IEEE SOCIETY ON MICROWAVE THEORY AND TECHNIQUES

NEWSLETTER

EDITOR: H. J. Kuno

Hughes Aircraft Co., 3100 W. Lomita Blvd., Torrance, California 90509

Number 90, Spring 1978

1978 INTERNATIONAL MICROWAVE SYMPOSIUM "MICROWAVES TODAY AND TOMORROW"

JUNE 27 - 29, 1978

CHATEAU LAURIER HOTEL, OTTOWA, ONTARIO, CANADA

The Steering Committee extends to you a warm welcome to join us in Ottawa, Canada, for the 1978 MTT-S International Microwave Symposium. The meeting will be held at the Chateau Laurier Hotel, located in the heart of Canada's capital city. Three other conferences (CPEM, IMPI, and Bio effects) that will be of interest to the microwave community will be held concurrently during the week of June 26-30, 1978. A convenient registration structure has been arranged whereby registration at the MTT-S Symposium entitles registrants to receive the MTT-S Digest and Session attendance at the other three conferences. The Technical Program for the Symposium contains the traditional areas of technical interest of MTT-S as well as new areas which reflect the evolving nature of microwave technology.

As was the case at the 1977 MTT-S Symposium in San Diego, the MTT-S exhibit will be managed by Horizon-House. Given the additional participation of CPEM and IMPI in the exhibit and the very large response of exhibitors to date, record numbers of exhibitors and exhibit attendees are expected.

Social and Workshop programs have been structured to complement the principal symposium activities and should provide an interesting week in Ottawa for both symposium attendees and spouses.

Attendees are strongly urged to register in advance and to make accommodation reservations as soon as possible if a preference for hotel exists. We look forward to meeting you in Ottawa.

PRESIDENT'S MESSAGE

by H. Sobol

The past year was a very busy and progressive year for MTT-S. Larry Whicker is to be congratulated on doing an excellent job as President and setting a standard that will be difficult to match in the years to come. The current year is one that presents us with a significant number of challenges that MTT-S must face.

One of our continuing problems is the recognition of new technology areas and the implementation of these new areas within our Society. In some areas, such as electro-optics including fiber optics, and bioeffects of electro-magnetic radiation, we will have to work closely with other societies both internal and external to IEEE. We will attack this problem through a new ADCOM committee on New Technologies, headed by our former president, Larry Whicker. Larry is planning this year to start a significant effort in MTT-S on microwave logic, stressing GaAs devices.

Another problem we face each year is on the method we use for election of ADCOM membership. I have asked Charlie Rucker, Chairman of our By-Laws Committee to head a committee that will review our procedures and give consideration to an approach suggested by the Washington Chapter. Our goal is to have a truly representative ADCOM with dedicated hardworking members.

Early statistics indicate a slight drop in our membership. We must analyze these figures and understand the reasons for this and take appropriate actions to correct any problems. The net result of a membership drop ultimately is lower budgets and fewer pages published in our Transactions.

This year our Symposium will be held outside the U.S. in Ottawa. We are looking forward to an outstanding meeting. The steering committee has done an excellent job in organizing the meeting and in achieving a top notch technical program. The association with several conferences held simultaneously and in close proximity to ours promises a super week in Ottawa this June. We look forward to seeing a terrific turnout of our membership.

We have a strong ADCOM team and I look forward to working with them this year. We encourage inputs from our membership, either directly to ADCOM or through your local chapters. This is your organization; the vitality of the operation is directly related to the efforts that the membership produce. We're always ready and willing to listen to you so please speak up.

EDITOR'S NOTES

by H. J. Kuno

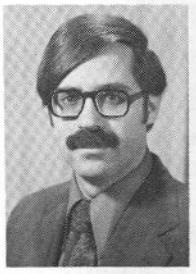
It is the time again for the annual *International* Microwave Symposium.

The field of microwaves indeed does cover the entire world. This international scope of microwaves is evident where one scans the program of the 1978 Microwave Symposium and the recent issues of the MTT–S Transactions. Reflecting the "International" nature of the Microwave theory and Techniques Society, the 1978 Symposium will be held outside the U.S. for the first time.

The Technical Program Committee and the ADCOM meetings were held in Ottawa, in February. In spite of the cold winter and the fact that many members forgot to bring their passports with them, attendance was very high. Excellent programs (both technical and social) are planned. A large exhibit is also expected. In addition, four workshops of timely interest are also planned. I am sure that everyone is anticipating another excellent symposium.

It is the time to meet many members, old and new friends. It is also the time to nominate candidates for the ADCOM. Nominating a candidate (or candidates) of your choice is one way of participating in the MTT-S operation.

We hope to see you and your families in Ottawa.



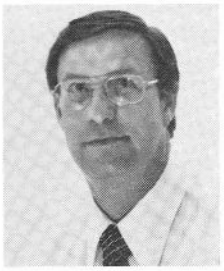
NEW ADCOM MEMBER

Barry E. Spielman

Barry E. Spielman joined the Naval Research Laboratory in 1971. He is currently the head of the Solid State Circuits Section in the Microwave Technology Branch. The activities of this section currently encompass research on: microwave components such as broadband power FET amplifiers, characterization of FET's for nonlinear operation, and analog monothic GaAs circuitry; and, millimeter-wave circuitry involving semiconductor-device mount characterization and solid state sources employing FET's operating nonlinearly. He has done computational analysis and experimental research leading to the development of multi-octave MIC couplers and hybrids; and the characterization of loss, dispersion, and higher order moding in planar transmission media for mm-wave applications.

In his academic career he received the BSEE degree from the Illinois Institute of Technology, Chicago (1964), MSEE degree from Pennsylvania State University, University Park (1967), and PhD degree from Syracuse University, Syracuse, N.Y. (1971).

Dr. Spielman is a member of the IEEE, member of the Editorial Board for the MTTS Transactions, member of MTT-S, past Secretary/Treasurer for the MTTS ADCOM, and past Chairman of the Washington, D.C. MTTS Chapter.



ADCOM HIGHLIGHTS

by D. Parker

The February AdCom meeting was held at the hotel Chateau Laurier in Ottawa Canada. This is the site of the 1978 International MTT Symposium in downtown Ottawa and is adjacent to the Canadian Parliament buildings. This was the first of three AdCom meetings to be held in 1978. Highlights of the meeting included a report on the forth coming symposium in June which promises to be outstanding and the financial report which showed that the MTT Society was very sound financially. The latter is in contrast to just a few years ago when it was necessary to reduce the page budget for the MTT Transactions for lack of adequate funds. Our improved financial position is a result primarily of the last two highly successful symposia, and in part to a higher rate of paid page charges for articles published in the Transactions.

PRESIDENT'S REMARKS – Harold Sobol

The area of communications is becoming very diverse, far reaching, and influential. To coordinate these technical activities within IEEE it has been recommended that a committee be established within TAB. AdCom endorsed this suggestion and H. Sobol will recommend to TAB that W. Cooper be MTT's representative. The IEEE in February 1977 adopted a policy recommending mandatory registration of all engineers as professional engineers in their respective states. D. Damon, Director of Division IV has been appointed chairman of a TAB Committee to work out a plan for implementing this policy. Because of the controversial nature of this issue, in November 1977 TAB voted to hold further implementation in abeyance until Damon's Committee report is completed. H. Sobol appointed an AdHoc committee from AdCom to formulate a position for MTT on professional registration. The committee is composed of D. Parker (Chairman). R. Knerr (Industry), L. Whicker (Government) and G. P. Rodrigue (University). The Committee will report at the June meeting in Ottawa. L. Whicker has also been appointed as the Division IV coordinator of professional activities. Three workshops on professional activities are planned to be held this year, one each in the West, Midwest, and the East. Warren Cooper will recommend an MTT representative for the East Coast workshop and G. Oltman will recommend one for the West Coast. Warren Cooper and Pete Rodrique will be MTT's two candidates for Division IV Director. A new society on the bioeffect of non-ionizing radiation independent of IEEE and IMPI is being formulated. The society hopes to be organized and functioning before the June Symposium in Ottawa. Because this society will tend to concentrate on clinical instrumentation and will attract primarily people who are not microwave engineers, AdCom resolved to support establishment of such a society and to lend assistance as needed.

BY LAWS – Charles Rucker

The Washington chapter has submitted proposed chantes to the MTT Society By-Laws wherein the MTT membership at large would vote for new AdCom members from a slate of candidates nominated by AdCom. Present By-Laws call for the election by Adcom of six members each year for a three year term.

C. Rucker was appointed as chairman of a committee to study the proposed changes and to report at the next meeting. Other members of the committee are W. Cooper, G. Oltman, R. Sparks, B. Spielman, and F. Rosenbaum.

The procedure for selecting symposia sites in the future was also changed. The by-laws were changed so that chapters need only send in a letter proposal to AdCom no later than May 1, 5 years in advance of the Symposium. AdCom will select a site based on these letter proposals. Final proposals will then be submitted no later than 28 months prior to the proposed meeting.

MEETINGS AND SYMPOSIA – K. Button & Harlan Howe

A. L. Van Koughnett reported that 228 papers were submitted and 151 accepted for the Ottawa Symposium. These papers will be presented in four parallel sessions over a three day period. In addition a total of four workshops will be held – two on Monday and three on Friday. These workshops are on:

1. Low-Noise Millimeter-Wave and Submillimeter Wave Receivers

2. Microwave and Millimeter-Wave Solid-State Power Generation

3. Super-Miniaturization of MIC Modules

4. Paramps versus Low-Noise GaAs FET Amplifiers

In addition, on Tuesday evening special sessions on Applications of High-Speed Logic for Digital Microwave Systems and Applications of Millimeter-Wave and Optical/IR Technologies will be held. Thus far 80 exhibitors have

requested booth space at the Symposium. Ottawa is the place to be the last week of June 1978. The 1979 Symposium will be held in Orlando, Florida and the steering committee is active and arrangements are moving along well. K. Button announced that the 4th International Conference on submillimeter waves will be held December 10 through 15, 1979 at the Americana in Miami Beach. It is planned to hold this conference annually in the future and it is hoped to be able to publish selected papers from the conference in a special issue of the MTT Transactions each year.

