IEEE SOCIETY ON MICROWAVE THEORY AND TECHNIQUES

NEWSLETTER

EDITOR: *S. L. March*

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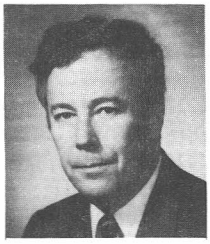
REFLECTIONS ON THE 1983 MTT-S SYMPOSIUM



by H. Howe, Jr.

Looking back on the 1983 MTT-S Symposium I am struck by the feeling that I'm sorry it's over. The Steering Committee put a lot of work into making the Symposium the success that it was, but we also had a lot of fun doing it. The crises and triumphs have blended together in memory leaving us all with a feeling of satisfaction. I know that everyone on the Committee agrees with me that working on a Symposium is a worthwhile adventure. I highly recommend it.

The attendance at the Boston Symposium broke all records. The final count showed a total attendance of 5,168 people. Interestingly enough, 2,448 came from the 5 New England States and an additional 952 from California. We had 333 attendees from outside the United States and the rest of the attendance was from all over the country. 1,523 registered for the MTT-S Symposium with 592 in attendance at the Microwave and Millimeter-Wave Monolithic Circuits Symposium. Two hundred twenty-two people showed up the day before the Symposium for the Workshop on Broadband Matching and 180 attended the Workshop on Mixers. The Hyperthermia Workshop attracted 46 specialists and 132 stayed over the weekend for the ARFTG Workshop the following week. These figures cannot be added directly because of the many overlaps of people who attended more than one function. However, when these duplicates are eliminated it turns out that 2,306 individuals participated in some aspect of the technical program.

The technical program consisted of 126 papers which were presented in regular sessions, plus 40 additional papers which were presented in Open Forum Sessions held in the late afternoon. The parallel sessions were reduced from 4 to 3 this year in order to permit the attendees to hear more of the papers and to minimize conflicts. There were an additional 16 papers presented on Tuesday at the Microwave and Millimeter-Wave Monolithic Circuit Symposium for a total of 182 technical presentations not including those activities in the Workshops and the panel sessions.

We were all gratified by the outstanding success of the Open Forum Sessions. Every effort had been made to pick papers which would be enhanced by this form of presentation. The quality of papers and the generally positive response from the large number of people who attended these sessions should certainly be an encouragement to continue this form of presentation. Ralph Levy stood firm in the face of projections of doom and he should be congratulated for bringing a new innovation to the MTT-S. Another innovation introduced at the technical sessions this year, was the hard cover on the Digest which everyone liked and which, I suspect, will also be continued.

Ted Saad and George Jerinic (with help from many people, including a generous contribution from the Raytheon Company), put together an outstanding Historical Exhibit. So many people at-

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SYMPOSIUM REFLECTIONS (from first page)

tended the Historical Exhibit this year it was impossible to keep track of the actual attendance. This event has grown annually and is now achieving a level of recognition and status which encourages additional contributions to the collection.

The social program was also a great success. Approximately 800 people attended the Museum of Fine Arts reception hosted by the Microwave Journal on the evening before the opening of the main Microwave Symposium. It was a nice way to start. The following day, 82 people went on the daytime tour to Newport, Rhode Island and 100 more went on the evening dessert tour of Boston. Seventy-six participated in the daytime tour of Boston on Thursday and 60 went out to visit Lexington and Concord on the final day of the Symposium.

On Thursday evening, we set another record when 766 people attended the Banquet to honor the recipients of this year's awards and to hear an outstanding presentation from Dr. Carl Sagan. This year the Microwave Career Award was presented to Mr. Marion Hines "for a career of meritorious achievement and outstanding technical contribution in the field of microwave theory and techniques." After the award was presented, Dr. Kiyo Tomiyasu made a brief announcement in which he mentioned that Mr. Hines was also the recipient of this year's IEEE Lamme Medal for his work in the field of electron devices. The Microwave Prize was then presented to Mr. Kazuhiko Honjo and Dr. Yoichiro Takayama for their paper, "GaAs FET Ultra-Broadband Amplifiers for GBIT/S Data Rate Systems," which was published in the IEEE Transactions on Microwave Theory and Techniques in July 1981. The Applications Award this year was presented to Mr. Les Besser, "for development and application of COMPACT, a microwave design program." The MTT-S Distinguished Service Award was presented to Mr. Theodore S. Saad for his many many years of activity and contributions to the benefit of the Microwave Theory and Techniques Society. Following these awards Dr. G. P. Rodrique, Vice President of IEEE for publication activities, made the presentation of Fellow certificates to Dr. H. George Oltman, Jr. and Mr. Robert Wenzel. The MTT-S Distinguished Lecturer Award was then presented to Dr. Joseph A. Giordmaine for his lecture on *Integrated Optics*. A number of certificates of achievement and recognition, as well as the past President's pin, presented to Richard Sparks, rounded out the evening's awards.

Our banquet speaker, Dr. Carl Sagan, told us that the search for extraterrestrial life is worth it, even if there is only an infinitesimal chance in a billion that someone is there. He enthralled the audience with his polished narrative and color slides of the space exploration and paid tribute to the microwave industry for making it all possible, since microwave communication technology is the base for all vehicular space exploration. Much of his talk was concerned with the techniques used to attempt to determine whether extraterrestrial life exists and the program which has currently been started to accelerate that search. He finished off the evening with a lively session of questions and answers from the floor.

In recent years the exhibition portion of our annual Symposium has been growing, just as the technical portion has. This year was no exception. In the adjacent Hynes Auditorium, 241 companies exhibited in 268 booths. The exhibition was under the skillful management of Howard Ellowitz of Horizon House-Microwave.

The success of the Symposium is made possible by the outstanding work performed by members of the Steering Committee. The did their jobs cheerfully, professionally, and well. I'd like to mention them all once more. Alphabetically the Steering Committee consisted of:

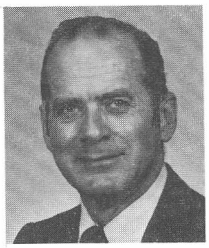
- John Bender
- Arthur A. Blaisdell
- Apostle Cardiasmenos
- W. Alan Davis
- Cliff Drubin
- Howard Ellowitz
- George Jerinic
- Richard Jerome
- Frank Leith
- Ralph Levy
- Alan Murphy
- James Oaks
- Frank O'Hara
- Larry Pihl
- John Putnam
- Gordon Riblet
- Betty Rose
- Theodore S. Saad
- Richard Sparks
- Peter Staecker
- Roger Sudbury
- Steven Temple
- Glenn Thoren
- Eloise White

and last, but not least, the "SOL HUROK" of the microwave world, Joe White. My sincere thanks to all of them.

TECHNOLOGY TRANSFER

The Defense Department's technology transfer program for Fiscal 1984 will require an $11.6-million budget and 157 people.

Although the Defense Department has participated in the review of export license applications for decades, the report said, "this participation only took its current focus on technology transfer in 1978. From inception until very recently, no single program element was identified for export control administration or technology transfer; in the Defense budget, all technology transfer investigation, analysis and administration was accomplished with funds and personnel formally associated with a number of Defense Department component programs."



PRESIDENT'S REPORT

by C. T. Rucker

Since becoming Secretary of your Administrative Committee in 1976 and an elected member thereof in 1977, I have reflected often on the status of the Microwave Theory and Techniques Society. Who are we? Do we concentrate on the right things? Are Symposium exhibits a healthy thing? Do we have too many parallel technical sessions at our Symposia? Should workshops fall in the same week as the Symposium? Are the Transactions serving the needs of the membership?

On the whole, I believe the answers to these questions are positive. To the question "Who are we?", I respond that we are the most vital means for disseminating technical information within the microwave community. "Do we concentrate on the right things?" I believe we do; the Transactions and Symposium technical sessions still receive our major emphasis just as they always have. Each of the other questions above could be answered in a similar manner.

Instead, let me relate an interesting item from a question and answer column I noticed in my local newspaper. A harried secretary wrote: "My supervisor's desk is an eyesore. What can I do about being accused of misplacing reports when they are buried in the scrap heap on my supervisor's desk?" If you think that the question is irrelevant to MTT-S, I agree. However, look at the columnist's response: "According to Einstein: (1) Out of clutter find simplicity. (2) From discord make harmony. (3) In the middle of difficulty lies opportunity . . .".

We have reached the point within MTT that diverse and sometimes distracting activities compete for our attention. There is an abundance of things to do at our annual Symposium. For some who remember "the good old days," the Society may have become ungainly, crassly commercial (the exhibits) or, at best, unfocused. Well, we are a little cluttered and sometimes a bit discordant. We have had some difficulties accompanying our growth. I submit, however, that Einstein was right. Only through clutter, discord and difficulty will a technical Society such as ours be able to seek the simplicity, harmony, and opportunity needed to maintain the leadership position we presently enjoy.

I remember "the good old days" too, but I prefer today's MTT Society over a retrograde to yesterday. We have never been healthier. It's true, "we can't go home again" and I suggest that if we could, we probably would not like it.

ADCOM HIGHLIGHTS

by H. G. Oltman, Jr.

The MTT Administrative Committee met on the two days prior to the 1983 Symposium. Below are the highlights of that meeting:

Will Some Future Symposium Chairman Go To Jail (??)

The 1983 Symposium Committee found it necessary to physically cut out two pages of their Symposium Digest. Although the author's company had approved publication of his paper (it was company funded work), a government office cognizant of that kind of work decided it should have been classified Secret. This is a serious problem. Had the Symposium Steering Committee not cooperated after being notified, they could have been imprisoned for two years and fined $100,000. It points out the need for authors to make certain that all cognizant parties approve public release of their paper. Symposium Committees are going to have to implement new paper acceptance procedures.

Divisional Realignment

Considerable discussion in the Adcom evolved around the realignment of the IEEE Societies and Groups that is proposed in order to implement a planned IEEE Bylaws change. That change will increase the number of Division Directors from eight to ten. It is proposed to align MTT-S under a Director representing four other Societies, only two of which were former affiliates—the Antennas and Propagation Society and the Magnetics Society. Other historic affiliates with which we occasionally hold joint meetings or have joint Chapters will be under different Directors. These other entities are the Electron Devices Society, the Quantum Electronics and Application Society, the Group on Sonics and Ultrasonics and the Parts, Hybrids, and Manufacturing Technology Society. The Administrative Committee felt that maintenance of close relationship with some of our former Divisional affiliates was important; it voted against the proposed realignment.

More MTT Lecturers in the Future

The Adcom approved an increase in the number of MTT-S Lecturers. The number will be determined by the interest of the membership and availability of lecturers. Adcom also approved the change in title from *National Lecturer* to *Distinguished Microwave Lecturer*. This reflects the international nature of MTT and the desire of Adcom to promote international activity.

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EXPANDING MICROWAVE HORIZONS

May 30 — June 1, 1984
San Francisco, California

1984 IEEE MTT-S International Microwave Symposium

CALL FOR PAPERS

The 1984 IEEE MTT-S International Microwave Symposium will be held on May 30 to June 1, 1984 in San Francisco.

The program will include an Open Forum, consisting of poster presentations, which was successfully introduced at the 1983 symposium in Boston. In addition, a "short paper" category is introduced to allow presentation of new material that is too narrow in scope for a full-length paper, but is of broader interest (e.g extension of previously reported work or initial results of promising new work). A short paper will be allotted half the presentation time and digest pages of a full-length paper.

Papers are solicited on new developments in the general microwave theory and techniques field extending from acoustics to optics, including:

* active and passive devices and components;
* discrete and/or integrated implementations;
* signal processing and systems;
* theory, design and measurements.

Prospective authors are required to submit:

1. Eight copies of a summary of two to four double-spaced typewritten pages with supporting illustrations.
2. Three copies of an abstract of 30 to 50 words on a separate sheet, to facilitate summary routing for review.
3. Three copies of a separate sheet with the complete mailing address, and a statement categorizing the submitted paper into "Session" or "Forum" and "Full-length paper" or "Short paper".

1884 1984 A CENTURY OF ELECTRICAL PROGRESS

Please mail to: Dr. Ferdo Ivanek, Chairman TPC MTT '84
Harris Corporation, Farinon Division
1691 Bayport Avenue
San Carlos, California 94070 U.S.A.

The closing date for processing the received mail is December 12, 1983. Notices to authors will be mailed by February 6, 1984.

The same quality criteria will be applied by the Technical Program Committee to papers submitted for either a Regular Session or the Open Forum. All accepted papers will be equally treated for publication in the symposium digest and in the special symposium issue of the Transactions.

The 1984 IEEE Microwave and Millimeter Wave Monolithic Circuits Symposium will be held in San Francisco on May 29 and 30, 1984, in conjunction with the 1984 IEEE MTT-S International Microwave Symposium, but papers for that symposium are solicited separately.

BROADCAST SATELLITES

A Special Issue of the *IEEE Journal on Selected Areas in Communications* will be devoted to broadcasting satellites. The issue will concentrate on television broadcasting in the 12 GHz band, but papers dealing with other kinds of systems (for example, sound broadcasting from satellites) and the provision of special services along with television (such as specialized audio channels, data, and Teletex) and the use of other allocated frequency bands (2500 MHz, 22 GHz, 42 GHz, and 85 GHz) will also be considered.

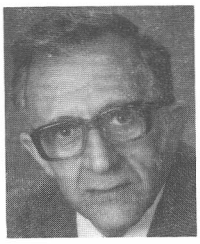
This issue is scheduled for publication in the last part of 1984, approximately one year after the conclusion of the ITU Regional Administrative Radio Conference (RARC'83) which will deal with planning the use of broadcasting satellites in the Western Hemisphere.

Papers dealing with the following topics are requested:

- Technology, components, and sub-systems for use in spacecraft (such as high-power TWTAs, shaped-beam antennas with fast roll-off and low sidelobes, and cross-polarization response), feeder link stations, low-cost receivers (such as LNAs, antennas with low sidelobes, and dual polarization feeds) and launch vehicles.
- Systems, including signal and interference objectives, system coverage and services, TT&C, systems proposed in various parts of the world, and scrambling methods and implementation.
- Radio regulatory, legal, and political issues (for example, international and domestic planning, establishment of transmission standards and receiver compatibility, and sharing with other services).
- Propagation effects on both downlinks and feeder links.
- Economic issues, such as markets, competition from other program delivery methods, channel requirements, and programming sources and considerations.

Prospective authors should prepare manuscripts in accordance with the "Information for Authors" published on the inside back cover of the *IEEE Transactions on Communications.*

Manuscripts should be received by October 1, 1983. Authors will be notified by January 1, 1984. Please send manuscripts to one of the guest editors: Richard G. Gould, Telecommunications Systems, 910 17th Street, N.W. Suite 1121, Washington, D.C. 20006; or Edward E. Reinhart, Satellite Television Corp., 1301 Pennsylvania Avenue, N.W., Washington, D.C. 20004.



History of MTT

by T. S. Saad

ADCOM XVII
JANUARY 1, 1969 THROUGH
DECEMBER 31, 1969

ADMINISTRATIVE COMMITTEE:	L. Young, Chairman J. H. Bryant, Vice Chairman R. W. Anderson, Secretary-Treasurer
	F. R. Arams R. W. Beatty P. J. B. Clarricoats A. C. Clavin S. B. Cohn H. W. Cooper G. I. Haddad J. B. Horton M. C. Horton D. D. King S. Okwit A. A. Oliner R. A. Rivers P. A. Rizzi T. S. Saad F. G. R. Warren
HONORARY LIFE MEMBERS:	A. C. Beck A. G. Clavier W. W. Mumford G. W. Southworth
EX-OFFICIO MEMBERS:	R. E. Henning R. H. Kingston S. W. Rosenthal E. N. Torgow G. Wade

Leo Young was Chairman of the XVIIth Adcom. John Bryant was Vice Chairman and Dick Anderson was Secretary-Treasurer. Following the organizational structure set up in the prior Adcom by Rudy Henning, activities were divided into 9 functions.

Frank Arams was Chairman of the Meetings and Symposia Committee. His responsibilities included the MTT Symposia, microwave presentations at the IEEE show and any other meetings that might be held during the year. Sy Okwit was Chairman of the Publications Committee. Reporting to him was George Haddad, Editor of the Transactions. Al Clavin was both Chairman of the Membership Services Committee and Editor of the Newsletter. Gene Torgow was Chairman of the Administration Committee. John Bryant was Chairman of the Finance Committee. Bob Beatty was the Chairman of the Standards Coordinating Committee. Don King was Chairman of the Long Range Planning Committee. Leo Young acted as the Technical Committee's Coordinator and Saul Rosenthal was Chairman of the Education Committee. In addition to those specific committees, there were representatives for the Quantum Electronics Council, the Solid State Circuits Council, CADAR (Computed-Aided Design and Reliability), and the Technical Activities Board (TAB).

The first meeting of the Adcom was held on March 27th at the New York Hilton Hotel in conjunction with the IEEE show. At that time, the MTT maintained a strong identity with the IEEE Convention. The second meeting was held on May 4th, at the Marriott Hotel in Dallas, Texas during the MTT Symposium. The third meeting was held on September 26th and 27th at IEEE Headquarters in New York City and the 4th meeting was held on December 15th at the Newporter Inn in Newport Beach, California, the site of the 1970 MTT Symposium.

During the year, Leo Young instituted a policy asking the members of the Adcom to bring written reports to the meetings rather than to provide oral presentations.

At the September meeting, Leo organized a new committee, the *Advisory Committee*. The members of the Committee were to be appointed by the Chairman for a period of three years. The first five members of the Advisory Committee were Hal Altschuler, Seymour Cohn, Art Oliner, Ted Saad, and Kiyo Tomiyasu. The object of the Advisory Committee was to enable the Adcom to take advantage of the older and more experienced members while, at the same time, continuing to bring in new blood.

FINANCE

The financial problems of MTT continued to be a major topic of conversation. At the September meeting of the Adcom, Hal Altschuler presented a report entitled "Future Financial Needs and Sources of Income of G-MTT." The recommendations of the report included increasing the membership fees from $5 to $6 on January 1, 1970 and from $6 to $7 on January 1, 1974. It also proposed that the institutional listings in the MTT Transactions be increased from $50 per issue to $75 per issue on January 1, 1970. It was further recommended that page advertising not be used in the Transactions. A vote was eventually taken increasing the dues from $5 to $6, effective January 1, 1970. Institutional listings were increased to $60 per single issue and $440 per 12 issues. At that same meeting, it was voted that the cost to MTT members would be the same whether they elected to receive the MTT Transactions or the IEEE Journal of Solid-State Circuits. MTT members who elected to receive the Journal of Solid-State Circuits in addition to the Transactions were to be charged $7, plus the Group fee. A similar arrangement was voted for the Journal of Quantum Electronics. MTT members who elected to receive the Journal of Quantum Electronics in addition to the Transactions would receive it for only $5, plus the Group fee.

However, in a memo dated October 10, 1969, Dick Emberson explained why the fees for the three publications available to MTT members would continue to be billed on a different basis than was voted at the Adcom meeting. The result was that an individual could join MTT for $6 if they chose to receive the MTT Transactions, for $5 if they chose to receive the Journal of Solid-State

Circuits. In combination, the prices for JQE and JSSC, with the Transactions were $11 and $13, respectively. An individual who wanted to join the Group and receive all three publications would be charged $18.

