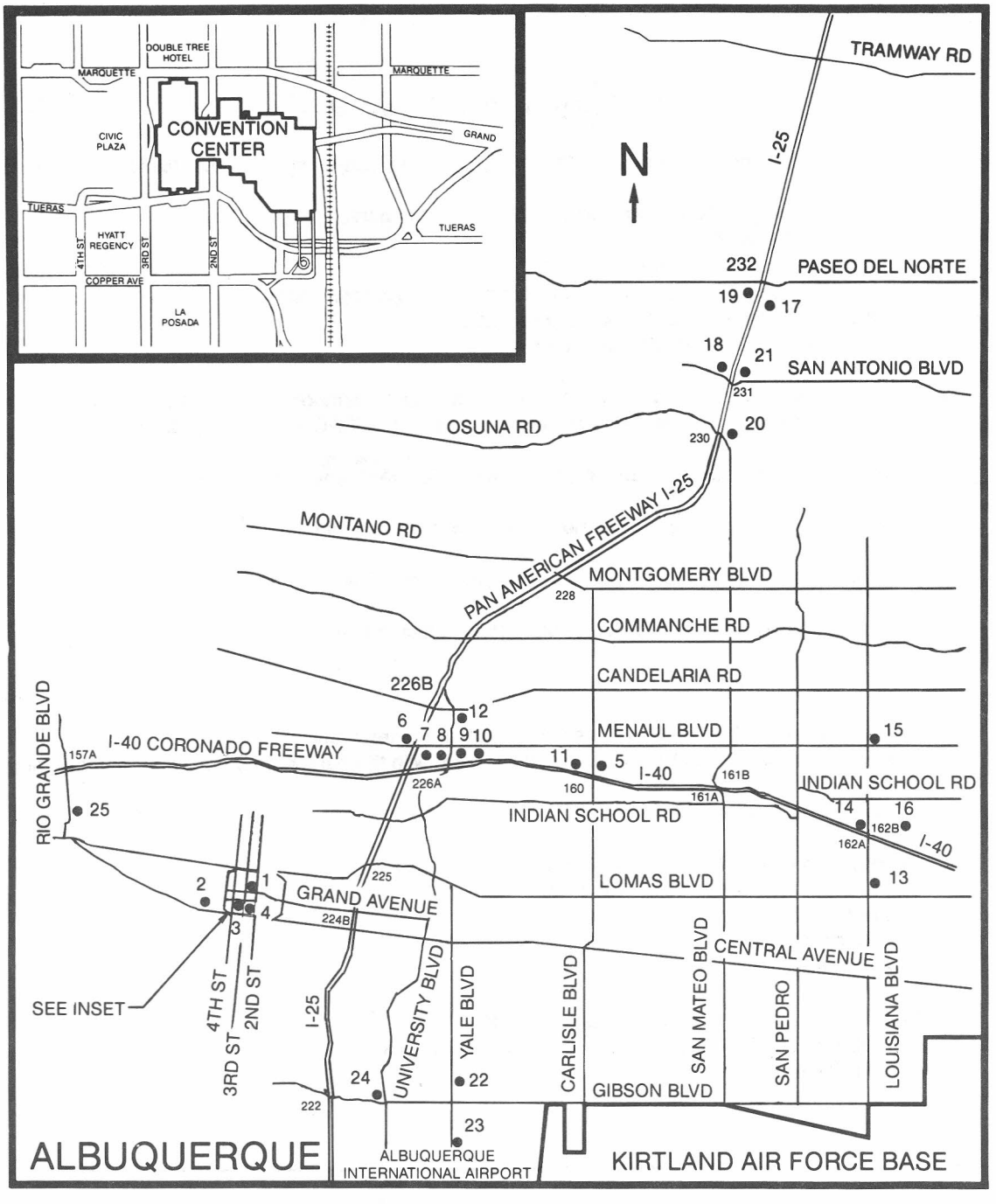
____ 8. Or, pay by credit card by entering the following information:
- Card type (MasterCard or VISA only)
- Card number
- Expiration date
- Signature

____ 9. Mail registration form(s) with your payment to:
1992 IEEE MTT-S Symposium
c/o LRW Associates
1218 Balfour Drive
Arnold, MD 21012, USA

On-Site Registration Fees

MTT-S Symposium Attendance	**IEEE Member**	**Non-Member**
All MTT-S sessions	$235	$295
Single-day registration	$	$
Retiree, Student, Life Member	$	$
MMWMC Symposium	$95	$115
Automatic RF Techniques Conference		
ARFTG Member	$	$
ARFTG Non-Member	$	$
Lunchtime Panel Sessions	$15	$15
Rump Panel Sessions	$15	$15

Workshops	**Attendee**	**Student, Retiree, Life Member**
Full Day	$75	$40
Half Day	$45	$25



REF #	CONFERENCE HOTELS	SINGLE	DOUBLE
1	DOUBLETREE	$90.00	$90.00
2	FRIENDSHIP INN	$36.00	$42.00
3	HYATT REGENCY	$95.00	$95.00
4	LA POSADA	$65.00/$86.00	$75.00/$96.00
5	QUALITY HOTEL 4 SEASONS	$62.00	$72.00
6	CLUBHOUSE INN	$52.95	$52.95
7	FAIRFIELD BY MARRIOTT	$56.00	$62.00
8	HILTON	$78.00	$88.00
9	HOLIDAY INN MIDTOWN	$63.00	$73.00
10	LE BARON INN	$42.25	$45.65
11	MARRIOTT RESIDENCE INN	$87.00	$87.00
12	SUPER 8	$35.88	$42.88
13	BARCELONA COURTS	$71.45	$80.45

REF #	CONFERENCE HOTELS	SINGLE	DOUBLE
14	MARRIOTT ALBUQUERQUE	$86.00	$96.00
15	RAMADA HOTEL CLASSIC	$67.00	$74.00
16	WINROCK INN	$67.00	$73.00
17	AMBERLEY SUITE	$58.00	$68.00
18	HAMPTON INN	$49.00	$53.00
19	HOLIDAY INN PYRAMID*	$72.00	$78.00
20	HOWARD JOHNSON'S	$53.00	$58.00
21	LA QUINTA INN NORTHEAST	$51.00	$59.00
22	MARRIOTT COURTYARD	$72.00	$82.00
23	AMFAC	$57.00	$61.00
24	RADISSON INN	$61.00	$71.00
25	SHERATON OLD TOWN	$78.00	$88.00

*ARFTG Headquarters Hotel

IMS 1992 Special Sessions

(Continued from page 18)

The Eleven Focus Sessions

The Special Sessions Committee arranged over the symposium proceedings 11 focus sessions which emphasize emerging technologies. The breadth of offerings is breathtaking. Topics range from "Film Resonators on MMIC Structures" and "Advance Millimeter-Wave Technology" to "Submillimeter Wave System Technology," "Microwave Technology in Radio Astronomy," and "Microwaves for Vehicle Communication and Control." For the really brute force aspects, we have "High Power Microwave Technology" and "Recent Advances in Ultra Wide Band Systems and Technology."

An abridged version of the Focus Sessions follows:

TUESDAY, JUNE 2, WEDNESDAY, JUNE 3, AND THURSDAY, JUNE 4

Title	Day	Organizers
Monolithic Thin Film Resonators on MMIC Structures	T	Moore & McAvoy
High Power Microwave Technology I	T	B. Miller
High Power Microwave Technology II	T	E. Schamiloglu
Vehicle Communication & Control Systems I	W	T. H. Oxley
Vehicle Communication & Control Systems II	W	E. Yamashita
Advanced Millimeter-Wave Technology	W	J. C. Wiltse
Submillimeter-Wave Systems	W	D. Rutledge
Microwave Technology in Radio Astronomy I	Th	P. Napier
Microwave Technology in Radio Astronomy II	Th	K. Tomiyasu
Recent Advances in UWB Systems & Technology I	Th	A. Rosen
Recent Advances in UWB Systems & Technology II	Th	S. Gurbaxani

Talk about superconductivity applications or noise models or the HBT reliability over wine and cheese and you got three lively Rump Sessions. And the New Mexican hors d'oeuvres make the matching of wits even more keen. It's a delight. Don't miss this one. ENJOY!

TUESDAY, JUNE 2, 1992

Title	Organizers
High-Tc Superconductivity Applications	K. K. Agarwal & M. Nisenoff
Are All FET Noise Models Equal, or . . . ?	J. Goel, M. Gupta & M. Pospieszalski
Heterojunction Bipolar Transistor Reliability	D. Hornbuckle, F. Ali & J. Kuno

See You at the Special Sessions

— Viewpoints —

Dear Editor:

I have been a strong supporter—and initiator—of professional activities in the IEEE since the early 1970s. These activities are now part of our constitutional charter, and they should remain so. Lately, however, I have come to believe that it is time for us to examine the way we support them through USAB.

USAB has an annual budget of about $3.5M, primarily funded through a $20/member mandatory Regional Assessment from all US members (Regions 1-6). Non-US Regions (Regions 7-10) also have such assessments, but they are much smaller and only $1 or $2 per member is spent on professional activities.

By contrast, IEEE does not have a mandatory assessment to support Technical Activities—although these are also in the charter and are our primary mission. Membership in Technical Societies is purely voluntary, and a member is free to drop the Society if he or she feels the Society's activities are going in the wrong direction, or if in his judgment the dues are not worth the benefits.