NEWSLETTER – J. Kuno

J. Kuno plans to publish three Newsletters this Year – one following each AdCom meeting in the spring, summer, and late fall. John said he would accept advertising in the Newsletter. He will also publish Institutional Listings in the Newsletter if they are in the Transactions.

TRANSACTIONS – Lamar Allen

A page budget of 1100 pages was approved for 1978. In 1977 page changes were paid or committed to be paid for 704 pages of the 1100 published. G. Oltman reported that the 25 yr Cumulative Index planned as a 13th Special Issue in 1978 will not be ready until April 1979 because of the extra time required to compile all the information. This index will cover the first issue through the December 1978 issue and is being made available to the 1977 membership at no extra cost. Other future Special Issues include

High Power Microwaves, May 1978

Microwaves in Medicine, August 1978

Microwaves and Millimeter-Wave Integrated Circuits, October 1978

1978 Symposium Special Issue, December 1978

Solid State Microwave and Millimeter Wave Power

Generation and Modulation

NEW TECHNOLOGY – L. Whicker, F. Rosenbaum

High speed logic devices and circuits has been selected as a new technical field that MTT AdCom intends to push and encourage beginning in 1978. We intend to organize either short courses or workshops if not a special conference where workers in this field can exchange ideas. This appears to be a rapidly developing new field for microwave engineers.

CHAPTER ACTIVITIES – R. Sparks

This year's national lecturer is John Osepchuk, who is lecturing on the biological effects of microwave microwave radiation. He is well booked by most of the larger chapter and has had good attendance. Charles Lechti of Hewlett Packard has been selected as the 1978–79 National Lecturer. He will be speaking on Advances in Microwave GaAs FET's with emphasis on practical applications.

R. Sparks indicated that MTT membership was down about 700 members. The membership dips in the early part of the year and usually picks up during the year. However MTT did not experience the total increase in enrollment as in the past. The cause for this is not known as yet. The membership committee is planning to provide help to the chapter chairmen by proving suggested programs for chapter meetings, possible lecture series, and aid in sponsoring symposia. The membership committee would appreciate feedback from the chapters. Especially a report or record of their meetings and some of their accomplishments.

The next AdCom Meeting will be held on June 26 in Ottawa preceding the symposium.

CHAPTER ACTIVITIES

by Dick Sparks

Ottawa Canada is Symposium City the week of June 26 – 30, 1978 with four microwave related technical conferences scheduled including the International Microwave Symposium. The advance Program for the MTT–S Symposium indicates nearly every topic of current interest is covered either in one of the four parallel sessions running daily or the workshops which precede and follow the conference.

The Symposium is the time of the year that the MTT–S ADCOM looks forward to having present at its meeting a maximum number of Chapter Officers or representatives also. The regular ADCOM meeting this year in Ottawa will begin at 8:30 AM on Monday June 26 at the Chateau Laurier Hotel. Following the precedent established last year, there is a Chapter Chairman's dinner schedule for 6:30 PM. This will be followed by the annual Chapter Chairman's meeting beginning at 8:00 PM at which time the status of the years activities in the chapters will be reviewed. Plan to be present to give your report and get some new ideas from the other Chairmen.

Membership in the Society recently has taken a significant drop and the reasons for this are not yet clear. Glen Thoren, our Membership Chairman, has expressed his views on the matter elsewhere in this issue of the Newsletter. We will be discussing this subject further at the Symposium and I would welcome any thoughts you may have as to the causes for membership decline and what steps can be taken to make the MTT Society better serve its members.

MEMBERSHIP NEWS

by Glen Thoren

It may be a sign of the times. I hope not.

Membership figures indicate a sharp decline in 1977. The Microwave Theory and Techniques Society has suffered one of the greatest membership declines in the IEEE. Of the thirty (30) Groups and Societies in the IEEE, only four (4) fell victim to membership decreases. While the IEEE gained 18% in membership MTT-S *lost* close to 9%. Division IV which includes Antennas and Propagation, Electron Devices, Sonics and Ultrasonics, Magnetics, Quantum Electronics, and others was the only Division to lose members. After this sobering news, the question is: *What can be done*?

The MTT-S ADCOM has been made fully aware of the need for the more active membership programs and dissemination of information. Direct contact with industries and universities is a must. The ADCOM members will become more directly involved with Chapter interaction on behalf of membership in the upcoming months.

The burden also rests with you! If you are reading this article, you most likely belong to MTT-S. Why don't you encourage a colleague to participate in the activities of the Society. It may have been said before but I'll risk repetition. "You only get out of Microwave Theory and Techniques Society in proportion to your input". Strong support by membership builds a strong Society.

Now the good news. The most successful Symposium in the history of MTT-S was held last June in San Diego, Twenty eight chapters were represented in the replies to the Membership Committee Membership Survey. Many opinions were expressed in the survey. The MTT-S should provide career guidance to the students in local colleges and universities. The potential opportunities of a career in "microwaves" can be presented in technical or topical lectures on campus.

The respondents felt strongly that members can be recruited from industry, the universities and government. The best method of contact is a one on one discussion with potential members. The effect of membership information at MTT-S lectures must be backed up by a concentrated membership campaign at the chapter level. The most serious concern that became obvious is the lack of an active, definitive, membership campaign by the local chapters. This can be remedied only with the dedication of present members, the leadership of the Chapter Chairman and the active support of the MTT-S ADCOM.

There is a lot to think about. But most important –

LET'S ACT NOW!!!

CALL FOR NOMINATIONS TO ADMINISTRATIVE COMMITTEE

by J. C. Aukland

All MTT members should note that they may assist the Nominations Subcommittee in obtaining nominees for the 1979 ADCOM member election. MTT members may enter a MTT society member's name as a nominee, by mailing a petition for that nominee with 25 society members' signature to me, or the ADCOM President, prior to our annual meeting, (usually in September).

The bylaws of MTT-S states that the Nominations Subcommittee should select a slate of *at least two* members of the Society for each vacancy which occurs on the Administrative Committee on January 7 of each year. Each nominee is contacted to assure his willingness to serve and his ability to attend ADCOM meetings. Nominees by the Nominations Subcommittee are selected by the principles of efficiency, geographical, and organizational distribution. Elections of the nominees are made by members of ADCOM not eligible for re-election at that time.

This year, we will elect six (6) members to our ADCOM. The Hold-over members are divided geographically as follows: East (7), Central (2), Southeast (2), Pacific (4).

Incumbents who may stand for re-election are geographically located as follows: Eastern (3), Central (1), and Pacific (2).

It may also be of interest to consider that the present ADCOM is composed of thirteen (13) members from industry, five (5) members from universities and non-profit organizations, and three (3) members from government agencies.

History of MTT

by Ted Saad

ADCOM V — July 1, 1956 through June 30, 1957

ADMINISTRATIVE COMMITTEE:

H. F. Engelmann, Chairman
W. L. Pritchard, Vice-Chairman
S. D. Robertson/Bob Wengenroth, Secretary-Treasurer

R. E. Beam	T. S. Saad
A. G. Clavier	Harold Schutz
S. B. Cohn	R. F. Schwartz
C. W. Curtis	G. C. Southworth
D. D. King	K. Tomiyasu
Henry Magnuski	Ernest Wantuch
W. W. Mumford	H. A. Wheeler
A. A. Oliner	J. R. Whinnery

Herb Engelmann was Chairman of the fifth AdCom, Bill Pritchard was Vice-Chairman and Bob Wengenroth was Secretary-Treasurer. The financial condition of the group remained moderately stable with a net worth of about $4,000 at the beginning of the AdCom term. Membership in August of 1956 had climbed to 3,067, placing the group fifth in the IRE. Publications were coming along smoothly. Papers were available for the Transactions and the newsletter was issued three times that year. Kiyo Tomiyasu was appointed editor of the Transactions.

All during the early period of the group concept there were many proposals for merging professional groups. At times, it was felt that there might be justification in combining Communication Systems, Electron Devices and Microwave in the Microwave Group. There was also some talk about combining Electron Devices, Antennas and Propogation and the Microwave Group.

In one of the early meetings of the AdCom, it was agreed that the P-GMTT hold an annual meeting. It was decided that the subject for the 1956 annual meeting would be microwave ferrites and it was agreed that the meeting would be held in New York City sometime early in December 1956 or late January 1957. It was felt that a two day meeting would be sufficient to cover the subject properly.

During the year, it was agreed that P-GMTT would be involved in the NEREM meeting in Boston. Also, there was an effort made to interest other IRE sections in the matter of organizing P-GMTT local Chapters. The changing of editors took place with the third issue of the Transactions for that year. There was still a great deal of interest in foreign distribution of the Transactions and Dr. Oliner was busy on an investigation of such a possibility. The group was also involved in the IRE convention of that year.

The annual meeting of the group was finally set for May 9 and 10, 1957 at the Western Union auditorium in New York. The theme of the meeting was microwave ferrites, with emphasis on applications and devices. Tore Andersen was the Chairman of that first annual meeting. During an AdCom meeting that year, the first proposal for an affiliate professional group membership was made. The AdCom itself had no opinion on the proposal, but the IRE insisted on going ahead and the AdCom felt it should go along with the idea. It was eventually announced that the IRE had instituted an affiliate membership plan and that all professional groups would be involved. Although the idea seemed basically sound, it never proved to be of sufficient value to MTT in comparison to other groups.