For 1969, the total expenses for MTT were $161,821 and the total income was $152,686. At the end of the year, membership in MTT was 6,933, which included 1,139 students and 13 affiliates. The balance at the end of the year according to IEEE was $15,161. It was quite clear that the MTT was coming close to the end of its balance and would have to make some hard decisions in order to remain financially sound.

In his budget for 1970, John Bryant projected a total income of $175,700, with total expenses of $163,100. He projected a reserve of $47,100, which was different than that presented by IEEE Headquarters.

Since MTT was still involved with QEC and SSCC, it's interesting to note that the Quantum Electronics Council had a projected total income for 1970 of $115,000, wih total expenses of $100,000, whereas the Solid-State Circuits Council had a projected total income of $97,000 and projected total expenses of $86,000.

QEC, SSCC, CADAR & OTHER COUNCILS

There still appeared to be some concern about possible conflict between the MTT and the Solid State Circuits Council. The original objective of the Journal of Solid-State Circuits was to provide an outlet for the papers from the International Solid-State Circuits Conference, which were not otherwise published in an archival transactions. In particular, a special issue entitled *Microwave Integrated Circuits*, made up primarily of papers from that meeting, was scheduled to be published by the SSCC. This caused some concern to MTT. The matter was ultimately resolved by having a joint publication of the MTT Transactions, the Transactions on Electron Devices, and the Journal of Solid State Circuits. In that way, the matter of turf regarding microwave integrated circuits was temporarily resolved. It was becoming clear that, in time, there would be less danger of overlap and more opportunity for cooperation.

The Quantum Electronics Council appeared to be operating with some success. At their 1969 Conference on Laser Engineering, they had over 1,200 paid registrants and there were over 45 exhibits. This was the largest attendance of any laser conference ever held. They were also planning a sixth International Quantum Electronics Conference to be held in Kyoto, Japan in 1970.

During the year, a meeting was held of CADAR representatives from IEEE groups to evaluate the organizational status of CADAR. It was decided that since the committee was primarily concerned with automated circuit design, it would be placed under the auspices of either the Electron Devices Group, or the Circuit Theory Group and it would continue to publish its newsletter. The other Groups, such as MTT were encouraged to handle their own computer-aided design problems on an internal basis. Thus, the old CADAR would go out of existence and the new one would have no direct relationship with MTT.

Another Group that was beginning to attract a bit of MTT attention was an IEEE Group on Oceanography.

LONG RANGE PLANNING

An ad hoc committee on the "name and scope of MTT" had been in operation for some time under the direction of Don King. At the first meeting of the Adcom, three items presented by the committee were discussed. The first was consideration of a name change. A number of possibilities were presented, but a motion to change the name was defeated. Another item in that report was a proposed revision of the concise statement of the IEEE Groups listing of MTT. This is a statement that identifies the field of interest and which usually appears in IEEE publications. The new concise statement Group listing was expanded. The old listing read as follows: "Microwave Theory, Microwave Circuitry and Techniques, Microwave Measurements and the Generation and Amplification of Microwaves." The new listing, approved by the Adcom, read as follows: "Microwave Theory, Techniques, and Applications as they relate to Components, Devices, Circuits, and Systems. Optical, Acoustic, Magnetic, Domain and other wave types are included where microwave methods of analysis and microwave technology apply."

The third item in that report had to do with the scope of the Group, as defined by Article III of the MTT Constitution. The field of interest was both enlarged and defined more precisely in some areas and left more general in others. This was to account for the changes in microwave technology itself and the dangers of encroaching on other Groups within the IEEE. In fact, one item was inserted in the field of interest, which spelled out the fact that considerable overlap existed with several other Groups. After discussion with other Groups, in particular the Group on Sonics and Ultrasonics, a revised version was presented at the December 15 Adcom meeting and a vote was taken for its approval.

STANDARDS COORDINATING COMMITTEE

During the year there was a good deal of activity in the Standards Coordinating Committee, particularly the work on Waveguide Standards. The proposal for the revision of the IRE standards on waveguide and waveguide component measurements was approved with minor changes and was forwarded to the IEEE Standards Committee. A document on components definitions was prepared by a subcommittee and was undergoing review. It was also recommended that a new committee on microwave magnetics operate as a separate committee, not a subcommittee, and that the Waveguide Standards Committee retain within its scope microwave ferrite components. A standards committee on microwave magnetics was formed, with Leo Young as Chairman.

With regard to work that had been done on the definition of lasers, Kiyo Tomiyasu reported that there was quite a bit of work done within the

Electron Devices Group about 1966. He also pointed out that the Quantum Electronics Council would be the logical group to take the initiative in bringing this work to its conclusion.

There was some concern over the muddle on alphabetical designations of waveguide bands. A number of articles had appeared in the MTT Newsletter and, although it created some interest, it was the opinion of the Standards Committee that it was a problem of the microwave industry and not of IEEE. However, MTT indicated a willingness to help.

MEMBERSHIP SERVICES

One of the encouraging aspects of the Adcom over the years was the increased concern for its membership. Serving the membership was the function of the Membership Services Committee under which there were several functions that were carried out by committee chairmen. Pete Rizzi started the year in charge of chapter activities, but he was later replaced by John Horton.

Dick Damon was the National Lecturer for 1969. The title of his talk was "Praetersonics — Springs, Magnets, and Microwaves." He spoke about microwave acoustic waves in solids providing novel and useful properties, which can be used to form many functions of conventional circuits. He spoke to a total of 14 chapters.

Towards the end of the year, Dr. Hal Sobol, then of RCA, was selected as the 1970 National Lecturer.

Another activity that was receiving much attention was the chapter-sponsored symposium. These were one day meetings. Four of the chapters were planning such meetings, including Boston, Northern New Jersey, Washington and Dallas. The Boston meeting was to be on phase-shifters; Northern New Jersey was planning an MIC Technology meeting; Washington was also concerned with MIC fabrication, emphasizing applications; Dallas was devoting their session to device and MIC technology.

Another product introduced by the Chapter Activities Committee was an MTT Directory, which was scheduled for distribution in January 1970. It included a list of Group officers, Adcom members, Editors, committees, Chapter Chairmen, etc. That directory, which now comes to us annually in one of the issues of the Newsletter, has become one of the more useful MTT publications.

Another area of chapter activities was the matter of communications with Chapter Chairmen. It was the general consensus at the Adcom meeting that there had to be more and better communications with the chapters.

One attempt to increase membership was proposed by Bob Rivers. The idea was to "get rid of the freeloaders." He called this *Operation GROTFL*. He suggested, among other things, that MTT members should not allow a non-member to borrow a copy of the Transactions. He also recommended that the Transactions be removed from library circulation. As an alternative he suggested that we require any library subscriber to the publication to show that at least 90% of eligible employees were members of the IEEE and the G-MTT. He also suggested that non-members be required to pay a substantially larger fee to attend the Symposium and the conventions. It was a unique set of proposals, but objections to it were so strong, that only one of the proposals was tried. The adopted suggestion set the Symposium registration fee for non-IEEE members substantially higher than the fee for IEEE members.

The Newsletter, under Al Clavin, continued to serve a very vital function for the Group. In fact, the Summer 1969 issue was 32 pages long, the longest issue to that time. The issues published that year carried more information of greater interest to the membership than in earlier years. One of Al Clavin's projects was a contest to select a symbol for MTT. The plan was to solicit proposals from members of the MTT, have submissions printed in the Newsletter, and vote on them at the March 1970 Adcom meeting. A number of the proposals included either the IEEE logo or the Smith chart, both of which had been usurped by other organizations.

This was also a period of time during which social action was receiving a great deal of interest. There was a growing movement for more IEEE and MTT participation in engineers' viewpoints on social, political and economic problems. At the time, the action was devoted primarily to private discussions, correspondence, and articles published in the Newsletter. However, the Adcom did feel MTT should form an ad hoc committee to investigate the proper responses of MTT in these areas. A meeting was held prior to the last Adcom meeting of the year, during which it was suggested that a rump session be held at the Symposium. Dave Leeson agreed to pursue the matter.

PUBLICATIONS

The Transactions continued in a monthly mode. For the year ending August 30, 1969, approximately 1,200 pages were published. That year, 196 articles were submitted, 98 of which were accepted, 48 were rejected, 16 were sent to other publications, and 34 required some type of major revision. There were two major concerns of the Adcom relative to the Transactions. One was the matter of the long delay in publication. According to George Haddad's report, this averaged about 6 months from the date the revised version of the paper was received until the issue was mailed. The second matter of concern had to do with the fact that there was income to be derived from the sale of the Transactions to other than members of the MTT. In discussing the matter with Headquarters, it was learned that Headquarters had an open order plan, called "OOPS", for libraries and others to receive special publications of the Institute automatically when issued. However, it did not include the Transactions. It was the general consensus that there should be some type of selling program for the Transactions. Headquarters had no objections to the Adcom doing the job itself. It was suggested that the sales could be done through chapters. The matter was to be looked into.

THE ADMINISTRATION COMMITTEE

The Administration Committee was responsible for such items as the Constitution and By-laws, nominations, relations with TAB, and awards. Again, there was discussion on the possibility of a two year term for the Chairman. It was felt by some that it would be desirable and would provide better continuity from year to year. However, the discussion was tabled, then given back to the By-laws Committee. Another matter that was given consideration was the possibility of separating the functions of Secretary and Treasurer. This was going to be considered as part of an overall review of the By-laws. The redefinition of the Group's scope was handled by the Planning Committee, but it became a matter for the Administrative Committee since it was to be included as a revision of the Constitution.

The Awards Committee selected Dr. John D. Rhodes of Microwave Development Laboratory as the Microwave Prize recipient. In addition, the Awards Committee recommended a new award, the W. W. Hansen Award. The matter was discussed in some detail. The Adcom appeared to favor such an award.

The election of new Adcom members was held at the September meeting. Members elected for three year terms included Gene Torgow, Bob Beatty, John Bryant, Dave Leeson, Pete Rodrigue and John Osepchuk. Nat Lipetz was elected for a two year term. John Bryant was elected Chairman for 1970, and Sy Okwit was elected Vice-Chairman.

In an effort to increase the income of the Group, Rudy Henning agreed to look into the structure and prices of Symposium Digests and Bob Rivers agreed to look into the possibility of Newsletter advertising.

MEETINGS AND SYMPOSIA

The 1960 MTT Symposium was held in Dallas, Texas at the Marriott Hotel. The Co-chairmen of the Steering Committee were Jim Sadler and Ben Hallford. John Horton was Chairman of the Technical Program Committee.

After several years of consideration, parallel technical sessions were finally incorporated in the 1969 Symposium. Although there were only two parallel sessions each day, morning and afternoon, it was still a major breakthrough. There had been some opposition to the idea of parallel sessions. The opposition came primarily from the older—more general type microwave engineers who were reluctant to miss out on some of the papers they would not be able to attend, because of the parallel session structure. In any event, it was a breakthrough that has since been expanded and carried on in all other Symposia.

In addition to the parallel sessions, there were evening panel discussions. Many foreign papers were presented, maintaining the international flavor of the coference. A record number of institutional listings were included in the digest, which helped to support the cost. The banquet featured music and songs from a Spanish trio during the dinner. William Gabriel received the Microwave Prize for 1968 for his paper, *Tunnel Diode Low Level Detection*. B. F. Coggan, from North American Rockwell, presented a talk on *Apollo and Beyond* and showed colored movies of the Apollo 8 and 9 missions. One interesting highlight of the banquet was the survey taken by Leo Young at the conclusion. The survey revealed that the majority of people at the banquet did not want exhibits at the MTT Symposia. Attendance at the Symposium was 730, with a net surplus of $2,800.

The 1970 Symposium, which had been scheduled for the Queen Mary, berthed at Long Beach, California, had to be changed to the Newporter Inn at Newport Beach, California, since it was not certain that the Queen Mary would be ready by the time of the Symposium. In anticipation of an increased number of papers, the Technical Program Committee was expanded to obtain broader and more expeditious reviews. The Chairman of the 1970 MTT Symposium was Sam Sensiper.

At the September meeting of the Adcom, proposals for the 1971 Symposium were presented by Chicago and Washington, D.C. After careful review, the Adcom voted in favor of the Washington Chapter's proposal. Warren Cooper was Chairman of that Steering Committee.

A matter that kept coming up for discussion was the question of exhibits at Symposia. Despite the vote at the banquet, the Adcom was seriously interested in the possibility of having exhibits. They pointed to other IEEE conferences at which exhibits had been held. They enlisted the aid of Lou Winner to give them information in the matter. At the May Adcom meeting, Warren Cooper moved that there be exhibits at the 1971 Symposium. The motion, however, was tabled. At the December meeting, after much discussion, Leo Young asked Warren Cooper and Don King to give further study to the matter and to submit a report in time for the March 1970 Adcom meeting. They were asked to consider and list the various alternatives. Their study was not to be tied directly to the 1971 Symposium, but to the general question of exhibits at MTT meetings.

At the 1969 IEEE Convention, G-MTT had 4 sessions, which were specific to MTT and controlled by the Adcom. The sessions were more applications oriented than the papers presented at the Symposium. Attendance was excellent. It ranged from a minimum attendance of 75 to a maximum of 300. In addition, the facilities were located close to the exhibitions at the Coliseum and, as a consequence, there was a tie-in between the exhibitions and the presentations.

In preparation for 1970, Don Temme, who had handled the 1969 presentation, recommended that the sessions be held in the New York Hilton. Unfortunately for MTT, and partly because of the success of the MTT special microwave sessions in 1968 and 1969, the 1970 IEEE Technical Program Committee decided to introduce a similar program of 8 applications sessions at the Coliseum, of which only two sessions were to be devoted to microwaves. Efforts were made to restore the larger MTT program, but without success. The net

result was that the Adcom adopted a unanimous motion deploring the fact that the special microwave sessions at the Coliseum for the 1970 IEEE Convention had been downgraded. This was perhaps the final act in convincing MTT members to divorce themselves from activities at the IEEE Convention. Jim Mulligan, who was Chairman of the Technical Activities Board that year came to an Adcom meeting and discussed the matter with the Adcom. The final result was that there would ultimately be only two microwave technical applications sessions at the Coliseum in March 1970. The sessions were to be devoted to microstrip and to semiconductor devices.

1969 was probably the high water mark as far as MTT involvement with the IEEE Convention was concerned. It was somewhat upsetting to some of the Adcom members, but the realities of increased specialization, etc., made it clear that the presence of MTT at the IEEE Convention was no longer the ideal way for presenting microwave information. During the year, there were other meetings that were discussed and considered. One was the possibility of having an MTT meeting co-sponsored with the St. Louis Section. This resulted in the 1969 Microelectronics Symposium which was held in Clayton, Missouri in September. There was also a 1970 Symposium on Submillimeter-waves proposed to be held at the Polytechnic Institute of Brooklyn. The IEEE International Solid-State Circuits Conference was held that year with an attendance of over 2,000. It was of particular interest to the Adcom, because of the fact that Lou Winner had a contract with ISSCC to handle most of the administrative details of the conference.

In the meantime, Peter Clarricoats acted as the MTT representative on the organizing committee for the European Microwave Conference. The conference was held in Brighton, England in September.

TECHNICAL COMMITTEES

Leo Young began the year as the Technical Committee Coordinator, but as Chairman he felt that it was appropriate to have someone function in his stead. At the May meeting, he selected Dave Leeson to act as Assistant Technical Committee Coordinator.

One of the objectives of the Technical Committee was to obtain statements concerning the field of interest of the technical committees. The committees were quite active in reviewing and soliciting papers for publication in the Transactions and also organizing technical sessions for the symposia.

Four new technical committees were being organized. They were: (1) Radiation Safety, (2) Microwave Measurements, (3) Microwave Frequency and Time, and (4) Microwave Communications. There was also some discussion of the possibility of a request for International Microwave Power Institute (IMPI) members to have an affiliate status with MTT.

SCHOLARSHIPS

Discussion went on relative to G-MTT grants-in-aid or scholarships. During the March meeting, the Scholarship Committee proposed that MTT provide grants-in-aid for graduate students working within the field of interest covered by MTT. The amount for such a grant-in-aid was $1,000 each for one year, renewable annually for two additional years. At the May meeting, it was voted to accept the proposal. Ultimately, a custody account for the Microwave Industry's Scholarship Fund was set up at Headquarters. Microwaves Magazine offered to contribute $1,000 per year for 5 years to the fund. Elmer Ebersol, Publisher of Microwaves Magazine, agreed to direct the fund raising and publicity activity for the scholarship committee. At the same time, an Awards Committee was being set up, whose function would be to determine the requirements and qualifications for the scholarships.

NEW BUSINESS

One of the ideas presented to the Adcom during the year was the possibility of having an experimental film titled *MTT Highlights for (whatever year)*. It was suggested that the first part of the film might be an introduction by the Adcom Chairman, telling the listeners a little bit about MTT. It could be a soft-sell for joining MTT. Then the film would continue giving a brief synopsis of perhaps the three or four most important microwave developments during the past year. This suggestion was made by Don Temme, who was very interested in the possibility of using films to promote microwave engineering and to expand the National Lecturer program.

Another interesting proposal was made by the Educational Activities Board of IEEE. The project they had in mind was called "Dial Access" information system. In concept, a fairly extensive list of topics would be developed in conjunction with each of the Groups. The basic content of the material related to these topics would answer the question "What is the current status of XYZ technology?" These current status dissertations would be approximately 5-8 double spaced, typewritten pages. They would be written by eminent workers in the field and, in turn, would be recorded by Headquarters on magnetic tape cartridges. People would be aware of the availability of the reports through listings in the IEEE Spectrum or other publications, as well as through individual mailings.

TECHNICAL ACTIVITIES BOARD (TAB)

During the year, there was considerable discussion about the reorganization of the Technical Activities Board. In particular, Adcom Chairmen were asked to write to the TAB Secretary on how a cluster or Division could be formed around their respective Group as a center. MTT felt that since TAB had decided to endorse Jim Mulligan's plan for the reorganization of IEEE technical activities, MTT would do all in its power to cooperate and help TAB implement the changes for the common good of all IEEE members. The only concern that MTT had was due to lack of specific information

on how the new proposed Divisions would be made up. In a letter to Dick Emberson, Leo Young pointed out that MTT would like to be associated with strong and viable Groups of generally similar technical interests. He also pointed out that MTT did not want to find itself in a Division with so many members that our Group would not be adequately represented by only one director. He suggested that the Groups that had a clear affinity with MTT included Antennas and Propagation, Electron Devices, Circuit Theory, and Sonics and Ultrasonics. He pointed out that there were still other groups that could be associated with MTT.

The basic TAB reorganization which resulted in the TAB structure of the 1980's took place during the year. One proposal included clustering Antennas and Propagation, Electron Devices, MTT, Sonics and Ultrasonics, Parts, Materials and Packaging, and Magnetics. This ultimately became Division IV.

At the December meeting of Adcom, it was unanimously voted that the Solid-State Circuits Council and the Quantum Electronics Council be included in Division IV. Also, at that same meeting, the Adcom voted unanimously to nominate Don King for Director of Division IV, as described in the TAB reorganization documents.

