



EDITOR: *H. J. Kuno*

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1979 INTERNATIONAL MICROWAVE SYMPOSIUM "THE WORLD OF MICROWAVES"

APRIL 30 - MAY 2, 1979

SHERATON TWIN TOWERS HOTEL, ORLANDO, FLORIDA



Come to the MTT/S International Symposium in Orlando this Year! A veritable smorgasbord of technical information is waiting for you starting April 30th. The 3 day, 4 parallel session symposium is followed by 2 days of workshops and MTT's first Specialty Conference on Gigabit Logic for Microwave Systems. One of the workshops or the Specialty Conference may well make it worth your while to stay for the week. The large number of originally submitted papers and the impressive final program of the Specialty Conference lead us to expect a heavy turn-out for this newest MTT venture. The increasingly international character of microwave engineering is apparent from the many overseas papers throughout the program, including the Japanese Session on Tuesday afternoon. The Monday evening session on Mainland China aims at giving you a better perspective on

most recent international developments as they relate to engineering.

Our Technical Program is paralleled by the biggest Microwave Exhibition ever. We hope you will browse through the wide array of materials, components and equipment assembled for you. Concern for our professional and societal relationships prompted scheduling a panel discussion on Professional Activities as part of the symposium program. Top IEEE officers responsible for Professional Activities are on this panel. Here is a golden opportunity to up-date yourself on IEEE's professional activities and IEEE's stand on current issues.

Have you ever wondered whether looking through tinted sunglasses might have some side effects, or what extra blue-violet or red light might do to your plants, your pet mouse, or yourself?

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PRESIDENT'S MESSAGE

by D. Parker

This is my first "President's Message" in the Newsletter. While contemplating what to write, I began to reflect upon the changes that have transpired in ADCOM and the MTT Society since 1972 when I was first associated with ADCOM as Secretary/Treasurer. At that time there was a general recession and Engineers by the thousands were layed off, many with a loss of pensions. Several left the engineering profession never to return. There were essentially no openings for teaching positions at Universities as well. ADCOM was very sensitive to the plight of engineers. I remember many ADCOM meetings, pre-ADCOM meetings, and Post-ADCOM meetings where Leo Young, Al Clavin, Bob Rivers, Warren Cooper and others discussed and planned ways to involve the IEEE in political actions to improve the economic situation for engineers. Through their efforts and that of others, the IEEE has changed from a strictly technical organization concerned with the accumulation and dissemination of technical information to an organization that is involved also in political and economic matters. Revision of the IEEE the constitution, establishment of the US Activities Board, an IEEE office in Washington DC, and committees like COMAR (Committee on Man and Radiation) are all outgrowths of these early efforts by some very dedicated and concerned engineers.

Life in the Microwave Industry is much different today. Business is booming and there just aren't enough microwave engineers. The topics at the pre-ADCOM and post-ADCOM meetings have shifted to the shortage of new graduates in microwaves, rapidly escalating salaries, and how does one minimize "job hopping" in this environment. Now is the time for the MTT Society to make a concerted effort to increase its membership. Local chapters should sponsor regular meetings with speakers who can attract young engineers just being introduced to microwaves. In an effort to assist local chapters and to increase the communications between ADCOM and the local chapters, each member of ADCOM was assigned at our last meeting in Orlando two or three chapters as his personal responsibility. He is to contact the chapter chairman regularly, let him know of ADCOM's interest, lend assistance, and provide a feedback channel from the local membership to ADCOM.

NOW is also the time for ADCOM to activate new student chapters. Many students choose the "digital" world because of early exposure; few really are introduced to "microwaves" and distributed circuits until they are seniors or graduate students. Strong student chapters could help alleviate this situation. With well planned seminars, that include hands on demonstrations, more freshman and sophomore students might catch the excitement and challenge of microwave circuit and system design. Our local chapters and ADCOM members need to do more to help the student chapters be vital.

Other changes have occurred during the last seven years. Most significant is our financial picture. In the early seventies, our cash reserves were low; in fact the Transaction total page budget was cut by 200 pages because of lack of funds. ADCOM devoted considerable effort to increase the number of page charges collected from authors and their companies that published in the Transactions. Exhibits were not a part of our annual symposium. The last couple of years the income from the exhibits alone nearly covered the total expense of the Symposia. MTTS now has a reasonable cash reserve, has increased the page budget of the Transactions up to 1200 pages per year, will provide this spring free of charge to the membership a twenty-five year index of the MTT transactions, and are planning other non-periodic publications and one-day Symposia to increase our services to the membership.

Historically at our annual meeting when elections are held for new ADCOM members, the double-edged sword of getting new blood and turning tried and true work horses out to pasture has been re-examined. At our last ADCOM meeting the Bylaws were changed wherein an ADCOM member who has served three consecutive terms cannot be nominated by the nomination committee for re-election. This action should help stimulate the election of more new members to ADCOM and provide adequate time for dedicated ADCOM members to serve well.

Finally, since 1972 MTT has grown from a Group to a Society. Two other societies have been formed that had early affiliations and support from the MTT Society. These are the New Bioelectromagnetics Society and the Quantum Electronics Society. Today we continue to encourage and sponsor new technologies like high speed logic, millimeter waves, and submillimeter waves. Hopefully they will find permanent homes in the MTTS.

The changes recounted above are the results of busy but dedicated volunteers. I am grateful for their efforts and welcome your ideas and assistance to bring about improvements for the future. The next ADCOM meeting is April 29, 1979 in Orlando, Florida.



EDITOR'S NOTES

by H. J. Kuno

This issue provides highly stimulating articles in addition to the advance program of the Symposium. Please take note of President Don Parker's reflection on professional changes in our field since 1972, while Steve Adam shares his thoughts on long range planning for MTT. We are privileged to have guest editorials by two former MTT presidents. Al Clavin addresses the problem of the current shortage of microwave engineers and Kiyo Tomiyasu discusses the balance between theoretical and application oriented papers in the MTT Transactions.

ADCOM HIGHLIGHTS

by S. Adam

MTT-S ADCOM winter meeting was held on January 9, 1979 in Orlando, Florida, site of the 1979 International Symposium. President Parker welcomed two of our new members, Bert Berson and Bob Hicks. He also introduced the new Secretary/Treasurer, Paul Greiling. Don Parker then reviewed action items of the last ADCOM meeting. He reported on MTT-S response to IEEE Headquarters regarding registration of engineers. MTT-S ADCOM was against this issue and sent our report to Headquarters. It was pointed out in Parker's letter (which is a synopsis of ADCOM's position derived in the October meeting) that registration is a means to enhance the professional statue and to improve the socio-economic status of engineers. It is not necessarily a means to protect the health, welfare and safety of the public. Furthermore, certification by IEEE is improper since it is the prerogative of the states. — MTT-S ADCOM meeting schedule was decided: April 29th, Orlando, Florida; Sept. 17th, San Francisco, CA; some time in November in the Midwest. — ADCOM decided to be co-operating sponsor for the 1980 APS Symposium. Also approved cooperating sponsorship to the 1979 Biennial Cornell Electrical Engineering Conference with EDS being full sponsor. It was also decided to share surplus with Bioelectromagnetics Society derived from last year's Biomedical Conference.