In March of 1957, the AdCom had it's first meeting during the IRE convention. This became an annual event. Although much business was transacted during the March meeting, it was, nevertheless, an opportunity to relax over lunch and to meet with AdCom members who were not able to attend all of the other meetings.

Because of the increased expenses of the group and because of the large amount of material being published both in the Transactions and the Newsletter, the group assessment was increased from $2.00 to $3.00 per member at the December 5, 1956 meeting. Another significant fact was brought to light on December 18, 1956 in a letter from Dr. Baker stating that the IRE policy on advertising in the Transactions was changed. IRE decided that advertising space in the Transactions would be allowed at rates twice those of the Proceedings. The AdCom in a meeting on January 17, 1957, voted to accept a limited amount of advertising for the MTT Transactions. With the increase in assessment, and the possible income from advertising, it appeared that no reduction in publications for economy purposes would be necessary.

The affiliate plan was put into motion. Under this plan, P-GMTT would admit to affiliate membership in the group those members of the American Physical Society who would qualify. To qualify, the APS member must be interested in microwaves and must not have been an IRE member for at least five years. The fee was $7.50 which included the $3.00 group assessment. It was expected that this affiliate membership would benefit both the present group members and the new affiliates. The idea behind the affiliate membership was to eliminate the necessity for them to join the IRE and pay the total dues of IRE membership. During the December 5, 1956 meeting, the annual award of P-GMTT was officially named the Microwave Prize and rules were voted for the annual selection. This work was done under the Chairmanship of Harold A. Wheeler, who was Chairman of the Awards committee at the time.

By increasing it's assessment and by adding the possibility of advertising income, the financial position of the AdCom was assured, at least for the immediate future. Despite that assurance, the treasurer's balance on May 31,

1957 was $59.00. Membership at the end of the AdCom term was approximately 3,600. There were fifteen chapters, most of them active. However, there were still geographical areas throughout the IRE where new local chapters could be formed.

As it had in the past, the group co-sponsored a portion of the URSI meeting. During the year, the discussions on an annual meeting began to crystallize and it was considered at least at one of the meetings that possible locations for the next annual meeting should be seriously considered, and among the possibilities were Boston, Philadelphia, and the West Coast. It was agreed however, that considerable local support would be required for meetings that were not held in the New York area, but as it so often happens, action was left to the incoming Chairman. It was agreed that, on the basis of contacts made by Dr. A. A. Oliner with European universities, fourteen university presidents, who had indicated an interest in receiving the Transactions, would begin receiving the Transactions for one year starting with the July 1957 issue, subject to renewal at the end of the year at the discretion of the AdCom.

IN MEMORY

Herman N. Chait
Fellow IEEE

Several years ago, when Herman N. Chait was at the Guam Tracking Station, word of his election as a Fellow of the Institute of Electrical and Electronic Engineers (IEEE) came over a microwave relay link he was manning. "The news came through over a particularly noisy communication and was a complete surprise to me," he recalled. "It was also one of the highlights of my career!"

The grade of Fellow is IEEE's highest attainable rank. Chait, holder of a number of patents on various antennas, was selected for the honor because he is one of the inventors of the microwave isolator and junction circulator. He was co-recipient of the Microwave Prize from P-GMTT of IEEE in 1956, and three years later received the RESA Sigma Xi Award in Applied Science from the Naval Research Laboratory in Washington, D.C.

A member of IEEE for 22 years, Chait joined the Aerospace Corp. in November 1963 as a staff engineer in Larry Hirschl's telecommunications and tracking department.

He was involved in the design, installation and checkout of spacecraft and ground station antenna systems. "I find it gratifying to carry through a job from birth to launch, or sell-off to the Air Force," said Chait.

Prior to joining Aerospace, he spent almost five years as vice president and technical director of the Cascade Research Division of Monogram Industries in Los Angeles, and 14 years with the Naval Research Lab as a civilian electronic scientist doing basic and applied research. He spent three years in the U.S. Navy as an electronic technician.

Chait graduated from high school in Boston (his home town) in 1941 and entered Northeastern University with a major in electrical engineering. While in the Navy, he received his B.S.E.E. degree in 1945 from Tufts University, and later completed the Navy's electronic technician's program in Chicago. He had also done graduate work at the University of Maryland.

Herman Chait passed away on January 7, 1978.

George E. Schafer
Sr. Member IEEE

Dr. George E. Schafer, 55, the chief scientist and technical director of the Electronic Proving Ground at Fort Huachuca, passed away on March 3, 1978.

Schafer had held the position since April 1970. Born in Lincoln, Neb., Schafer earned his bachelor's degree from Macalester College in St. Paul, Minn. in 1943; his master's degree from the University of Minnesota in Minneapolis in 1949 and his doctorate in physics from the University of Colorado in Boulder in 1958.

He was an Air Force Weather officer from 1943 to 1946 and then taught physics from 1948 to 1950 at Southern Methodist University in Dallas, Texas and at Nebraska State Teachers College in Chadron.

He joined the National Bureau of Standards in 1951 and became associated with what is now known as the Institute for Basic Standards in 1952. He became chief of the Radio Standards Engineering Division in 1962, assistant to the deputy director for radio standards in 1966 and chief of the Microwave Circuit Standards Section in 1969.

He had published numerous articles in the field of microwave measurements, and was visiting professor of electrical engineering at North Carolina State College in Raleigh from 1961 to 1962.

He received the Department of Commerce silver medal award for his contributions to radio standards and was selected as a first-year participant in the Department of Commerce Science and Technology Fellowship Program.

Schafer was a member of the American Physical Society, the U.S. Commission of International Scientific Radio Union, and was a senior member of the IEEE and its groups on microwave theory and techniques and on instrumentation and measurement.

REPORT OF THE DIRECTOR, DIVISION IV

Number 4, March 14, 1978

by Dick Damon

The first 1978 meetings of most of the IEEE major Boards and the Board of Directors were held in February. I'll try to summarize some of the more significant results and seek your opinion on issues which are still under discussion.

The Board of Directors met on Sunday and Monday, February 19–20; some of the actions taken are as follows:

- Nominated Jerry Suran and Leo Young as candidates for 1979 President and Executive Vice President, respectively. It was also reported that Irwin Feerst has announced his intention to seek signatures for his petition candidacy as 1979 President.

- Elected the members of the Nominations and Appointments Committee for the period April 1, 1978 to March 31, 1979. This committee is responsible, among other duties, for recommending to the Board of Directors "a list of candidates to fill vacancies expected to exist among the chairmen, members and consultants to all Standing Committees for the ensuing year . . ." (Bylaw 311.7). There are many important and interesting positions to be filled. I am a member of the N&A Committee for the coming year and solicit your recommendations.

- Approved procedures to implement the IEEE Policy on Ethical Conduct, which includes discipline of a member who violates the Code of Ethics, and support for a member placed in jeopardy for adherence to the Code of Ethics. A Member Conduct Committee has been appointed to deal with these issues.

- Approved a Bylaw change to allow Chapters to have their own treasury and bank accounts, and to retain funds received from Societies/Groups or from programs they sponsor. The Section, Region and Institute will continue to have oversight of all Chapter funds including auditing, accounting and reporting.

- Defeated a proposed Constitutional amendment to establish the office of President-Elect/Executive Vice President.

- The Treasurer reported, in a pre-audit financial statement, that the Institute ended the year with a surplus. The Groups/Societies of Division IV had a 1977 net surplus of $269.3K against actual 1977 total expenses of $1249.5K, and none of the Groups/Societies of Division IV had a deficit for the year. The reserves of the G/S in Division IV are generally in good shape.

The TAB OpCom meeting was held on Thursday, February 16 and the TAB meeting on Thursday evening and Friday, February 17. Some of the topics were also on the BoD agenda, discussed above. Additional items included:

- Discussion of a Revised Charter for the Energy Committee.

- Approval of the transfer of the Research and Development Committee and Communications Policy Committee from TAB to USAB. Neither of these had been implemented within TAB and it was concluded that their proposed roles were better conducted within USAB. USAB is in the process of establishing a Committee on Discovery and Innovation in Electro-Technology and a Committee on Telecommunications Policy.

- Discussion of the issues involved in the publication of Standards in Transactions, in addition to the regular publications by the Standards Board.

On Friday evening, I attended a workshop for the newly-appointed Divisional PAC Coordinators. I have appointed Dr. Larry Whicker, 1977 MTT-S President, as Division IV PAC Coordinator, and encourage each G/S to work with Larry in this area.

The issue of engineering registration was discussed at this meeting, as well as at the USAB meeting which I attended on Sunday evening and at a meeting of the BoD with the Florida Council on Saturday evening. While on this subject, and to bring you up to date, the Ad Hoc Committee on Registration met on January 5 and again on March 10–11. It appears that we have agreed on a revised Policy on Registration to be submitted to the major Boards and the Board of Directors for their May meetings. Appropriate documentation is being prepared and I will keep you all informed as rapidly as feasible.

The Audit Committee met on Saturday, February 18. Among other topics, revised Policies on Electioneering were recommended and subsequently approved by the Board of Directors. These have since been mailed to all G/S Presidents and Newsletter Editors, so there is no need to describe them here. As Chairman of the Audit Committee, I will be pleased to hear your suggestions for any further revisions which may appear useful as we implement these Policies.

The Division IV Nominating Committee has considered an excellent slate of potential candidates and nominated Dr. L. K. (Larry) Anderson and Dr. G. P. (Pete) Rodrigue as candidates for the position of Director, Division IV for 1979-1980. Their names will appear on the 1978 ballot. I've known both Pete and Larry for many years and have the highest regard for their technical competence, personal integrity and dedication to IEEE. I'm delighted that Division IV will be represented by one of these two outstanding members. I can only urge you to vote for your choice in the 1978 election.