CLOSING REMARKS

1969 was a year of growth and change for the MTT Adcom. The budget continued to plague us, but we were moving ahead as though we had the money. The Transactions continued to grow in strength and stature, as did the Symposium. The introduction of parallel sessions at the Symposium constituted a sudden change that would have great impact as the years went on. The pressure for exhibits at the Symposium continued.

Another aspect of the Adcom that was exciting was the introduction of new young microwave engineers, the reaching out to the Chapters and the closer ties with IEEE Headquarters through the new TAB organization.

One final item. Because of the pressure of outside activities, Pete Rizzi had to decline the responsibility of Chairman of the History and Records Committee. After several attempts to locate a likely candidate, Leo Young finally selected Ted Saad.

INTEGRATED OPTICS

Integrated Optics: Theory and Technology is Volume 33 of the Springer Series in Optical Sciences. The book was edited by R. G. Hunsperger and was published by Springer-Verlag, Berlin, West Germany in 1982. The 299 page volume, which retails for $34.00, has been reviewed by J. D. Farina of the United Technology Research Center, East Hartford, Connecticut. The book review originally appeared in the IEEE Journal of Quantum Electronics, Volume QE-19, April 1983, page 770.

This book provides a good general overview of the field of integrated optics. It is intended to serve as a text for advanced engineering students.

In the Introduction of this book, the author makes a very strong case for integrated optics. He compares various methods of signal transmission, pointing out advantages and shortcomings of each. It becomes apparent to the reader that optical integrated circuits are the logical companion of optical fiber systems, and that there is a need for integration on a much larger scale than is common today. The only obvious omission from this section is the application of integrated optics to optical signal processing, such as RF spectrum analyzers, etc. This is where optical integrated circuits offer distinct advantages over other methods, especially when combined with SAW devices.

Chapters 2-7 present a fairly complete description of the theory of optical waveguides along with many of the methods available for their realization in integrated form. Perhaps these chapters, which appear rather complete as a whole, should have been reorganized to eliminate any redundancies and sequencing problems which occur. For example, Chapter 2, Optical Waveguide Modes, is really a result of the theory of optical waveguides, which is the subject of Chapter 3. Another example along these same lines is the section on prism coupled loss measurements in Chapter 5, which appears before prism coupling is formally introduced in the next chapter, entitled Waveguide Input and Output Couplers.

Unlike the first seven chapters, the remaining nine are organized in a sequence which is easier to follow. In Chapters 8 and 9, the subject of modulation is covered for both the electrooptic and acoustooptic cases. Each is presented with a mixture of theory and practice at a level which an advanced engineering student can easily understand.

Chapters 10-14 present a very good first introduction to semiconductor lasers, covering a brief review of the basic principals all the way to distributed feedback lasers. Again, these chapters are well presented and are annotated with figures which are helpful.

Integrated optical detection is introduced in Chapter 15. This is done in such a way as to give an overview of the basic types of detectors and various methods of fabrication.

This book, in its entirety, is a complete overview of the field of integrated optics. It is not the type of book which could be used as a primary text without a lot of reorganization done by the instructor. In addition, the problems at the end of each chapter are not really complete or a difficult as a challenging text should have, even at the introductory level. However, the book, along with its extensive references, does appear to be just the thing for the practicing engineer who desires a first, or occasional, look into the field of integrated optics.

1982-83 MTT-S NATIONAL LECTURE

Through May 6, 1983, Dr. Joseph A. Giordmaine, the 1982-1983 MTT-S National Lecturer has delivered his talk, *Integrated Optics*, at nineteen locations. A short summary of his visitations follows:

Location	Chapters, Other	Date	Attendance
New Jersey Coast	MTT/ED/QEA	10/27/82	136
Southeastern Michigan	MTT/ED/AP	10/28/82	30
Charlottesville, VA	University of Virginia	10/29/82	35
Atlanta, GA	MTT/AP	11/ 9 /82	35
San Diego, CA	MTT/AP	11/18/82	30
South Bay Harbor, CA	MTT	2/ 8 /83	70
Phoenix, AZ	MTT/ED/AP	2/ 9 /83	45
San Francisco, CA	MTT	2/10/83	100
Montreal, Canada	MTT/AP	2/15/83	44
Syracuse, NY	MTT/AP	2/16/83	12
Philadelphia, PA	MTT/AP	2/17/83	13
Chicago, IL	MTT/AP	3/21/83	27
Gainesville, FL	IEEE Section	3/22/83	30
St. Louis, MO	MTT/ED/AP	3/23/83	45
Dallas, TX	MTT	3/24/83	48
Baltimore, MD	MTT/AP	4/20/83	52
Canaveral, FL	MTT/AP	4/21/83	23
Schenectady, NY	MTT	5/ 5 /83	34
Bethlehem, PA	IEEE Section	5/ 6 /83	55
		Total	864

NEW BOOKS

Progress in Optical Communication, Volume 2, edited by J. J. B. Clarricoats is the second reprint volume on optical communication to be based entirely on reprints from Electronics Letters. The volume, IEE Reprint Series 4, contains some 200 of the most significant contributions published in optical technology during the period from January 1980 to December 1981. The text is divided into five main subject areas: 1. Theory and Basic Measurement Techniques; 2. Fibre Properties, Design and Manufacture; 3. Connectors, Splices, Couplers, Switches and Other Components; 4. Systems, Instruments and Related Principles; and 5. Sources and Detectors. The soft-covered, 344 page volume costs £23.50 in the United Kingdom, $53.00 in the United States, and £30.75 elsewhere. Orders should be sent to Peter Peregrinus Ltd., P.O. oBz 26, Tichins, Herts, SG5 1SA, England or Peter Peregrinus Ltd., IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. A package and handling charge of £1.50 per volume will be added to all orders which are not pre-paid.

Kenneth J. Button is the Editor for a new Plenum Publishing Corporation (233 Spring Street, New York, NY 10013) series, **Reviews of Infrared and Millimeter Waves.** Volume 1 covers topics such as quantum response of nonlinear tunnel junctions as detectors and mixers, mixing with SIS arrays, and a fast detector of discontinuous metal film for millimeter through optical frequencies. The volume, published in 1983, contains 364 pages and sells for $45.00.

CALL FOR PAPERS

International Conference on Communications (ICC '84)
When: May 14-17, 1984
Where: RAI Conference Centre, Amsterdam, The Netherlands
Deadline: September 1, 1983
Submission: Five double-spaced typed copies each of manuscript (3000 word maximum) and 100 word abstract
Submit to: C. A. May, Technical Program Chairman, British Telecom Research Laboratories, Martlesham, Heath, Ipswich, IP5 7RE, England

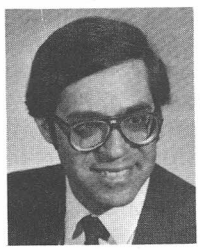
1984 IEEE International Solid-State Circuits Conference
When: February 22-24, 1984
Where: San Francisco, California
Deadline: September 23, 1983
Submission: 30 copies of both a 35 word abstract and a 300-500 word summary
Submit to: Lewis Winner, 301 Almeria, Coral Gables, FL 33134, (305) 446-8193

National Radio Science Meeting
When: January 11-14, 1984
Where: University of Colorado, Boulder, Colorado
Deadline: October 1, 1983
Submission: Abstracts
Submit to: S. W. Maley, Department of Electrical Engineering, University of Colorado, Boulder, CO 80309

National Radar Conference—1984
When: March 13-15, 1984
Where: Atlanta, Georgia
Deadline: October 1, 1983
Submission: 300 word abstract plus 75 word biography. Only unclassified papers will be accepted
Submit to: Dr. Edward K. Reedy, NRC-84 Technical Chairman, Georgia Institute of Technology, Engineering Experimental Station, Radar and Instrumentation Laboratory, Atlanta, GA 30332, (404) 424-9621

1984 International Symposium on Electromagnetic Compatibility
When: October 16-18, 1984
Where: Tokyo, Japan
Deadline: January 31, 1984
Submission: Original plus 2 copies of 35-50 word abstract plus 500-750 word summary in English
Submit to: Prof. T. Takagi, EMC '84/Tokyo, Tohoku University, Department of Communications, Sendai 980, Japan

Conference on Precision Electromagnetic Measurements
When: August 20-24, 1984
Where: Delft, The Netherlands
Deadline: February 1, 1984
Submission: Original of 35-50 word abstract plus 500-700 word summary
Submit to: Prof. Dr. H. Postma, Technical Programme Chairman CPEM 84, Delft University of Technology, P.O. Box 5046, 2600GA Delft, The Netherlands



ANNUAL TECHNOLOGY SUMMARY

by B. E. Spielman

The MTT-S Technical Committees are going to be involved in an exciting new activity. Each year, based upon inputs provided by the technical committees, the Microwave Theory and Techniques Society will provide an annual summary of technology writeup for its membership in the MTT-S Transactions. This writeup is intended to provide summaries and highlights of the technical advances made during the previous calendar year in those areas of importance to the Society membership. These writeups are to be geared for a reader who is not an expert in the technical area, but who has sufficient background to understand commonly used technical terminology for the specialty. Thereby, the reader may, from this summary: 1) gain a quick update on what is happening in areas other than his own specialty; 2) access in a single source enough information to begin a more in-depth study of the technology.

It is interesting to note that this kind of membership service is not entirely new to the MTT Society. For example, in the July 1961 issue of the IRE Transaction on Microwave Theory and Techniques, there appeared an article entitled *Report on Advances in Microwave Theory and Techniques—1960*, an interesting contribution authored by R. C. Hansen and M. T. Weiss.

Some noteworthy characteristics of these writeups are summarized as follows: 1) The authors of each input will be identified with the published writeup; 2) Each committee's technology input will be a maximum of one to two transation pages; 3) The approach of citing key references within the writeup will be encouraged; 4) In some unusual cases, there may not be a substantive contribution by some technical committee(s).

Publication on the first annual technology summary is planned for a Transactions issue in mid-1984.

THE 1983/1984 MTT-S DISTINGUISHED LECTURE

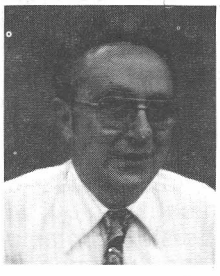
Beginning in 1983, the MTT-S National Lecture will be changed to The MTT-S Distinguished Lecture. The first MTT-S Distinguished Lecturer will be Dr. Stephen F. Adam, who has entitled his talk **Modern Microwave Measurements.**

Modern Microwave Measurements

The use of digital computers has changed many measurement techniques and has improved the accuracy and speed of microwave measurements since the late 1960s and early 1970s. On-board microprocessors are now being designed into measurement systems, providing additional flexibility and accuracy. Automated spectrum analyzers now perform a multitude of sophisticated measurements from modulation analysis to phase noise measurements. Automatic network analyzers are expected to undergo further improvements as improved and enhanced microprocessors are designed into them.

A number of measurement techniques, including those for power, frequency, noise, and scattering parameters, will be discussed.

Stephen F. Adam



Stephen F. Adam was born in Budapest, Hungary. He received the B.S. and M.S. degrees in mechanical and electrical engineering and a Ph.D. in electrical engineering in 1952, 1955, and 1965, respectively.

From 1951 to 1956, Dr. Adam was a Member of the Technical Staff of the Research Institute for Telecommunications in Budapest, performing research and development work in the field of microwave measurements. Since 1957 he has been a Member of the Technical Staff of Hewlett-Packard Company where he continued the development of microwave measurement systems. Dr. Adam has held various project and section management positions at Hewlett-Packard Company and is currently in charge of Integrated Products Research and Development in the Microwave Semiconductor Division.

Dr. Adam is the author of *Microwave Theory and Applications,* published by Prentice-Hall in 1969, and of numerous articles which have been published in the MTT Transactions and the trade literature.

Dr. Adam is a Fellow of the IEEE and a member of five IEEE Societies including the Microwave Theory and Techniques Society. He has been a member of the MTT-S Administrative Committee since 1973 and was its President in 1980. Dr. Adam was Technical Program Committee Chairman for the 1975 IEEE MTT-S International Microwave Symposium and will be the General Chairman for the 1984 International Microwave Symposium. He has also served on the Executive Committee and as Technical Program Committee Chairman for the Conference on Precision Electromagnetic Measurements. Dr. Adam is also a member of the IEEE Technical Activities Board, Transnational Relations Committee, the MTT Transactions Editorial Board, and the Association of Old Crows. He is the past secretary to IEC-TC66-WGS, the committee involved with the standardization of microwave measurements.

To contact Dr. Stephen Adam with regard to his Distinguished Lecture, his address is Hewlett-Packard Company, Microwave Semiconductor Division, 350 West Trimble Road, San Jose, CA 95131, (408) 263-7500, extension 2820.

ROBOTICS VIDEOCONFERENCE

A videoconference entitled *Robot Sensing and Intelligence* is being offered by the Institute of Electrical and Electronics Engineers Educational Activities Board (EAB) on November 7, 1983, from 11:00 A.M. to 4:00 P.M. Eastern Standard Time. The course to be televised nationwide on a "live" network established by TLC, "The Learning Channel," will cover: Multi-spectral robot vision, contact and non-contact, and internal state sensing; characteristics of signals generated by various sensors; sensor selection as a function of application, the key role of VLSI technology in robot sensing and intelligence; robot sensing and intelligence from a systems integration viewpoint; machine intelligence related to sensor data processing; productivity increases through robot sensing and intelligence; advances in sensing and intelligence to broaden robot applications through flexibility and adaptability. Discussions will be supported by print and numerous tape segments.

The broadcast will originate from the studios of South Carolina Educational TV, Columbia, South Carolina. The instructors are: Dr. Antal Bejczy, Jet Propulsion Laboratory, Pasadena, California, who is the coordinator; Dr. R. C. Gonzalez, University of Tennessee, Knoxville, Tennessee; Dr. Larry Leifer, Stanford University, Stanford, California; and Mr. Douglas Lockie, Strategic Technologies, Sunnyvale, California. Telephone hookups will allow participants to interact with the instructors.

The videoconference will be broadcast to various universities, companies, and IEEE Section-sponsored locations. Registration before October 24 for IEEE members is $130; $180 for non-members. After October 24, registration for IEEE members is $155; $205 for non-members. $25.00 of non-member fee is applicable toward IEEE membership.

CONSTITUTION OF THE IEEE SOCIETY ON MICROWAVE THEORY AND TECHNIQUES

ARTICLE I
NAME AND OBJECT

Section 1. This organization shall be known as the Microwave Theory and Techniques Society of the Institute of Electrical and Electronics Engineers, Incorporated, hereafter referred to as the Society.

Section 2. Its objects shall be scientific, literary, and educational in character. The Society shall strive for the advancement of the theory and practice of electronics, allied branches of engineering, and of the allied arts and sciences, and the maintenance of high professional standards among its members, all in consonance with the Constitution and Bylaws of the IEEE and with special attention to such aims within the field of interest of the Society as are hereinafter defined.

Section 3. The Society shall aid in promoting close cooperation and exchange of technical information among its members, the members of the IEEE, and of the profession, and to this end shall hold meetings for the presentation of papers and their discussion, and through its committees shall study and provide for the needs of its members.

ARTICLE II
MEMBERSHIP

Section 1. The members of the Society shall consist only of members of the IEEE in any grade, including students, having an interest in any phase of the field of interest of the Society who apply for membership in accordance with IEEE practice and comply with the Constitution and Bylaws of the Society.

Section 2. Affiliates may participate in Society activities as provided by the IEEE Bylaws and subject to the applicable IEEE rules and regulations and any additional limitations imposed by the Society Bylaws.

Section 3. A Society Affiliate cannot serve in an elective office in the Society or in a Chapter of the Society nor vote for candidates for these offices. An Affiliate can serve in any appointive office in the Society or a Chapter of the Society, except the office of Secretary-Treasurer.

Section 4. A Society Affiliate is entitled to receive notices of all meetings sent to Society members, to receive copies of publications of the Society, to attend and participate in any function of the Society by payment of IEEE member charges, and to receive any award bestowed upon him or her by the Society.

Section 5. A Society Affiliate may not receive any IEEE benefits that are derived through IEEE membership except as approved by the Executive Committee of the IEEE.

ARTICLE III
FIELD OF INTEREST

Section 1a. The Field of Interest of the Society shall be Microwave Theory, Techniques, and Applications, as they relate to components, devices, circuits, and systems involving the generation, transmission, and detection of microwaves. It shall include scientific, technical, and industrial activities, subject to timely modifications approved by the IEEE TAB.

Section 1b. Microwave Theory and Techniques relates to electromagnetic waves usually in the frequency region between 1 - 100 GHz; other spectral regions and wave types are included within the scope of the Society whenever basic microwave theory and techniques can yield useful results. Generally, this occurs in the theory of wave propagation in structures with dimensions comparable to a wavelength, and in the related techniques for analysis and design. Examples are optical waves in suitably scaled structures, as well as the applications of acoustic, magnetic, and domain waves to microwave systems.

Section 1c. Considerable overlap exists with several other Societies. Specific areas are electron tubes and semiconductor devices for the Society on Electron Devices; radiating elements and propagation for the Society on Antennas and Propagation; and acoustical waves for the Society on Sonics and Ultrasonics. In each case, activities in areas of common interest shall be coordinated to assure a constructive and mutually satisfactory result.

Section 2. The Field of Interest of the Society may be enlarged, reduced, or shifted moderately as the needs of the occasion indicate with the provision that, if it overlaps the field of interest of another Society to the extent that interference occurs, the IEEE TAB may draw up more exact lines of demarcation, and that, if some other Society wishes to enlarge its field to the disadvantage of the Society, that this Society will reasonably and in good faith consider the proposals and abide by any decision of the IEEE TAB.

ARTICLE IV
CHAPTERS

Section 1. A sub-society may be formed and operated on any plan not inconsistent with the powers of the Administrative Committee of this Society. A sub-society formed in a Section shall be known as a Chapter. A Chapter may assist the Administrative Committee of this Society in the management of the Society's Annual Meeting or Symposium held in the Section in which the Chapter is located. The Chapter shall be responsible for coordinating with the Section on such major meetings or symposia. A Chapter may promote meetings of the Section in the field of interest of this Society under the control and supervision of the officers of the Section in which the Chapter is located.

ARTICLE V

FINANCIAL SUPPORT

Section 1. The Society may levy fees on its members and Affiliates for publication and other purposes. Society membership and Society affiliation may be maintained only by regular payment of the Society fee. Any Society member of Affiliate who is delinquent in paying the Society fee for three (3) months shall be dropped from Society membership or affiliation. (The fee for certain categories of special members as established in the Bylaws shall be paid by the Society).

Section 2. The Society may make registration charges at its Society meetings, symposia, conferences, conventions, etc. The registration fee for the non-IEEE members shall be higher than for IEEE members and Society Affiliates.

Section 3. The Society shall not make registration charges at a meeting, conference, or convention which it operates as part of a Sectional, Regional, or Institute meeting, conference, or convention.