I strongly believe that we should apply the same criteria and principles to both types of activities. Thus, we should establish a number of Professional Activities Societies (on say Pensions, Career Development, R&D Policy, etc.) under a Professional Activities Board, just as we have Technical Societies under a Technical Activities Board; and membership in each Society should be entirely voluntary.

The issue boils down to the freedom of choice, and trust in good judgment of members. Unfortunately, many USAB leaders believe that freedom will lead to renunciation, because of ignorance on the part of the members; and they believe "Father Knows Best" what is good for us naive engineers. (They may be partially right: members may indeed renounce their programs, but because of the ability to see that the Emperor has no clothes, not because of ignorance!)

The argument of those supporting mandatory assessments goes something like this: (1) Mandatory dues are the price of belonging to the group, just as taxes are the price of a free society. (2) Each constituent does not decide the amount or the purpose of the tax; elected representatives do. Similarly, let the Board of Directors, not members, decide the amount and purpose of dues. (3) Since professional activities help all engineers, therefore all members should pay for them. (4) Given the choice, no one likes to pay taxes; and engineers are very frugal ("cheap"), so they won't pay anything at all.

These arguments are evidently specious. (1) Not all taxes are mandatory; only those that provide basic services are. Many other taxes are optional, depending on extra goods or services used—e.g., sales tax to buy non-essential goods, highway tolls to use a turnpike, fees to use a recreational facility, etc. Thus the issue is: to what extent does USAB provide basic services for the common good that need to be supported by mandatory assessments?

(2) Constituents in many states have asserted their right to override their representatives when it comes to taxes: witness Proposition 13 in California, and demands for a Constitutional Amendment to balance the US budget.

Some time ago I suggested that we need a Constitutional Amendment stating that mandatory dues should be used primarily to support basic services, and additional dues to support special interest activities—whether they are technical or professional—should be voluntary. However, several IEEE leaders whose opinion I respect feel that this may be divisive, so I am putting the idea on hold. Yet, I hope we can have an open debate on the issue: How much should be spent

(Continued on next page)

Viewpoints

(continued from previous page)

on the USAB, and what should be the primary focus of USAB projects in order to maximize the benefits?

(3) Our technical activities also help all engineers, by producing new technologies, new jobs, and so on, but we have not made it mandatory for all members to join a technical society. Why make an exception for professional activities?

(4) Joining a Technical Society is voluntary, and only about half of IEEE members do so—but those who do, join more than 2 Societies on the average. Obviously, given the choice, many engineers are willing to pay voluntarily to support worthy causes. The key is the value they perceive in the cause, or in the way it is being served.

USAB has been around for about 15 years, and has been fortunate to be served by a dedicated core of volunteers and an excellent staff. Yet, it is not clear if the actual benefits of USAB's efforts have been worth the cost—mostly because we have a minor role in the broad scheme of things. Take lobbying the Congress. After years of effort, we got a legislative victory in pension reform, but the big guns there were the labor unions. We can claim a share of the victory, but let's not overdo it—lest we sound like the proverbial army sergeant who claimed that "I and the Generals won the war." Take lobbying the Administration: we have not succeeded in changing the procurement regulations that lead to white-collar wage-busting practices. Take any of the issues before state governments; we have made very little progress.

Most of USAB's $3.5M budget goes to support pet projects perceived to be important by a few "Central Planners," but which do not result in valuable products or measurable benefits. People everywhere are relying on competition and a free market—of ideas and services, not just economy and politics. We should let the "consumer" decide how much value he puts on our product, instead of bundling it with some basic commodities. Let each member decide, freely, which society he wishes to join and support, instead of having to pay mandatory dues and assessments to support what someone else thinks is important.

This is not to say that we should give up professional activities; indeed we should redouble the effort. However, we will get results only when we give up monopolistic and paternalistic attitudes, let the members choose the areas needing our effort, and let each individual make his decision as to the value received. When Professional Activities really reflect the members' needs and their priorities, they will attract members in large numbers. And these members will be happy to pay $15 or $20 or more for the privilege to join a Professional Society on say Pensions or Career Development, just as they do to join a Technical Society on say Computers or Communications.

We have a new Administration in the IEEE. The new President and the new Vice President for Professional Activities have an opportunity to make a difference. It is hoped that they will take a hard look at the USAB programs, and will consider the challenge of setting up several Professional Societies with voluntary participation—perhaps in parallel with the existing mandatory dues structure.

Sincerely,
Dr. S. H. Durrani

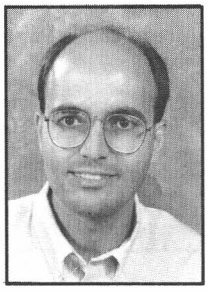
Dr. S. H. Durrani, a Past Director of IEEE, proposes an open debate on the issues of ***funding*** *and* ***focus*** *of professional activities in the IEEE. Specifically: Should we establish Professional Societies with voluntary membership and dues, as we have done for Technical Societies; and Should we restructure USAB and streamline its programs, so as to get the maximum benefit from our expenditures.*

Dr. Durrani has served as Chairman, Washington Section; President, Aerospace and Electronics Systems Society, and Director of the IEEE. He also served on USAB and many of its Committees, and was awarded its Citation of Honor in 1980.

The Editor will consider contributions from MTT-S members expressing timely and relevant items of interest to our technical community. Submissions should be limited to 300-500 words. Opinions expressed in Viewpoints are solely those of the author(s) and do not reflect an official position of the MTT Society.

Please correspond directly with Dr. Durrani to express your views. His address is: Dr. S. H. Durrani, Code TP, NASA Headquarters, Washington, DC 20546 USA

1992 MTT-S Symposium: Interactive Forum



by Edl Schamiloglu
Interactive Forum Chairperson

That's right—*Interactive Forum!* The Technical Program Committee of this year's Symposium decided this updated title best describes the unique opportunities available for presentations in this session. What started initially as a session utilizing poster boards as "grown up" to feature online computer demonstrations, video-taped presentations, hardware exhibits, and this year, even a full scale demonstration of computer vehicular control. You are encouraged to attend the two Interactive Forum sessions and use the opportunity to discuss details of the presentations in a comfortable atmosphere.

This year will continue the innovative use of Invited Interactive Forum speakers that was initiated last year in Boston. Dr. Wolfgang Hoefer of the University of Ottawa and James Gilb of Arizona State University will each make a 15-minute presentation at the beginning of their respective sessions. Following these presentations, the Interactive Forum session chairman will give a brief synopsis of the papers in the session before opening the session for interaction.

The Interactive Forum sessions this year will each have over 50 high quality papers in them. This is partly in response to the record number of submissions to the Symposium, but in addition, the generous amount of space available at the convention center allows for an enhancement of these sessions. The individual papers in the Interactive Forum will be grouped together in sessions which will be clearly displayed at the convention center. In addition, the overwhelming majority of the Interactive Forum papers are placed in a session where they do not conflict with related oral sessions. This should ensure a strong attendance.

The Interactive Forum is a unique opportunity to communicate with authors of the papers and to observe displays and presentations that would not be possible in oral sessions. The facilities in the convention center are comfortable and spacious and should allow for an enjoyable experience. Add to this plenty of wine, cheese and munchies, and you have a pair of sessions to eagerly await!

1991 Microwave Workshops and Exhibition (MWE'91)

by Masami Akaike
MWE'91 Steering Committee
Chairperson
ATR Optical and Radio
Communications Research Laboratories
Sieka-cho, Soraku-gun, Kyoto, 619-02
Japan

The 1991 Microwave Workshops and Exhibition (MWE'91) was held at Sunshine World Import Mart Building, Ikebukuro, Tokyo, Japan, from September 17 through September 19, 1991. MWE'91 was sponsored by the Institute of Electronics, Information and Communication Engineers (IEICE) APMC National Committee, and cosponsored by the IEEE MTT-S Tokyo Chapter and IEICE Technical Group on Microwaves. The outline was reported by Prof. Itoh, 1990 President, in the Fall 1991 issue of the IEEE *MTT-S Newsletter*.

MWE'91 was planned and organized as an international joint meeting of workshops and an exhibition which would offer microwave engineers the opportunity to exchange a wide spectrum of information.

The scope of MWE'91 covered the themes ranging

(1) from basic research to applications,

(2) from academia to industry, and

(3) from tutorial lectures to the frontiers of science.

The keynote address, four tutorial lectures, 9 workshop sessions, and 2 technical group-meetings on microwaves and satellite communications were well organized and scheduled. Furthermore, 10 technical seminars were given by the companies participating in the exhibitions. There were two official languages, English and Japanese. The proceedings except for the tutorial lectures were written in English.

From overseas, 10 people were invited to make presentations in the workshops. There were 4,000 registered participants, 1,200 of whom attended the workshops.

Keynote Address

"High-speed digital transmission technology in microwave, millimeter-wave, and lightwave regions in Japan," by Prof. K. Miyauchi, Science University of Tokyo. The progress in digital communications (terrestrial microwaves, guided millimeter-waves, satellite, and optical fiber systems) technology in the frequencies from microwaves to lightwaves since the 1950's was overviewed and future trends were discussed.

Tutorial Lecture (1)

"An invitation to distributed constant circuits," by Prof. K. Suetake, Kanagawa University. The concept from lumped-constant circuits to distributed-constant circuits was plainly explained with a number of illustrations and video animations.

Tutorial Lecture (2)

"S-matrix and Smith chart," by Prof. T. Yoneyama, Tohoku University. The basic concepts of transmission lines were shown. The scattering matrix, impedance and admittance matrices, and their expressions on the complex plane were explained. The applications of these matrices were also discussed.