Harlan Howe, Meeting and Symposia Chairman, reported on 1978 Symposium. Final report will follow. W. Steenaart was commended for the success of the Ottawa Symposium's Technical Program. J. L. Allen reported on the 1979 Symposium Technical Program. 250 papers were submitted with 154 accepted, 9 invited papers, and 7 additional papers for the Japanese Session. R. Henning reported on the workshop arrangements. — Larry Wicker discussed the 1980 Washington D.C. Symposium. Workshops will be held May 26th & 27th; Symposium on May 28-30, 1980. G. Oltman discussed the 1981 Los Angeles Symposium to be held at the Bonaventure Hotel. This will be a joint Symposium with APS. No report was submitted on the 1982 Dallas Symposium.

Ken Button discussed the Submillimeter Wave Conference to be held in Miami Beach on December 15, 1979. In October, 1980 it will be held in Germany, and in San Juan, Puerto Rico in December, 1981.

Transaction Editor, J. L. Allen, reported that he has zero backlog on applications papers; also that R. Knerr will be the New Business Editor and G. Oltman the New Applications Editor. Page allocations for 1979 was set for 1200. There were 4 special issues approved for 1980. A special issue on Open Guided Wave Structures with Tatsuo Itoh as Guest Editor was approved. G. Oltman reported that the 26

years index is half completed and will be issued in July, 1979. — On institutional listings, ADCOM decided to drop it for the future.

Operations Chairman, C. T. Rucker, discussed the findings of the AdHoc Committee on elections. (This issue was discussed in the Fall 1978 MTT Newsletter.) With 2% of the membership voting, 2:1 in favor was recorded to date. R. Hicks was appointed to the Elections Committee and J. Aukland to the Bylaws and Procedures Committee.

After lunch ADCOM toured the symposium facilities at the Sheraton Twin-Towers and enthusiastically approved all arrangements.

J. Aukland discussed some bylaws changes limiting ADCOM membership to 3 consecutive terms.

R. Sparks reported that in February, 1978 MTT membership dropped 9% due to the separation of QEA Society. But by November, we were 1% over compared to the previous year. R. Sparks also assigned ADCOM members to particular chapters to be responsible for helping with speakers, and in general, to provide direct support from ADCOM.

J. Kuno reported on his activities as Newsletter Editor. He stated that there will be as many issues as there are meetings held. He also solicited Guest Editorials.

R. Sparks commended Charles Liechti as an excellent National Lecturer. The responses received so far are extremely favorable. For the 1979-80 year, Dr. James Wiltse of Georgia Tech Engineering Experiment Station, was selected as National Lecturer on the subject of "Millimeter Wave Systems."

IEEE membership is the highest ever: 191,374 as of December 1978. — Up 0.9%.

A discussion on transferring non-periodic publications under the control of Transactions was tabled since such a decision would warrant a bylaws change.

S. Adam reported on his initial thoughts on long range planning. More on this subject is discussed later in this issue.

J. Horton, Chairman of Technical Committees, reported on some changes which are listed in the 1979 committee. Activities of the committees are listed below:

MTT-2, Microway Acoustics (C. S. Hartmann Chairman): Special issue on Saw Device Applications (August 1980).

MTT-4, Submillimeter Wave Techniques (D. T. Hodges Chairman): International Conference on Submillimeter Waves and Their Applications (Dec. 1979), Submillimeter Wave Conference — 1980 (Wurzburg, Germany), Workshop/Topical Conference — 1980.

MTT-5, Microwave High Power (H. Goldie): Working with H. Schrank on Standards Committee.

MTT-6, Microwave and Millimeter Wave Integrated Circuits (E. F. Belohoubek): Two Workshops at Orlando: High Power, High Efficiency Solid State Amplifiers (joint with MTT-7), Microwave Parasitics.

MTT-7, Microwave and Millimeter Solid State Devices (B. Berson, H. J. Kuno): Workshop at Orlando: High Power, High Efficiency Solid State Amplifiers (joint with

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SOME THOUGHTS ON LONG RANGE PLANNING

by S. Adam

ADCOM, being the governing body of MTT, has the responsibility of identifying and steering its activities to assure the vitality of the Society. In 1977 Hal Sobol presented an excellent report on our activities and identified a number of key issues. I have reviewed them and added an additional issue of Education. In its long range planning, MTT must address these 12 issues:

- 1) Technical Vitality of the Society
- 2) Technical Committees
- 3) Chapters
- 4) Membership
- 5) Standards
- 6) Transactions
- 7) Symposiums and Meetings
- 8) Technology Forecasting
- 9) Interaction of MTT with Industry, Government and Academia
- 10) Social Impact of Our Technology
- 11) ADCOM Membership
- 12) Education

There are several committees already formed and working to address these areas. At this time I'd like to concentrate on 3 items only:

- 1) Membership
- 2) ADCOM Composition
- 3) New Technology

1) In the September issue of *Microwaves*, Stacey V. Bearse, Editor, wrote the editorial: "MTT Membership is Declining. Do You Know Why?". Bearse examines the 3 major aspects of the society:

— Publications: Transactions are far too theoretical, largely useless for average "Grass-Roots-Level" microwave engineer. "Accent of Applications" is a step in the right direction, but not enough.

— Meetings: International Microwave Symposium is the most productive service MTT offers; more down-to-earth papers are presented. Good workshops, great exhibits.

— Auxiliary Benefits: IEEE life insurance, some people feel, is a great bargain. IEEE membership does not carry the weight it used to 10 years ago.

Some "Letters to Editor" were published in the December issue of *Microwaves*. It was interesting reading and most certainly educational with titles like: "Help for 'Working' EE"; "A Question of Readability"; "Ritual Abracadabra?"; "Elect MTT Board Members"; "Top-Heavy with PhD's"; "Publications Proved Useless".

It is true these letters are a small sample of opinion, but it is quite worthwhile to study. "Accent of Applications" issues and special interest issues are already in progress. Maybe other departments dealing with review or tutorial material could enhance the usefulness of the Transactions for the grass-root-engineer. I would not consider eliminating the "Accent on Theory" department since this is the forum where the "body of knowledge" is being catalogued. An Ad-Hoc Committee dealing with this issue is being formed.