Section 4. The Society may raise revenues by other means, such as advertising, shows, requests for contributions, etc., provided such means do not conflict with policies established by the IEEE or do not encroach on prior established revenue fields of other IEEE organizations. The Society must receive from the IEEE General Manager an opinion that a proposed method of raising revenue is non-conflicting and not against IEEE policy before embarking on the proposed plans.

ARTICLE VI

OFFICERS AND MANAGEMENT

Section 1. The Society shall be managed by an Administrative Committee consisting of 18 elected members of the Society plus additional ex-officio members as provided in the Bylaws. Elected members shall be of at least Member grade.

Section 2. The terms of office of the elected members of the Administrative Committee shall be three years, one-third of the members being elected each year.

Section 3. The current Administrative Committee shall annually elect one of the members of the following year's Administrative Committee as President, and another as Vice-President, whose terms shall be for one year. These officers shall be of at least IEEE Senior Member rank.

Section 4. The Incoming President shall appoint a Secretary-Treasurer for a one-year term, whose selection is subject to approval by the Administrative Committee as specified in the Bylaws. This officer need not be an elected member of the Administrative Committee.

Section 5. The President, under direction of the Administrative Committee shall have general supervision of the Society. The President shall preside at meetings of the Administrative Committee, at any general meeting of the Society, and have such other powers, and perform such other duties as may be provided in the Bylaws, or as may be delegated to him/her by vote of the Administrative Committee. In his/her absence or incapacity, his/her duties shall be performed by the Vice-President.

Section 6. The Administrative Committee may utilize the services of IEEE Headquarters as bursar, in which case funds will be handled under rules established by the IEEE General Manager. If not, the Secretary-Treasurer shall receive and deposit all monies in his/her name as such officer of the Society in such depository as shall be named by the Administrative Committee withdrawable on his/her sole signature. The Secretary-Treasurer shall make only such disbursements as shall be ordered by the Administrative Committee.

Section 7. The Secretary-Treasurer shall be responsible for recording the minutes of all meetings of the Administrative Committee and general meetings of the Society, for maintaining Society files and records, and for bringing to the attention of the Administrative Committee all relevant facts bearing on the Society's finances. The Secretary-Treasurer shall aid the President in the preparation of Administrative Committee meeting agendas and of the annual estimated budget, and shall perform such other duties as may be required by the President, the Administrative Committee or the Society Bylaws.

Section 8. The President, as soon as expedient after election, shall appoint the standing committees provided by the Bylaws.

Other Committees may be authorized by vote of the Administrative Committee and shall be appointed by the President.

Members appointed shall serve until their successors are appointed or the committee dissolved.

Section 9. The President, as a member of the IEEE TAB when notified of a meeting of said committee, is entitled to representation of the Society at such meeting by himself/herself, by a delegate, or by letter.

Section 10. The newly elected President, Vice-President, and members of the Administrative Committee shall assume office on the first day of January following the election, unless a different time is provided in the Bylaws.

Section 11. Neither the Microwave Theory and Techniques Society nor any officer or representative thereof, shall have any authority to contract debts for, pledge the credit of, or in any way bind the IEEE except within prior approved budgets.

Section 12. Monies held by or for the Society legally belong to the IEEE, and such monies shall not be expended for purposes known to be inimical to the interests of the IEEE.

ARTICLE VII

NOMINATION AND ELECTION OF ADMINISTRATIVE COMMITTEE

Section 1. Nominating procedures as prescribed in the Bylaws shall include provision for nomination by petition.

Section 2. Within nine months after the date set for members of an Administrative Committee to assume office, a Committee consisting of coming holdover elected members of the Administrative Committee shall elect the members to fill the vacancies on the Administrative Committee about to occur with the coming year and shall transmit the names of such elected members to the President of the IEEE TAB. Unless disapproval of such elected members is received within 60 days of such transmittal, the elections shall become final.

Section 3. Within-term vacancies on the Administrative Committee shall be filled by elections for the unexpired terms by the remainder of the elected members of the Committee.

ARTICLE VIII
MEETINGS

Section 1. The Society may hold technical meetings, such as conferences, symposia, or conventions either alone or in cooperation with Sections, Regions, Convention Committees of the IEEE, or other technical organizations subject to IEEE rules and regulations. The Society shall sponsor at least one technical meeting of major scope each year, which may be held during the International Convention, during some other IEEE meeting, or as a separate conference.

Section 2. Technical meetings of the Society shall be open on an equal basis to all members of the IEEE and to Society Affiliates. Special provisions may be made for IEEE student members.

The Society shall not sponsor classified meetings. However, a classified meeting, sponsored by another organization, may be held in conjunction with a Society technical meeting, and publicity on such a meeting may be included in Society mailings provided it is made perfectly clear that the classified meeting is not sponsored by the IEEE or the Society.

Section 3. Meetings of the Administrative Committee shall be held at such times as are found necessary. Meetings of the Administrative Committee may be called by the President at his/her own discretion, or upon request by two other members of the Committee.

Section 4. Six elected members of the Administrative Committee shall constitute a quorum. No meeting of the Administrative Committee may be held unless a quorum is present.

Section 5. A majority vote of those elected and ex-officio members of the Administrative Committee attending a meeting shall be necessary in the conduct of its business except as otherwise provided in this Constitution or the Bylaws.

Section 6. Business of the Administrative Committee may be handled by informal meetings, correspondence, telephone, or telegraph where, in the opinion of the President, matters requiring action can be adequately handled in that manner. A majority vote of the members of the Committee is necessary for approval of actions handled in that manner. The Secretary-Treasurer shall prepare minutes of the action including a record of the individual votes.

ARTICLE IX
AMENDMENTS

Section 1. Amendments to this Constitution may be initiated by petition submitted by 25 members of the Society, or by action of the Administrative Committee, such petition being submitted to the IEEE TAB and to the Executive Committee of he IEEE for approval. After such approval, the proposed amendment shall be publicized in a Society publication, or by letter to all members, with notice that it goes into effect unless 10 percent of the Society members object within 30 days. If such objections are received, a copy of the proposed amendment shall be mailed with a ballot to all members of the Society at least 30 days before the date appointed for return of the ballots, and the ballots shall carry a statement of the time limit for their return to IEEE Headquarters. Approval of the amendment by at least two-thirds of those voting shall be necessary for its enactment.

Section 2. Suitable Bylaws or changes in the Bylaws to this Constitution may be adopted by a two-thirds vote of the Administrative Committee present in meeting assembled provided that notice of the proposed Bylaw or change in the Bylaw has been sent to each member of the Administrative Committee at least three weeks prior to such meeting, by first class mail. No Bylaw shall take effect until 30 days after it has been publicized to all members of the Society and a copy has been mailed to the IEEE TAB office.

ARTICLE X
PUBLICATIONS

Section 1. Publications of any material may be entirely or partly by means of the Proceedings of the IEEE by meeting the standards, and to the extent that it is equitable to other fields of interest.

Section 2. The Society shall publish an IEEE Transactions on Microwave Theory and Techniques at least four times a year and a Newsletter at convenient intervals. The Society may also join with other Societies to publish such Journals as may be approved by the Administrative Committee.

MTT-S BY-LAWS

SECTION I — NOMINATIONS, ELECTIONS AND APPOINTMENTS

A. Nominations

1. NOMINATIONS SUBCOMMITTEE

On or before February 1 of each year, the President of the Administrative Committee shall ascertain that a Nominations Subcommittee has been appointed in accordance with Section IIIA of these Bylaws, which shall consist of a Chairman and four or more members of the Society not more than half of whom may be members of the Administrative Committee.

2. MEMBERSHIP NOMINATIONS

(a) Procedure

Each year, before the annual meeting of the Administrative Committee, the Nominations Subcommittee shall select a slate of at least two members of the Society for each vacancy in the elected membership which will occur on the Administrative Committee on the following January 1. Additional nominations may be made by members of the Administrative Committee or by petitions signed by 25 members of the Society. Informal Chapter recommendations are also in order. Such recommendations must be relayed to the Administrative Committee for discussion and possible nomination. In each case, the nominees or potential nominees must be contacted prior to the annual meeting to ascertain that they will accept the nomination.

The Nominations Subcommittee, in its nominations, and the Administrative Committee, in its elections, shall be guided in their selections by principles of efficiency, geographical, and organizational distribution. Administrative Committee members who will have served three consecutive terms by the following January 1 shall not be considered eligible for renomination by the Nominations Subcommittee.

(b) Call for Nominations

The Chairman of the Nominations Subcommittee shall cause to be published and distributed to the entire Society membership a call for nominations. This call for nominations shall include publication in the Winter Newsletter. In addition, the Membership Services Committee shall inform all Chapters, in writing, of upcoming elections and nominations due date.

3. DIVISIONAL DIRECTOR

Every two years, for purposes of election to office commencing on even years, the President shall determine a concensus of the Administrative Committee to select a slate of at least two Senior Members or Fellows from the Society as candidates for Divisional Director and shall ascertain their desire to serve. Candidates names will be forwarded by March 1 to the Division Director or his nominations committee.

4. OTHER IEEE NOMINATIONS

The Nominations Subcommittee shall recommend to the President of the Administrative Committee candidates for certain Institute or TAB positions.

B. Elections

1. MEMBERSHIP

The Administrative Committee shall hold an annual meeting each year during the Fall. At the annual meeting, the Administrative Committee shall hold elections to fill vacancies in the Administrative Committee to occur on the succeeding January 1. All Elected Members and the three (3) immediate past Presidents of the Administrative Committee not presently eligible for re-election shall elect, provided that these holdover members present constitute a quorum. The Administrative Committee may make contingent elections to be effective in case an Elected Member fails to accept the office, or a disapproval is received from Headquarters. The names of the Elected Members shall be transmitted to the Chairman of the Technical Activities Board. Unless disapproval of such Elected Members is received within 60 days of each transmittal, the elections shall become final.

Each eligible voter shall submit a ballot listing their choice of filling the six elective positions. The votes shall be counted by a teller's committee appointed by the President of the Administrative Committee, no member of which is either eligible to vote or a candidate for election. All votes shall carry equal weight. Any candidate receiving a plurality and majority on the first ballot is elected. Additional ballots shall be held, listing as candidates the remaining nominees. In the event that the first ballot does not fill all six (6) vacancies, the eligible voters may choose to remove from the next ballots, candidates having the fewest number of votes on the previous ballot. On the second ballot, a plurality of votes shall elect and the Presiding Officer shall not vote except to break a tie.

2. PRESIDENT AND VICE-PRESIDENT

At its annual meeting, the Administrative Committee shall elect as its President one of the Elected Members of the following year's Administrative Committee for the year beginning on the succeeding January 1; and shall elect as its Vice-President one of the Elected Members of the following year's Administrative Committee for the year beginning on the succeeding January 1.

The President and Vice-President shall each be elected by a majority vote of members eligible to vote as prescribed in Section II. The Presiding Officer shall not vote except in the event of a tie.

3. WITHIN-TERM VACANCIES

Within-term vacancies on the Administrative Committee shall be filled by elections for the unexpired terms by the remainder of the Elected Members of the Committee (MTT Constitution, Article VII, Section 3).

4. HONORARY LIFE MEMBER

Nomination for Honorary Life Member of the Society may be made by any member of the Administrative Committee, or by a petition signed by at least 50 members of the Society. A two-thirds affirmative vote by all of the Elected Members of the Administrative Committee will be required to elect an Honorary Life Member. In the absence of a sufficient number of Elected Members of the Administrative Committee at a regular meeting, election of Honorary Life Member may be conducted by mail ballot.

(a) Eligibility

The position of Honorary Life Member may be bestowed upon an outstanding member of the profession who fulfills the following minimum requirements:

(1) The candidate shall have made significant technical contributions in the field of interest of the Society.

(2) The candidate shall have performed outstanding service to the profession and to the IEEE.

(3) The candidate shall have been a member of the Society for at least five years.

(4) The candidate shall have been an Elected Member of the Administrative Committee.

(b) Award

Society fees for Honorary Life Members shall be paid from the Society Treasury. The Secretary shall arrange for this with IEEE Headquarters. The award shall consist of a suitable certificate and a feature publication in the IEEE Transactions on Microwave Theory and Techniques.

C. Appointments

1. SECRETARY

The President Elect, upon receiving notice of election as President, shall submit to the Administrative Committee the name of a proposed Secretary, who shall be a member of the Society, but need not be a member of the Administrative Committee for appointment. If a majority of the members of said Administrative Committee do not object within 30 days of oral or written announcement to the Administrative Committee, the appointment shall become final. If a majority of the members of said Administrative Committee object, a new name(s) must be submitted. The incumbent Secretary shall remain in office until a successor is appointed and arranges to take over the office.

SECTION II — ADMINISTRATIVE COMMITTEE MEMBERSHIP

A. Elected Member

An Elected Member of the Administrative Committee is a member of the Society elected in accordance with Article VI, Sections 1 and 2, and Article VII, Sections 1 and 2, of the Constitution. An Elected Member has full rights and voting privileges on all matters before the Administrative Committee, as defined in the Constitution and these Bylaws.

B. Ex-Officio Member

An Ex-Officio Member shall serve on the Administrative Committee as provided for by these Bylaws. An Ex-Officio Member of the Administrative Committee has all discussion and voting privileges in all matters before the Administrative Committee, except that no vote may be cast to elect members to the Administrative Committee nor to elect the President nor Vice-President of the Administrative Committee. An Ex-Officio Member is not included in a quorum count. An Ex-Officio Member may serve on standing and ad hoc committees.

C. Honorary Life Member

An Honorary Life Member of the Society has all of the rights of an Ex-Officio Member of the Administrative Committee.

D. Past President

Past Presidents shall be Ex-Officio Holdover Members and have the full rights and voting privileges of Elected Members of the Administrative Committee for three years following their term of office as President of the Administrative Committee, provided that membership in good standing is maintained with the Society. Any remaining years of a Past President's elective term on the Administrative Committee will be vacated, and a Past President will be ineligible for re-election to the Administrative Committee for this three year period. The Past President's vacated Elected Member seat will be filled in accordance with Article VII, Section 3, of the Constitution. Election of a member to fill this forthcoming vacancy shall take place during that meeting of the Administrative Committee at which the annual election of members for the coming year is held.

E. Transactions Editor

The Transactions Editor, if not an Elected Member of the Administrative Committee, shall be an Ex-Officio Member of the Administrative Committee during the tenure of that office and for a period to terminate on a December 31st ranging from at least one to less than two years thereafter. The Transactions Editor shall be a member of the Society.

F. Non-Voting Member

A Non-Voting Member of the Administrative Committee may participate in discussions of all matters before the Administrative Committee but does not have a vote on any Administrative Committee business. Non-voting Members shall receive notification of meetings and copies of the minutes of meetings. Non-Voting Members may serve on standing or ad hoc committees.

G. Secretary

The Secretary, if not an Elected Member or Ex-Officio Member of the Administrative Committee, shall be a Non-Voting Member of the Administrative Committee during the tenure of that office. The Secretary shall be a member of the Society.

H. Chairman of A Standing Committee

The Chairman of a Standing Committee shall be a Non-Voting Member of the Administrative Committee unless such Chairman is an Elected or Ex-Officio Member of the Administrative Committee.

I. Chapter Chairman

The Chairman of a Chapter of the Society shall be a Non-Voting Member of the Administrative Committee, unless such Chairman is an Elected Member or Ex-Officio Member of the Administrative Committee.

J. Chairman of an Ad Hoc Committee

The Chairman of an Ad Hoc Committee shall be a Non-Voting Member of the Administrative Committee for the duration of the Ad Hoc Committee, unless such Chairman is an Elected Member or Ex-Officio Member of the Administrative Committee.

K. Chairman of Quantum Electronics Council

The Chairman of the IEEE Quantum Electronics Council, if he is not a member of the Administrative Committee, shall be a Non-Voting Member of the Administrative Committee during the tenure of that office.

L. Chairman of the Solid-State Circuits Council

The Chairman of the IEEE Solid-State Circuits Council, if he is not a member of the Administrative Committee, shall be a Non-Voting Member of the Administrative Committee during the tenure of that office.

M. Representative to IEEE Headquarters, TAB

The Representative(s) to IEEE Headquarters, TAB and/or Division IV, if not a member of the Administrative Committee, shall be a Non-Voting Member of the Administrative Committee during the tenure of that office.

N. Advisory Committee

A member of the Advisory Committee, if not an Ex-Officio Member, shall be a Non-Voting Member of the Administrative Committee.

SECTION III — COMMITTEES

A. Standing Committee

The following Standing Committees shall be appointed by the President as soon as possible after election as President and such committees shall hold office for one year co-extensive with the term of office of the President except as otherwise noted in these Bylaws. It will be discretionary with the Administrative Committee President to appoint any part or all of any Standing Committee, or to appoint the Chairman only of each committee and request the latter to appoint additional committee members.

1. MEETINGS AND SYMPOSIUM COMMITTEE

The Meetings and Symposium Committee shall, as required, assist the respective program committees in planning and selecting programs within the field of interest of the Society for the technical conferences of the Institute and Society. Upon instruction of the Administrative Committee, the Meetings and Symposium Committee also cooperates with the committees responsible for other meetings, conventions, and symposia.

The Meetings and Symposium Committee Chairman shall take office immediately upon appointment and shall continue for one year, plus such time as is necessary to bring to a termination all activities in connection with any meetings managed by said committees. Such an extension of the term of a Meetings and Symposium Committee for the completion of a given task shall not preclude the appointment of a new committee at the designated time for the succeeding year.

2. PUBLICATIONS COMMITTEE

The Publications Committee shall be responsible for publications and dissemination of technical information of interest to the Society. The Committee shall be responsible for publishing the Transactions and for notifying the technical community of meetings, special publications, and other information of interest to the Society.

(a) Transactions Editor

The Transactions Editor is responsible for the technical editorial content of the IEEE Transactions on Microwave Theory and Techniques. The Editor is also responsible for coordination with the IEEE facilities for publication. The Transactions Editor shall appoint and be Chairman of the Transactions Editorial Board. The Transactions Editor will continue to serve until such time is a successor is named by the President of the Administrative Committee, and for such time thereafter as may be necessary for a successor to assume the duties of Editor.

(b) Associate Editor of the Transactions

An Associate Editor of the Transactions shall carry out the duties assigned by the Transactions Editor.

3. EDUCATION COMMITTEE

The Education Committee shall be responsible for the promotion and coordination of activities furthering the cause of education as it relates to the Society and

the field of microwaves. The committee shall institute and administer educational-aid programs to be wholly or partially sponsored by the Society. These activities shall encompass both support of educational activities at the undergraduate/graduate level and continuing education for the Society membership. The committee shall obtain all necessary IEEE approval to implement each activity.

(a) Scholarship Subcommittee
The Scholarship Subcommittee shall be responsible for instituting and administering the scholarship programs which are wholly or partially sponsored by the Society. The subcommittee shall be responsible for the necessary review and screening of scholarship applications and shall submit the subcommittee recommendations to the Administrative Committee for approval.

(b) Grants-In-Aid Subcommittee
The Grants-In-Aid Subcommittee shall be responsible for instituting, evaluating and administering the grants-in-aid programs which are wholly or partially sponsored by the Society. The subcommittee shall be responsible for the necessary review and screening of grant-in-aid applications and shall submit the subcommittee recommendations to the Administrative Committee for approval.