MTT WAVEGUIDE STANDARDS COMMITTEE NEEDS YOUR HELP

The Waveguide Standards Committee is forming a subcommittee to produce a new standard on TERMS FOR NON-LINEAR AND ACTIVE WAVEGUIDE COMPONENTS. Like the U.S. Marines, we are looking for "a few good men" to help collect and produce definitions which will eventually become part of the IEEE Standard Dictionary of Electrical and Electronics Terms.

This new standard will be devoted to terms for waveguide components including:

- ATR and TR tubes
- Ferrite circulators, isolators, & phase shifters
- Limiters
- Mixers, upconverters, and down converters
- Masers and parametric amplifiers
- Klystron, magnetron, TWT and cross-field amplifiers
- Backward wave oscillators

If you can help, please fill out the following and send to the chairman of the Waveguide Standards Committee, Hal Schrank:

( ) I would like to serve on the subcommittee

( ) I suggest _____ for the subcommittee

( ) I can't join the subcommittee but can review and/or contribute definitions related to

_____

( ) I can't join the subcommittee but enclose some existing definitions for consideration

Name _____

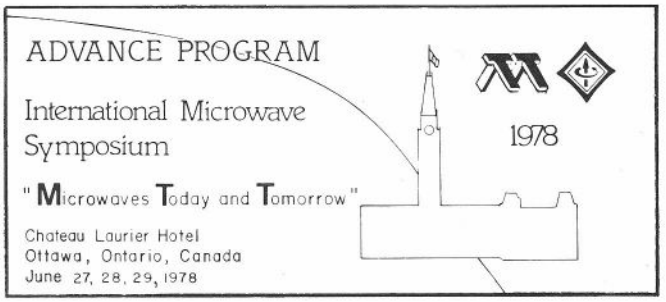
Address _____

_____

Phone _____

Please send to: Helmut E. Schrank
Westinghouse Electric Corporation
P.O. Box 746, MS-333
Baltimore, MD 21203

Or call: (301) 765-2973



by Willem Steenaart

On February 20th the Technical Program Committee met in Ottawa's Chateau Laurier Hotel to complete the Technical Program for the 1978 Symposium. There will be 23 sessions, and 3 panel sessions. A total of 158 papers will be presented. Additionally there will be two workshops presented on the Monday preceding the Symposium and two workshops on the Friday after.

I would like to take this opportunity to thank all TPC members and the organizers of panels and workshops for their efforts. I am sure that we will have an excellent program.

We hope to see at least as many MTT members and sympathisers in Ottawa as there were last year in San Diego.

TECHNICAL PROGRAM COMMITTEE

FEBRUARY 1978, OTTAWA

STANDING, LEFT TO RIGHT:

Ken Button, John Kuno, Bill Steenaart, C. R. Boyd, Wolfgang Hoefer, Toshiaki Irie

SITTING, LEFT TO RIGHT:

Martin Schneider, Bert Berson, Lester Eastman, George Haddad

STANDING, LEFT TO RIGHT:

Tatsuo Itoh, H. Okean, Garlan Yip, Al Wexler, Ernie Komarek, Jacques Legendre, Bob Beatty

SITTING, LEFT TO RIGHT:

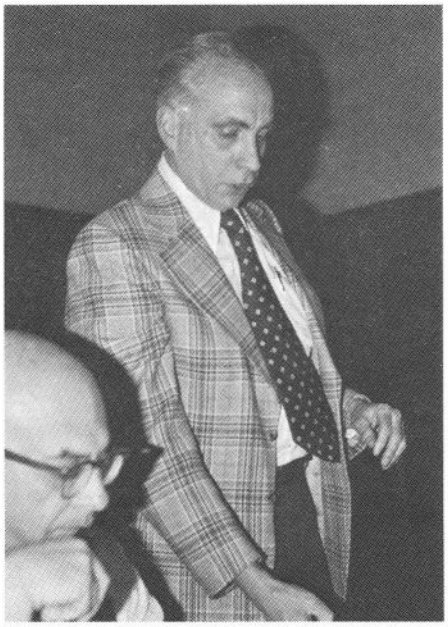
Jim Whelehan, John Bandler, Peter Silvester, Don Chambers

STANDING, LEFT TO RIGHT:

Barry Spielman, Guy Painchaud, Martin Caulton, Ted Saad, Ralph Levy, Chandra Kudsia

SITTING, LEFT TO RIGHT:

Clinton Hartman, Reinhard Knerr, Leo Young, Harry Goldie



BILL STEENAART, TECHNICAL PROGRAM CHAIRMAN, PRESENTING THE PLAN TO ADCOM.

A. L. VAN KOUGHNETT, STEERING COMMITTEE CHAIRMAN, REVIEWING THE STATUS OF THE SYMPOSIUM TO THE ADCOM.

DISCUSSION IN PROGRESS AT ADCOM MEETING

SELECTING PAPERS AT TCP MEETING.

RENE' DOUVILLE AND BERT BERSON ARRANGING A WORKSHOP.

1:00 A.M. TORONTO AIRPORT, BOB HICKS AND HAL SOBOL MISS A FLIGHT CONNECTION TO TCP AND ADCOM MEETINGS

1977 MTTS INTERNATIONAL MICROWAVE SYMPOSIUM

TUESDAY MORNING JUNE 27, 1978

Adam Room (A)

MICROWAVE QUO VADIS

Chairman: H. Sobol, Rockwell Int'l
Organizer: L. Young, NRL

0840 A1.1 "PLANNING ELECTRONICS DEVELOPMENTS FOR INDUSTRY"
C. Phipps, T.I.

0905 A1.2 "PLANNING MICROWAVE DEVICE RESEARCH AND DEVELOPMENT FOR DEFENCE"
L. Young, NRL, L. Weisberg, Off. Underscy. Def. R&E

0930 A1.3 "COMMUNICATIONS FOR A MOBILE SOCIETY: IMPLICATION OF DEVELOPMENTS AT 900 MHZ"
R. Bowers, Cornell Univ.

0955 A1.4 "MICROWAVE DEVICES IN JAPAN"
T. Irie, NEC, Japan

MacDonald-Cartier Room (B)

FINLINE AND MILLIMETER-WAVE COMPONENTS

Chairman & Organizer: M. Caulton, RCA

1030 B1.1 "NEW INTEGRATED MILLIMETER-WAVE COMPONENTS USING FIN-LINES"
H. Hofmann, H. Mainel, B. Adelsek, AEG-Telefunken, Germany

1050 B1.2 "AN X-BAND BALANCED FIN-LINE MIXER"
G. Begemenn, K. Schuenemann, Univ. of Braunschweig, Germany

1110 B1.3 "ADVANCES IN E-PLANE PRINTED MILLIMETER-
L. D. Cohen, P. J. Meier, AIL-Cutler Hammer

1130 B1.4 "SIMULATION STUDY OF ELECTRONICALLY VARIABLE ANTENNAS AND TUNABLE FILTERS INTEGRATED IN A QUASI-PLANAR WAVEGUIDE"
T. Itoh, A. S. Herbert, Univ. of Kentucky

Renaissance Room (C)

PANEL SESSION

1030 "STABILIZATION OF FUNDAMENTAL FREQUENCY OSCILLATORS FOR COMMUNICATIONS APPLICATIONS"
Moderator and Organizer: F. Ivanek, Farinon Electric

Convention Hall (D)

FILTERS AND PASSIVE COMPONENTS

Chairman: J. D. Rhodes, Univ. of Leeds
Organizer: R. Levy, MDL

1030 D1.1 "AN ALIGNMENT TECHNIQUE FOR MULTIPLE BALL YIG BANDPASS FILTERS OPERATING OVER MULTI-OCTAVE FREQUENCY BANDS"
M. Cohen, Loral Electronic Systems

1050 D1.2 "14-GHZ MIC 16-NS DELAY FILTER FOR DIFFERENTIALLY COHERENT QPSK REGENERATIVE REPEATER"
Y. S. Lee, COMSAT Labs.

1110 D1.3 "IMPROVEMENT OF PERFORMANCE OF MICROSTRIP STRUCTURES BY EQUALIZATION OF PHASE VELOCITIES"
A. Ros, D. Pompei, F. C. De Ronde, Lab. d'Electronique, Nice, France

1130 D1.4 "A MATCHED COAXIAL-RADIAL TRANSMISSION LINE JUNCTION"
R. C. Allison, R. L. Eisenhart, P. T. Greiling, Hughes

TUESDAY AFTERNOON, JUNE 27, 1978

Adam Room (A)

DIGITAL MICROWAVE SYSTEMS

Chairman: G. Chao, Tectronix
Organizer: P. Greiling, Hughes

1330 A2.1 "APPLICATIONS OF GIGABIT LOGIC" INVITED PAPER
L. Micheel, G. Rabanus, WPAFB

1350 A2.2 "A MULTI-GIGABIT SIGNAL PROCESSING SYSTEM"
C. Ryan, Michigan Tech. Univ.

1410 A2.3 "MICROWAVE GaAs FET SWITCHING"
R. A. Gaspan, H. H. Yee, Hughes

1430 A2.4 "1.6 Gb/s 16-LEVEL SUPERPOSED APSK MODEM WITH BASEBAND SIGNAL PROCESSING COHERENT DEMODULATION"
M. Washio, N. Komiyama, Y. Takimoto, T. Shimamura, NEL, Japan

BREAK – 1450–1520

1520 A2.5 "AN INTEGRATED DPSK DEMODULATOR FOR 14 FHz SATELLITE COMMUNICATIONS APPLICATIONS"
W. Childs, C. E. Mahle, COMSAT Labs.