2) ADCOM is now evaluating the changes in the ADCOM membership election procedure. Some early returns show favoritism to make changes, which will require changes in bylaws. For the long term vitality of MTT this has seriously been considered. Already a maximum of 3 terms of consecutive ADCOM membership has been put into the bylaws. Through the efforts of the Washington Chapter, broader elections of ADCOM membership is on the table to be resolved soon.

3) The issue of New Technology is one of the most important relating to the technical vitality of our Society. We need to identify tangential fields to our base field which would still co-exist with other potentially competing societies/groups. We also must overcome parochialism when some newly formed fields we've spawned, separate from us. There is nothing wrong with this. The committee on New Technology is now actively studying different fields. Millimeter Waves, GIGABIT Logic, Near Millimeter and Infrared Technology along with others are being evaluated. We can use many tools to put these activities in the forefront. Special sessions at the Symposium; special issues of transactions dealing with these fields; one-day symposia; national lecturers; etc., are just a few avenues to consider.

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MTT-6), Special Issue — Power Devices — May 1979.

MTT-8, Microwave Network Theory (R. Levy Chairman): Workshop at Orlando: Filter Technology.

MTT-9, Digital Microwave Systems (P. T. Greiling Chairman): Sponsoring First Specialty Conference on GIGABIT Logic for Microwave Systems (Orlando); Special Issue on GIGABIT Logic for Microwave Systems (April 1980); Organizing a One-day Seminar on GIGABIT Logic (with San Francisco MTT Chapter).

MTT-10, Microwave Biological Effects (O. P. Gandhi): Working on Program Committee — Microwave Biological Effects Conference (AP Symposium, June 1979); Plans for MTT to Co-Sponsor same conference in 1980 (Austin, Texas).

MTT-11, Microwave Measurements (E. L. Komarek Chairman): Working with ARFTG.

MTT-13, Microwave Ferrites (C. R. Boyd Chairman): Millimeter Wave and Submillimeter Wave Ferrite Workshop — 1980; Standards Work with H. Schrank.

MTT-14, Microwave Low Noise (J. J. Whelehan Chairman): Looking into Millimeter Wave NF Standards.

MTT-15, Microwave Field Theory (T. Itoh Chairman): Planning Special Issue on "Open Guided Wave Structures."

MTT-16, Microwave Systems (J. B. Horton Chairman): Organizing Session at ICC '79.

L. Whicker discussed new technology. His activities in identifying new areas of interest for MTT is paramount to the survival of the Society. Millimeter, Submillimeter Waves, Surface Acoustic Waves, GIGABIT Logic: further study in regard to motivating these areas within MTT is being studied.

Reports were given on Councils and Committees activities; how SSCC, COMAR, PAC are moving.

Some discussion centered around Congressional Fellowship and the possible establishment of a Microwave Hall of Fame.



CHAPTER ACTIVITIES

by Dick Sparks

In reviewing the activities of the various MTT-S Chapters last year I find that many of them have not been sending their meeting reports to Steve Temple, the Chapter Records Chairman. This information is very helpful in updating the Speaker's List that is distributed to Chapter Chairmen each year. Steve's committee is currently preparing the new Speaker's List for distribution at the 1979 Microwave Symposium and would like to receive reports from every Chapter on meetings that have been held since September 1978. Send your schedule of speakers, topics and any lecture series that are planned for the rest of this season also, if this information is available. Steve's address is in the MTT-S Directory but is repeated here for your convenience:

S. Temple — Mail Stop M20-53

Raytheon Company
Bedford, MA 01730

As always, I would like to hear from any Chapter that is having difficulty in obtaining speakers for their meetings.

At the MTT-S Administrative Committee Meeting held in January each chapter was assigned to one of the elected members of ADCOM to serve in a liaison capacity. Chapter Chairmen have been notified who their liaison member is and should expect to be contacted by them in the very near future. But don't wait to be called if you have anything to discuss; contact him directly. The liaison member will serve as a personal contact for each Chapter to voice its concerns to ADCOM, to aid in the solution of local problems, to receive names of candidates for nomination to ADCOM and to be of general service and support to the Chapter during the year.

MTT-S membership ended the year 1978 on a positive note after suffering nearly a ten percent drop last February. The December statistics indicate a net increase over 1977 of 1.6 percent with a total of 5,696 current members. There has been considerable concern by the Administrative Committee regarding the earlier drop in membership, and the microwave trade journals have voiced their opinions in editorials published during the year. Several interesting (?) "Feedback" letters were published in the December 1978 MicroWaves — I really wonder how representative those responses are of the silent majority of former IEEE/MTT-S members. It is worth noting that IEEE membership, at the end of 1978, had reached a new high of 199,623 members.

All chapter officers and/or representatives make a note on your calendars to plan to attend the annual Chapter Chairmen's dinner and meeting just prior to the International Symposium in Orlando. The date is set for Sunday evening, April 29. The exact time and place will be sent out in a later mailing.

CALL FOR NOMINATIONS TO THE ADMINISTRATIVE COMMITTEE

R. B. Hicks

All MTT members should note that they may assist the Nominations Subcommittee in obtaining nominees for the 1980 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 on 17 September 1979.

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 the ADCOM not eligible for re-election at that time.

This year we will elect six (6) 3 year term members and one (1) 2 year term member to ADCOM. The hold over members will be geographically divided as follows: East (6), Central (3), Southeast (0), Pacific (5).

Incumbants who may stand for re-election are geographically located as follows: East (1), Central (1), Southeast (3), 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) from government agencies. Members whose term expires are distributed as follows: industry (3), universities and non-profit organizations (3) and government agencies (1).

ANNOUNCEMENT

**FOURTH INTERNATIONAL
CONFERENCE ON INFRARED
AND
NEAR-MILLIMETER WAVES
Americana Hotel of Bal Harbour
Miami Beach, Florida, USA,
December 10-15, 1979**

History of MTT

by Ted Saad

ADCOM VII July 1, 1958 through June 30, 1959

Administrative Committee: T. S. Saad, Chairman
A. A. Oliner, Vice-Chairman
S. W. Rosenthal, Secretary-Treasurer

T. N. Anderson	W. W. Mumford
R. E. Beam	W. L. Pritchard
A. C. Beck	S. D. Robertson
A. G. Clavier	R. F. Schwartz
S. B. Cohn	Gustave Shapiro
C. W. Curtis	George Sinclair
H. F. Engelmann	Ernest Wantuch
Henry Magnuski	R. D. Wengenroth
George Southworth, Honorary Life Member	

The Chairman of the seventh Adcom was Ted Saad, the Vice-Chairman was Art Oliner, and the Secretary-Treasurer was Saul Rosenthal. During this Adcom term, Gus Shapiro began his unforgettable tour of duty, replacing Bob Wengenroth as the Newsletter Editor. Kiyo Tomiyasu having completed more than two years of outstanding service as editor of the Transactions resigned to be replaced by Don King.