4. OPERATIONS COMMITTEE
The Operations Committee shall be responsible for the operational conduct and advisory administration of the Society and the Administrative Committee. It shall be responsible for maintaining the Constitution, the Bylaws, and the Procedures Handbook; for ensuring the proper conduct of business meetings; for providing nominations for offices; and for maintaining historical records.

(a) Bylaws and Procedures Subcommittee
The Bylaws and Procedures Subcommittee is responsible for the preparation of constitutional amendments and changes to the Bylaws for Administrative Committee action, when such amendments or changes either appear necessary or are so directed by the Administrative Committee. The subcommittee is also responsible for examining Society actions to determine whether these are in accordance with the Constitution and Bylaws of the Society and the Constitution and Bylaws of the IEEE.

The subcommittee shall also maintain a Handbook of Procedures for the Administrative Committee as a guide for officers and committee members of the Administrative Committee. This Handbook shall be in accordance with these Bylaws, the Society Constitution and the Constitution and Bylaws of the IEEE. Within this framework, the Handbook shall define the specific duties, actions, and responsibilities of the officers and committee chairmen.

(b) Nominations Subcommittee
The Nominations Subcommittee shall nominate candidates for Elected Members of the Administrative Committee in accordance with Section I of these Bylaws; and shall be responsible for recommending to the Administrative Committee nominees for all IEEE positions for which the Society can nominate, in accordance with Section I of these Bylaws.

5. FINANCE COMMITTEE
The Finance Committee shall be responsible for planning, establishing, and administering budgetary control and disbursing of finances for the Society in accordance with the Constitution and the rules of the IEEE. The committee shall also be responsible for planning and soliciting Society incomes such as from institutional listings in the IEEE Transactions on Microwave Theory and Techniques. The Chairman of the Finance Committee shall be a member of the Administrative Committee.

6. STANDARDS COORDINATING COMMITTEE
The Standards Coordinating Committee shall be responsible for establishing and/or reviewing IEEE Standards within the scope of interest of the Society. The committee shall periodically upgrade existing standards and shall initiate standards in new areas when they have become sufficiently established. The Chairman of the Standards Coordinating Committee shall appoint Ad Hoc Standards Committees to deal with specific areas requiring standardization.

7. LONG-RANGE PLANNING COMMITTEE
The Long-Range Planning Committee shall be responsible for review of advanced goals and policies of the Society and shall submit recommendations to the Administrative Committee President and to the Operations Committee Chairman for inclusion in the Constitution, the Bylaws, or the Procedures Handbook.

8. TECHNICAL COORDINATING COMMITTEE
The Technical Coordinating Committee shall investigate, evaluate, and in some instances, promulgate new or peripheral technologies of interest to the Society. The Technical Coordinating Committee shall coordinate with the Meetings and Symposium Committee to afford the latest technical coverage in all meetings of interest to the Society. The Chairman of the Technical Coordinating Committee shall appoint Ad Hoc Technical Committees to deal with specific areas requiring technology emphasis. The Chairman of the Technical Coordinating Committee will be an advisory member of

all Technical Committees. The Chairman of each Technical Committee shall report to the Chairman of the Technical Coordinating Committee any significant developments (such as special sessions that the Technical Committee is helping to arrange and organize at the MTT-S Symposium, special issues of the Transactions that are being planned, etc.), for possible inclusion in the minutes of the Administrative Committee. The Chairman of each Technical Committee should report to and advise the Chairman of the Technical Coordinating Committee each year, prior to December, as to the continuation of that Technical Committee during the next year.

9. MEMBERSHIP SERVICES COMMITTEE

The Membership Services Committee shall encourage membership in the Society and shall maintain records of Society membership. The committee is responsible for the promotion of the Society's area of interest with the formation of new Society Chapters, shall maintain liaison among the IEEE, Society Chapters, and the Administrative Committee, and shall disseminate publicity and information of interest to the IEEE, to the Chapters, and to the Society membership.

(a) The Newsletter Editor

The Newsletter Editor is responsible for the publication of an information bulletin called "Newsletter".

(b) Chapter Activities Subcommittee

The Chapter Activities Subcommittee shall be responsible for promoting and maintaining close liaison between the Chapters and the Administrative Committee.

(1) Distinguished Lecturer

The Distinguished Lecturer shall be nominated by the Membership Services Committee and shall be approved by the Administrative Committee during their annual September meeting.

(2) Membership Drive Subcommittee

The Membership Drive Subcommittee shall be responsible for promoting increased membership for the purpose of improved welfare of the Society and IEEE.

10. AWARDS COMMITTEE

The term of office of the Awards Committee Chairman shall normally begin on October 1 of the year in which that Chairman is appointed. The term of office shall normally be more than 1 year.

The Chairman of the Awards Committee shall hold the grade of Fellow of the IEEE. This committee shall cooperate with the IEEE in recommending members of the Society for IEEE awards, shall select for the Administrative Committee the recipient of the Microwave Prize, and shall suggest the recipient of the Microwave Career and Microwave Application Awards.

The Chairman of the Awards Committee is empowered to submit to IEEE Headquarters the names of the candidates for IEEE Awards with approval of the President of the Administrative Committee.

B. Ad Hoc Committees

The President of the Administrative Committee shall create Ad Hoc Committees when, in the President's judgement, such committees are required. The President may appoint a Chairman of an Ad Hoc Committee, who shall be a member of the Society and request the Chairman to appoint additional members, or the President may name any part of all members of an Ad Hoc Committee. Ad Hoc Committees shall serve until they are disbanded by the President of the Administrative Committee.

SECTION IV — MEETINGS AND SYMPOSIA

A. Meeting Notices

No meeting of the Administrative Committee shall be held for purpose of transacting business unless each Administrative Committee member shall have been sent notice of the time and place of such meeting at least 20 days prior to the scheduled date of the meeting.

B. Meeting In Absence of Quorum

If less than a quorum attend a duly called meeting, tentative actions may be taken which will become effective upon subsequent ratification, either at a meeting or by mail, by a sufficient number of members as to constitute a majority of the voting members of the Administrative Committee. Minutes of such meetings shall be mailed by the Secretary to each committee member who shall register his disapproval of any actions taken at such meetings within 30 days after the mailing of said minutes. Ratification of such action by said committee member is automatic.

C. Symposium

1. LETTER PROPOSAL SUBMISSION

Letter proposals by Chapters to sponsor the Symposium for a given year should be submitted to members of the Administrative Committee at least five years prior to the date of the proposed meeting and no later than May 1.

These proposals should be brief and must contain at a minimum:

(a) a statement signifying the willingness of a Chapter to host the Symposium,

(b) a proposed technical and administrative organization showing adequate local interest and participation and,

(c) a proposed facility available and adequate to house both technical sessions and exhibits.

2. CONSIDERATION OF LETTER PROPOSALS

The Administrative Committee will consider letter proposals received by May 1 at the Symposium meeting. Proposals received after May 1 will be considered if agreed

by a majority of the Administrative Committee members present.

3. SELECTION OF SITE
   The Administrative Committee will utilize adequate letter proposals for long range planning purposes. When appropriate, one or more proposing Chapters will be informed of the committee's acceptance of their proposal, thus allowing necessary long term site selection and facilities committments to be made.
4. FINAL PROPOSAL SUBMISSION
   At an appropriate time, no later than 28 months prior to the proposed meeting, a thorough proposal will be requested from the host Chapter for consideration by the Administrative Committee at their Symposium meeting. The purpose of this proposal is to insure adequate planning and attention to detail found necessary for previous symposia. Upon request, the Chairman for the Committee on Meetings and Symposia will provide samples of reports or proposals generated for previous meetings.
5. CHAPTER NOTIFICATION
   Society Chapters are to be informed of these provisions via the "Newsletter" and by individual letter by the Chairman of the Membership Services Committee in January of each year.

D. Other Technical Meetings

Society participation in technical conferences will be in accordance with IEEE policies and practice. Participation of the Society as a joint sponsor, co-sponsor, or co-operator of meetings of another IEEE Society or Group, IEEE Section or a non-IEEE organization requires a vote of approval by the Administrative Committee. The policy governing the extent of participation in such meetings by the Society shall be in accordance with the policy of the Society and the IEEE.

SECTION V — FINANCES

A. Bursar

The Society shall use the service of the IEEE as Bursar in accordance with the Constitution and the rules of the IEEE.

B. Fees

Each member of the Society shall be assessed a yearly fee, established by the Administrative Committee, which money will be used for the publications and activities of the Society and/or the IEEE.

C. Authorization For Payment of Bills

The approval of one Administrative Committee officer is needed in the case of bills presented to IEEE Headquarters for payment, and the approval of two Administrative Committee Officers is required for payments to any member of the Society or of the Administrative Committee. The Chairman of the Finance Committee will be responsible for requesting all disbursements from IEEE Headquarters.

D. Authorized Budgets

The Administrative Committee may establish an annual operating budget for the operation of any committee and/or activity by a majority vote. Requests for advances, reimbursements, or the payment of bills submitted within the limits of the established budget for any committee, shall be sent by the committee Chairman to the Chairman of the Finance Committee in accordance with paragraph C above.

E. Symposium Advances

The Administrative Committee may make an advance to the Steering Committee of an annual Symposium of the Society.

F. Symposium Finances

All financial arrangements for a Symposium or other special activity shall be in accordance with prudent management procedures, applicable IEEE policies, and any special conditions imposed by the Society. Money deposited in a Symposium or similar account shall be identified with the Society and IEEE. In the event of activities co-sponsored with others, a clear and explicit statement of the financial arrangements shall be reduced to writing at the outset.

SECTION VI — MISCELLANEOUS COMMITTEE BUSINESS

A. Administrative Year

The Administrative Year of the Society shall be January 1st through December 31st of the same year.

B. The Microwave Prize

The Society shall present an award known as *The Microwave Prize* annually. The prize shall be awarded to the author of that paper, published in the IEEE Transactions on Microwave Theory and Techniques, Proceedings of the IEEE, or other official IEEE publication, which is judged to be the most significant contribution in the field of interest of the Society. The paper must have been published during the year ending June 30th preceding the award. The selection of the recipient of *The Microwave Prize* will be the responsibility of the Awards Committee, who will make their recommendation to the Administrative Committee at the Annual meeting of the Administrative Committee. The President of the Administrative Committee shall inform the recipient of *The Microwave Prize* as soon as possible after the Administrative Committee has approved the award. The award shall consist of a suitable certificate, a cash sum of three hundred dollars, and a feature publication in the IEEE Transactions on Microwave Theory and Techniques. If the paper as published has more than one author, a certificate will be presented to each author and the cash sum will be divided equally among the authors, except in the case that there are four or more authors, each shall receive a cash sum of $100.00.

C. Microwave Career Award

The Society shall present an award known as *The Microwave Career Award*. This award shall be considered annually but not necessarily presented annually. The award shall be made to an individual for a career of meritorious achievement and outstanding technical contribution in the field of microwave theory and techniques. The individual must be a member of the IEEE.

Selection of the recipient of the award will be the responsibility of the MTT-S Awards Committee which will make its recommendation to the MTT-S Administrative Committee at its Annual meeting. Nominations for the award can be submitted by any member of the Society. The award shall consist of a suitable certificate, a plaque, a cash sum of one thousand dollars, and a feature publication in the IEEE Transactions on Microwave Theory and Techniques.

A travel allowance may be authorized by the MTT-S Administrative Committee. The travel allowance is for those individuals with insufficient organizational funding for travel to receive the award.

1. GUIDELINE FOR MICROWAVE CAREER AWARD

   The award shall be made to an individual for a career of meritorious achievement and outstanding technical contribution in the field of microwave theory and techniques. The eligibility requirements are publication in technical journals, presentation of lectures, contributions to be considered in conjunction with any or all of the areas of contributions mentioned above.

D. Microwave Application Award

The Society shall present an award known as *The Microwave Application Award*. This award shall be considered annually but not necessarily presented annually. The award shall be made to an individual for an outstanding application of microwave theory and techniques.

Selection of the recipient of the award will be the responsibility of the MTT-S Awards Committee which will make its recommendation to the MTT-S Administrative Committee at its Annual meeting. Nominations for the award can be submitted by any member of the Society. The award shall consist of a suitable certificate, a cash sum of three hundred dollars, and a feature publication in the IEEE Transactions on Microwave Theory and Techniques.

1. GUIDELINE FOR MICROWAVE APPLICATION AWARD

   The award shall be made to an individual for an outstanding application of microwave theory and techniques. The eligibility requirements are creation of a new device, component, or technique; novel use of a device or component; or a combination of any or all of the above. Publication of a paper is not required.

   The award is aimed primarily toward young or emerging workers.

E. Distinguished Service Award

The Society shall present an award known as *The Distinguished Service Award*. The award shall be considered annually but not necessarily presented annually. The award shall be made to an individual who has given outstanding service for the benefit and advancement of the Microwave Theory and Techniques Society. The individual must be a member of the IEEE and a member of MTT Society.

Selection of the recipient of the award will be the responsibility of the MTT-S Awards Committee which will make its recommendations to the MTT-S Administrative Committee at the Annual meeting. Nominations may be made by any member of the MTT-S Administrative Committee or by a petition signed by at least 25 members of the Society. The award shall consist of a suitable certificate, a plaque and a feature publication in the IEEE Transactions on Microwave Theory and Techniques.

1. GUIDELINE FOR DISTINGUISHED SERVICE AWARD

   The award shall be made to an individual who has given outstanding service for the benefit and advancement of the Microwave Theory and Techniques Society. The eligibility requirements are service in one or more of the following areas: the Administrative Committee, publications, meetings and symposia, Chapter leadership, committee chairman, committee member, Editor, lecturer or other distinguished service. Factors which will be considered are: leadership, innovation, activity, service, duration, breadth of participation and cooperation.

SECTION VII — CHANGES TO THE BYLAWS

Suitable Bylaws or changes in the Bylaws may be adopted by a two-thirds vote of the Administrative Committee present in meeting assembled provided that notice of the proposed Bylaw or change in the Bylaw has been sent to each member of the Administrative Committee at least three weeks prior to such meeting, by first class mail. No Bylaw shall take effect until 30 days after it has been publicized to all members of the Society and a copy has been mailed to the IEEE TAB office. (MTT Constitution, Article IX, Section 2).

ELECTROMAGNETIC FIELDS

McGraw-Hill Book Co., New York, NY published **Introduction to Electromagnetic Fields** by Clayton R. Paul and Syed A. Nasar. The book, published in 1982, retails for $29.95. This review by William G. Duff of Atlantic Research Company originally appeared in the Electromagnetic Compatibility Society Newsletter, Number 116, Spring 1983.

The subject of electromagnetic fields is one of the most important topics in electrical engineering in general, and in the special areas of electromagnetic interference (EMI) and electromagnetic compatibility (EMC). In particular, electromagnetic fields often play a major role in determining whether a particular configuration of a potentially interfering emitter and potentially susceptible receptor will result in EMI or EMC. Many of the major mechanisms of coupling between culprit emitters and victim receptors involve electromagnetic field interactions. Examples of coupling mechanisms involving electromagnetic field interactions include: antenna-to-antenna, wire-to-wire, field-to-wire, case radiation, case penetration, etc. In order to be able to understand and assess potential EMI situations and to recommend and design fixes to ensure EMC, it is necessary to have an understanding of the fundamentals of electromagnetic fields. This book provides a good introduction to the basic understanding of electromagnetic fields.

The subject of electromagnetic fields is inherently difficult because the quantities of interest are functions of both time and spatial parameters. In order to solve most electromagnetic field problems, it is necessary to visualize and understand governing equations. This book provides a clear explanation of the fundamental principles and concepts which, in turn, makes the subject matter interesting and helps to motivate the reader to assimilate the material. The book presents the important concepts with a minimum of detail so that the reader can distinguish the "forest from the trees."

A review of the literature shows that there are a number of excellent books that cover static fields in considerable detail, but do not give sufficient coverage of time-varying fields. Likewise, there are a number of books that cover the topic of time varying fields in considerably more detail and sophistication than is required for an overall introduction and basic understanding of the subject. As a result, the subject of electromagnetic fields has, perhaps, been viewed as being more difficult than is really necessary for a fundamental understanding. This book is excellent in bridging the gap between the existing references that cover static fields in detail or cover time-varying fields in more detail than is required for a basic understanding of the subject.

This book presumes that the reader has been introduced to the basic standard field concepts such as Coulomb's law and Gauss' law through standard elementary physics courses. Consequently, the discussion of static field concepts is minimized so that the more important topics of time-varying fields and the engineering applications (uniform plane waves, transmission lines, waveguides and antennas) can be covered in sufficient depth.

Chapter 1 provides an introduction and motivational survey, and Chapter 2 presents all of the necessary vector algebra and vector calculus tools and concepts. Chapter 3 contains the static electric field concepts (Coulomb's law, electric field, Gauss' law, potential, energy, capacitance, and mechanical forces). Chapter 4 presents the static magnetic field concepts (the Biot-Savart law, Ampere's law, energy, inductance, mechanical forces, and magnetic circuits). Relatively brief discussions of material properties are included in Chapters 3 and 4.

Chapter 5 begins the discussion of time-varying field concepts by introducing and discussion Maxwell's equations, the boundary conditions, Poynting vector, and the important sinusoidal, steady-state solution technique. Chapter 6 begins the discussion of the applications and implications of Maxwell's equations from an engineering standpoint. The concept of electromagnetic waves is discussed in considerable detail so that this fundamental concept will be firmly understood when it recurs later. Reflection and transmission of uniform plane waves, as well as polarization of these waves, also are discussed.

Chapter 7 contains a discussion of wave propagation on transmission lines. Both transient and sinusoidal, steady-state behavior are discussed. The emphasis is on fundamental principles, and the Smith chart and its applications are discussed in detail in Appendix C. Chapter 8 presents a discussion of rectangular waveguides, which, although brief, covers the essential points.

The topic of antennas is covered in Chapter 9 in somewhat more detail than is customary in a text aimed at this level. The Hertzian dipole and the long linear dipole are discussed in somewhat standard manner, as is the topic of linear arrays. Antenna directivity and gain also are discussed. Coupling between two antennas is considered, and the important concepts of reciprocity, with regard to impedance and pattern for an antenna in either a transmitting or receiving mode, are derived. The Friis transmission equation also is derived.

Chapter 10 contains the traditional techniques for solution of static field problems for which simple, closed-form solutions are not obtainable. Solution techniques for Laplace's and Poisson's equations, as well as numerical methods (finite-difference and method of moments) and analog and graphical methods, are discussed.

This book is a must in any reference list or library that deals with the subject of electromagnetic fields.

STAMPS HONOR E. E.s

The block of four stamps will be issued September 21st at the Inventors' Hall of Fame in Arlington, Virginia.

COLLEGE COSTS

Following is a student's itemized list of expenditures for one semester (1825) at Columbian College (now George Washington University), Washington, DC.