1540 A2.6 "DIGITAL SATELLITE COMMUNICATION SYSTEMS, COMPONENTS AND LIMITATIONS"
C. L. Cuccia, Ford Aerospace

1600 A2.7 "6 GHz, 5W GaAs FET POWER AMPLIFIER FOR 78 M BITS/S 8-PHASE PSK SIGNAL TRANSMISSION"
Y. Saito, S. Fukada, I. Haga, NEC, Japan

1620 A2.8 "A LOGIC MODULE USING TRANSFERRED-ELECTRON LOGIC DEVICES FOR TIME-OF-ARRIVAL DETERMINATION OF GHz SIGNALS"
W. R. Curtice, RCA

MacDonald-Cartier Room (B)

COMPUTER-AIDED DESIGN

Chairman & Organizer: J. W. Bandler
McMaster Univ.

1330 B2.1 "A NETWORK REDUCTION TECHNIQUE FOR MICROSTRIP THREE-DIMENSIONAL PROBLEMS"
C. L. Chao, TRW

1350 B2.2 "GENERALIZED SPECTRAL DOMAIN METHOD FOR MULTI-CONDUCTOR PRINTED LINES AND ITS APPLICATION TO TUNABLE SUSPENDED MICROSTRIPS"
T. Itoh, D. Radcliffe, A. S. Herbert, Univ. of Kentucky

1410 B2.3 "NEW RESULTS IN NETWORK SIMULATION, SENSITIVITY AND TOLERANCE ANALYSIS FOR CASCADED STRUCTURES"
J. W. Bandler, M. R. M. Rizk, H. L. Abdel-Malek, McMaster Univ.

1430 B2.4 "EXACT CALCULATION OF THE UNCERTAINTY ON THE INPUT REFLECTION COEFFICIENT OF ARBITRARY TWO-PARTS DUE TO MISMATCHES AND ARBITRARY REFERENCE PLANES"
H. Tromp. Ghent Univ., Belgium

BREAK – 1450–1520

1520 B2.5 "DEVICE-CIRCUIT INTERACTION SIMULATION OF A TRAPATT AMPLIFIER"
R. K. Mains, M. A. Masnari, G. I. Haddad, Univ. of Michigan

1540 B2.6 "COMPUTER-AIDED DESIGN OF HIGHLY LINEAR, HIGH-POWER VARACTOR-TUNED FREQUENCY MODULATORS"
E. Marazzi, B. Rizzoli, Univ. of Bologna, Italy

1600 B2.7 "EVALUATION OF SUPER-TSD NETWORK ANALYZER CALIBRATION PROGRAMS BY COMPUTER SIMULATION"
R. A. Speciale, NBS

2000 PANEL SESSION: "APPLICATIONS OF MILLIMETER-
2200 WAVE AND OPTICAL/IR TECHNOLOGIES"
Moderator: L. Young, NRL
Organizer: P. S. Meier, AIL

Renaissance Room (C)

FERRITE DEVICES

Chairman & Organizer: C. R. Boyd, Hughes

1330 C2.1 "NON-RECIPROCAL FERRITE PHASE SHIFTERS FOR MILLIMETER APPLICATIONS"
R. A. Stern, R. W. Babbitt, USAETDL

1350 C2.2 "NEW CONFIGURATIONS OF THE NONRECIPROCAL FERRITE PHASE SHIFTER"
A. Mizobuchi, H. Kurebayashi, Mitsubishi, Japan

1410 C2.3 "RELIABILITY EVALUATION OF THE RARF FERRITE PHASE SHIFTER"
G. A. Lindauer, Emerson Electric

BREAK – 1430–1500

1500 C2.4 "LOW LOSS, HIGH POWER LATCHING WAVEGUIDE SWITCH"
W. S. Piotrowski, J. E. Raue, TRW

1520 C2.5 "SLIM-GUIDE CIRCULATORS IN C, X, K AND U BANDS"
A. D'Ambrosio, GTE, Italy

1540 C2.6 "YIG RESONATOR CIRCUIT WITH ISOLATOR PROPERTY AND ITS APPLICATION TO GUNN DIODE OSCILLATORS"
F. Okada, K. Ohwi, Y. Yokachi, National Defence Academy, Japan

2000 PANEL SESSION: "APPLICATION OF HIGH-SPEED
2200 INTEGRATED CIRCUITS FOR DIGITAL MICRO-WAVE SYSTEMS"
Moderator: M. Yoder, ONR
Organizer: P. T. Greiling, Hughes

Convention Hall (D)

FIBER AND INTEGRATED OPTICS

Chairman: G. L. Yip, McGill Univ.
Organizer: D. B. Anderson, Rockwell Int'l

1330 D2.1 "OPTICAL FIBER COMMUNICATION AND INTE-GRATED OPTIC" – Invited Paper
E. A. J. Marcatili, Bell Labs

1350 D2.2 "REVIEW OF TECHNIQUES FOR PROPAGATION IN SLAB AND FIBER WAVEGUIDES" – Invited Paper
L. B. Felsen, PINY

1410 D2.3 "SCATTERING FROM AN ARBITRARILY-LOCATED OFF-AXIS INHOMOGENEITY IN A STEP-INDEX OPTICAL FIBERS"
A. Safaai-Jazi, F. L. Yip, McGill Univ.

1430 D2.4 "QUANTITATIVE MODE ANALYSIS IN OPTICAL FIBERS"
H. Shigesawa, K. Takaima, Doshisha Univ., Japan

BREAK – 1450–1520

1520 D2.5 "SCATTERING CHARACTERISTICS OF A BEAM MODE IN DIELECTRIC-SLAB OPTICAL WAVEGUIDE"
M. Imai, S. Miyanaga, T. Asakura, Hokkaido Univ., Japan

1540 D2.6 "RESONANT CHARACTERISTICS OF DIELECTRIC RESONATORS FOR MILLIMETER-WAVE INTEGRATED CIRCUITS"
T. Itoh, C. Chang, Univ. of Kentucky

1600 D2.7 "LARGE BANDWIDTH OPTICAL MODULATORS UTILIZING MILLIMETER WAVELENGTH DRIVERS"
A. E. Popa, T. K. Plant, Hughes

1620 D2.8 "LASER DIODE CHARACTERIZATION FOR MULTI-CHANNEL APPLICATIONS"
C. S. Kim, G.E.

WEDNESDAY MORNING, JUNE 28, 1978

Adam Room (A)

MICROWAVE GaAs FET's

Chairman: F. Hasagawa, NEC, Japan
Organizer: L. J. Eastman, Cornell Univ.

0830 A3.1 "A LOW NOISE SINGLE ENDED GaAs SCHOTKY FET AMPLIFIER FOR A 14 GHz SATELLITE COM-MUNICATION APPLICATION"
P. Estabrock, C. M. Krowne, E. J. Crescenzi, Jr., Watkins-Johnson Intl.

0850 A3.2 "A TECHNIQUE FOR PREDICTING LARGE SIGNAL PERFORMANCE OF A GaAs MESFET"
H. A. Willing, C. Rauscher, NRL

0910 A3.3 "A STUDY OF THIRD ORDER INTERMODULATION DISTORTION PRODUCTS OF GaAs POWER FETS"
E. W. Strid, T. Duder, Fannon Electric

0930 A3.4 "INTERMODULATION DISTORTION IN GaAs FETS"
J. A. Higgins, Rockwell Intl.

BREAK – 0950–1020

1020 A3.5 "A 7 WATT C-BAND FET AMPLIFIER UTILIZING SERIAL POWER COMBINATION TECHNIQUE"
P. T. Ho, Ford Aerospace

1040 A3.6 "A 1.0 WATT GaAs MESFET OSCILLATOR AT X-BAND"
R. M. Rector, G. D. Vendelin, DEXCEL

1100 A3.7 "PHASE CHARACTERISTICS OF I-BAND PULSED GATE GaAs FET POWER AMPLIFIERS"
R. L. Camisa, R. L. Ernst, J. Goel, H. Wolkstein, RCA

1120 A3.8 "CURRENT-VOLTAGE CHARACTERISTICS, SMALL SIGNAL PARAMETERS, SWITCHING TIMES AND POWER-DELAY PRODUCTS OF GaAs"
M. S. Shur, Wayne State Univ.
L. F. Eastman, Cornell Univ.

MacDonald-Cartier Room (B)

SPECIAL SESSION ON MILLIMETER WAVE DEVELOPMENTS IN JAPAN

Chairman & Organizer: T. Makimoto, Osaka Univ.

0830 B3.1 "MILLIMETRIC WAVEGUIDE LINE IN A CABLE TUNNEL"
F. Nihei, K. Yanagimoto, F. Ishihara, Ibarki, ECL, NTT

0850 B3.2 "LOW LOSS FLEXIBLE HELIX WAVEGUIDE"
T. Hayakawa, I. Takashima, K. Inada, Fujikura Cable Works, M. Miyauchi, Ibaraki ECL, NTT

0910 B3.3 "GaAs TUNNEL DIODES"
J. Nishizawa, K. Motoya, RIEC, Tohoku Univ.
Y. Okuno, Semicon, Res. Instl.

BREAK – 0930–1000

1000 B3.4 "IMPEDANCE MEASUREMENT OF MILLIMETER-WAVE IMPATT DIODES"
N. Kanmun, K. Yamamoto, E. Hagihara, M. Akaike, Yokosuka ECL, NTT

1020 B3.5 "THERMOELECTRIC TRANSDUCER FOR SHORT MILLIMETER-WAVE POWER MEASUREMENTS"
I. Sugiura, H. Toda, Anritsu Electric Co.