One of the techniques employed by Gus Shapiro was to supply each Adcom member with stamped, addressed envelopes with which to mail him their news items. The technique worked for only a short while. A second innovation was the addition of humor to the Newsletter in the form of jokes interspersed throughout each issue. That seemed to stimulate members to examine each issue thoroughly. It also stimulated some criticism.

Although there was still some question as to the merit of the affiliate plan, six foreign societies were accorded affiliate privileges. The six included two societies in England and one each in France, Germany, Italy, and Australia.

Chapter activities continued to grow. During the year, two chapters were added, the Tokyo Chapter in Japan and the Omaha-Lincoln Chapter in Nebraska.

The annual symposium was held at Harvard University, Cambridge with Bill Pritchard as Chairman and Henry Riblet as Chairman of the Technical Program Committee. The attendance was a record 615. It was an outstanding symposium which succeeded in maintaining the high standards set by the Stanford meeting. Perhaps the high point was the banquet speech given by Dr. Ed Purcell of Harvard on the subject of Listening to Space.

During the year, Ernie Wantuch resigned from the Adcom due to the press of business, and was replaced by Moody Thompson.

There was much discussion in the Professional Groups Committee Meetings on the subject of discontinuing advertising in the Transactions. PGMTT, because it was one of the few groups successful in its ability to sell advertising space opposed the idea.

There was also concern about the IRE and WESCON Convention Records. The Professional Groups, through their own annual meetings, were siphoning off most of the better papers in their narrow technical areas. This generated some difficulty in obtaining good papers for IRE and WESCON.

PGMTT was in favor of some type of change in the papers to be presented at the Conventions but not discontinuance of the Convention Records. Eventually it was decided that the Convention Records would continue but would no longer be distributed free to group members.

As activities in the Group had grown, it was becoming apparent that half day meetings of the Adcom were inadequate and, after a poll of Adcom members, full day meetings were adopted.

During the prior Adcom and the beginning of this one, it was generally agreed that the Annual Symposium would alternate between the East and West Coast. For 1960, proposals were received from both Los Angeles and San Diego. Originally there was some concern about Wescon conflicting with the Symposium in L. A. Later, the L. A. committee agreed to submit a proposal. In a historic, all day meeting in Palo Alto, with presentations and pressure from both L. A. and San Diego, the Adcom voted, by the thinnest of margins, to hold the 1960 symposium in San Diego. It was a decision which was questioned many times.

An interesting letter was received by the Adcom from Bill Brown of Raytheon pointing out what appeared to be a new area of growth for electronics. The area was the use of radiated electromagnetic energy for power purposes at the point of reception.

One of the problems encountered — perhaps not a problem, but more likely a blessing — was the dilemma in choosing a Microwave Prize. Because there were so many good papers to select from and because three in particular received the bulk of votes, it was decided to award not only a Microwave Prize, but two honorable mentions as well. The Microwave Prize winner was Ladislav Goldstein for his paper "Nonreciprocal Electromagnetic Wave Propagation in Ionized Gaseous Media" which appeared in the PGMTT Transactions of January 1958. The two authors who received honorable mention were Seymour Cohn for his paper entitled "Parallel-Coupled Transmission Line — Resonator Filters" which appeared in the PGMTT Transactions of April 1958, and H. E. D. Scovil for his paper entitled "The Three-Level Solid-State Maser" which appeared in the PGMTT Transaction of January 1958.

In part, through the continued diligent efforts of Tore Anderson as the Advertising Editor and the financial successes of the annual symposia, the balance at the end of April, 1959 was \$10,414.71. Membership was about 4,000.

The Würzburg Conference

1980

The Fifth International Conference
on

Infrared & Millimeter Waves

October 20-24, 1980

Würzburg, Federal Republic of Germany

*REPORT OF THE DIRECTOR, DIVISION IV
Number 7, December 17, 1978*

by Dick Damon

Since my last report following the August Board of Directors meeting, I have attended a total of 20 IEEE meetings, including AdCom meetings of five Societies/Groups of Division IV (CHMT, ED, Mag, QEA and SU). Other commitments prevented my attendance at the AP-S and MTT-S AdCom meetings this fall. In addition, there were meetings concerning: engineering registration, Nominations and Appointments Committee, preparation of the TAB Manual, Audit Committee, USAB activities and, finally, the December 6-11 series of meetings of TAB OpCom, TAB, Audit Committee, Annual Assembly and Board of Directors.

The Board of Directors completed action on a policy on registration. The proposed policies had been published in The Institute (page 6, October 1978) and the views of Sections and Society/Group AdComs were solicited. More than 150 individual letters from members were received; more than 80 of the 238 Sections and 18 of the 30 AdComs responded to the poll. The response attests to the interest in this issue, and showed substantial consensus. In accordance with this consensus, the Board of Directors approved: the proposed policy 7.4 (Attachment A in The Institute, October) as a replacement for the present policy 7.4, the proposed policy 7.100 (Attachment B of The Institute, October) as a replacement of the policy 7.100 which was placed in abeyance last year by the BoD, and a modified resolution on certification by the IEEE (modified from Attachment D of The Institute) which establishes a group to study the issue but deletes reference to a special member grade for certified or licensed engineers. The Board took no position on paragraph C of policy 7.100, regarding who should be registered, but referred the issue to USAB for further study. This action on paragraph C was in accordance with the Section and G/S votes, which showed about equal preference for versions 1 and 2 (published as Attachment C in The Institute) and a plurality for "neither" — certainly a mandate for inaction on this issue! Thus we now have a basic policy on engineering registration, which can be modified as the need arises.

Other action by the Board of Directors included:

- Approved a re-structuring of USAB to provide for two Vice-Chairmen — one for "inward-looking" and one for "outward-looking" activities.
- Tabled a proposed policy on IEEE Position Papers, despite some very hard work during the meeting to formulate an acceptable statement. I think the action to table occurred principally because many late changes were made, and there was a desire to consider the statement further before a final vote.
- Approved the 1979 budget, which has a budgeted \$520K deficit; this is partially covered by pledges from the Groups/Societies/Councils and the Sections.
- Approved a revised policy statement on electioneering, which places the authority for informing the members of the views of candidates and the issues involved in referendum statements with the governing

body of each IEEE entity (G/S/C AdCom, Section executive committee, etc.) rather than with the Board of Directors. The policy also permits G/S/C officers, editors, and others to express opinions on candidates and issues as they relate to the interests of their members.

- Endorsed the concept of an IEEE Center for the History of Electrical Engineering and voted initial funds (\$25K) for planning.
- Received the report of the Treasurer forecasting a 1978 surplus of about \$600K for the IEEE General Fund and \$750K for the G/S/C funds.