Tuition	$30.00
Boarding, 10 weeks @ $2.00	20.00
Bed and Bedding	5.00
Coal, 11 bushels @ 40¢	4.40
Wood	.50
Blacking, shoes and boots	2.00
Room and furniture	9.00
Library	2.00
Lamps	2.00
Washing, 3 dozen @ 37½¢	1.13
Miscellaneous	8.75
	$84.78

BELL DIVESTITURE

Despite the billion-dollar stakes involved in the Bell System divestiture, there still is room for levity among industry participants and observers. Look no further than the names being bandied about for the new AT&T and its to-be-divested operating companies. *RATT* for the "Remaining AT&T." *WACCOS* (Wire and Cable Companies) for the divested Bell operating companies. Or how about *TOM* (The Other Mother) for the Bell operating companies? An ambitious soul, believed to be employed somewhere in the Bell System, even individually nicknamed the seven regional holding companies—*Yankee Bell* (Northeast region), *Liberty Bell* (Mid-Atlantic), *Southern Belle, Cow Bell* (Midwest), *Buffalo Bell* (Rockies and West), *Taco Bell* (Southwest) and *Tinker Bell* (California).

TOAST!

If "Here's mud in your eye" is the best you can come up with for a toast, everyone should have two or three toasts memorized for that inevitable occasion when they will be called upon to rise and give a toast.

"May you live to be 100—with one extra year to repent."

"Here's a health to your enemies' enemies."

"May the road rise to meet you; May the wind be always at your back; The sun shine warm upon your face; The rain fall soft upon your fields; And until we meet again, may God hold you in the hollow of his hand."

For dramatic effect:

"Here's to your coffin. May it be made with 100-year-old oak trees, which I shall plant tomorrow."

The word "toast" comes from an old Irish tradition dating back to the 16th Century. Imbibers of the day would put a piece of toast in a glass of whiskey or beer to improve the flavor, possibly to remove impurities. By the 18th Century, the word had taken on its present meaning.

In the two centuries, people realized that a graceful thought adds more flavor to a drink than toasted bread.

Toasting is always done with the right hand, with the glass held straight out from the shoulder. This shows there is no sword or dagger concealed, as there sometimes was when toasting first began.

The first historical records of toasting are found at about the 14th Century. Toasting is mostly an oral tradition.

The tradition of throwing glasses is rooted in the same mythology as the ringing of church bells —noise to ward off evil spirits.

The tradition of throwing the glass into the fireplace after a toast probably originated in Lithuania and Estonia during the 18th Century.

They were the first conspicuous consumers. A piece of glass was worth a great deal of money then and the Lithuanians and the Estonians were very wealthy. A wealthy nobleman would impress his guests by throwing the glass.

There are no truly American toasts. They seem to have been killed off by Prohibition. Although whiskey returned, the toast did not.

MEMBERSHIP MATTERS

by E. C. Niehenke

GROWTH

MTT-S membership has experienced a quantum increase this past year. MTT's rank in IEEE Society growth increased from twelfth place a year ago to fourth place this year. Membership in the Society increased 10.2 percent to 6336 for the twelve month period ending April 30, 1983. Last year's increase was only 3.7 percent. For the same period, the growth rate for the Institute was 7.1 percent. The current MTT membership in arrears (1061) is not counted in the above statistics.

CHAPTER RECOGNITION

The Albuquerque and Montreal Chapters have done outstanding jobs in promoting MTT-S membership for 1982 as indicated by their membership statistics. Albuquerque experienced a 33 percent growth in membership, while Montreal increased its membership by 17 percent. Representatives from these two Chapters received Chapter Recognition Awards during the banquet accompanying the recent MTT Symposium in Boston.

FILTER DESIGN

The book review on **Electronic Filter Design Handbook** was performed by W. E. Moyer of Martin Marietta Aerospace Company, Denver, Colorado and originally appeared in the Spring 1983 issue (Number 116) of the Electromagnetic Compatibility Society Newsletter.

This 1981 book by Arthur B. Williams was published by McGraw-Hill Book Company, New York, NY ($37.50).

According to the author's preface, the book is intended to provide practical, in-depth data "so that the average engineer can design almost any type of filter with no prior experience." Design of both active and passive filters is accomplished by using normalized numerical tables in conjunction with time and frequency domain response curves for a variety of filters. While the book cannot really be used as a stand-alone guide to filter design, it does contain numerous references to standard treatments of filter design and theory, and will be useful as a reference book of practical design techniques for the practicing filter designer or as a supplemental textbook for a college-level filter design course.

Chapter one consists of a brief introduction to modern network theory and discusses whether to choose an active or passive filter design (frequency limitations, size, economics of manufacture and ease of adjustment).

Chapter two deals with selection of the response characteristics desired for low-pass, high-pass, band-pass and band-reject filters. The technique used is to transform the required response to a normalized low-pass specification with a cut-off frequency of 1 radian/second. By comparing the required normalized response to selected categories of normalized response curves, a satisfactory low-pass filter may be determined and the tabulated normalized component values of the chosen filter transformed to give the final design. Attenuation characteristics, group delay characteristics, impulse response and step-response curves are provided for Butterworth, Chebyshev, linear phase, transitional, synchronously tuned and elliptic-function type filters. The advantages and limitations of each type of filter are discussed, with numerous sample calculations presented.

Chapter three covers LC and active low-pass filter design in considerable detail, with examples of frequency and impedance scaling. Topics discussed include duality, reciprocity, designing for unequal termination impedances, effects of dissipation and minimum acceptable Q of reactive circuit elements for a given filter response. Several examples of elliptic-function design are presented.

Chapter four deals with LC and active high-pass filter design, with examples of elliptic-function filter designs presented.

Chapter five covers LC and active band-pass filter design of both wide-band and narrow-band filters. Wide-band filters (defined as filters where the ratio of upper cutoff frequency to lower cutoff frequency is greater than 2) are treated as a cascade of low-pass and high-pass filters. Step-by-step procedures for conversion of normalized low-pass tabulated values to band-pass values are presented with numerous examples for various types of filters (Butterworth, Chebyshev, synchronously-tuned, elliptic-function, etc.).

Chapter six deals with LC and active band-reject filter design, with emphasis on elliptic-function band-reject filter, and null network design.

Chapter seven covers design of time-domain response networks, including all-pass transfer networks (delay lines), delay equalizer sections, wide-band phase-shift networks and adjustable delay and amplitude equalizer networks. There are numerous examples of network design presented.

Chapter eight presents several refinements in LC circuit design, including the use of tapped inductors to reduce resonating capacitance values, designing with parasitic capacitances, filter tuning methods and techniques for measuring filter insertion loss, input impedance, return loss, time-domain characteristics and the Q of inductors.

Chapter nine deals with design of magnetic components. Basic principles of magnetic circuit design, laminated inductor, toroidal coil, ferrite cores, high-frequency coil design and transformer

design techniques are presented.

Chapter ten deals with the topic of component selection for LC and active filters. Differences in construction and electrical characteristics of different types of capacitors, resistors and operational amplifiers and the effects of these differences in component characteristics on the overall filter characteristics are discussed. This information will aid the designer in selecting the proper components for a given filter application.

Chapter eleven is a brief introduction to digital filter design.

Chapter twelve consists of the normalized filter design tables which were used in the previous chapters of the book. The following normalized (order 2 to order 10) filter design tables are presented:

- Butterworth LC and Active Low Pass Filters
- Butterworth Uniform and Dissipation Network
- Butterworth Lossy-L Network
- 0.01-d B, 0.1-d B, 0.25-d B, 0.5-d B and 1-d B Chebyshev LC and Active Low-Pass Filters
- 0.1-d B, 0.25-d B, 0.5-d B and 1-d B Chebyshev Uniform Dissipation Network
- Bessel LC and Active Low Pass Filters
- Linear Phase with Equi-ripple Error of 0.05° and 0.05° LC and Active Low-Pass Filters
- Transitional Gaussian to 6dB and to 12dB LC and Active Low-Pass Filters
- Elliptic-Function LC and Active Low-Pass Filters

In summary, the book is a good filter design cookbook, with many worked-out examples, tables, graphs and relatively sophisticated design techniques presented. The book's major weakness is its lack of either sufficient theoretical justification (derivations) or explicit references for many of the design techniques, equations, and data presented. (A case in point is Figure 3-8, Minimum Q requirements for low-pass filters, which gives the required Q for different orders of the different types of filters. This figure appears as if by magic, with no indication as to which of the many references to Chapter three it was derived from, or to the tolerances on the curve with regard to derating of filter response for variation in Q). In spite of this weakness, the book will be a useful addition to the reference shelf of those involved in filter design and/or analysis.

NBS BUDGET

A total of $98.7 million is included for the Commerce Department's National Bureau of Standards (NBS) in the fiscal 1984 budget proposal. The budget request represents a net decrease of $19.2 million from the Bureau's current appropriation of $117.9 million.

SOVIET ECONOMY

A recently released CIA study suggests that the Soviet economy is healthier than Washington had previously believed. Between 1950 and 1980, the CIA report concluded, the Soviet gross national product grew at an average rate of 4.8 percent a year, surpassing the 3.4 percent growth rate of the American economy. Investment in new productive facilities shot up from 14 percent of the country's Gross National Product in 1950 to 33 percent in 1980, while over the same period American investment slipped from 17.5 percent to 13.8 percent of the much larger U.S. GNP. And despite heavy military spending, which absorbed between 11 percent and 13 percent of all Soviet output during the 1970s, living standards improved significantly.

MODE-LOCKING

R. R. Alfano, Director of the Institute of Ultrafast Spectroscopy and Lasers, Department of Physics, The City University of New York, New York, NY reviewed **Mode-Locking in Solid State and Semiconductor Lasers** by M. S. Demokan. The book review was originally published in Optical Engineering, Volume 22, Number 2, March-April 1983. The book (ISBN 0-471-10498-1) was published by John Wiley and Sons, New York in 1982. The 227 page book retails for $39.95.

This is a good book on explaining various aspects of mode-locking solid-state and semiconductor lasers. It is written on an advanced level and can be useful to both researchers and graduate students who are familiar with laser physics. The book is timely since ultrafast laser pulse technology is one of the most active areas of photonics.

It is a good overview but should have included the phasor sideband model of mode-locking. Some of the key theoretical and experimental pioneers to this field have not been referencd. The first part of the book is more detailed than the latter part on semiconductors. The book does not discuss methods for measuring the ultrafast pulse duration and shape, nor detail mode-locked laser designs. Reliable mode-locked Nd:glass lasers have been built by a number of scientists. Chirping and dechirping of pulses are not explained.

With regard to the format and style—I found the labeling of the chapters and subchapters confusing; there is a lack of references; the references are hard to find; the print is too small; and the book lacks photographs showing the temporal emission patterns from mode-locked lasers. Overall, I rate the book good.

ROBOTICS COUNCIL

The creation of an *IEEE Technical Council on Robotics and Automation* has been approved by the Technical Activities Board. A committee chaired by George N. Saridis, a professor in Rensselaer Polytechnic Institute's Electrical, Computer, and Systems Engineering Department, Troy, NY, drafted a constitution and bylaws that was submitted to the Technical Activities Board in July.

In a letter informing Professor Saridis of the approval of the creation of this Council, Irving Engelson, Staff Director for Technical Activities, wrote, "It is my hope that only those Societies which have a strong interest in robotics and automation and have a history of some activity in that field will be given the opportunity to join. Robotics is an exciting area, and Societies should not merely jump on the bandwagon of popularity, but rather on the wagon of real interest."

Further information may be obtained from Prof. Saridis at the School of Engineering; Electrical, Computer, and Systems Engineering Department; Rensselaer Polytechnic Institute; Troy, NY 12181.

P.E. EXAM QUESTIONS

For a number of years there has been much discussion and debate within the engineering community and the IEEE concerning the efficacy of examinations as a means of determining competency to be licensed to practice a given engineering discipline. The National Council of Engineering Examiners (NCEE), a body composed of representatives of each State Board of Engineering Examiners, has been able to forge agreement among the various states to standardize one common examination to the point that 48 out of the 50 states now utilize the uniform examination.

Historically, the IEEE's involvement with the NCEE had been minimal until the mid-1970's at which time the United States Activities Board (USAB) Registration Task Force began to look at the question of the adequacy of the examination to the practice of the disciplines encompassed within the electrical engineering profession.

The area of question adequacy has been reviewed by the NCEE with the cooperation of our task force and at minimum two basic areas needing improvement have been identified:

- The orientation of a majority of writers of questions is basically academic resulting in textbook-type questions which have little relevancy to the real work world an engineer must deal with
- The level and type of question lags the state-of-the-practicing-art of Electrical Engineering by five to ten years.

You can play a part in providing the leadership and the capability to make the Professional Engineering Examinations more relevant to the practice of modern engineering by providing examinations that properly test for competency to practice.

The IEEE is in the process of establishing a system that will provide a continuing source of examination questions to the NCEE for their use in examining electrical/electronics engineers requesting licensing under the various jurisdictions. The Task Force currently estimates that it will take at least sixty writers, each writing one question per year to supply NCEE's needs and build up a reserve of unused questions.

Also, if you are interested in developing questions for the examination, please write to: Joel B. Snyder, PE, Co-Task Force Leader, IEEE/USAB Licensure & Registration Task Force, c/o IEEE Washington Office, 1111 19th Street, NW, Washington, DC 20036, or call (202) 785-0017 and request the Question Writer's PE Packet. The NCEE pays an honorarium for each question it accepts.

PROPOSED ADDITIONS TO THE IEEE DICTIONARY

authorized characters. Certain eccentric people who are allowed to come in.

broad band. A small contingent of women.

clinker coolers. Air-conditioning systems in jails.

conventional thermocouples. Thermocouples who are, in most respects, quite conservative.

dynamic range. A pasture that grows wild cows.

floppy diskettes. Members of the chorus line at the Silicon Valley Burlesque.

high state. Condition following eight hours of committee work plus two-and-a-half hours of Happy Hour.

mine hoist. The guy who's giving the party.

phase shift. That period of time during the working day when Fay is on the job, usually midnight to 4 A.M.

single failure criterion. I told you when I hired you —drop *one* tray of dishes and out you go.

strength of guys. Some guys are a lot stronger than others. It has to do with eating vegetables when you're a kid.

INCREASED E.E. DEGREES

The number of BSEE and MSEE degrees awarded in 1982 rose 11% over the 1981 figure, according to the American Association of Engineering Societies' Engineering Manpower Commission. United States universities granted 16,094 BSEE degrees to the Class of 1982 versus 14,558 in 1981, plus 4186 master's degrees, versus 3762 in 1981. Foreign students receiving master's degrees rose 25% in 1982, with 1097 students graduating at that level versus 875 in 1981. Those foreign students receiving bachelor's degrees remained virtually the same: 1333 in 1982 and 1317 in 1981.

Average starting salaries were $24,696 at the BSEE level; $28,428 at the master's level. However, approximately nine percent of the 1982 BSEE recipients and five percent of those earning MSEE degrees received no job offers upon graduation.

JAPANESE PATENTS

Japanese engineers have one distinct advantage over their U.S. counterparts—most can read English, whereas most American engineers know no Japanese. One result is that the Japanese have been able to examine U.S. patents while their colleagues in the U.S. have not been able to examine Japanese patents. However, a new service, the Japanese Patent Retrieval Services Patent Profiling, will allow non-Japanese-reading persons access to Japanese patent information.

The bimonthly publication profiles the latest in microelectronics and integrated circuits. Each issue contains alphabetical listings of assignees, application numbers, and the English title of the innovation. English translations of each patent abstract cost $80 for one-week availability; translations of the complete disclosure cost $120 a page for 10-day availability. Other language translations are also offered. The original Japanese abstract and disclosure pages are priced at $2 and $15, respectively.

Future editions will be available in the fields of computers, physics, robotics, and biochemistry.

An introductory subscription to the service, begun May 1, is $260 per year for the microelectronics and integrated-circuit-structure edition, if ordered before August 31. Thereafter, subscription rates will increase to $540 per year. For more information, or to order, contact Fumio Wada, Publisher, Japanese Patent Retrieval Services Patent Profiling, 2465 E. Bayshore Road, Suite 301, Palo Alta, CA 94303, or call (415) 856-6965. JPRS can also retrieve, upon request, any patented technical information from Japan.

HISTORIC LETTER

To: Jesus, Son of Joseph
Woodcrafters Carpenter Shop
Nazareth 25922

From: Jordan Management Consultants
Jerusalem 26544

Dear Sir:

Thank you for submitting the resumes of the twelve men you have picked for management positions in your new organization. All of them have now taken our battery of tests; and we have not only run the results through our computer, but also arranged personal interviews for each of them with our psychologist and vocational aptitude consultant.

The profiles of all tests are included, and you will want to study each of them carefully.

As part of our service and for your guidance, we make some general comments, much as an auditor will include some general statements. This is given as a result of staff consultation and comes without any additional fee.

It is the staff opinion that most of your nominees are lacking in background, education and vocational aptitude for the type of enterprise you are undertaking. They do not have the team concept. We would recommend that you continue your search for persons of experience in managerial ability and proven capability.

Simon Peter is emotionally unstable and given to fits of temper. Andrew has absolutely no qualities of leadership. The two brothers, James and John, the sons of Zebedde, place personal interest above company loyalty. Thomas demonstrates a questioning attitude that would tend to undermine morale. We feel that it is our duty to tell you that Matthew has been blacklisted by the Greater Jerusalem Better Business Bureau. James, the son of Alphaeus, and Thaddaeus definitely have radical leanings, and they both registered a high score on the manic-depressive scale.

One of the candidates, however, shows great potential. He is a man of ability and resourcefulness, meets people well, has a keen business mind and has contacts in high places. He is highly motivated, ambitious and responsible. We recommend Judas Iscariot as your controller and right-hand man. All of the other profiles are self-explanatory.

We wish you every success in your new venture.

Sincerely yours,
Jordan Management Consultants

MORE NEW BOOKS

Advanced Millimeter Wave Technology is a reprint volume edited by David J. Colliver. The 417 page book is divided into eight sections: Propagation; Passive Components and Circuits; Active Components; Solid-State Devices; Tubes; Measurements; Passive Systems and Receivers; and Active Systems. Sequentially, the number of papers in each section is six, eleven, sixteen, seven, three, seven, eleven, and six. The papers previously were presented at a European Microwave Conference or a Military Microwave Conference. The soft cover volume costs £22 sterling, which includes packaging and postage via surface mail. Order from Microwave Exhibitions and Publishers Limited, Convex House, 43 Dudley Road, Turnbridge Wells, Kent TN1 1LE, United Kingdom.

Van Nostrand Reinhold has announced the publication of **Hardware and Software Concepts in VLSI,** edited by Dr. Guy Rabbat of IBM Corporation. The 576 page book, published in May 1983, retails for $42.50. The book examines large-scale embedded systems and the effect of technology on system design. Discussions of the system architecture of microprocessors focus on uses of VLSI technology, hardware algorithms for string processing, VLSI chip architecture, and VLSI design based on the use of PLA macros. The contributors also explore masterslice bipolar design, Josephson junction technology, computer-aided design methods for gate arrays and other VLSI chips, MOS technology, gallium arsenide technology, oxidation technology, and electron beam testing techniques for microprocessors. Other information is included on routing techniques in VLSI as they apply to printed circuit boards, cell-based VLSI design, and design verification and logic simulation in VLSI.