1040 B3.6 "RADAR SENSOR FOR AUTOMOTIVE COLLISION PREVENTION"
T. Tamama, A. Iwabe, K. Ban, M. Tsudo, S. Mitsui, K. Baba, Mitsubishi Electric Co., M. Kiyoto, H. Endo, N. Fujiki, Nissan Motor Co.

1100 B3.7 "MILLIMETER WAVE PROPAGATION EXPERIMENT WITH GEOSTATIONARY SATELLITE ETS-II OF JAPAN"
R. Hayashi, N. Fugono, Radio Res. Lab., MPT

WEDNESDAY AFTERNOON, JUNE 28, 1978

Renaissance Room (C)

AUTOMATED NETWORK ANALYZER TECHNIQUES

Chairman: Stephan F. Adam, H.P.
Organizer: E. L. Komarek, NBS

0830 C3.0 "OVERVIEW OF SIX-PORT DEVELOPMENT"
Cletus A. Hoer, NBS

0850 C3.1 "CALIBRATING TWO SIX-PORT REFLECTOMETERS WITH A PRECISION LENGTH OF TRANSMISSION LINE"
Cletus A. Hoer, NBS

0910 C3.2 "A NEW TECHNIQUE FOR CALIBRATING DUAL SIX-PORT NETWORKS WITH APPLICATION TO 5-PARAMETER MEASUREMENTS"
R. Sussman, Sperry Res. Centre

BREAK – 0930–1000

1000 C3.3 "AN IMPROVED METHOD FOR CALIBRATING THE SIX-PORT REFLECTOMETER"
Glen F. Engen, NBS

1020 C3.4 "THE APPLICATION OF "TSD" TO THE CALIBRATION OF THE DUAL SIX-PART"
Glen F. Engen, Ross A. Speciale, NBS

1040 C3.5 "A MICROPROCESSOR CONTROLLED AUTOMATIC NETWORK ANALYZER IN A COMPUTER-AIDED DESIGN SYSTEM"
E. Hammerstad, Univ. of Trondheim, Norway

1100 C3.6 "A SURVEY OF AUTOMATIC NETWORK ANALYZERS CONFIGURED WITH THE IEEE-488 INTERFACE BUS"
J. K. Fitzpatrick, Hewlett-Packard

Quebec Suite (D)

MICROWAVE FIELD THEORY

Chairman & Organizer: P. Silvester, McGill University

0830 D3.1 "SCATTERING CALCULATIONS USING THE BOUNDARY ELEMENT METHOD"
M. H. Lean, G. Jeng, A. Wexler, Univ. of Manitoba

0850 D3.2 "ANALYSIS OF NONUNIFORM TRANSMISSION LINES ON CURVED CROSS-SECTIONS"
P. A. McGovern, Univ. of Newcastle, Australia

0910 D3.3 "ANALYSIS OF A THREE-DIMENSION ARBITRARILY SHAPED DIELECTRIC INSIDE A RECTANGULAR WAVEGUIDE"
J. J. H. Wang, Georgia Inst. of Technol.

0930 D3.4 "FILTER CHARACTERISTICS OF RADIAL WAVE-GUIDE COUPLED BY ANNULAR SLOTS"
B. Azarbar, L. Shala, Univ. of Manitoba

BREAK – 0950–1020

1020 D3.5 "FIELD BEHAVIOR NEAR A DIELECTRIC EDGE"
J. Bach Anderson, V. V. Soloduknov, Aaiborg Univ., Denmark

1040 D3.6 "A NOVAL ENERGY RELATION CONCERNED WITH ELGEN MODES OF TRANSMISSION LINE AND ITS APPLICATION TO THE DERIVATION FOR PROPAGATION CONSTANT"
K. Araki, Y. Naito, Tokyo Inst. of Techno., Japan

1100 D3.7 "SPACING OPTIMIZATION OF ARRAYS ABOVE AN IMPERFECTLY CONDUCTING GROUND AS AN INVERSE PROBLEM"
L. A. Wegrowicz, Polish Academy of Sciences

1120 D3.8 "EFFECTS OF ALTERNATING ELECTRIC FIELD ON CERENKOV RADIATION"
A. A. Risbud, R. G. Takwale, Univ. of Poona, India

Adam Room (A)

FILTERS AND MULTIPLEXERS

Chairmen: C. Kudsia, COMDEV; R. Levy, MDL
Organizer: L. Levy, MDL

1330 A4.1 "MILLIMETER-WAVE MIC BANDPASS FILTERS AND MULTIPLEXERS"
D. Rubin, D. Saul, NOSC

1350 A4.2 "A GENERALIZED MULTIPLEXER THEORY AND DESIGN OF GENERAL MANIFOLD MULTIPLEXERS"
J. D. Rhodes, Univ. of Leeds, R. Levy, MDL

1410 A4.3 "EXTENDED-JUNCTION COMBINE MULTIPLEXERS"
P. M. LaTourette, J. L. Robards, Acronetics

1430 A4.4 "COMPUTER-AIDED FILTER ALIGNMENT AND DIAGNOSIS"
H. L. Thal, Jr., G.E.

1450 A4.5 "LINEAR PHASE VS EXTERNALLY EQUALIZED LONGITUDINAL DUAL-MODE FILTERS FOR SPACE APPLICATION"
C. M. Kudsia, S. Kallanteris, M. N. S. Swamy, COMDEV Labs.

BREAK – 1510–1540

1540 A4.6 "INTERDIGITAL MICROSTRIP CIRCUIT PARAMETERS USING EMPIRICAL FORMULAS AND SIMPLIFIED MODEL"
A. Dalby, Eng. Academy of Denmark

1600 A4.7 "WAVEGUIDE BANDSTOP FILTERS UTILIZING $Ba_2Ti_9O_{20}$ RESONATORS"
C. L. Ren, Bell Labs.

1620 A4.8 "MINIATURIZED BANDPASS FILTER USING HALF-WAVE TEM MODEL"
K. Wakino, T. Nishiwaka, H. Matsumoto, Y. Ishikawa, Murata Mfg. Japan

1640 A4.9 "BANDPASS FILTERS USING TM_{010} DIELECTRIC ROD RESONATORS"

MacDonald-Cartier Room (B)

MICROWAVE SYSTEMS

Chairmen: R. B. Hicks, Rockwell Int'l
H. Ogura, Kyoto Inst. of Technology
Organizers: J. Horton, TRW
K. Iizuka, Univ. of Toronto

1330 B4.1 "A NEW 40 GHz DIGITAL DISTRIBUTION RADIO WITH SINGLE LOCAL OSCILLATOR"
M. Hata, A. Fukazawa, M. Bessho, S. Makino, M. Higochi, Oki Electric, Japan

1350 B4.2 "SOLID STATE TRANSMIT/RECEIVE MODULE FOR PAVE-PAWS (AN/FPS-115) PHASED ARRAY RADAR"
D. J. Holt, Raytheon

1410 B4.3 "REMOTE SENSING OF DIRECTIONAL GRAVITY WAVE SPECTRA AND SURFACE CURRENTS USING A MICROWAVE DUAL-FREQUENCY RADAR"
D. L. Schuler, NRL

1430 B4.4 "A FOUR BAND MILLIMETER-WAVE RADIOMETER DESIGN FOR ATMOSPHERIC REMOTE SENSING"
F. E. Goodwin, M. S. Hersman, J. C. Shine, Hughes

BREAK – 1450–1520

1520 B4.5 "MICROWAVE BLACK BODY CALIBRATION OF THE TIROS N MICROWAVE SOUNDER UNIT"
R. S. Iwasaki, Caltech

1540 B4.6 "DESIGN OPTIMIZATION OF A SATELLITE COMMUNICATIONS SUBSYSTEM"
A. B. Bell, L. A. Keyes, C. K. Mok, A. R. Raab, Spar Technology Ltd.

1600 B4.7 "EXPERIMENT PLAN FOR THE EXPERIMENTAL COMMUNICATIONS SATELLITE (ECS)
K. Yoshimura, N. Fugono, S. Morite, A. Ogawa, RRL, Japan

1620 B4.8 "A BROADBAND FREQUENCY DIVIDER IN WAVE-GUIDE"
R. G. Harrison, COMDEV

Renaissance Room (C)

MICROWAVE MEASUREMENTS

Chairman & Organizer: E. L. Komarek, NBS

1330 C4.1 "MEASUREMENT TECHNIQUES FOR ATTENUATION CONSTANT OF DIELECTRIC IMAGE LINES IN THE MILLIMETER WAVE RANGE"
K. Solbach, Univ. of Duisburg, Germany

1350 C4.2 "TWO-SIGNAL" METHOD OF MEASURING THE LARGE SIGNAL S-PARAMETERS OF TRANSISTORS"
S. Mazumder, P. van der Puije, Carleton Univ.

1410 C4.3 "MODELING OF THE FEED-THROUGH WIDEBAND (D.C. TO 12.4 GHz) SAMPLING-HEAD"
S. M. Riad, N. S. Nahaman, NBS

1430 C4.4 "COMPARATIVE TESTING OF LEAKY COAXIAL CABLES BY USE OF A TWO-CABLE CAVITY RESONATOR"
D. J. Gale, J. C. Beal, Queens Univ.

Quebec Suite (D)

MIC AMPLIFIERS AND OSCILLATORS

Chairman & Organizer: R. H. Knett, Bell Labs

1330 D4.1 "4 GHz 3 WATT FET AMPLIFIER FOR DIGITAL TRANSMISSION"
H. Yokouchi, H. Karematsu, K. Ogana, H. Ashida, Fujitsu, Japan

1350 D4.2 "A 2W, 4 GHz GaAs FET AMPLIFIER FOR RADIO RELAY APPLICATIONS"
W. E. Schroeder, J. W. Gewartowski, Bell Labs

1410 D4.3 "MICROWAVE GaAs POWER FET AMPLIFIER WITH LUMPED-ELEMENT IMPEDANCE MATCHING NETWORKS"
H. Q. Tserng, H. M. Macksey, T.I.