Many of the topics voted upon by the Board of Directors were previously discussed at the TAB OpCom and TAB meetings. Other actions taken by TAB included:

- Approved the 1979 G/S/C budgets as presently prepared, which have fixed charges assessed to each G/S/C for Headquarters services.
- Accepted the principle that G/S/C budgets should be changed so that Headquarters charges include a charge dependent upon use of services by each G/S/C, together with a (lower) fixed charge, and instructed the TAB Finance Committee to prepare revised 1979 budgets which reflect this concept.
- Approved a training course for G/S/C officers, to be held in January at IEEE Headquarters.

A revised TAB Manual should be available early in 1979. It will be in loose-leaf form, so that it can be easily updated. Since I was Chairman of the Committee that worked on this, you may direct complaints or suggestions for improvements to me; I hope it's useful.

This concludes my two-year term as Director of Division IV. The job has at times been both exhilarating and exhausting. Some of the activities in which I've been involved include:

- Completion of the merger of the Parts, Hybrids and Packaging Group with the Manufacturing Technology Group to form the Components, Hybrids and Manufacturing Technology Society.
- Change of the Quantum Electronics Council to the Quantum Electronics and Applications Society.
- Sponsoring of a Congressional Fellow. In my second report, of July 1977, I pointed out the desirability of having a Fellow identified with the interests of Div. IV, and noted that none of the Fellows to date had this technical background. In talks to the AdComs, I proposed that the Societies and Groups of Div. IV would benefit by jointly funding a Congressional Fellow. This did not happen, but I am pleased to note that the Electron Devices Society is itself providing sponsorship for a Congressional Fellow in 1979-1980. In the future, perhaps other Societies of Div. IV can also sponsor a Fellow, or join with ED-S in their activity.
- Development of revised policies on engineering registration, as chairman of an ad hoc committee of the BoD, which were largely accepted by the Board.
- Development of revised policies on electioneering, as chairman of the 1978 Audit Committee, which were adopted by the Board of Directors.

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Whether you have or have not been curious about these spectral problems, both you and your spouse will be fascinated by the beautifully illustrated talk of our banquet speaker, Dr. John N. Ott. Join us at the banquet — enjoy an excellent meal, good company, recognize this year's outstanding microwave engineers, and learn about biological effects of light.

While the April 30 to May 2 symposium is at the Sheraton Twin Towers, the May 3 and 4 workshops and the Specialty Conference are at the 10-story Howard Johnson's at Florida Center across the street. Both hotels are a few blocks from Interstate 4 and thus, very accessible. To make sure that you will have a room at these hotels at favorable rates, register early — no later than April 8.

We hope you will bring along your wife and maybe your children and spend a weekend with us. Orlando is a delightful city offering excellent and varied accommodations, restaurants, and tourist attractions and is located in Florida's citrus region — an area with many lakes and some gently rolling hills. We selected April 30 to May 4 since we can expect "statistically" pleasant weather, tourist attractions are not crowded, and rates are lowest. You, your wife, and two of your children under 18 can stay in the symposium hotel for \$32 a night. You will find a wide choice of attractions within a 15 mile range of the hotel, including Disney World and Sea World. Beyond this limited range are such other outstanding attractions as Castillo de San Marcos and the restored old city of St. Augustine (98 miles), Kennedy Space Center of NASA (Titusville — 60 miles), the Greek community of Tarpon Springs and sponge diving (115 miles), Cypress Gardens (Winter Haven — 47 miles), Bok Singing Tower and Mountain Lake Sanctuary (Lake Wales — 43 miles), Marine Land (88 miles), Busch Gardens and Ybor City (Tampa — 84 miles), Silver Springs (Ocala — 72 miles), Gulf of Mexico resorts (Clearwater — 106 miles, Sarasota — 130 miles, St. Petersburg — 104 miles), and Atlantic Ocean resorts (Daytona — 55 miles, Cocoa — 47 miles) and many others.

For additional information on the symposium, please contact myself (College of Engineering, University of South Florida, Tampa, Florida 33620, (813) 974-2287 or Joseph Pullara (Martin-Marietta Aerospace, Orlando, Florida 32805, (305) 352-4516). Additional information on tourist attractions is best obtained from the Orlando Chamber of Commerce, Post Office Box 1913, Orlando, Florida 32802.

I look forward to seeing you!

Rudolf E. Henning

Chairman

Steering Committee

BANQUET

The main banquet speaker at the 1979 International Microwave Symposium to be held in Orlando, Florida (April 30, May 2, 1979) will be the internationally known Dr. John Nash Ott. Dr. Ott will be talking on "Some Biological Effects of Electromagnetic Radiation". Dr. Ott has produced some of the most original and creative work in

this area.

Dr. Ott will show a 45 minute film of time-lapse sequences illustrating the effects of visible light and other electromagnetic wavelengths on plant, animal and human health and behavior.

He will present data from controlled studies at over ten major leading medical research centers indicating that light not only influences tumor development in laboratory animals, but also that light of different wavelengths significantly affects not only the glands, but also the principal organs, including heart, liver and kidneys.

Dr. Ott's pictures show that variations in the periodicity, intensity and wavelength distribution of light energy control certain plant growth processes such as setting of buds, opening of flowers, determination of sex and maturing of fruits. He points out similar responses in animals and suggests how these may be brought about as the result of light entering the eyes and stimulating the retinal-hypothalamic-endocrine system.

Many of the time-lapse sequences in several of the late Walt Disney's films, such as "Secrets of Life" and "Nature's Half-Acre," are the work of John Ott, as well as the time-lapse sequences in Paramount's more recent production of "On a Clear Day You Can See Forever" which starred Barbra Streisand.

Dr. Ott was a pioneer in studying the effects of light and radiation from fluorescent lights and TV on the learning disabilities and behavioral problems of school children, and his work was credited for bringing about passage of the 1968 Radiation Hazards bill.

Citations and awards have come to him from horticultural, scientific, and medical societies, including an honorary Doctor of Science degree from Loyola University of Chicago and the Grand Honours Award of the National Eye Research Foundation. The Photographic Society of America presented him its highest award, The Progress Medal for 1975.

Continued from Page 7

- Participation in planning and conducting the TAB/USAB Conferences on U.S. Technological Policy Issues.
- My proposal of a magazine with articles of broad interest to the members of Div. IV, like Computer Magazine or Communications Magazine published by two of the larger IEEE Societies, did not find wide support by the AdComs and is presently dormant. Is anyone interested?

Overall, it's been satisfying to serve as your Director. The best part has been the opportunity to work closely with some of the most dedicated people I've ever known — the volunteers and staff of IEEE. I've thoroughly enjoyed the opportunity to meet with the AdComs of the Societies and Groups of Division IV, to meet other Society officers on TAB and to work with the Board of Directors and IEEE staff.