Tutorial Lecture (3)

"Electromagnetic wave propagation along microstrip transmission lines," by Prof. E. Yamashita, University of Electro-Communication. The nature of electromagnetic waves along microstrip lines was explained. Propagation properties of TEM waves and quasi-TEM waves, the dispersion properties, and the capacitance difference formula for calculating conductor loss were shown.

Tutorial Lecture (4)

"The fundamentals and applications of electromagnetic wave absorbers," by Prof. Y. Naito, Tokyo Institute of Technology. The importance of the material for electromagnetic-wave absorbers is emerging. This lecture first discussed electromagnetic compatibility and leakage regulation. The loss materials and their mechanisms of conductive, dielectric and magnetic losses were explained.

Workshops:

Nine workshops were opened. Topics of current interest were selected.

(i) Modern technologies for mobile radio equipment (5 papers): circuit components, SAW filters, silicon bipolar integrated circuits, frequency synthesizers, and power amplifiers.

(ii) Lightwave/microwave interaction devices, circuits and systems (7 papers): Optical control transmission lines, optical control integrated circuits, optical modulators, optical link for microwave/mm-waves, optical link for mobile communications, optical link for 256QAM radio, and fiber optic video distribution.

(iii) Microwave high-Tc superconductors and cryogenic semiconductor devices (7 papers): Surface impedance, YBaCuo disk resonator/filters, superconducting resonator/filters, high-speed transmission lines, microwave detector/mixers, three-terminal devices, and cryogenic HEMT.

(iv) Satellite communication technology (5 papers): Recent overview, current and future of INTELSAT, current and future of regional satcom in US and Japan, advanced payload technology, and intelligent satcom.

(v) Electromagnetic analyses of guided wave structures (5 papers): Network approach, extended spectral-domain approach, mode-matching and transverse resonance methods, time-domain simulation by TLM, and time-domain finite-difference method.

(vi) Satellite broadcast technology (6 papers): BS-3 high-power transponder, British BS design, Ka-band BS in Japan, 22-GHz high-power TWT, high-power amplifier design in US, and flat panel antenna for BS reception.

(vii) Remote sensing (5 papers): Earth observation program in Japan, microwave sensors, long-wavelength microwave radiometry, searches for primordial galaxies by mm-waves, and advanced surface radars.

(viii) Microwave and millimeter-wave transistors (5 papers): Technology overview, power GaAs FETs, mm-wave power transistors, low-noise FETs, and novel MMIC process technology.

(ix) Circuit technology for MMICs (5 papers): High-power MMICs, low-noise MMICs, oscillator/mixer MMICs, passive components, and microstrip antennas.

Microwave Exhibition 1991

More than 200 companies displayed their products, and about 4000 attendants visited.

Seminars by Companies

Ten seminar sessions were opened by 11 US, and 6 Japanese companies. Themes were mainly the introduction of new technologies concerning measurement, components characteristics, and CAD.

Microwave Exhibition

Another light of MWE'91 was, as the name of this meeting shows, a technical exhibition which was held on the 4th (Microwave Exhibition '91) and 7th (Microwave USA'91) floors of the World Import Mart in Sunshine City. More than 200 microwave and microwave-related companies, including producers of new materials, displayed their products. About 4,000 attendants visited the exhibition. An increase of 15% compared with APMC'90 shows a growing interest in the field of microwave technology/industry. The Microwave USA'91 was organized and arranged by the US Trade Center, as was in APMC'90. Such a close relationship between two exhibitions will be maintained hereafter.

It was quite regrettable that the Gulf War broke out as the organization of MWE'91 proceeded. The number of speakers from overseas was therefore restricted. Some speakers had to cancel their original schedules.

Preparation for MWE'92 is now moving along under the Steering Committee. The chairperson is Prof. Y. Kobayashi of Saitama University. The dates will be September 16 to 18, 1992. We expect MWE'92 to be even larger and more international.

For further information for MWE'92, please contact Prof. Kobayashi, Faculty of Electrical Eng., Saitama Univ., Shimo-ohkubo, Urawa-shi, Saitama-ken, 338 Japan, phone: +81 48 856 1546, fax: +81 857 2529.

1993 IEEE Microwave Theory and Techniques Society Fellowships and Grants-in-Aid

Graduate Fellowships

- Several $5,000 fellowship awards each year.
- For graduate research studies in microwave engineering on a full-time basis.
- Applicants must have attained high academic achievement in engineering or physics.
- Award can be granted *in addition* to any other support received by student.
- Award cannot be used for equipment purchase, travel, supplies, etc.
- Award made to institution for support of named student.
- Faculty supervisor must be MTT-S member.

Application deadline: 23 October 1992

Educational Grants-in-Aid

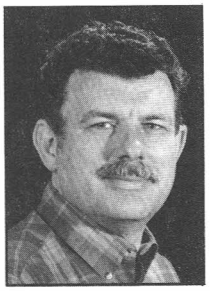
- For individual members of MTT-S
- Number and amount to be based on proposals submitted, proposed activity, financial justification, and Society budget.
- Applicant must be MTT-S member of 5 years standing.
- Applicant must be a full-time employee of a degree granting institution of higher learning or a not-for-profit research institution.
- Emphasis is on supporting junior faculty members.
- Award made to institution for support of named individual research activity (i.e., faculty member, etc.).
- Award may be used for equipment, travel, supplies, or individual use, directly related to a clearly defined microwave activity.
- Funds cannot be carried over into second year.

Application deadline: 13 November 1992

For applications for the Fellowships and Grants-in-Aid contact:

Mr. Daniel G. Swanson
Chairman, MTT-S Educational Awards Committee
Watkins-Johnson Co.
3333 Hillview Avenue
Palo Alto, CA 94304-1204
(415) 813-2036

ARFTG Highlights Spring 1992



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 in the later fall.

Measurement Accuracy Issues 39th ARFTG Conference

The 39th ARFTG Conference will be held in conjunction with the 1992 IEEE MTT-S Symposium in Albuquerque, NM, on June 5, 1992. This allows easy attendance for those attending the MTT-S or MMIC Symposiums earlier in the week. Technical sessions and manufacturers' exhibits will be held in the Holiday Inn Pyramid Plaza Hotel. Shuttle buses will be available from the hotels to the Albuquerque Convention Center where the MTT-S technical sessions and exhibits will be held.

The theme of the 39th ARFTG Conference will be *Measurement Accuracy Issues*. As both the performance of microwave technology and the ability to measure that performance continues to advance, the subject of how to best measure a device's performance while achieving sufficient accuracy becomes less trivial. To address this issue, this conference is soliciting papers on measurement accuracy limitations, measurement accuracy needs, appropriateness of a technique for determining a specific device's performance, metrology considerations and related cost/time/performance trade offs. Those interested in participating should contact Conference Chair: Mike Little, RL/OCTP, Griffiss AFB, NY 13441-5800, phone (315) 330-4381, or Conference TPC: John Rooks, RL/OCTP, Griffiss AFB, NY 13441-5700, phone (315) 330-4381. Deadline for paper submissions is March 15, 1992.

In addition to 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, and all meals and break refreshments, one year membership in ARFTG and a post-conference digest of the presented papers.

38th ARFTG Conference Wrapup

The 38th Conference was held in San Diego, CA, on December 5 & 6, 1991, and the theme was *On-Wafer Testing III*. There were approximately 100 attendees plus 14 tables that were in the concurrent exhibitors' room. The Conference Chair was Allen E. Rosenzweig, TPC was Larry Dunleavy and Exhibits Coordinator was Jim Rautio. The conference focused on practical on-wafer testing of MMICs and discrete devices. Topics included S-parameter, noise, power and package measurements of linear and non-linear DUTS. The correlation of CAD models and actual measurements results, new calibration techniques and standards for on-wafer measurements, microwave and millimeter wave probing techniques were also discussed.

The presented papers included:

On-Wafer Large Signal Model Verification, Glen Martin

QSOLT: A New Fast Calibration Algorithm for Two-Port S-Parameter Measurements, Anderea Ferrero

Characterization of Thin Film Calibration, Frank Williams

On-Wafer GaAs Schottky Diode Characterization Using an Integrated Pulsed I-V/Pulsed S-Parameter Measurement System, Sam Pritchett

Cryogenic Vacuum On-Wafer Probe System, Joy Lasker

On-Wafer Millimeter Network Analysis for Device and Circuit Design, Jim Tabuchi

Active Probe for Millimeter-Wave On-Wafer Measurements, M. S. Shakouri

*** Selected as "Best Paper of the 38th ARFTG Conference ***

Comparison of On-Wafer Calibrations, Dylan Williams

Reciprocity Relations for On-Wafer Power Measurements, Roger Marks

Accurate Noise Characterization of Low Noise Devices, Martin Grace

Benchmark for the Validation of Microwave CAD Software, Robert Furlow

Automated Data Acquisition Systems for FET Measurements and Its Application, Siqi Fan

Analysis of Bias Oscillations in MMIC Measurements, Michal Odyniec

Accuracy Improvements to On-Wafer Amplifier Noise Figure Measurements, C. E. Woodin

Panel Session on *"On-Wafer Testing Issues for the 90's and Beyond,"* Eric Strid, Doug Dunn, Dylan Williams, Mike Golio, M. S. Shakouri

A conference digest is 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.