1430 D4.4 "A 5-WATT C-BAND AMPLIFIER"
W. C. Tsai, Raytheon

BREAK – 1450-1520

1520 D4.5 "A 2-6.2 GHz, 300 mW GaAs MESFET AMPLIFIER"
D. Hornbuckle, H.P.

1540 D4.6 "THE INJECTION LOCKED OSCILLATOR AS A MICROWAVE AMPLIFIER OF MSK-MODULATED SIGNALS"
S. Kumar, W. J. Chudobiak, J. S. Wight, Carleton Univ.

1600 D4.7 "6-12GHz TRANSMISSION TYPE DIELECTRIC RESONATOR TRANSISTOR OSCILLATORS"
S. Shimozake, T. Hayasaka, K. Sakamoto, NEL, Japan

1620 D4.8 "TUNING SPEED VARIATIONS IN WIDEBAND VARACTOR-TUNED OSCILLATORS"
D. J. Peterson, Univ. of Michigan

THURSDAY MORNING, JUNE 29, 1978

Adam Room (A)

MIC COMPONENTS

Chairman: R. Douville, CRC
Organizer: R. Knett, Bell Labs.

0830 A5.1 "AN X-BAND DUAL GATE MESFET IMAGE REJECTION MIXER"
S. C. Cripps, O. Nielsen, J. Cockrill, Plessey, UK

0850 A5.2 "GaAs FET APPLICATIONS FOR INJECTION-LOCKED OSCILLATORS AND SELF-OSCILLATING MIXERS"
Y. Tajima, Shibura, Japan

0910 A5.3 "WIDEBAND MESFET MICROWAVE FREQUENCY MULTIPLIER"
J. J. Pan, Harris Corp.

BREAK – 0930-1000

1000 A5.4 "DUAL GATE GaAs FET AS A FREQUENCY DOUBLER AT KU BAND"
P. T. Chen, C. T. Li, P. H. Wang, HP

1020 A5.5 "86 GHz HIGH POWER IMPATT NEGATIVE RESISTANCE AMPLIFIER"
M. Anoo, I. Haga, NEL, Japan

1040 A5.6 "SUMMARY OF RF LINEAR MODULATION"
G. F. Bock, Hughes

1100 A5.7 "A BETTER MICROSTRIP CONNECTOR"
R. L. Eisenhart, Hughes

MacDonald-Cartier Room (B)

MICROWAVE NETWORK THEORY

Chairman: A. Oliner, PINY
Organizer: P. Silverster, McGill Univ.

0830 B5.1 "FREQUENCY MULTIPLICATION BY A PRIME NUMBER USING MULTIPLIER CHAINS"
A. I. Grayzel, W. Emswier, A. I. Grayzel, Inc.

0850 B5.2 "THE EXISTENCE OF TWO LOW FREQUENCY MODES OF OPERATION FOR STANDARD CIRCULATION JUNCTIONS"
G. P. Riblet, MDL

0910 B5.3 "ON SOME FIVE-WAY HYBRID POWER DIVIDER-DIVIDERS"
N. Nagai, K. Ono, E. Maekawa, Hokkaido, Univ., Japan

0930 B5.4 A NEW CONFIGURATION PROVIDING NEGATIVE RESISTANCE AT A HIGHER FREQUENCY THAN THAT OF THE NEGATIVE RESISTANCE DEVICE BY ITSELF"
A. I. Grayzel, A. I. Grayzel, Inc.

BREAK – 0950-1020

1020 B5.5 "PERFECTLY MATCHED CODIRECTIONAL TEM TRANSFORMERS WITH SHIELDED COUPLED TWIN LINES AND NON-HOMOGENEOUS DIELECTRIC MEDIUM"
R. A. Speciale, NBS

1040 B5.6 "MUTUAL COUPLING BETWEEN TWO CIRCULAR WAVEGUIDES TERMINATED IN A CONDUCTING SPHERICAL CAVITY"
P. K. Bondyopadhyay, PINY

1100 B5.7 "TRANSMISSION CHARACTERISTICS OF HELIX WAVEGUIDE"
K. Yamaguchi, Y. Masuda, T. Kuwahara, Sumitomo, Japan

1120 B5.8 "A DYNAMIC SPATIAL GREEN'S FUNCTION FOR MICROSTRIP LINES
El-Behery, Univ. of Waterloo

Renaissance Room (C)

MICROWAVE HIGH POWER

Chairman: H. Goldie, Westinghouse
Organizer: K. Tomiyasu, GE

0830 C5.1 "HIGH POWER STABLE PULSED X-BAND IMPATT AMPLIFIERS USING RESONANT CAVITY POWER COMBINERS"
R. G. Mastroianni, A. C. Levitan, United Technologies

0850 C5.2 "POWER COMBINING IN A SINGLE MULTIPLE-DIODE CAVITY"
Karl Varian, Rockwell Int'l

0910 C5.3 "NEW BROADBAND CONICAL WAVEGUIDE POWER COMBINERS FOR HIGH-POWER, HIGH-EFFICIENCY IMPATT AMPLIFIERS"
J. P. Quine, D. D. Khandelwal, GE Research Labs.

0930 C5.4 "THE DESIGN OF LARGE SCALE TERRESTRIAL RECTENNAS FOR LOW-COST PRODUCTION"
W. C. Brown, Raytheon

BREAK – 0950-1020

1020 C5.5 "HIGH POWER PERFORMANCE OF A 5 KW MIC DIODE PHASE SHIFTER"
A. Schwarzmann, RCA

1040 C5.6 "A HIGH POWER BROADBAND MILLIMETER-WAVE SWITCH AND RECEIVER PROTECTOR"
H. Goldie, Westinghouse

1100 C5.7 "A MULTIPLE DIODE STRUCTURE FOR HIGH POWER MICROWAVE GENERATION"
K. Fukui, S. Nogl, Univ. of Wisconsin

1120 C5.8 "MICROWAVE ROAD PATCH SYSTEM"
L. L. Boyko, Syracuse Research Corp.

Convention Hall (D)

MICROWAVE SOLID STATE DEVICES

Chairman: G. Haddad, Univ. of Michigan
Organizer: L. F. Eastman, Cornell Univ.

0830 D5.1 "ON THE POWER AND FREQUENCY STABILITY OF IMPATT OSCILLATORS"
K. Wilson, J. Twisleton, J. Walker, G.E. Research, UK

0850 D5.2 "A MILLIMETER-WAVE OSCILLATOR USING NEWLY DEVELOPED HERMETICALLY SEALED IMPATT DIODE"
H. Hagao, H. Hasumi, S. Katayama, NEC, Japan

0910 D5.3 "HIGH POWER V-BAND DOUBLE-DRIFT IMPATT AMPLIFIER"
K. P. Weller, D. L. English, E. M. Nakaji, Hughes

0930 D5.4 "BARITT-DIODE VIDEO DETECTORS"
P. J. McCleer, G. I. Haddad, Univ. of Michigan

BREAK – 0950–1020

1020 D5.5 "SURFACE ORIENTED TRANSFERRED-ELECTRON DEVICES"
L. F. Eastman, Cornell University
M. S. Shur, Wayne State Univ.

1040 D5.6 "A 1.5 WATT 9 GHz SILICON TRANSISTOR POWER AMPLIFIER"
H. T. Yuan, Y. S. Wu, T.I.

1100 D5.7 "A NEW MICROWAVE HIGH-POWER TRANSISTOR" (STATIC INDUCTION TRANSISTOR)
Y. Kajiware, K. Horikin, Y. Horikiri, Y. Yukimoto, G. Nakamura, M. Aiga, Mitsubishi, Japan

THURSDAY AFTERNOON, JUNE 29, 1978

Adam Room (A)

LOW NOISE TECHNIQUES

Chairman: S. Okwit, LNR
Organizer: H. Okean, LNR

1330 A6.1 "MINIATURE SPACEBORNE S AND KU-BNAD LOW NOISE AMPLIFIERS FOR TDRSS"
C. Allen J. de Bruyl, P. Lombardo, H. Okean, E. Ng. LNR

1350 A6.2 "NOISE AND TRANSFER PROPERTIES OF HARMONICALLY SYNCHRONIZED OSCILLATORS"
R. Knoechel, K. Schuenemann, Univ. of Braunschweig

1410 A6.3 "LOW-NOISE LOW DISTORTION GAAS FET AMPLIFIERS FOR 6 GHZ SINGLE SIDEBAND RADIO"
K. K. Agarwal, Y. L. Kuo, Bell Labs

BREAK – 1430–1500

1500 A6.4 "CRYOGENIC MILLIMETER-WAVE RECEIVER USING MOLECULAR BEAM EPITAXY DIODES"
R. A. Linke, M. V. Schneider, A. Y. Cho, Bell Labs.

1520 A6.5 "LOW-NOISE THIN-FILM DOWNCONVERTERS FOR MILLIMETER SYSTEMS APPLICATIONS"
A. G. Cardiasmenas, J. M. Cotton, T. R. Delconte, Alpha Industries

1540 !6.6 "FAILURE OF THE CLASSICAL CIRCUIT MODEL IN THE ANALYSIS OF LOW-LOSS BAND-LIMITED DIODE MIXERS"
M. Hines, Microwave Associates

MacDonald-Cartier Room (B)

MICROWAVE TRANSMISSION LINES

Chairman: T. Itoh, Univ. of Kentucky
Organizer: P. Silvester, McGill Univ.