I want to thank all those who served on various Boards and Committees as representatives of Division IV, and to thank the members of the G/S of Division IV for giving me the opportunity to serve as your Director.

GUEST EDITORIALS



"ON THE SHORTAGE OF ENGINEERS"

Al Clavin

In April of 1970, I wrote an editorial for the MTT newsletter, entitled "on a Surplus of Engineers". From the title of this editorial you can see that the pendulum has swung full circle. How did we get into this unstable situation?

In the early 70's many good engineers were driven from the profession due to lack of employment opportunities. They have never returned. We were in the midst of the Vietnamese War. A very unpopular war, in which the aerospace technologists were given a great deal of the blame, perhaps for creating those weapons that were used during the conflict. Certainly, at the end of the war technologists were very unpopular with young people entering college. "Why be an engineer when you have better prestige and salary by being a Doctor, Lawyer or Indian Chief (business management)?" Almost any medical doctor these days can start at \$50,000 to \$100,000 a year. How many engineers can start at those levels?

Besides our image as war mongers, we were also feeling the brunt of those who claim that industry and technologists were responsible for pollution. And last but not least, we microwave engineers were responsible for the "Zapping of America".

What is there to do about the present shortage of engineers? Certainly this swinging pendulum must be stopped and stabilized. We in the profession must bear part of the blame as well as our friends from universities and government. In the near-term we can do nothing. There are just not enough qualified engineers. The solution rests only with long term activities.

First, we must tell it like it is. John Osepchuk has done this very well in the October '78 Microwave Journal article, titled "The Conning of America". Universities must do more research and have stronger advisory personnel in order to guide students into the proper professions. For example, even now there is a strong imbalance in engineering.

More engineering students are turning into "bit freaks", as they are enamored with computer technology and applications. A friend of mine, an engineer of long standing, recently exclaimed "Nature is a bitch, and there are no mechanical engineers!" I understand what he meant but would like to add that there are no "microwave engineers!"

The study of electro-magnetic theory we know is tough. It involves understanding vector differential equations. We must convince the young engineers that this field is worthy of their time. New areas are being reached into; millimeter and sub-millimeter waves, acoustics, and integrated optics.

Interesting problems are yet to be solved in microwave integrated circuits, generation of microwave power by semiconductors, stable oscillators, and on and on. In our recruiting activities at universities we should draw attention to these challenges. If we can interest a wider young audience perhaps we could plant the seeds in the years to come for additional engineers. The IEEE should also be involved, perhaps by publishing statistical data that can help students in choosing the correct profession.

In doing these things, are we planting the seeds for yet another surplus? I hope not, but we must certainly be alert. Industrial organizations can also help in this latter aspect by looking at such things as sabbaticals and re-training for engineers, especially in those times in the future when we again may have a surplus. Government spending, especially in research and development should show a steady, slow growth in terms of real dollars so as to maintain a strong technology base.

If we all work together, perhaps we can reduce the amplitude of that swinging pendulum.



"A PROFESSIONAL REPOSITORY"

Kiyo Tomiyasu

Upon joining industry my first task was to develop a high-power, multi-channel rotary joint. In the library I found several books and papers which provided useful background. For convenience let us call collections of knowledge such as these a professional repository. Authors of technical material wish to teach and share their professional knowledge. They exert effort to prepare the manuscripts and to furnish the details associated with the publication. The papers are written to express clarity in purpose and utility and to provide adequate credence.

There seems to be a misconception that analytical and theoretical type papers have greater archival value than hardware and application type papers. Concern has been expressed that too few hardware papers are published in the MTT TRANSACTIONS. In an engineering profession both types of papers are equally valuable. There is a possibility that relatively few hardware type papers are submitted for consideration for publication. The editorial standards for a hardware paper should be no less than that for a theoretical or analytical paper. An archival technical journal is a suitable medium to publish a paper describing hardware with performance credibility. Hardware type of papers have appeared in the MTT TRANSACTIONS, for instance, in the May 1978 and other issues.

Thoughts related to these have been expressed by former MTT/S President Robert A. Rivers, and published in the Summer and Fall 1974 issues of the MTT NEWSLETTER. He refers to the collection of information as Body of Knowledge and Microwave Encyclopedia.

Our members have derived much benefit from our professional repository, and in return, members should submit papers of archival significance to the repository.

1979 INTERNATIONAL MICROWAVE SYMPOSIUM

MONDAY, APRIL 30, 1979

Orange Room

THE WORLD OF MICROWAVES — WHAT NEXT?

Chairman: D. Parker, Hughes Aircraft Company

- 0830 TECHNOLOGY FOR THE DEVICES OF THE 80's:
A-1 MOLECULES, ELECTRONS AND IONS
B. Berson, Hewlett-Packard Company
- 0900 MILLIMETER-WAVE TRENDS FOR THE 80's
A-2 J. Wiltse, Georgia Institute of Technology
- 0930 LOGIC AT MICROWAVE FREQUENCIES: COURTSHIP
A-3 OR MARRIAGE?
M. Yoder, Office of Naval Research
- 1000 MICROWAVES IN THE MEDIA: TRUTH OR CONSE-
A-4 QUENCES?
J. Osepchuk, Raytheon Company

BREAK — 1030-1100

Osceola Room

MILLIMETER WAVE MIXERS/LOW NOISE AMPLIFIERS

Chairmen: J. Whelehan, AIL Division of Cutler-Hammer
and S. Okwit, LNR Communications

- 1100 NOISE AND CONVERSION LOSS ANALYSIS OF TWO-
B-1 DIODE SUBHARMONICALLY PUMPED AND BAL-
ANCED MIXERS
A. Kerr, Goddard Space Flight Center
- 1120 DEVELOPMENT OF A 183 GHz SUBHARMONIC MIXER
B-2 R. Forsythe, V. Brady, Georgia Institute of Technology;
G. Wrixon, University College, Ireland
- 1135 A 94 GHz BALANCED MIXER USING SUSPENDED
B-3 SUBSTRATE TECHNOLOGY
A. Cardenas, TRG Division Alpha Industries;
P. Parrish, University of Massachusetts
- 1150 AN APPROACH TO OPTIMAL MIXER DESIGN AT
B-4 MILLIMETER AND SUBMILLIMETER WAVELENGTHS
D. Held, Jet Propulsion Laboratory
- 1215 LOW TEMPERATURE PERFORMANCE OF GaAs
B-5 MESFETS AT L-BAND
J. Pierro and K. Louie, AIL Division of Cutler-Hammer