IEEE CAREERS CONFERENCE

The IEEE is planning its third national conference on engineering careers in the Fall of 1983. The United States Activities Board (USAB) of the IEEE is the sponsor and its Task Force on Career Maintenance and Development will conduct the conference.

The conference title is *Enhancing Engineering Careers by Fulfilling Individual and Organizational Goals.* It will be held in the heart of Silicon Valley at Hyatt Rickeys, Palo Alto, California on October 27 and 28, 1983.

The Conference will examine means for improving engineers' match with their jobs to ensure more secure and rewarding careers for them and to yield more productivity and stability for industry —to seek new ways to bring the engineers' goals and the organization's goals closer together.

In addition, it will examine careers from the viewpoint of the engineer, the manager, the social scientist, and the academic. USAB believes improvements in engineers' careers will evolve when companies believe that a good career climate can benefit their bottom line. This 1983 Conference is intended to stimulate that evolutionary process.

Immediately following the Conference, on Friday afternoon and evening, USAB will sponsor a "Career Strengthening Workshop." This Workshop has been well received by engineers in many cities —it provides personal career advice and tools for the participant.

The registration fee for the Conference and for the Workshop will cover the cost for the proceedings.

A new feature to appeal to those in the Bay Area who can't make the time for the entire Conference is the opportunity to participate, for a modest fee, in one of three evening events on Thursday, October 27.

Further information and registration material is available from the IEEE Washington Office, Suite 608, 1111 19th Street, NW, Washington, DC 20036, (202) 785-0017.

TRACKING U.S. PATENTS

The Communications Publishing Group, Inc. is offering four of its patent-tracking reports via the Newsnet on-line service. Engineers, scientists, patent attorneys, and R&D managers with access to a communicating terminal can call up information on the entire content of four Hitech patent reports on data communications, telephony, fiber optics, and laser technology. Patent information can be searched by title, key word, grant dates, inventors, companies, or U. S. class and subclass listings.

The Hitech series comprises a wide selection of "current awareness" reports, each of which covers a distinct area of technology through edited abstracts, drawings, and listings of relevant U.S. patents granted within the past several weeks. The reports, published every two weeks, also track recently published international patents and applications. For a free sample of CPG's hardcopy reports, and for further information on Newsnet and upcoming additional report offerings, contact Communications Publishing Group, Inc., 101 Verndale Street, Brookline, MA 02146; telephone (617) 566-2373.

LASER/OPTICS

Academic Press (P.O. Box 773, Old Chelsea Station, New York, NY 10113) has available a number of books on various aspects of laser or optical technology. These include:

Optical Fiber Telecommunications, edited by Stewart E. Miller and Alan G. Chynoweth, ISBN 0-12-497350-7, 705 pages, $65.50; **Effects of High-Power Laser Radiation,** by John F. Ready, ISBN 0-12-583950-2, 433 pages, $58.50; **Optical Fibers** by T. Okoshi, ISBN 0-12-525260-9, 320 pages, $45.00; **Industrial Applications of Lasers** by John F. Ready, ISBN 0-12-583960-X, 587 pages, $59.50; **Fundamentals of Optical Fiber Communication,** second edition, edited by Michael K. Barnoski, ISBN 0-12-079151-X, 376 pages, $26.50; **Heterostructure Lasers, Part A—Fundamental Principles,** by H. Casey and M. B. Panish, 272 pages, $47.00; **Heterostructure Lasers, Part B—Materials and Operating Characteristics,** by H. Casey and M. B. Panish, 330 pages, $58.00; **Applications of Optical Fourier Transforms,** by H. Stark, ISBN 0-12-663220-0, 560 pages, $67.50; **Laser Speckle and Applications in Optics** by M. Francon, translated from French by H. H. Arsenault, 161 pages, $27.50; **Applied Optics and Optical Engineering,** edited by R. Shannon and J. Wyant—Volume 7, 368 pages, $45.00, —Volume 8, 432 pages, $46.00, —Volume 9, 400 pages, $52.00; **$CO_2$ Lasers,** by W. W. Duley, 446 pages, $74.50; **Microwave Optics, The Optics of Microwave Antenna Design,** by S. Cornbleet, 416 pages, $69.50; **An Introduction to Electrooptic Devices,** by I. Kaminow, 409 pages, $46.00; **Laser Applications, Volume I,** edited by M. Ross, ISBN 0-12-431901-7, 320 pages, $75.00; **Laser Applications, Volume 2,** edited by M. Ross, ISBN 0-12-431902-5, 366 pages, $75.00; **Laser Applications, Volume 3,** edited by M. Ross, ISBN 0-12-431903-3, 238 pages, $70.00; **Laser Applications, Volume 4,** edited by J. Goodman and M. Ross, ISBN 0-12-431904-1, 208 pages, $55.00 (all four volumes available for $233.75); **Optical Radiation Measurements, Volume 1, Radiometry,** edited by F. Grum and R. Becherer, 352 pages, $47.50; **Optical Radiation Measurements, Volume 2, Color Measurement,** edited by F. Grum and C. J. Bartleson, 372 pages, $45.00; **Optical Radiation Measurements, Volume 3, Measurement and Photoluminescense,** edited by K. D. Mielenz, 336 pages, $49.00; **Optical Radiation Measurements, Volume 4, Physical Detectors of Optical Radiation,** edited by W. Budde (all four volumes are available for $162.35).

Fiber Optics and Communications is a monthly newsletter published by Information Gatekeepers, Inc., 167 Corey Road, Brookline, MA 02146, (617) 739-2022. The publication tracks over three hundred trade publications, reporting major developments and activities clearly and precisely. A yearly subscription costs $180. A six month trial subscription is available for $90. With a subscription, you will receive a free copy of the current edition of the *Fiber Optics Handbook and Buyers Guide.*

SHORT COURSES

McGraw-Hill Seminars is offering a number of potentially interesting short courses this Fall. **Fabrication Processes for VLSI** will be presented November 8-9, 1983 at the Holiday Inn in Waltham, Massachusetts. The seminar leader is Dr. Roy A. Colclaser. The course fee is $695. Martin G. Freedman will be serving as the course coordinator for **Thick Film Hybrid Technology.** The course will be presented October 24-25, 1983 at the Holiday Inn City Centre in Chicago, Illinois and December 8-9, 1983 at the McGraw-Hill Building in New York, NY. This course also costs $695 per pupil. **Fiber Optics Applications: Integrated Optics, Transducers, Short and Long Distance Communications** will be taught October 20-21, 1983 at the Sheraton Boston in Boston, Massachusetts and December 1-2, 1983 at the University Hilton in Los Angeles, California, by Dr. T. K. Lakshmanan. The fee for this course is also $695 per student. Philip R. Geffe will be serving as the seminar leader for **Designing Analog Filters,** offered at the McGraw-Hill Building in New York, New York (September 19-21, 1983) and at the Holiday Inn Golden Gateway in San Francisco, California (October 24-26, 1983). The course fee is $795 each. For additional information, contact Carol Clark, McGraw-Hill Seminar Center, Suite 603, 331 Madison Avenue, New York, NY 10017, (212) 687-0243.

Advanced Microwave Circuit Design is being presented for the first time on October 10-15, 1983 at the University of California in Los Angeles. For a fee of $975 per pupil, the course is open to students who have previously completed the basic short course, **Microwave Circuit Design.** The lectures include K. C. Gupta, Jerry Y. C. Chin, Les Besser, Robert A. Pucel, and Edward C. Niehenke. For additional information, contact the Short Course Program Office, UCLA Extension, 6266 Boelter Hall, Los Angeles, CA 90024, (213) 825-1295.

The Engineering Experiment Station at Georgia Institute of Technology is sponsoring **Microwave and Stripline Design Using Programmable Calculators and Desk-Top Computers.** The course will be presented October 18-20, 1983. For a fee of $695, each participant will receive the text, *Microwave Circuit Design Using Programmable Calculators,* and a TI-59 programmable calculator. Students wishing to use their own calculator can deduct $200 from the fee. Contact Department of Continuing Education, Georgia Institute of Technology, Atlanta, GA 30332, (404) 894-2547 for further details.

The George Washington University School of Engineering and Applied Science is also planning to present four short courses in remote sensing technology during September to December 1983. From September 12-15, 1983, the school will present course 1032 DC, **Modern Techniques for Information Extraction from Remotely Sensed Data.** The course fee is $830 per student. The following week, September 19-23, 1983, **Applying Remote Sensing Techniques to the Marine Environment**

(course 947 DC) will be presented for a $855 per pupil fee. **Digital Image Processing of Earth Observation Sensor Data** (course 307 DC) will be given October 10-14, 1983. The fee is the same as for the previously mentioned course. Also, during the December 6-8, 1983 period, **Advanced Geological Remote Sensing** has been scheduled. The fee for the three day course (number 892 DC) is $685 per student. Additional information is available from Continuing Engineering Education, George Washington University, Washington, DC 20052, (202) 676-6106 or (800) 424-9773.

Also offered by George Washington University will be **Microwave High-Power Tubes and Wave Propagation,** course number 1037 DC, offered August 22-26, 1983.

Autumn and early Winter offerings of Continuing Education Institute include: **Radar Systems Engineering,** September 12-16, 1983, Columbia, Maryland; **Fiber Optics: Technology and Applications,** September 26-27, 1983, Santa Clara, California; October 24-25, 1983, Newport Beach, California; October 31-November 1, 1983, Boston, Massachusetts; **Radar Detection with Unusual and/or Unknown Noise Statistics,** October 10-13, 1983, Los Angeles, California and November 7-10, 1983, Columbia, Maryland; **Radar Target and Signal Fluctuation Models,** October 24-27, 1983, Los Angeles, California and November 14-17, 1983, Columbia, Maryland; **Semiconductor Materials and Process Technologies,** November 7-11, 1983, Palo Alto, California; **Advanced Microwave Circuit Design,** November 14-18, 1983, Vienna, Virginia; and **Microwave Circuit Design,** December 5-9, 1983, Palo Alto, California. For further information on any of these courses, contact Continuing Education Institute, Oliver's Carriage House, 5410 Leaf Treader Way, Columbia, Maryland 21044, (301) 596-0111 or 10889 Wilshire Boulevard, Suite 1030, Los Angeles, California 90024, (213) 824-9545.

OPTICAL COMMUNICATIONS

Introduction to Optical Fiber Communications by Yasuharu Suematsu and Ken-Ichi Iga has been translated from the fourth Japanese edition by H. Matsumura. The 208 page book (ISBN 0-471-09143-X) has been edited and revised by W. A. Gambling. The John Wiley and Sons, New York, NY book costs $29.95.

This review by Marvin D. Drake, The MITRE Corporation, Bedford, Massachusetts originally appeared in the March-April 1983 issue of Optical Engineering (Volume 22, Number 2).

This book is organized into three parts, with the first part, Chapters 1-3, starting with a brief history of optical communications leading up to fiber optics, followed by the basic theory of light guiding and then an exposition of how light propagates in optical fiber waveguides. The second section of the book, Chapters 4-6, concentrates on light sources for optical fiber communications, with a brief explanation of detectors and integrated optic devices. The authors go into detail about the principles, structure, fabrication, and operation of solid-state sources, particularly semiconductor LEDs and ILDs. The last two chapters then return to optical fiber waveguides, their characteristics, how they are fabricated, how they may be used in systems, and some examples. Seven short appendices, which present in a little more detail material presented in the body of the book, finish the book.

The authors state: "This is a textbook about optical communications using the optical fiber and is intended for students and younger scientists who will shoulder the responsibility for its future progress." Indeed, the book is presented in the manner of a person who is very knowledgeable in this field, passing along to a beginning colleague a heuristic approach to optical fiber communications, pointing out along the way what is important, why it is important, and where the technology is going. The book is filled with short "chunks" of important information about fiber optics that could not be found easily in the literature and represent the expert observations and conclusions of the authors. This book does assume that the reader is knowledgeable in semiconductor physics and technology with a basic background in geometrical optics and electromagnetic theory. There is some repetition of material; thus, the reader can almost delve into the book for a single topic of interest without reading all of the previous chapters.

Despite the many good points of this book, it is not, in my opinion, a textbook for either undergraduate students or graduate students in a formal course. There is not sufficient exposition of the material presented nor is there a continuity throughout the book. The formulas that do appear are often introduced simply by "it can be shown that." The weighting of the subjects presented also varies widely, from very light on modulation and detection to very heavy on the details of semiconductor structures.

Overall, this book is an introduction as well as a survey of devices and technology for optical fiber communications. Several side topics are also mentioned, such as planar optical waveguides, integrated optic devices, GRIN rod lenses, and wavelength division multiplexing. The reader, hopefully, is left wanting to know more about the topics introduced. The bibliography provided by the authors includes the key historical references, in fiber optics as well as many other topics, to start the interested reader in the proper direction. The authors thoughtfully provide titles of the articles listed, but unfortunately the references are mostly before 1978. I hope that subsequent editions will include a more recent bibliography and also that the articles cited be referenced in the appropriate points in the text.

CHAPTER CHAIRMAN CORRECTION

The MTT/ED Chapter of the India Council has announced a change in the Chapter Chairmanship for 1983. The Chapter Chairman is B. Bhat, Centre for Applied Research in Electronics, Indian Institute of Technology, Hauz Khas, New Delhi-110016, India, tel. 665674. For 1984, the Chapter Chairman will be R. S. Gupta, Department of Physics, Microwave Laboratory, University of Delhi, Delhi 110016, India.

EE SALARIES

The salaries of some electrical engineers have increased in real terms since 1981, reversing a three-year trend, the new 1983 IEEE salary survey shows. But most IEEE members' salaries have been decreasing in real terms since 1972, when the survey began.

The median annual pay of IEEE members in the United States is now $40,000, a 15.9 percent increase from that reported in the 1981 survey. The real income of most members, however, has continued downward, according to comparisons with previous surveys. Only among the upper-income tier of engineers did real yearly pay show an upturn.

For most members, the latest survey shows, inflation continues to outpace wage increases. To have the buying power of 10 years ago, the typical member would need a base salary of $45,234, or about $5,000 more than the present reported median.

The survey uses the median—the value of the middle term in an array of data—because it is not unduly influenced by a few very high or very low reported incomes, as the mean can be.

A comparison of the 1983 salary median with that of the original salary survey shows that the real purchasing power of the average member has declined more than 10 percent. But whether or not other compensation—such as commissions, bonuses, and profit sharing—helped offset inflation over the 11.5 years is not known, because these factors were not included in the survey until 1977.

A 1977-83 comparison of these supplementary salary data, along with other information on pay scales in various technical fields, and according to years of experience, will be presented at a later date.

The 1983 IEEE survey covers a variety of data from tuition benefits to compensation for patents and IRA plans. The questionnaire was mailed to 31,795 of the 147,608 IEEE nonstudent members in the United States. A total of 12,361 members replied, or 38.9 percent.

By comparing the membership grade and geographic distribution of the entire 147,608 members to that of the sample, the correlation was found to be very close.

A comprehensive summary of the salary survey is available from the IEEE. To order a copy, write to the IEEE Service Center, Publication Sales Division, 445 Hoes Lane, Piscataway, NJ 08859. The cost is $60 for members and $75 for non-members.

MOBILE RADIO

The *IEEE Transactions on Communications* has scheduled a special issue for publication in 1984 which will be dedicated to all aspects of Channel Design for Emerging Radio Applications, i.e., mobile radio. Papers dealing with the following topics are requested:

- analog or digital modulation techniques for efficient frequency utilization
- communication theory of mobile channels
- new channel techniques, such as pulse shapes or codes which have application in the mobile radio environment
- channel comparisons, based upon such criteria as efficiency, robustness, or cost to implement

Prospective authors should prepare complete manuscripts and forward them as soon as possible to the Guest Editor: Dr. John H. Davis, Bell Telephone Laboratories, Crawfords Corner Road, Room WB-2A-104, Holmdel, NJ 07733.

ELECTROMAGNETIC METROLOGY

A quick reference for metrologists interested in the publications of the NBS Electromagnetic Technology Division is provided by *Metrology for Electromagnetic Technology: A Bibliography of NBS Publications (NBSIR 82-1677)*. It lists publications by the division's staff for the years 1970 through 1981 by name and gives ordering information. The papers cover methods, standards, and metrological support available for microwave circuits, laser systems, optical communications equipment, systems using transient or pulsed electromagnetic phenomena, cryoelectronics, superconductors, and other unusual electrical engineering materials. Available for $9 prepaid from the National Technical Information Service, Springfield, VA 22161. Order by PB#83-111658.

ADCOM (continued from page 3) . . .

No "MTTS Letters"

After review of its usefulness, the Publication Committee under Reinhard Knerr recommended against creation of a new, rapid-response publication, the MTT-S Letters. The need for such a publication in our mature microwave technology does not exist. Furthermore, we presently have means for publishing camera-ready papers within two months of receipt. The Adcom agreed with the Publication Committee and the plan has been dropped.

New Meritorious Service Award

Awards to its deserving members are an important duty of a Society. Recognizing this, the Awards Committee chaired by Don Parker perceived the need for recognition of MTT members who have given exceptional service to the Society. To accomplish this, his committee has recommended creation of a *Meritorious Service Award* to recognize members who have a long history of varied service to the Society. Adcom approved the creation of the award.

Special Transactions Issue—1984 IEEE Centennial

In celebration of the 1984 IEEE Centennial, the MTT-S will publish a special issue of the Transactions. Ted Saad, the Guest Editor, has asked distinguished MTT-S members who have been leaders in the development of microwave technology to write about their experiences. This promises to be an exciting issue. It could be much more interesting reading to a majority of our membership than our conventional fare.

Las Vegas—Site for the 1987 Symposium

The MTT Society made a historic change in its direction when Adcom approved Las Vegas, Nev. as the site for our 1987 Symposium. There is no Chapter there from which to form a steering committee to organize the Symposium. Instead, the steering committee will be composed of willing MTT members spread throughout the U.S. A commercial convention service company will be hired to assist in the planning and the publicity and to interface with the hotel and exhibit manager.

Los Angeles members offered Adcom an eleventh hour alternative with a Long Beach site. The motivation for their offer was the suggestion of better service to the membership through greater possible attendance at centers of microwave industry. Had the Adcom heeded their suggestion, we would have been limited to meeting in the four or five large microwave industrial centers like Los Angeles and Boston. We've now expanded our horizons. Who's for Hawaii?

IMMIGRATION REFORM

The death knell has sounded for the controversial "return home" provision of the Immigration Reform and Control Act. The provision would have required all foreign graduates of higher-education institutions in the United States to return to their native countries before applying for visas in the U.S. Recently the U.S. Senate voted to let those foreign students stay who have earned a master's or doctoral degree and have been offered faculty positions, as well as those students who have received a degree in natural sciences, mathematics, computer sciences, or engineering. However, the latter students must have a bona fide job offer in the field of their degree. Neither the Senate's nor the House of Representatives' version of the immigration bill now contains the return home provision. Because the provision was originally opposed by the White House, the immigration act will likely be signed into law by President Reagan.