EXCOM Election & Awards

EXCOM elections were held at the 38th Conference in San Diego and Jim Taylor, Bill Pastori, Bob Judish and Greg Burns were elected to the twelve member EXCOM. In addition, Bill Pastori was elected as President, Gary Simpson as Vice-President, J. Greg Burns as Treasurer, and Frank Mendoza as Secretary. Mario Maury, Jr., received the Automated Measurement Career Award and Mark Roos received the ARFTG Service Award.

Join ARFTG

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

IEEE TAB Periodicals Council and PUB (Publications Board)

by Tatsuo Itoh
Division IV Representative

In the beginning of 1992, I was appointed by Dr. Martin V. Schneider, Division IV Director, to serve on the TAB Periodicals Council for the next two years as the Division Representative. This is a body reporting to the TAB (Technical Activities Board) of IEEE, serving as a policy formulating body in the areas of Society/Council and other TAB periodicals such as *IEEE Transactions*. I found out that this council also reports to PUB and I am automatically a member of PUB. The Periodicals Council has 12 voting members, one representative from each of the ten IEEE Divisions, Chair and Past Chair. In addition, a number of ex officio members and IEEE staff serve on the council. IEEE PUB consists of Chair, Vice Chair who is the Chair of the Periodicals Council, 10 Division Representatives, Representatives of other Boards and Chairs of Institute, PUB/Boards.

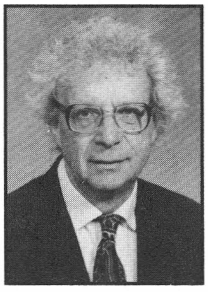
The first meeting of the Council for 1992 was held in Vancouver, British Columbia, on February 11 which was followed by PUB meeting on February 12. Since most of the items discussed and processed are common to the two meetings, only some highlights are presented below. If any of you require more information, you may get in touch with me. Then, I will provide you a response either directly or via an appropriate IEEE entity.

Action Items included new publication proposals. Communications Society, Computer Society and ACM (Association of Computer Machinery) have proposed a joint periodical called *IEEE/ACM Transactions on Networks*. Through the Council and PUB actions, this proposal was approved. These societies considered the new *Transactions* vital to regain the market being lost to a number of competing commercial publications. Two more proposals for new *Transactions, IEEE Transactions on Control Systems Technology from the Control Systems Society* and *IEEE Transactions on Speech and Audio Processing from the Signal Processing Society*, were presented. Although both received endorsement from the Council, they required some further work, so the action was postponed to the next Council meeting in June. PUB endorsed this resolution.

The report of the Panel to Conduct a 5-year Review of the Out-of-House Publication of Consumer Electronics Transactions was presented to and accepted by the Council. The report contains the findings by the Panel including the difficulty to substantiate the reduction of publication cost and time by the use of outside publishing service. The Panel also found that this *Transactions* is substantially different from the norm of other IEEE Transactions/Journals and deviates from the IEEE Policies and Procedures in regard to the uniformity in style and formal and other quality guidelines.

(Continued on page 34)

Report of the Division IV Director



by Martin Schneider

At the end of every year, each IEEE Division Director prepares a summary report highlighting the activities of the Societies in the Division. In the following report, which is based on inputs from each Society President, I have added a preface listing activities of common interest to members in our Division. The document shows that the Societies in Division IV continue to be leaders in expanding existing services and starting new projects.

1991 Annual Report of Division IV—Electromagnetics and Radiation

Division IV is composed of five technical Societies: Antennas and Propagation (AP), Electromagnet Compatibility (EMC), Magnetics (MAG), Microwave Theory and Techniques (MTT) and the Nuclear and Plasma Sciences (NPS). An additional member of our electromagnetic team is the Superconductivity Committee (SCC). Two additional Societies are joining Division IV in January 1992: Broadcast Technology (BT) and Consumer Electronics (CD).

The year 1991 in Division IV was characterized by efforts to enhance communications between the Societies and encourage their transnational activities. For example:

1. New chapters were formed at an increasing rate by the Societies in Regions 8, 9 and 10. In addition, members of Regions 8 and 10 were elected to the Administrative Committees of two Societies.
2. Vice Presidents in each Society were encouraged to attend the AdCom meeting of another Society to establish contacts and learn from the experiences of other groups.
3. Six videotapes on electromagnetic topics featuring distinguished IEEE lecturers were produced. The program has been adopted by LEOS in Division I and has generated interest in other Divisions.
4. A new series of articles, "Classic Papers Revisited," was created. The purpose of this series is to rewrite fundamental classic papers, written several decades ago, for a modern audience.
5. A Division IV speakers' catalog was prepared for the IEEE Colloquium 1992 in Region 8. The proposed list includes four Society Presidents in Division IV, and the timely topic *Telecommunications Manufacturing in Newly Industrializing Countries.*
6. IEEE Press Books on electromagnetic subjects became very popular. The best seller was R. Collin's original book, *Field Theory of Guided Waves;* 2,400 copies were sold in 1991. Also in great demand were new EM titles such as *Computational Electromagnetics* by E. Miller, L. Medgyesi-Mitschang and E. Newman, and a monograph by Chen-To Tai entitled *Generalized Vector and Diadic Analysis.*

The specific activities and accomplishments of the individual Societies and the Superconductivity Committee were as follows:

AP

Under the leadership of Helmut E. Schrank, President of the Antennas and Propagation Society, a project to advance the understanding of electromagnetic field concepts through computer-generated educational aids reached an important milestone. Magdy Iskander produced the first CAEME (Computer Applications for Electromagnetic Education) software books, which include eight discs of applicable software. The *AP Magazine*, in its second year, has grown into a highly respectable and successful IEEE publication as evidenced by the feedback from readers and by the worldwide participation of authors.

EMC

The Electromagnetic Compatibility Society, headed by President Edward L. Bronaugh, established new chapters in the United Kingdom and Germany, finalized the agreement with the French SEE to start a chapter in France, and is in the process of forming a joint Society with EMC-IREE in Australia. The EMC Society created an archive of all the Symposia, Newsletters and other relevant technical and historical information. Progress was also made in updating existing standards and the publication of a new, important standard, No. 299-1991, entitled *IEEE Standard for Measuring the Effectiveness of EM Shielding Enclosures.*

MAG

The Magnetics Society, under President Stanley H. Charap, began the publication of *Advances in Magnetics* which appeared in a special issue of the *Transactions on Magnetics* and will be printed on a yearly basis. An update of the directory *University Programs in Magnetics* was completed and distributed at the Joint INTERMAG-MMM Conference. A revision and expansion of the directory is scheduled for 1992. Plans are underway to resume the Society's Equipment Grant Program for university and advanced undergraduate teaching.

MTT

The Microwave Theory and Techniques Society, presided by Ferdo Ivanek, hosted the 50th anniversary celebration of the MTT Radiation Laboratory in Boston, Massachusetts. The festivities included a general reception in the Boston Museum of Science and were held in conjunction with the 1991 International Microwave Symposium. The AdCom, which had two members from Region 8, became more transnational by electing a member from Region 10. The MTT-S Technical Committees, the Society's backbone, have sharpened their focus on emerging technologies and are holding an annual workshop on new technology directions.

NPS

The Nuclear and Plasma Sciences Society, under President Harold L. Flescher, continued its activities in a large number of technical disciplines: Computer Applications in NPS, Environmental Instrumentation, Fusion Technology, Nuclear Instruments and Detectors, Nuclear Medical Sciences, Particle Accelerators, Plasma Sciences, Radiation Effects, and Reactor Instrumentation and Controls. On the transnational scene it held its first conference outside the USA in Aachen, Germany. The topic was: Real Time Computer Applications in Nuclear, Particle and Plasma Physics. The Society was also an active participant in the RADECS meeting, the first European Radiation Effects Conference held in Grande Motte, France.

SCC

The Superconductivity Committee, chaired by Alan F. Clark, started the publication of the *IEEE Transactions on Applied Superconductivity* in March 1991. The first issue carried articles on Josephson junctions applicable to digital and logic circuits, and high-Tc films. The editors, Theodore van Duzer and Clark A. Hamilton, invite submissions on power applications including energy storage and magnetic levitation, superconductive motors and generators, power transmission, microwave devices, and logic and memory circuits. The SCC committee includes representatives from ten technical IEEE Societies.

Nominations for Division IV Director

The Nominations Committee for Division IV received and confirmed two candidates for the next appointment of Division IV Director. They are:

W. Kenneth Dawson
Nuclear and Plasma Sciences Society
Division Head and Professor of Physics
TRIUMF and University of Alberta
4004 Wesbrook Mall
Vancouver, BC, Canada

Clark E. Johnson, Jr.
Magnetics Society
Rastech Corporation
P.O. Box 50116
Minneapolis, MN 55405

Their vitae and position statements follow:

W. Kenneth Dawson

Dr. Dawson received a BScA in applied physics from Laval University in 1951 followed by an MA and PhD in Nuclear Physics from Queen's University. In 1955 he joined the Defence Research Board (Canada) as a Research Scientist. Four years later he moved to the Physics Department of the University of Alberta where he is Professor of Physics. Since 1982 he has been stationed at TRIUMF where he serves as a Division Head and Special Advisor to the Director. Before going to TRIUMF he spent two years at Los Alamos, the second of which was as a group leader. His technical and scientific responsibilities at TRIUMF lie in the areas of electronics, computing and controls for medium and large scale physics applications. He has authored or coauthored over 50 papers and has actively participated in the preparation of 9 IEEE/ANSI standards. Dr. Dawson has been awarded a Standards Medallion and is a Fellow of the IEEE. Within the Nuclear and Plasma Sciences Society his duties have included Administrative Committee Member, Secretary and President. At present he is Editor-in-Chief for the Society. He is also a member of the Association for Computing Machinery and the American Association of Physics Teachers.