BREAK — 1230-1400

Lake Room

PANEL SESSION: PROFESSIONAL ACTIVITIES

Chairman: R. E. Henning, University of South Florida

- 1100 PANEL LEADER AND MODERATOR: Dr. Bruno O.
C Weinschel, IEEE Vice President for Professional Activities
PANEL MEMBERS:
Dr. Leo Young, IEEE Executive Vice President;
Dr. Lawrence R. Whicker, IEEE/USAB PAC
Coordinator, Div. 4

BREAK — 1230-1430

Cape Canaveral Room

MICROWAVES IN THE BIOENVIRONMENT

Chairman: R. Olsen, NAMRL

- 1100 AN OVERVIEW OF SATELLITE POWER SYSTEMS —
D-1 MICROWAVE HEALTH AND ECOLOGY
D. Cahill, EPA
- 1125 A COMBINED MONITOR-DOSIMETER FOR NON-
D-2 IONIZING RADIATION
G. Fanslow, Iowa State University

- 1140 TUMOR DETECTION USING MICROWAVE ENHANCED
D-3 THERMOGRAPHY AND COMPUTER AIDED IMAGE
ANALYSIS
J. Thompson, J. Faulk, R. Fellers, M. Huhns, T. Simpson
and J. Caulfield, University of South Carolina

- 1155 TERATOLOGICAL STUDIES OF FETAL EXPOSURE
D-4 OF MICE TO RF RADIATION
J. Nelson, J. Lin and M. Ekstrom, Wayne State
University

- 1210 RESPONSE OF A MODEL MOUSE CANCER TO
D-5 FAR-FIELD MICROWAVE HYPERTHERMIA
D. McCulloch, J. Robinson, A. Cheung, G. Harrison
and W. McCready, University of Maryland School
of Medicine

BREAK — 1225-1400

Broward Room

SIX-PORTS

Chairman: S. Adam, Hewlett-Packard Company

- 1100 THRU-LOAD DELAY: AN IMPROVED TECHNIQUE
E-1 FOR CALIBRATING THE DUAL SIX-PORT
G. Engen and C. Hoer, National Bureau of Standards
- 1120 PERFORMANCE OF A DUAL SIX-PORT AUTOMATIC
E-2 NETWORK ANALYZER
C. Hoer, National Bureau of Standards
- 1140 PHASOR SIGNAL ANALYSIS OF THE SIX-PORT
E-3 A. Lance and W. Seal, TRW Defense and Space Systems
Group
- 1200 A COMPACT WAVEGUIDE 'RESOLVER' FOR THE
E-4 ACCURATE MEASUREMENT OF COMPLEX
REFLECTION COEFFICIENTS USING THE SIX-PORT
MEASUREMENT CONCEPT
G. Riblet, Microwave Development Labs, Inc.
- 1220 ANALYSIS OF SIX-PORTS
E-5 R. Speciale, TRW Defense and Space Systems Group

BREAK — 1240-1400

**MONDAY AFTERNOON AND EVENING,
APRIL 30, 1979**

Osceola Room

MILLIMETER-WAVE DEVICES

Chairman: H. Kuno, Hughes Aircraft Company

- 1400 HIGH POWER 94 GHz PULSED IMPATT
F-1 OSCILLATORS
K. Chang, C. Sun, D. English and E. Nakaji, Hughes
Aircraft Company
- 1420 HIGH POWER PULSED IMPATT OSCILLATORS NEAR
F-2 140 GHz
Y. Ngan and E. Nakaji, Hughes Aircraft Company
- 1440 A 90 GHz FM-CW-RADAR TRANSMITTER
F-3 H. Barth and M. Bischoff, AEG-Telefunken, Ulm,
Germany

BREAK — 1500-1530

- 1530 PERFORMANCE OF 93 GHz SELF-MIXING GUNN
F-4 OSCILLATOR
J. Paul, Hughes Aircraft Company

- 1500 LOW NOISE MILLIMETER WAVE SCHOTTKY
F-5 BARRIER DIODES WITH EXTREMELY LOW LOCAL
OSCILLATOR POWER REQUIREMENTS
D. Vizard, Appleton Laboratory, UK; N. Keen, Maz-
Planck-Institut fur Radio-astronomie, Bonn;
W. Kelly and G. Wrixon, University College, Ireland

- 1610 PRINTED-CIRCUIT BALANCED MIXER FOR THE 4
F-6 AND 5mm BANDS
P. Meier, AIL Division of Cutler-Hammer

BREAK — 1630-2000

2000

Special Invited Session

Chairman: J.L. Allen, University of South Florida

**ENGINEERING TECHNOLOGY
AND EDUCATION IN MAINLAND CHINA**

Dr. Joseph M. Petit, President, Georgia Institute of Technology

Lake Room

MICROWAVE MEASUREMENTS

Chairman: E. Komarek, National Bureau of Standards

- 1400 MEASURING ANISOTROPY IN MICROWAVE
G-1 SUBSTRATES
M. Olyphant, Jr., 3M Company
- 1415 COMPARATIVE MICROWAVE MEASUREMENTS OF
G-2 COMPLEX DIELECTRIC CONSTANT OF HIGH
PERMITTIVITY THIN FILMS
P. Pramanick and C. Dasgupta, Indian Institute of
Technology
- 1430 A NEW SELF-CALIBRATING TRANSISTOR TEST
G-3 FIXTURE
R. Lane and G. McCollum, California Eastern
Laboratories, Inc.
- 1445 A COMPUTER AIDED MEASUREMENT PROGRAM
G-4 FOR INTRINSIC INSERTION LOSS OF BILATERAL
MICROWAVE DEVICES
M. Gillette
- 1500 CAPACITANCE DETECTOR FOR VIDEO DISCS
G-5 K. Kawamoto and E. Denlinger, RCA Laboratories

BREAK— 1515-1600

MICROWAVE INTEGRATED CIRCUITS

Chairman: D. Bowyer, Martin Marietta

- 1600 A COMPARISON OF COPLANAR WAVEGUIDE AND
H-1 MICROSTRIP FOR GaAs MONOLITHIC INTEGRATED
CIRCUITS
A. Gopinath, Lincoln Laboratory, Massachusetts Insti-
tute of Technology
- 1620 THE COPLANAR-SLOT TRANSITION AND A DIGI-
H-2 TAL PHASE MODULATOR
R. Davidheiser, TRW Systems Group
- 1640 VARIOUS EXCITATION OF COPLANAR WAVEGUIDE
H-3 M. Houdart, Thomson-CSF, France
- 1700 A QUADRI-PHASE MODULATOR IN FIN-LINE
H-4 TECHNIQUE
E. Kpodzo, K. Schunemann and H. El-Hennawy,
Technische Universitat Braunschweig

Cape Canaveral Room

MICROWAVE SYSTEMS

Chairman: J. Horton, TRW

- 1400 USE OF MULTIPLE BEAM ANTENNA SYSTEMS IN
I-1 COMMUNICATIONS SATELLITES
E. Matthews, Ford Aerospace and Communications
Corp.
- 1425 A 10 WATT, C-BAND FET AMPLIFIER FOR TWTA
I-2 REPLACEMENT
P. Ho, C. Pham and R. Mencik, Ford Aerospace &
Communications Corp.
- 1445 HIGH PERFORMANCE DOWN AND UP CONVERTERS
I-3 FOR A 30/20 GHz SPACECRAFT TRANSPONDER
SYSTEM USING SUSPENDED SUBSTRATE
TECHNOLOGY
A. Cardasmenos, TRG Division of Alpha Industries;
R. Swartley, GE Valley Forge Space Center

- 1510 OCTAVE INPUT S-TO-Q-BAND LARGE-SIGNAL
I-4 UPPER-SIDE-BAND VARACTOR UP CONVERTER
H. Okean, L. Steffek and H. DeGruyl, LNR Communi-
cations, Inc.