1330 B6.1 "A SINGLE METHOD FOR ANALYZING FIN LINE STRUCTURES"
A. M. K. Saad, K. Schuenemann, Univ. of Braunschweig, Germany

1350 B6.2 "FIN LINE DESIGN MADE EASY"
W. J. R. Hoefer, Univ of Ottawa

1410 B6.3 "NEW PROPAGATION EFFECTS FOR THE INVERTED STRIP DIELECTRIC WAVEGUIDE FOR MILLIMETER WAVES"
A. A. Oliner, S. T. Peng, J. P. Hsu, PINY

1430 B6.4 "DISPERSION CHARACTERISTICS OF ELEVATED SHIELDED STRIPLINE"
D. C. Chang, J. C. Tippett, Univ. of Colorado

BREAK – 1430–1500

1520 B6.6 "A COMPLETE ANALYSIS OF THE DISCRETE MODE SPECTRUM OF OPEN MICROSTRIP TRANSMISSION LINES"
A. R. van de Capelle, P. J. Luypaert, Univ. Leuven, Belgium

1540 B6.6 "EFFECT OF CONDUCTOR THICKNESS ON THE MODE CAPACITIES OF SHIELDED STRIP TRANSMISSION LINES"
J. L. Knighten, IRT, R. E. Post, Iowa State Univ.

1600 B6.7 "ANALYSIS OF THREE NARROW TRANSVERSE "STRIPS IN WAVEGUIDE"
K. K. Chang, P. J. Khan, Shared Applications

1620 B6.8 "DE-EMBEDDING MICROSTRIP DISCONTINUITIES"
G. Baratino, M. Parodi, Univ. of Genova, Italy

Renaissance Room (C)

SUBMILLIMETER-WAVES

Chairman & Organizer: K. J. Button, MIT

1330 C6.1 "TWO-PHOTON PUMPING OF A FOUR-LEVEL SYSTEM IN AMMONIA TO OBTAIN 12.16 μM RADIATION FOR ISOTOPE SEPARATION"
J. W. Leap, K. J. Kim, E. G. Malk and P. D. Coleman, Univ. of Illinois

1350 C6.2 "A SUBMILLIMETER-WAVE POLARIMETER FOR PLASMA DIAGNOSTICS"
C. H. Ma, D. P. Hutchinson, K. L. van der Sluis, Univ. of Mississippi

1410 C6.3 "WAVEGUIDE SYSTEMS FOR SHORT MILLIMETER AND SUBMILLIMETRIC WAVELENGTHS"
D. J. Harris, K. W. Lee, J. M. Rieves, C. O. Bozler, C. O. Parker, UWIST, U.K.

BREAK – 1430–1500

1500 C6.4 "SUBMILLIMETER WAVELENGTH SURFACE-ORIENTED DIODE RECEIVERS"
R. H. Murphy, H. R. Fetterman, C. O. Bozler, C. D. Parker, J. P. Donnelly, B. J. Clifton, W. T. Lindsey, P. E. Tannenwald' MIT

1520 C6.5 "HIGH SENSITIVITY SUBMILLIMETER HETERODYNE RECEIVER"
H. R. Fetterman, P. E. Tannenwald, B. J. Clifton, C. D. Parker, W. D. Fitzgerald MIT

1540 C6.6 "SUBMILLIMETER-WAVE FREQUENCY MULTIPLIERS AND IMPATT OSCILLATORS"
M. Hirayama, T. Takada, T. Ishbashi, M. Ohmon, Musashino Lab, Japan

1600 C6.7 "A 0.9 MM HETERODYNE RECEIVER FOR ASTRONOMICAL OBSERVATIONS"
N. R. Erickson, Univ. of Calif., Berkely

Convention Hall Room

MICROWAVE ACOUSTICS

Chairman: R. Mariani, USAECOM
Organizer: C. Hartman, T.I.

1330 D6.1 "TWO-PORT MAGNETOSTATIC WAVE RESONATORS USING PERIODIC REFFECTIVE ARRAYS"
J. M. Owens, C. V. Smith, E. P. Snapka, J. H. Collins, Univ. of Texas

1350 D6.2 "MAGNETOSTATIC SURFACE WAVE TRANSDUCER DESIGN"
J. C. Sethares, Hanscom AFB

1410 D6.3 "MAGNETOSTATIC FORWARD VOLUME WAVE REFLECTION CHARACTERISTICS OF A SHALLOW GROOVED GRATING"
J. P. Parekh, H. S. Tuan, SUNY

1430 D6.4 "THEORETICAL CONSIDERATIONS FOR VELOCITY CHANGE OF LAMB WAVES BY MAGNETO-ELASTIC EFFECT"
M. Tsutsumi, T. Morimoto, N. Kumagai, Osaka Univ.

BREAK – 1450-1520

1520 D6.5 "SLANTED REFLECTIVE ARRAY CORRELATOR"
B. R. Potter, Martin Marietta, C. S. Hartman, T. I., W. R. Shreve, H. P.

1540 D6.6 "TWO-PORT SAW RESONATOR USING PIEZO-ELECTRIC SURFACE SHEAR WAVE MODE"
Y. Kinoshita, H. Kojima, T. Tabuchi, Hitachi, Japan

1600 D6.7 "A NEW A/D CONVERTER USING SURFACE ACOUSTIC WAVES"
M. Feldmann, J. Henaft, CNET, France

1620 D6.8 "ANALYSIS OF TEMPERATURE DEPENDENCIES IN THE PERFORMANCE OF ACOUSTO-ELECTRIC SURFACE WAVE DEVICES"
P. S. Schenker, C. C. Hsu, Univ. of South Carolina.

MICROWAVE EXIBITION

The largest exhibition ever assembled for an MTT-S meeting will be open to Symposium registrants. The exhibition will offer a unique opportunity to view products and meet with representatives of manufacturers of principal microwave devices, components, and subsystems suppliers for in-depth discussion.

WORKSHOPS

In conjunction with the symposium four workshops are planned.

I. Low Noise Millimeter-Wave Receivers, Monday, June 26, 8:30 – 17:00

II. Solid State Microwave/Millimeter-Wave Power Generation and Modulation, Monday, June 26, 8:30 – 17:00

III. Super Miniaturization of MIC Modular Friday, June 30, 8:30 – 17:00

IV. Paramps, FET's, and Mixers: An Assessment of the State-of-the-Art, Friday, June 30, 8:30 – 17:00

BANQUET

20:00, Wednesday, June 28, 1978, Adam Room, Chateau Laurier Hotel.

Dr. George Sinclair, educator, scientist and businessman is the guest speaker. "Is the Engineer Losing Contact with the Real World" will be the topic of his speech.

A cocktail party sponsored by the exhibitors will precede the banquet in the Exhibition Area.

SOCIAL ACTIVITIES

The Social Program Committees of the four Ottawa Symposia (June 26-30, 1978) have planned activities to acquaint members and friends of MTT with the capital city of Canada.

A. Ottawa in Perspective
Monday, June 26

B. Parliament Hill and Lower Town Promenade, Tuesday, June 27

C. Ottawa River Boat Cruises, Tuesday Evening, June 27

D. Upper Canada Village Tour, Wednesday, June 28

E. Gatineau Hills Tour, Wednesday, June 28

F. Talk n'Craft, Thursday, June 29

G. Day in Ontario, Friday, June 30

FUTURE MTTS INTERNATIONAL MICROWAVE SYMPOSIUM PLAN

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*proposal stage

TOPICAL MEETINGS

29 MARCH–1 APRIL 1978

Third International Conference on Submillimeter Waves and their Applications. Univ. Surrey, Guildford, England (MTT–S is cooperating sponsor)
Member of Organizing Committee:
Ken Button
M.I.T. National Magnet Lab
170 Albany Street
Cambridge MA 02139
Tel: (617) 253-5561

10–15 DECEMBER 1979

Fourth International Conference on Infrared and Submillimeter Waves (MTT–S full sponsor) Program Committee: Ken Button

ARAB SUMMER SCHOOL

1978: Solid-State Electronics
July 1–13, Bloudan, Syria

An intensive short course on solid-state electronics including integrated circuits, digital-circuit design and microprocessors, charge-coupled devices and applications, microwave solid-state devices and circuits, optoelectronic devices and optical communications, and solar cells will be held in Bloudan, Syria, from July 1 to 13, 1978. This School is sponsored by Kuwait University, Kuwait Institute for Scientific Research and the Syrian Supreme Council for Science. Several outstanding guest speakers from the U.S. and other countries will be giving the lectures. Several fellowships which include transportation, lodging, meals, and a stipend will be available to U.S. citizens of Arab origin who wish to attend. For further information and for fellowship applications, please contact Dr. M. El-Gabaly, Kuwait Institute of Scientific Research, Kuwait.

LETTERS TO THE EDITOR

Dear Editor,

In regard to some of the questions you raised in "Editors Notes", I have the following comments to offer on the MTT Symposium:

Whether to have three or four parallel sessions should be left up to the steering committee each year. It depends on the number of rooms available in the selected hotel. However, I think three are preferable.

I think Horizon House did an excellent job of handling exhibits last year in San Diego and feel this arrangement enhances the MTT Symposium, allowing the local steering committee to concentrate on the quality of the technical program.

For future workshops, I suggest one to counteract the adverse hysteria caused by such publications as "The Zapping of America", with well-prepared reputable microwave and medical experts to separate facts from myths, perhaps in the format of a panel discussion. This material should then be widely published, not limited to IEEE publications.

Your first issue of the MTT Newsletter was very well done – keep up the good work!

Sincerely,

Helmut E. Schrank

INSTITUTIONAL LISTINGS

The IEEE Microwave Theory and Techniques Society is grateful for the assistance given by the firms listed below, and invites aplication for Institutional Listing from other firms interested in the microwave field.

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