Position Statement

There are many reasons to believe that the next few years will be very important ones for the long-term future of the IEEE. A change in general manager is slated to take place, there are financial difficulties, there are strong winds in the

transnational direction at a time when national concerns are increasing and new technologies seem to emerge on an almost daily basis. Where there are problems there are also opportunities. The IEEE has problems. With clear vision and good leadership we can turn the problems into opportunities and then into realities. I would be honored to have the privilege of working with you to make a better, more responsive IEEE.

Clark E. Johnson, Jr.

Clark E. Johnson received his BS (Physics, 1950) and MS (EE, 1961) from the University of Minnesota. He is a Fellow of the IEEE, and has held many offices, including President, in the IEEE Magnetics Society. He also has been Chairman of the Conference Executive Committee and served in numerous capacities with other professional associations. His professional career started in magnetic recording at the 3M Company, followed by a number of positions as Director, Vice President, President, and Founder of technology-based companies. He spent 1988 in Washington, DC, as an IEEE Engineering Fellow, working for the ranking congressional member of the Science and Technology Committee. He holds 19 patents, and is the author of more than thirty technical papers. He is presently President of Rastech Corporation and of the Card Systems Testing Laboratory.

Position Statement

The cold war is over; the U.S. is now engaged in the greatest struggle of its existence—an economic war with implications that will determine our future as a nation. We must regain and retain our technological leadership, and to do so will require a concerted effort from the engineering community. It is mandatory that the IEEE inspire and motivate its members to lead this revolution. As a Director, one of my major responsibilities will be to encourage and enable our membership to actively participate in the political process. Our technological leadership as a nation and gainful employment for our members depends on our political success. Nothing else will matter if we drift into 3rd world status.

Dr. Werner J. Kleen

(Continued from page 4)

eling Wave Tubes," summarized his knowledge in the field. Both books were translated into English.

In 1952 Dr. Kleen joined Siemens in Munich where he organized the microwave Tube Research Group. He was put in charge of the newly established Research Laboratories of Siemens & Halske AG. Under his leadership, the laboratory which was mainly materials oriented entered the field of electronic components and became one of Europe's most prestigious institutions. He initiated high speed memory work in ferrite sheets, as well as the effort that led to the highly successful piezoelectric microphone marketed by Siemens. Even then, after having published more than 30 papers and 8 book volumes, he still found time to edit the book, "Laser," in 1969.

In 1968 Dr. Kleen was appointed Director of ESTEC, the research and development organization of the European Space Agency (ESA). His drive to introduce reliable and state-of-the-art technology laid the groundwork for the successful launch of several satellites by ESA after his retirement.

The "Microwave Career Award" was one of his many awards. He became a Fellow of IEEE in 1957, received the Medal of the Swedish Engineers' Society in 1950, the Gauss-Weber Medal of the University of Goettingen in 1955 and the IEEE/Frederik Philips Award in 1982. His friends and colleagues are saddened by his death, but his image will live on through his fundamental work.

—Reinhard H. Knerr

Special Session—ISCAS 92

Advances in Microwave and Millimeter Wave Circuits and Systems

Organizer: *Vijai K. Tripathi, Dept. of Electrical and Computer Engineering, Oregon State University, Corvallis, Oregon 97331-3211*

Co-Chairs: *K. C. Gupta, Dept. of Electrical and Computer Engineering, University of Colorado at Boulder, Boulder, Colorado 80309-0425*

R. Vahldieck, Dept. of Electrical & Computer Engineering, University of Victoria, Victoria, Canada

A special session on the Advances in Microwave and Millimeter Wave Circuits and Systems is planned for the IEEE International Conference on Circuits and Systems to be held in Sheraton Harbor Island Hotel San Diego from May 10 through 13, 1992. The special session, scheduled for the afternoon of Monday, May 11, 1992, includes the following papers:

- "Advances in Computer-Aided Design of Microwave and Millimeter Wave Circuits," Prof. I. Wolff, University of Duisburg, Dept. of Electrical Engineering, Duisburg D-4100, Germany
- "The 'COSMIC' 5018 ESPRIT Projects: A Joint European Effort in the Field of GaAs MMIC's," Prof. F. Giannini, University of Rome "Tor Vergata," Dept. of Electronic Engineering, Via Fontanile di Carcaricola, 00173 Rome, Italy; Dr. A. Mbaye, CEE, Bruxelles, Belgium; Dr. E. Pettenpaul, Siemens, Munich, Germany.
- "Two-Dimensional Components in Microstrip Circuits," Prof. K. C. Gupta, University of Colorado at Boulder, MIMICAD Center, Electrical & Computer Engineering Dept., Campus Box 425, Boulder, Colorado 80309-0425.
- "Advances in the Field Theory Based CAD of MM-Wave Passive Circuits," Prof. F. Arndt, University of Bremen, Microwave Dept., Kufsteiner Str., NW1, D-2800 Bremen 33, Germany.
- "Advances in Monolithic Microwave and Millimeter Wave Integrated Circuits," Dr. V. Sokolov, Honeywell (SRC), Bloomington, Minnesota; Dr. I. Bahl, ITT Gallium Arsenide Technology Center, 7670 Enon Drive, Roanoke, Virginia 24019.
- "Modeling and Analysis of Noise in MMICs: Recent Progress and Current Status," Dr. M. S. Gupta, Hughes Aircraft Company, Microelectronic Circuits Division, Torrance, California 90509.
- "Application of Network Theory in the Design of Microwave Circuits: Potential and Limitation," Prof. R. Vahldieck, University of Victoria, Laboratory for Lightwave Electronics, Microwave and Communications, Dept. of Electrical & Computer Engineering, Victoria, Canada V8W 2Y2.
- "Kinetic Inductance Based Superconducting Circuits: Filters, Couplers and Other Components," Dr. J. M. Pond, Microwave Technology Branch, Code 6850, Electronics Science & Technology Division, Naval Research Laboratory, Washington, DC 20375-5000.
- "Nonlinear Analysis and Optimization of Microwave Circuits," Dr. C. Holmes, EEsof, Inc., 5601 Lindero Canyon Road, Westlake Village, California 91362-4020.
- "Coupled Line Multiports," Prof. V. K. Tripathi, Oregon State University, Dept. of Electrical & Computer Engineering, Corvallis, Oregon 97331-3211.

MTT-S Chapter Meetings

Reporting Period (Received): 1/8/91-12/12/91

ALBUQUERQUE (MTT/AP/EMC)
- R. L. Hutchins, BDM International, Inc., "Impulse Radar: Physics and Prospects," 11/28/90. Attendance: 28.
- P. Pathak, OSU Electro Science Lab., "High Frequency Methods for Analyzing Antenna and Scattering Problems," 1/31/91. Attendance: 22.

ATLANTA (MTT/AP)
- A. Taflove, Northwestern University, "Super-computing Computational Electromagnetics and Where Is Engineering Electromagnetics Going?", 2/12/91. Attendance: 16.
- A. J. Gasiewski, Georgia Institute of Technology, "Passive Microwave Remote Sensing of Earth's Atmosphere," 3/6/91. Attendance: 12.
- J. Whinnery, University of California, "Some Relations Between Microwave and Optics," 4/17/91. Attendance: 32.
- G. P. Rodriquek, Georgia Institute of Technology, "Superconductors at Microwave Frequencies," 5/22/91. Attendance:
- C. T. Tai, University of Michigan, "A Systematic Treatment of Vector Analysis," 10/7/91. Attendance: 30.
- V. K. Tripp, GA Tech Research Institute, "Multi-octave Spiral Microstrip Antennas," 10/18/91. Attendance: 13.
- B. Steinberg, University of Pennsylvania, "High Resolution Microwave Imaging," 11/12/90. Attendance: 27.

BEIJING (MTT)
- W. Lin, University of Electronic Science and Technology, "Circular Coaxial Line with a Cross of Unequal Arms as Inner Conductor," 1/14/91-1/17/91. Attendance: 78.
- J. Lee, Cheng Kung University, "CAD for VLSI," 5/5/91. Attendance: 42.

BENELUX (MTT/AP)
- R. E. Munson, Ball Aerospace, "Microstrip Antennas: Theory and Applications," 3/16/90. Attendance: 63.

CENTRAL NEW ENGLAND/BOSTON (MTT)
- T. Itoh, University of California, "Antennas and Propagation/Microwave Theory and Techniques," 1/15/91. Attendance: 28.
- J. Adams, IEE Spectrum "New Opportunities Amid Shifting Defense Priorities," 2/20/91. Attendance: 32.
- M. A. Hollis, MIT Lincoln Labs, "Microwave Transistors—A Review," 3/21/91. Attendance: 29.
- P. Dufilie, B. Desormiere, Thomson-ICS, "Bulk and Surface Acoustic Wave and Optic Devices for RF and Microwave Signal Processing," 4/24/91. Attendance: 38.

CHICAGO (MTT/AP)
- J. P. Phillips, Motorola Inc., "Adaptive Antenna Control," 4/8/91. Attendance: 16.
- R. Knox, Epsilon Lambda, "Low Cost Millimeter Wave Subsystems," 5/20/91. Attendance: 20.