The return home provision generated a hornet's nest of controversy during the past two sessions of Congress. Pushed on by the aggressive efforts of Irwin Feerst, Chairman of the Committee of Concerned EEs, more and more people in the engineering community were giving their support to the provision. Finally the Institute of Electrical and Electronic Engineers came out in favor of it, a surprising reversal in its stand.

MEETINGS OF INTEREST

The following compilation represents nearly one year's worth of potential meetings of interest to members of the Microwave Theory and Techniques Society. Additions, deletions, or corrections should be addressed to the MTT-S Newsletter Editor.

- **The 13th European Microwave Conference** is scheduled to be held September 5-8, 1983 at the Messezentrum in Nurnberg, West Germany. There will be a workshop on Microwave Imaging Methods on September 9th. For further information, contact Microwave Exhibitions and Publishers Ltd., Convex House, 43 Dudley Road, Tunbridge Wells, Kent, TN1 1LE, United Kingdom.
- **IREECON '83** will be held September 5-9, 1983 in Sydney, Australia. For further information, contact the General Secretary, IREE, P.O. Box N125, Grosvenor Street, Sydney 2000, New South Wales, Australia.
- September 5-9, 1983 are also the dates for the **Sixth European Conference on Circuit Theory and Design.** The conference site is the University of Stuttgart, Stuttgart, West Germany. Contact Dr. E. Gleissner, AEG-Telefunken, Gerberstrasse 34, D-7150 Backnang, West Germany for additional data.
- Peking, China is the site for the **Second International Conference on Lasers,** September 6-9,

1983. Contact Charles P. Wang, The Aerospace Corporation, P.O. Box 92957, Los Angeles, CA 90009 for further information.

- **The 1983 Asian International Electrical, Electronic, and Communications Exhibition** will take place September 6-10, 1983 at the Stadium Negara, Kuala Lumpur, Malaysia. Contact TMAC, 680 Beach Street, Suite 428, San Francisco, CA 94109, (415) 474-3000 for further information.
- The Maui Surf Hotel, Maui, Hawaii is the site for the September 12-14, 1983 **Symposium on VLSI Technology.** For further information, contact Dr. Frank B. Micheletti, Rockwell International, MRDC, Department 550, 135-HA27, 3370 Miraloma Avenue, P.O. Box 3105, Anaheim, CA 92803, (714) 632-4380.
- **Midcon '83** will be held September 13-15, 1983 in Rosemont, Illinois (outside Chicago), at the O'Hare Exposition Center. For further information, contact Kent Keller, Electronic Conventions, Inc., 999 North Sepulveda Blvd., Suite 410, El Segundo, CA 90245, (213) 772-2965 or (800) 421-6816.
- The University of Kent, Canterbury, England is the location for the **13th European Solid State Device Research Conference.** Contact Dr. Clive Jones, Institute of Physics, 47 Belgrave Square, London SW1X 8QX, United Kingdom, tel: 01-235-6111 for additional information on the September 13-16, 1983 meeting.
- **EASCON, the Electronic and Aerospace Systems Convention,** will be held at the Shoreham Dunfey Hotel, Washington, D.C., September 19-21, 1983. Contact Dr. John M. Walker, Westinghouse Electric Corp., Mail Stop 3200, P.O. Box 1521, Baltimore, MD 21203, (301) 765-7491 for more information.
- **The Sixth National Quantum Electronics Conference** will be held September 19-22, 1983 at Sussex University, Brighton, England. Contact Dr. P. L. Knight, Optics Section, Blackett Laboratory, Imperial College, London SW7 2BZ, England, telephone 01 (589) 5111, Extension 2539 for further details.
- The **Sixth International Conference on Digital Satellite Communications** will be held September 19-23, 1983 at the Hyatt Regency Hotel, Phoenix, Arizona. Requests for information should be directed to Howard B. Briley, Comsat, 950 L'Enfant Plaza, S.W., Washington, D.C. 20024, (202) 863-6248.
- **The Ninth European Solid-State Circuits Conference** is scheduled to be held September 20-23, 1983 in Lausanne, Switzerland. Additional information is available from the Secretary, ESSCIRC '83, Vlado Valencic, EPFL-33 Ave. de Cour, CH-1007 Lausanne, Switzerland.
- The **1983 Electrical and Electronics Conference and Exposition** will be held in Toronto, Canada at the Automotive Building of the Canadian National Exhibition, September 26-28, 1983. Contact IEEE Canadian Region Office, 7061 Yonge Street, Thornhill, L3T 2A6, Ontario, Canada, (416) 881-1930 for more details.
- **MAECON—the Mid-American Electronics Conference** is scheduled for September 26-28, 1983 at the Kansas City Convention Center, Kansas City, Missouri. Contact Dale Litherland, Electronic Conventions, Inc., 8110 Airport Boulevard, Los Angeles, CA 90045, (213) 772-2965 for further information.
- Bangalore, India is the site of the October 9-13, 1983 **International Radar Symposium, India—1983.** Additional information can be obtained from N. L. Krishnan, Bharat Electronics Ltd., 29 Race Course Road, Bangalore 560-001, India.
- Bally's Park Place Hotel in Atlantic City, New Jersey is the site of the October 10-14, 1983 **Fiber Optic Communications Exposition.** For additional details, contact Information Gatekeepers, Inc., 167 Corey Road, Brookline, MA 02146, (617) 739-2022.
- **The Second European Conference on Integrated Optics** will be held in Firenze, Italy on October 17-18, 1983. For further details, contact Secretariat ECIO '83, IROE-CNR, Via Panciatichi 64, 50127 Firenze, Italy. Telephone 39-55-4378512.
- The annual meeting of the **Optical Society of America** will be held October 17-21, 1983 in New Orleans, Louisiana. Contact Optical Society of America, 1816 Jefferson Place, N.W., Washington, DC 20036, (202) 223-8130 for additional information.
- The **1983 International Test Conference** will be held October 18-20, 1983 at the Franklin Plaza Hotel in Philadelphia, Pennsylvania. Contact Harry Hayman, P.O. Box 639, Silver Spring, MD 20901, (301) 589-3386.
- The Hotel Pacific, Tokyo, Japan is the site for the **Fifth International Telecommunications Energy Conference, INTELEC '83.** The conference is scheduled to be held October 18-21, 1983. Additional information can be obtained from Mr. K. Yamamura, International Congress Services, Inc., Chikusen Building, Fifth Floor, 2-7-4 Nihombashi, Chuo-ku, Tokyo 103, Japan.
- **ECOC '83,** the **Ninth European Conference on Optical Communication** will take place October 23-26, 1983 in Geneva, Switzerland. Further information can be obtained from H. Melchior, Institute for Applied Physics, Swiss Federal Institute of Technology, 8093 Zurich, Switzerland.
- The **IEEE 1983 International Symposium on Electromagnetic Compatibility** will be held October 24-26, 1983 at the Shoreham Dunfey Hotel, Washington, D.C. Because this will be the Silver Anniversary of the EMC Society, the theme of the symposium will be "A Quarter Century of EMC Progress." Additional details can be received from William G. Duff, Atlantic Research Corporation, 5390 Cherokee Avenue, Alexandria, VA 22314, (703) 642-4049.
- October 25-27, 1983 are the dates for the **1983 IEEE Gallium Arsenide Integrated Circuit Symposium.** The conference will be held at the Ramada Towne House in Phoenix, Arizona. Dr. Thomas M. Reeder, Tektronix, Inc., Mail Stop 50-370, P.O. Box 500, Beaverton, OR 97077, (503) 627-5496 can supply additional information.
- **Forum '83, the 4th World Telecommunication**

Forum, is organized by ITU and will be held October 26-November 1, 1983 in the Conference Center in Geneva, Switzerland. Contact Forum '83 Secretariat, International Telecommunication Union, Place des Nation, CH-1211, Geneva 20, Switzerland for more information.

- **The International Microelectronics Symposium** is scheduled for October 31 to November 2, 1983 at the Philadelphia Civic Center, Philadelphia, Pennsylvania. Contact T. T. Hitch, RCA Research Laboratories, U. S. Route 1, Princeton, NJ 08540, (609) 734-2189 for added information.
- October 31-November 2, 1983 are the scheduled dates for the **1983 Ultrasonics Symposium.** For additional information on the conference, to be held at the Marriott Hotel in Atlanta, Georgia, contact Dr. R. S. Kagiwada, TRW Space and Defense Systems, Building R6, Room 2033, One Space Park, Redondo Beach, CA 90278, (213) 535-5515.
- The **1983 Military Communications Conference (MILCOM '83)** will be held October 31 to November 2, 1983 at the Hyatt Regency-Crystal City in Arlington, Virginia. For further information, contact Charles R. Wolfson, Defense Communications Agency, Washington, DC 20305, (202) 692-2486. Both classified and unclassified papers will be presented.
- **The Fifth Digital Avionics Systems Conference** will be held October 31-November 3, 1983 at the Seattle Sheraton Hotel, Seattle, Washington. Additional details can be obtained from Cary R. Spitzer, Mail Stop 472, NASA Langley Research Center, Hampton, VA 23665, (804) 865-3318.
- The twentieth annual **DoD/Association of Old Crows Electronic Warfare Technical Symposium** will be held November 1-3, 1983 in Virginia Beach, Virginia. Contact the Association of Old Crows, Electronic Defense Association, Arlington, Virginia, (703) 920-1600 for further information.
- November 1-3, 1983 are the dates for **Autotestcon '83,** to be held at the Hyatt Regency Hotel in Fort Worth, Texas. For more information, contact W. T. Beard, General Dynamics Co., Mail Stop 24-65, P.O. Box 748, Fort Worth, TX 76101, (817) 732-4811, extension 4723.
- The Pittsburgh Hilton Hotel, Pittsburgh, Pennsylvania is the site of the November 8-11, 1983 **Magnetism and Magnetic Materials Conference.** Contact Fred E. Werner, Westinghouse R and D Center, 1310 Beulah Road, Pittsburgh, PA 15235, (412) 256-3556 for more information.
- **WESCON, the Western Electric Show and Convention** is scheduled to be held November 8-11, 1983 at the Moscone Convention Center in San Francisco, California. Eileen Algaze, Electronic Conventions, Inc., Suite 410, 999 N. Sepulveda Boulevard, El Segundo, CA 90245, (213) 772-2965 can supply more information.
- **The 1983 National Telesystems Conference (NTC '83)** will be held November 14-16, 1983 at the Cathedral Hill Hotel in San Francisco, California. Walter C. Melton, Stanford Telecommunications, Inc., 1195 Bordeaux Drive, Sunnyvale, CA 94086, (408) 734-5300 can supply further details. The conference theme is Space Systems for the National Well Being and Security.
- November 14-17, 1983 are the dates for the **International Congress on the Applications of Lasers and Electro-Optics,** which will be held in San Francisco, California. The Laser Institute of America, 5151 Monroe Street, Toledo, OH 43623 can supply further information.
- The Mexican Section of Region 9 is sponsoring the **Eleventh International Conference on Electrical and Electronic Engineering—Mexicon '83** from November 23 to 25, 1983 in Cuernavaca, Mexico. Contact Jose A. Tovar, Mexicon '83, Caliacan 115, Col. Hipodromo, 06100 Mexico City, D.F. Mexico for further information.
- The Town and Country Hotel in San Diego, California is the site for the **Global Telecommunication Conference (Globecom '83).** The November 29-December 1, 1983 meeting theme is "World Communications Year—A Time For Planning." Contact Dr. Peter A. Vena, Globecom '83, P. O. Box 81466, San Diego, CA 92138, (714) 457-2340 for more details.
- December 5-6, 1983 are the scheduled dates for the **1983 International Electron Devices Meeting.** The symposium will be held in Washington, DC. Contact Ms. Melissa Widerkehr, Courtesy Associates, 1629 K Street, NW, Washington, DC 20006, (202) 296-8100 for additional data.
- The Kenyatta Conference Centre in Nairobi, Kenya is the site for the **First IEEE Conference for All-Africa,** scheduled for December 7-9, 1983. The focus of Africon '83 will be meeting Africa's short-term needs for electrical technology. For further details, contact R. Mischler, IBM Research Laboratories, 8803 Ruschlikon-ZH, Switzerland.
- December 12-16, 1983 are the dates for the **Sixth International Conference on Lasers and Applications.** The conference will be held in San Francisco, California. Contact Society for Optical and Quantum Electronics, P.O. Box 245, McLean, VA 22101, (703) 241-8909 for additional information.
- **The Eighth Annual International Conference on Infrared and Millimeter-Waves** is scheduled for December 12-17, 1983 at the Doral Hotel, Miami Beach, Florida. Contact Prof. Kenneth J. Button, Massachusetts Institute of Technology, National Magnet Laboratory, Cambridge, MA 02139, (617) 253-5561 for more information.
- The University of Colorado, Boulder, Colorado is the site for the January 11-14, 1984 **National Radio Science Meeting,** sponsored by the U.S. National Committee of the International Union of Radio Science (URSI). For further information, contact S. W. Maley, Department of Electrical Engineering, University of Colorado, Boulder, CO 80309.
- January 16-20, 1984 are the dates for the **URSI Specialist Meeting on Microwave Signatures in Remote Sensing.** The conference will be held in Toulouse, France. Contact either Dr. Erwin Schanda, Universitat Berne, Institute of Applied Physics, Silderstrasse 5, 3012 Berne, Switzer-

land or Dr. Richard K. Moore, Remote Sensing Laboratory, University of Kansas, 2291 Irving Hill Drive-Campus West, Lawrence, KS 66045 for additional information.

- **Southcon '84** is scheduled to be held January 17-19, 1984 at the Orange County Convention Center in Orlando, Florida. Contact Dale Litherland, Electronic Convention, Inc., 8110 Airport Boulevard, Los Angeles, CA 90045, (213) 772-2965 for more information.
- **OFC '84,** the topical **Meeting on Optical Fiber Communication,** is scheduled for January 23-25, 1984 at the Hyatt Regency Hotel in New Orleans, Louisiana. Contact Optical Society of America, 1816 Jefferson Place, N.W., Washington, DC 20036, (202) 223-8130 for further details.
- Haifa, Israel is the site of the **Aviation and Astronautics Conference** scheduled for February 8-9, 1984. For additional details, contact Prof. I. Y. Bar-Itzhack, Department of Aeronautical Engineering, Technion-Israel Institute of Technology, Haifa 32000, Israel.
- The 1984 edition of the **International Solid-State Circuits Conference** will be held February 22-24, at the San Francisco Hilton Hotel, San Francisco, California. For additional information, contact Lewis Winner, 301 Almeria Avenue, Coral Gables, FL 33134, (305) 446-8193.
- Atlanta, Georgia is the site for the March 13-15, 1984 **National Radar Conference—1984.** The conference theme is Radar Technology for the Eighties. Additional information can be obtained from Dr. Edward K. Reedy, Georgia Institute of Technology, Engineering Experimental Station, Radar and Instrumentation Laboratory, Atlanta, GA 30332, (404) 424-9621.
- The third annual **Phoenix Conference on Computers and Communications** will be held March 19-21, 1984 in Phoenix, Arizona. The conference theme is *The Challenge of Change*. For additional information, contact Susan C. Brewer, Honeywell LCPD, Mail Stop Z22, P. O. Box 8000F, Phoenix, AZ 85066.
- The Galt House Hotel in Louisville, Kentucky is the site for **Southeastcon '84,** an April 8-11, 1984 gathering. For additional information, contact Mr. Robert T. Coomes, 1104 Wood Wynd Way, Louisville, KY 40223, (502) 429-1108.
- April 10-12, 1984 are the dates for the **Second International Conference on Metal—Organic Vapor Phase Epitaxy.** For further information, contact Dr. P. A. Houston, University of Sheffield, Department of Electronic and Electrical Engineering, Mappin Street, Sheffield S1 3JD, United Kingdom. Telephone 44(0742)78555.
- **The International Magnetics Conference (INTERMAG)** will be held April 10-13, 1984 at the Hamburg Conference Centre, Hamburg, West Germany. For additional details, contact either Prof. Dr. Walter E. Proebster, IBM Deutschland GmbH, D-3280, B-7030-45, Schoenaicherstrasse 220, 7030 Boeblingen, Federal Republic of Germany, tel. (0) 7031-16-3929 or F. B. Hagedorn, Bell Telephone Laboratories, Room 2-D348, 600 Mountain Avenue, Murray Hill, NJ 07974, (201) 582-6415.
- **The IEEE 1984 National Symposium on Electromagnetic Compatibility** will be held April 24-26, 1984 at the Hyatt Regency Hotel in San Antonio, Texas. Additional information is available from Melvin Johnson, Southwest Research Institute, P.O. Drawer 28510, San Antonio, TX 78284, (512) 684-5111, extension 2009.
- The 1984 edition of the **International Symposium on Circuits and Systems** will take place May 7-10, 1984 at the Queen Elizabeth Hotel, Montreal, Quebec, Canada. Additional information can be obtained from Dr. M. N. S. Swamy, Dean of Engineering, Concordia University, 1455 de Maisonneuve Boulevard West, Montreal, Quebec, H3G 1M8, Canada, (514) 879-5926.
- The RAI Congresscentrum in Amsterdam, The Netherlands is the scheduled site for the May 14-17, 1984 **International Conference on Communications.** Contact Dr. K. Teer, Philips Research Laboratories, 5600-MD Eindhoven, The Netherlands for further details.
- **Electro '84** will be held at the Boston-Sheraton Hotel and the Hynes Auditorium, Boston, Massachusetts. Contact Dale Litherland, Electronic Conventions, Inc., 8110 Airport Boulevard, Los Angeles, CA 90045, (213) 772-2965 for more information on the May 15-17, 1984 conference.
- **The National Aerospace and Electronics Conference (NAECON '84)** will be held May 22-24, 1984 at the Dayton Convention Center, Dayton, Ohio. Contact NAECON '84, 110 East Monument Avenue, Dayton, OH 45402, (513) 223-6266 for further details.
- **THE 1984 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM** is scheduled to be held at the Hyatt Regency Hotel, San Francisco, California, May 30-June 1, 1984. Contact Dr. Stephen F. Adam, Hewlett-Packard Company, 350 West Trimble Road, San Jose, CA 95131, (408) 263-7500, extension 2820 for additional information. The Symposium will be preceded by the **1984 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium.**
- **The Thirteenth International Quantum Electronics Conference** will be held at the Anaheim Convention Center and the Anaheim Marriott Hotel, Anaheim, California, June 18-22, 1984. The Optical Society of America, 1816 Jefferson Place, N.W., Washington, DC 20036, (202) 223-8130 can supply further information.
- June 25-29, 1984 are the dates for the **IEEE International Antennas and Propagation Symposium.** The conference will be held jointly with the USNC/URSI meeting at the Westin Hotel, Copley Place, Boston, Massachusetts. Contact Dr. Allen C. Schell, RADC/EE, Hanscom Air Force Base, MA 01731, (617) 861-3700 for further information.
- The Delft University of Technology, Delft, The Netherlands is the location for the **1984 Conference on Precision Electromagnetic Measurements.** Contact Dr. C. Beekhuizen, Delft University of Technology, Department of Electrical Engineering, Postbox 5031, 2600-GA Delft, The Netherlands, telephone 01 (388) 3071 for further data on the August 20-24, 1984 conference.