CLEVELAND (MTT/ED/LEO)
- Meeting held on 11/19/90. Attendance: 9.

COLUMBUS (MTT/AP)
- P. Encrenaz, Observatoire deParis, "The Impact of Coherent Detection Techniques on Terrestrial and Planetary Atmospheric Research, and on the Discovery of Interstellar Molecules," 3/4/91. Attendance: 27.
- M. Wengler, University of Rochester, "Sub-millimeter Heterdyne Detection with Superconductive Electronics," 4/22/91. Attendance: 58.
- E. C. Burt, Lincoln Lab. MIT, "RCS Predictions Using High Frequency Techniques," 5/9/91. Attendance: 16.
- K. Kobayashi, Chuo University, "Wiener-Hopf Analysis of the Diffraction by Open-Ended Parallel Plate Waveguide Cavities," 6/20/91. Attendance: 14.
- Y. Ogawa, Hokkaido University, "Time-Domain Superresolution Techniques for Electromagnetic Wave Measurements," 7/1/91. Attendance: 9.

DALLAS (MTT)
- C. D. Chang, Hughes Aircraft Co., "MMIC Design Centering for Yield Enhancement," 1/24/91. Attendance: 17.
- B. Maoz, Hittite Microwave Corp., "Heterojunction Bipolar Transistors for Microwave Circuit Applications," 2/28/91. Attendance: 29.
- D. Butler, Southern Methodist University, "Microwave Aspects of Superconductivity," 4/25/91. Attendance: 30.

DAYTON (MTT/AP)
- B. Kent, University of Michigan, "Finite Element Methods and Scattering Solutions for Bodies of Revolution," 2/12/91. Attendance: 32.

DENVER-BOULDER (MTT/AP/GRS)
- Z. Povovic, University of Colorado at Boulder, "Grid Oscillators," 1/17/91. Attendance: 10.
- N. Daulter, NIST 813.02, "Characterization of Planar Circuits using Pulsed Lasers," 3/21/91. Attendance: 35.
- J. Heinback, SEL NOOA, "Interplanetary Scintillations using Extragalactic R/N," 5/16/91. Attendance: 25.

FINLAND (MTT/AP)
- M. Engelson, Tektronix, "Oscillator Phase Noise Measurements Using a Spectrum Analyzer," 1/23/91. Attendance: 14.
- P. Gandhi, University of Utah, "Advances in Dosimetry of RF Radiation: Numerical Methods and Measurement Techniques," 5/28/91. Attendance: 27.
- D. L. Jaggard, University of Pennsylvania, "Fractal Electromagnetics and Its Applications," 6/10/91. Attendance: 23.
- R. Wylde, Thomas Keating Ltd., "Three Examples of Physics and Manufacturing in Quasi-Optics for Plasma Diagnostics, Remote Sensing, and Astronomy," 6/17/91. Attendance: 21.
- P. H. Pathak, Ohio State University, "Asymptotic High Frequency Techniques for EM Antenna and Scattering Anomalies," 11/12/91. Attendance: 28.
- B. A. Galwas, Warsaw University of Technology, "Broadband Varactor Tuned Transistor Oscillators," 11/13/94. Attendance: 23.

FRANCE (MTT)
- V. Rizzoli, Bologna University, "Simulation and Design of Non-Linear Microwave Circuits"; R. Quere,, IRCOM, Limoges University, "Electric Models for FETs for CAD of Non-Linear Circuits, 4/12/91. Attendance: 49.
- H. Daembkes, Daimler Benz AG, "Microwave and Millimeter Wave HEMT Devices and Circuits"; P. Gamand, Philips Microwave Ltd., "Millimeter-wave HEMT Based MMICs, Examples and Impact on Performance," 10/1/91. Attendance: 39.

INDIA (MTT/ED)
- D. J. Harris, University of Wales, "H-Guides and Groove Guides," 12/7/90.

- A. R. Jha, Jha Technical Consultancy, "Millimeter-wave Microstrip Antennas," 1/28/91.
- A. R. Jha, Jha Technical Consultancy, "Microwave Superconductivity Devices," 1/28.

ITHACA (MTT)
- Meeting held on 4/17/90. Attendance: 25.
- Meeting held on 5/2/91. Attendance: 20.
- G. Arjavalingam, TJ Watson Research Center, "Broadband Quasi-Optical Microwave Measurements with Optoelectronically-Generated Transient Radiation"; B. J. Rubin, IBM TJ Watson Research Center, "Full-Wave Modeling of Signal Propagation and Radiation in Electronic Packages," 10/10/91. Attendance: 20.
- W. R. Curtice, W. R. Curtice Consulting, "Nonlinear GaAs FET Modeling: A Mixture of Art and Science," 11/21/91. Attendance: 16.

LOS ANGELES (MTT)
- S. A. Horanessian, Aerospace Corporation, "Sensor Systems From Microwaves to Electro-Optical," 1/22/91. Attendance: 35.
- T. Itoh, UCLA, "New Ideas and Concepts in Microwave Circuit Configurations," 2/19/91. Attendance: 53.
- P. Asbeck, UCSD, "Heterojunction Bipolar Transistor Technology for Microwave & Millimeter-wave Applications," 3/19/91. Attendance: 37.
- E. Strid, Cascade Microtech, "Frontiers of High Frequency Probing," 4/23/91. Attendance: 32.
- W. R. Curtice, W. R. Curtice Consulting, "Nonlinear FET Modeling: A Mixture of Art and Science," 5/14/91. Attendance: 81.
- A. F. Podell, Pacific Monolithics, "Do All GaAs Companies Lose Money?", 6/25/91. Attendance: 56.

MILWAUKEE (MTT/AP/ED/IM)
- J. Zuencher, Easton Corporation, "Subsystems Used in Eaton Kenway's New Automated Guided Vehicle," 2/21/91. Attendance: 22.
- J. F. Greenleaf, Mayo Clinic, "Multidimensional Ultrasonic Imaging and Tissue Characterization," 3/26/91. Attendance: 61.

NEW JERSEY COAST (MTT/ED/LEO)
- A. V. Lehman, Bell Core, "Surface Emitting Laser Arrays: Devices and Applications," 1/29/91. Attendance: 13.
- W. F. Brinkman, AT&T Bell Labs., "Future of Optical Communications," 4/9/91. Attendance: 29.
- J. Aspell, AT&T Bell Labs., "Erbium Doped Fiber Amplifiers for Future Undersea Transmission Systems," 4/23/91. Attendance: 19.
- P. W. Wallace, Anadigics, Inc., "GaAs Technology for Microwave and Optical Fiber Applications," 5/28/91. Attendance: 15.
- J. Zirilli, Engineering and Professional Services Inc., "Neural Networks Trained with Back Propagation," 6/18/91. Attendance: 16.

NEW SOUTH WALES (MTT/AP)
- T. B. Vu, University of New South Wales, "Antenna Systems for Mobile Satellite Communications," 6/19/90. Attendance: 15.
- J. C. Wiltse, Georgia Institute of Technology, "Recent R&D Developments at Georgia Institute of Technology," 4/17/91. Attendance: 24.
- J. C. Wiltse, Georgia Institute of Technology, "Some Interesting Topics in Millimeter Waves," 4/18/91. Attendance: 19.

NORTH JERSEY (MTT/AP)
- R. Pengelly, COMPACT, "CAD for MMIC Implementation," 3/21/91. Attendance: 25.
- J. Whinnery, University of California, Berkeley, "Some Relationships Between Microwaves and Optics," 2/28/91. Attendance: 31.

ORLANDO (MTT/AP)
- V. Tripathi, University of Central Florida, "Computational Methods in MMIC Planar and Quasi-Planar Structures," 9/20/90.
- P. S. Neelakanta, Florida Atlantic University, "Electromagnetic Scattering at Random Surfaces: Application of Fractal Methods," 10/18/90.
- P. H. Pathak, Ohio State University, "Basic Review of Uniform Geometrical Theory of Diffraction Concepts," 11/27/90.
- J. R. Wait, University of Arizona, "Antenna Performance as Influenced by Finite Ground Planes," 1/17/91.
- T. K. Sarkar, Syracuse University, "Scattering From Finite Dielectric and Conducting Bodies," 2/13/91.
- W. Curtice, "Non-Linear GaAs FET Modeling: A Mixture of Art and Science," 3/21/91.
- J. Dunsmore, Hewlett Packard, "Understand and Optimize Mixer Performance," 10/30/91. Attendance: 16.
- F. Wilcox, Martin Marietta, "Synthetic Aperture RADAR," 11/21/91. Attendance: 20.

PHILADELPHIA (MTT/AP)
- S. Saatchi, NASA/Goddard, "Electromagnetic Wave Interaction with Natural Media: Modeling and Applications in Microwave Remote Sensing," 1/29/91. Attendance: 6.
- P. H. Cho & J. Evan-Morgis, Naval Air Development Center, "Digital Data Processing for the NADC Synthetic Aperture Radar (SAR)," 2/28/91. Attendance: 19.
- K. R. Foster, University of Pennsylvania, "Currents of Death? The Controversy About Health Effects of Non-ionizing Electromagnetic Fields," 4/30/91. Attendance: 26.
- A. Madjar, Drexel University, "The GaAs MESFET as an Optical Detector," 5/23/91. Attendance: 11.

PHOENIX (MTT/AP/ED/EMC/LEO)
- J. Abrokwah, Motorola Inc., "Complementary GaAs Heterostructure Field Effect Transistors," 2/14/91. Attendance: 13.
- J. Pond, Naval Research Laboratory, "Superconducting Microwave Circuits and Devices," 2/28/91. Attendance: 25.
- K. Maracas, Salt River Project, "Electromagnetic Fields and Health Effects Issues: Can Science Provide an Interim Solution?", 3/5/91. Attendance: 22.
- M. B. Steer, North Carolina State University, "The Design of MMIC Circuits Through Computer Simulation: An Historical Perspective and Comparisons," 3/27/91. Attendance: 29.
- A. F. Tasch, Microelectronics Research Center, University of Texas at Austin, "MOS Transistor Scaling for Deep Submicron Technology," 4/2/91. Attendance: 25.
- A. Gross, AG Associates, "Antennas and Coupling Systems for Clandestine Operations," 4/25/91. Attendance: 26.
- D. Ackley, Motorola Inc., "High-Performance InP/InGaAs Avalanche Photo Diodes for Optical Communications," 5/2/91. Attendance: 12.
- H. Goronkin, Motorola, Inc. "Quantum Barriers to ULSI Scaling," 9/26/91. Attendance: 16.
- T. H. Ning, IBM TJ Watson Research Center, "Technology Trends in sub-0.5 um Bipolar," 10/10/91. Attendance: 13.
- C. Spindt, SRI International, "Vacuum Micro Electronics: Micro-fabrication Technology Applied to Vacuum Devices," 10/17/91. Attendance: 26.

- D. Reagor, Los Almos Labs, "Microwave Device Applications of High Temperature Superconductors," 11/7/91. Attendance: 13.
- J. Si, Arizona State University, "Recurrent Neural Networks for Associative Memories," 11/21/91. Attendance: 9.

POLAND (MTT/AP/AES)
- W. Klembowski, Telecommunications Research Institute, "Survey of Desirable Feature for Multi-function Radar Antennas"; S. Pogrzelski, Telecommunications Research Institute, "New Methods of Designing Linear Passive Antenna Arrays," 11/23/90. Attendance: 48.
- Z. H. Czyz, Telecommunications Research Institute, "Theoretical Foundations of Radar Polarimetry"; A. Tyrowicz, Telecommunications Research Institute, "Meeting of Performance/Cost Ratio Demands in Electronically Steered Array-Fed Reflector Antennas," 11/24/90. Attendance: 45.
- E. Sedek, Telecommunications Research Institute, "Microwave Ferrite Devices for Multi-function Radars"; A. Wronka, Telecommunications Research Institute, "Advances in Mechanical Constructions of Microwave Components," 11/24/90. Attendance: 44.
- M. Kostrzewa, P.I.T. Antenna Division, "New Facilities and Modernization of the Antenna Elevated"; W. Rodziejczak, P.I.T. Antenna Division, "Super Wide Band Horn Antenna," 11/25/90. Attendance: 43.

SAN DIEGO (MTT/AP)
- D. Parker, Hughes Aircraft, "Transmit/Receive Module Developments for Airborne Active Array Radars," 10/12/90. Attendance: 26.
- A. Silver, TRW, "Microwave and Gigabit Superconductive Electronics," 11/28/90. Attendance: 22.
- J. Whinnery, University of California Berkeley, "Some Relations Between Microwaves and Optics," 1/18/91. Attendance: 53.

SAN FERNANDO VALLEY (MTT)
- L. Wan, BEI-Systron Donner, "Technologies of the 90's—For the Environment," 11/14/90. Attendance: 24.
- R. E. Nunson, Ball Aerospace, "Microstrip Antennas," 1/17/91. Attendance: 39.
- "State of the Art in Microwave CAD, EESOF, COMPACT, HP," 3/21/91. Attendance: 34.
- S. Anderson, Qualcomm, "Direct Digital Synthesis," 4/18/91. Attendance: 35.
- W. Curtice, "Non-Linear FET Modeling," 5/14/91. Attendance: 49.

SANTA CLARA VALLEY/SAN FRANCISCO (MTT)
- L. B. Milstein, University of San Diego, "An Overview of Spread Spectrum Communications," 4/10/91. Attendance: 135.

SCHENECTADY (MTT)
- S. Luryi, AT&T Bell Labs., "Real Space Transfer Transistors and Logic Circuits," 9/11/90. Attendance: 31.

SOUTH AFRICA (MTT/AP)
- J. C. Oliver, CSIR, "The Finite Difference Time-Domain Analysis of Multiport Waveguide Junctions and Discontinuities"; D. Van Rensburg, LGI, "Improvements in the Numerical Analysis of Conducting Thin Wire Radiators," 10/30/90. Attendance: 10.
- E. Barnard, University of Pretoria, "Neural Networks: An Introduction"; J. Joubert, University of Pretoria, "The Analysis of Radiating Slots in the Broad Wall of a Rectangular Waveguide Inhomogeneously Loaded with a Dielectric Slab," 11/21/90. Attendance: 19.

SPAIN (MTT/AP)
- T. Sarkar, Syracuse University, "Conjugate Gradient Method on Some Eigenvalue Problems," 1/16/90. Attendance: 26.
- R. E. Munson, Ball Aerospace, "Microstrip Antennas: Principles and Applications," 3/27/90. Attendance: 54.
- A. Vander Vorst, University of Catolique de Louvain, "Microwave Biomedical Applications," 10/29/90. Attendance: 23.
- A. Vander Vorst, University of Catolique de Louvain, "Millimeter-wave Atmospheric Propagation," 10/30/90. Attendance: 31.
- V. Rizzoli, University of Bologna, "Simulation and Design of Nonlinear Microwave Circuits," 11/29/90. Attendance: 31.
- J. Polivka, PTT Research Institute of Praha, Czechoslovakia, "Microwave Active Radiometers: Applications," 12/17/90. Attendance: 13.
- T. Sarkar, Syracuse University, "Accurate Computation of Wide Band Response Using Narrow Band Information," 3/15/91. Attendance: 20.
- I. Wolff, Duisburg University, "Three Dimensional Field Analysis in Planar Microwave Circuits," 4/10/91. Attendance: 35.

ST. LOUIS (MTT/AP/ED)
- R. Lynch, McDonnel Douglas, "Cockpits into the 21st Century," 9/17/90. Attendance: 10.
- C. el Johnson, Independent Consultant, "HDTV—America's Last Chance to Regain Technological Supremacy?", 10/10/90. Attendance: 25.
- R. Arvidson, Washington University, "The Magellan Mission to Venus," 11/19/90. Attendance: 15.
- D. Atkenson, Emerson Electric, "Combat Talon RADAR Lab Facilities," 12/10/90. Attendance: 11.
- B. E. Spielman, Washington University, "Thin Film Superconducting Electronic Components," 1/21/91. Attendance: 18.
- C. Tsang, IBM, "The Magnetoresistive Head and Its Applications in High Density Magnetic Recording," 2/12/91. Attendance: 22.
- J. Whinnery, University of California Berkeley, "Some Relations Between Microwaves and Optics," 2/26/91. Attendance: 33.
- B. Argyle, TJ Watson Research Center, "Optical Imaging of Magnetic Domains and Implications for Magnetic Recording," 4/2/91. Attendance: 26.
- W. F. Pickaard, Washington University, "Worrying About the Health Effects of 60Hz Fields." Attendance: 21.

SWEDEN (MTT/AP)
- R. Pengally, COMPACT Software, "The Design of MMIC Circuits Through CAD Simulation," 4/11/91. Attendance: 30.
- M. J. Howes, University of Leeds, "Microwave Research Projects at Leeds University," 4/12/91. Attendance: 12.
- F. T. Ulaby, University of Michigan, "RADAR Polarimetry: Measurement Techniques and Calibration Approaches," 5/2/91. Attendance: 22.
- P. H. Pathak, Ohio State University, "Asymptotic High Frequency Techniques for EM Antenna & Scattering Analysis"; E. V. Jull, University of British Columbia, "The Complex Source Point Technique in Beam Diffraction by Reflectors," 11/13/91. Attendance: 15.

SWITZERLAND (MTT/AP)
- D. Chang, University of Colorado, "Computer Design of Microstrip Antennas and Arrays," 9/5/90. Attendance: 14.

TAIWAN (MTT)

- R. J. F. Fang, COMSAT Labs., "Recent Advancements in Satellite Communications at COMSAT Laboratories," 2/17/90. Attendance: 52.
- J. K. Butter, SMU, "High Power Laser in Grading Surface Emitter Configuration," 3/14/90. Attendance: 35.
- M. Pecht, University of Maryland, "Electronic Component Reliability Analysis," 6/1/90. Attendance: 24.
- W. Chiu, General Electric CO., "General Satellite Overview: Program Management & System Engineering"; W. Clopp, General Electric Co., "Typical Spacecraft System Design and Production"; R. Harten, NASA, "Instrument Interface Considerations for Scientific Satellite," 6/21/90. Attendance: 32.
- P. K. Dai, TRW, "Management and System Development"; R. Y. Huang, TRW, "Space Systems"; C. F. Lillie, TRW, "Space Science," 9/8/90. Attendance: 23.
- R. R. Keenly, CONDOL, "Power, Pattern and Polarization Measurements of Ground Based RADARS"; J. E. Fisher, CONDOL, "Advanced RADAR Signal Processing Techniques," 11/9/90. Attendance: 14.

TOKYO (MTT)

- T. Yoneyama, Tohoku University, "A Report on the Third Asia Pacific Microwave Conference"; M. Koshiba and 4 members, Hokaido University, "A Report on the 1990 European Microwave Conference," 11/16/90. Attendance: 23.
- K. Sakai and 5 other members, CRL, "Conference Review: 15th International Conference on Infrared and Millimeter Waves," 2/21/91. Attendance: 23.
- R. S. Pengelly, COMPACT Software, "CAD for MMIC Implementation—A Review," 4/23/91. Attendance: 76.
- R. S. Pengelly, COMPACT Software, "CAD for MMIC Implementation—A Review," 4/25/91. Attendance: 37.
- R. R. Winning, Kyoto University, "A Frequency Agile Mode Converter for Gyrotrons," 5/24/91. Attendance: 34.
- K. Miyauchi, Science University of Tokyo, "High Speed Digital Transmission Technology in Microwave, Millimeter-wave and Lightwave Regions in Japan"; K. Hie, et al., "Modern Technologies for Mobile Radio Equipment," 10/17/91. Attendance: 329.
- Y. Kobayashi, Saitama University, "Microwave High-Tc Superconductors and Cryogenic Semiconductor Devices"; S. T. Peng, et al., National Chiao-Tong University, "Electromagnetic analyses for Guided Wave Structures," 10/17/91-10/18/91. Attendance: 157.
- M. Tsutsumi, et al., Kyoto Institute of Technology, "Lightwave/Microwave Interaction Devices, Circuits and Systems"; H. Fukumuro, et al., KDD, "Satellite Communication Technology," 10/17/91-10/18/91. Attendance: 179.
- S. Miura, et al., NASDA, "Satellite Broadcast Technology," 10/18/91. Attendance: 101.
- K. Seuttake, et al., Kanagawa University, "Invitation to Distributed Constant Circuits"; E. Yamashita, et al., University of Electro-Communications, "Electromagnetic Wave Propagation Along Microstrip Transmission Lines," 10/18/91. Attendance: 321.
- Y. Harauyama, et al., NASDA, "Remote Sensing"; H. Oqawa, et al., ATR, "A Report on the 1991 IEEE MTT-S International Microwave Symposium," 10/18/91-10/19/91. Attendance: 121.
- K. Honjo, et al., NEC, "Microwave and Millimeter-Wave Transistors"; T. Takagi, et al., Mitsubishi, "Circuit Technology for MMICs," 10/19/91. Attendance: 313.

TWIN CITIES (MTT)

- K. M. Buckleym, University of Minnesota, "Signal Processing for Multiple Beam Antennas," 2/21/91. Attendance: 8.
- V. Sokolov, Honeywell, "Microwave Optoelectronics for Phased Arrays," 3/21/91. Attendance: 23.
- B. Sainati, Alliant Tech Systems, "Microstrip Antennas: Analysis and Applications," 4/18/91. Attendance: 32.

UNITED KINGDOM/IRELAND (MTT/ED)

- B. Jackson, Thorn EMI, "RADAR Signature Control Through Measurement and Prediction," 12/19/90. Attendance: 20.
- J. D. Rhodes, Filtronic Comp. LTD, "Microwave Subsystems for EW Applications," 3/27/91. Attendance: 33.
- J. R. Forrest, National Transcommunications Ltd., "Technology Development in Digital Microwave Systems," 6/27/91. Attendance: 41.
- A. G. Stove, Philips, Tes., "Microwave & Millimeter-Waves for Vehicle Control," 9/25/91. Attendance: 50.

VENEZUELA (MTT/COM)

- Video, "TDR, Cable Submarine, Intelsat, TVRO," 3/19/90. Attendance: 18.
- Video, "Antennas, TVRO, Intelsat, RADAR," 3/26/90. Attendance: 18.
- Charla: Comenzando una empressa de Telecommunications Un caso real. Ponente: A. Alvarex, 4/4/90. Attendance: 31.
- Video, "IEEE/Intelsat," 6/6/90. Attendance: 50.
- Video, "IEEE/Fiber Optics," 7/6/90. Attendance: 20.
- V. Cuesta, Royalsat, "TVRO, Presente y futuro," 11/15/90. Attendance: 30.

VIRGINIA MOUNTAIN (MTT/ED)

- J. E. Andrews, ITT/EOPD, "Image Intensifier Technology for Night Vision Goggles," 10/18/90. Attendance: 18.
- R. Anhoff, Gateway Modeling Co., "Modeling of Equivalent Circuit Parameters of GaAs MESFETs," 1/9/91. Attendance: 15.

WASHINGTON/NORTHERN VIRGINIA (MTT)

- D. Schilling, SCS, "Personal Communications Networks Using Direct Sequence Code Division-Multiple-Access Spread Spectrum," 3/12/91. Attendance: 85.
- R. Dixon, Dixon Associates, "Receivers for Spread Spectrum Systems," 2/12/91. Attendance: 75.
- M. Fox, ICS-Thomson, "Bulk and SAW Devices," 4/9/91. Attendance: 53.

YUGOSLAVIA (MTT)

- V. Rizzoli, University of Bologna, "Simulation and Design of Nonlinear Microwave Circuits," 9/18/90. Attendance: 55.

IEEE TAB Periodicals Council

(Continued from page 28)

The Council, in concurrence with the PUB, will inform the Consumer Electronics Society about the concern and request for a response.

Some societies maintain double queues for the papers printed in the *Transactions:* those by the authors who promised to pay page charges and those not. This practice is discouraged and will be so stated in the forthcoming *Editor's Manual.*

Several business and operation issues of publication operations were reported and some actions taken. One of them is approval of the new 1993 Publishing Services Rates and Magazine Rates. Due to streamlining of the operation including the increased use of electronic publication, the rates for editing, for instance, are decreasing. In addition, IEEE is strengthening its marketing effort for its periodicals and other publication products.

AUTOMATIC RF TECHNIQUES GROUP

CALL FOR PAPERS

ARFTG 39th CONFERENCE - FALL 1992 — ALBUQUERQUE, NM

FIRST CALL FOR PAPERS — JUNE 5, 1992

The Automatic RF Techniques Group will hold their 39th Conference at the Pyramid Plaza Hotel in Albuquerque, NM on Friday June 5, 1992. The conference theme is:

MEASUREMENT ACCURACY ISSUES

As both the performance of microwave technology, and the ability to measure that performance, continues to advance, the concept of how to best measure a device's performance while achieving sufficient accuracy becomes less trivial. The main focus of ARFTG's 39th Conference includes papers addressing measurement accuracy limitations, measurement accuracy needs, appropriateness of a technique for determining a specific device's performance, metrology considerations, and cost/time/performance trade offs. Papers on other RF measurement or computer-aided-design topics will also be considered.

Technical presentations shall be informal twenty-five minute talks using view-graphs or 35-mm slide illustrations. Authors are requested to submit a one page abstract and a 500 to 1000 word summary with attachments containing illustrations, etc., providing sufficient technical content to enable proper evaluation and explaining the contribution's usefulness to the conference attendees. All accepted papers will be published in the post-conference digest. **Two copies of the abstract and summary should be received no later than March 15, 1992.**

Manufacturers interested in exhibiting at the conference should contact the Exhibit Coordinator for information and an application and agreement form.

Submit papers to:

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Conference Chairman

Michael Little
RL\OCTP
Griffiss AFB, NY
13441-5700
(315) 330-4381

Video Tape Review

Engineers should be able to go home with a video on a technology that interests them and play it on their VCRs.
IEEE President Merrill Buckley
The Institute, *Nov./Dec. 1991*

Quasioptical System Design for Millimeter Wavelengths

Developed and Presented by Paul F. Goldsmith
University of Massachusetts, Amherst

"What is quasi-optics?" a colleague once asked me. "Is it like electro-optics or opto-electronics?" Whereupon I replied, "Not really" and proceeded to describe a quasi-optical system as a microwave or millimeter circuit which has mirrors, lenses, and beams with the general appearance of an optical system.

Without giving away the ending, this 66 minute tape provides an excellent tutorial-like introduction describing when and why quasi-optical systems are used, as well as how to design components specific to your needs. Topics covered include: Gaussian optics, lenses, horns, grids, and system design. The tape has a generous sprinkling of examples accompanied by pictures of components and final systems.

The star of the video, Paul Goldsmith, is a faculty member at the University of Massachusetts' Five College Radio Astronomy, where he works on low-noise quasi-optical receiver technology. Nearly a decade ago he helped found Millitech Corp., a company specializing in millimeter-wave components and systems. He continues to work part-time for Millitech, developing millimeter-wave antennas and quasi-optical components and systems.

The tape is accompanied by a 54 page booklet which includes copies of the key slides used in the video. This provides a convenient way of following the video while taking notes. If the tape whets your appetite, the end of the booklet contains an extensive bibliography of quasi-optical related literature. Because this is a diverse, rapidly developing area, the relevant material is scattered across many journals and publications. What is needed is a comprehensive text that could be used by millimeter-wave engineers—Paul Goldsmith are you listening?

You won't find this tape at your local video store. The tape may be ordered directly from the IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. IEEE members pay $59.95, non-members pay $109.95 (IEEE product number HV0211-3) plus $5 shipping and handling. Checks should be made payable to the IEEE. Add sales tax for shipments to CA, DC, NJ, and NY. Credit card charges are accepted. PAL video format is also available on request. Overseas customers should call for appropriate air-mail charges: (908) 562-5499.

Richard C. Compton
Cornell University