BREAK — 1530-1600

- 1600 MIC FRONT END FOR AN I-BAND MONOPULSE
I-5 AIRBORNE RADAR
J. Soula and Y. Amblard, Thomson-CSF, France
- 1625 2.5 W AMPLIFIER FOR 11 GHz 1800 FDM CHANNELS
I-6 SYSTEM
E. Cesani, G. Corbetta and M. Molinari, Telettra, Italy
- 1650 NEW HETERODYNE RECEIVER HEAD
I-7 T. Hayasaka, M. Noguchi and K. Sakamoto, Nippon
Electric Co., Japan
- 1705 AN ULTRA LOW-NOISE MICROWAVE SYNTHESIZER
I-8 G. Alley, MIT Lincoln Laboratory;
H. Wang, Bell Telephone Laboratories

BREAK — 1730-2000

Broward Room

MICROWAVE ACOUSTICS AND MAGNETOSTATIC WAVES

Chairman: R. Rosenfeld, Sawtek, Inc.

- 1400 APPLICATION OF SAW AND MSW DEVICES
J-1 P. Carr and J. Sethares, Rome Air Development Center
- 1430 MAGNETOSTATIC WAVE REFLECTIVE ARRAY
J-2 FILTERS
J. Owens and C. Smith, Jr., University of Texas at
Arlington
- 1450 MAGNETOSTATIC VOLUME WAVE RESONATORS
J-3 J. Castera, Thomson-CSF, France
- 1510 A TEMPERATURE STABILIZED MAGNETOSTATIC
J-4 WAVE DEVICE
J. Adam, Westinghouse Research and Development
Center

BREAK — 1530-1545

- 1545 SHALLOW BULK ACOUSTIC WAVE DEVICES
J-5 A. Ballato, T. Lukaszek, USAERADCOM
- 1615 PRACTICAL ASPECTS OF SURFACE ACOUSTIC
J-6 WAVE OSCILLATORS
S. Salmon, Philips Research Laboratories, England
- 1635 APPLICATION OF SAW OSCILLATORS TO LOW-
J-7 NOISE COMMUNICATIONS SYSTEMS
E. Staples, J. Schoenwald, S. Dolochycki and T. Lim,
Science Center, Rockwell International
- 1655 TEMPERATURE CHARACTERISTICS OF MICRO-
J-8 WAVE ACOUSTIC RESONATORS
R. Moore and B. Newman, Westinghouse Defense and
Electronics System Center; B. McAvoy and J. Murphy,
Westinghouse R & D Center

BREAK — 1715-2000

TUESDAY, MAY 1, 1979

Osceola Room

SOLID STATE SOURCES

Chairman: W. Cox, Georgia Institute of Technology

- 0830 VARACTOR-TUNED GUNN OSCILLATORS WITH
K-1 WIDE TUNING RANGE FOR THE 25 TO 75 GHz
FREQUENCY BAND
L. Cohen, AIL Division of Cutler-Hammer
- 0850 A MICROSTRIP LOW NOISE X-BAND VOLTAGE
K-2 CONTROLLED OSCILLATOR
E. Niehenke and R. Hess, Westinghouse Defense &
Electronic Systems Center
- 0910 AN 8-18 GHz FET YIG TUNED OSCILLATOR
K-3 R. Oyafuso, Avantek

- 0930 HARMONIC LOAD-PULL
K-4 R. Stancliff and D. Poulin, Hewlett-Packard
BREAK 0950-1020
- 1020 OPTICAL-MICROWAVE EFFECTS IN IMPATT DIODE
K-5 OSCILLATORS
H. Vyas, R. Gutmann, and J. Borrego, Rensselaer Polytechnic Institute
- 1040 3 GHz, 15 W SILICON BIPOLAR TRANSISTORS
K-6 I. Uchizaki, S. Hori, Y. Oda and N. Tomita, Toshiba Research and Development Center, Japan
- 1100 FM NOISE OF TRANSMISSION-TYPE INJECTION-
K-7 LOCKED GaAs FET OSCILLATORS AND AMPLIFIERS
K., Mishima and Y. Tajima, Toshiba Research and Development Center, Japan
- 1120 A 6 GHz HIGHLY STABILIZED GaAs FET OSCIL-
K-8 LATOR USING A DIELECTRIC RESONATOR
T. Saito, Y. Arai and H. Komizo, Fujitsu Labs, Ltd.
Y. Itoh and T. Nishikawa, Murata Mfg. Co., Ltd.
BREAK - 1140-1330

Lake Room

MILLIMETER WAVE INTEGRATED CIRCUITS

- Chairman: K. Knerr, Bell Laboratories
- 0830 TRANSMISSION MEDIA FOR MILLIMETER-WAVE
L-1 INTEGRATED CIRCUITS
F. Tischer, Naval Postgraduate School
- 0850 MEASUREMENTS OF DISPERSION CHAR-
L-2 ACTERISTICS AND FIELD DISTRIBUTIONS IN
INVERTED STRIP DIELECTRIC WAVEGUIDE IN
MILLIMETER WAVELENGTH
M. Azarmanche and B. Chan Song Lint, O.N.E.R.A., France
- 0910 MULTIMODE WAVEGUIDE COMPONENTS FOR
L-3 MILLIMETER-WAVE INTEGRATED CIRCUITS
R. Mittra and S. Bhooshan, University of Illinois at Urbana-Champaign
- 0930 E-BAND LEAKY WAVE ANTENNA USING
L-4 DIELECTRIC IMAGE LINE WITH ETCHED
RADIATING ELEMENTS
K. Solbach, University of Duisburg
BREAK - 0950-1020
- 1020 A DISTRIBUTED FEEDBACK DIELECTRIC WAVE-
L-5 GUIDE OSCILLATOR WITH A BUILT-IN LEAKY-
WAVE ANTENNA
B. Song and T. Itoh, The University of Texas at Austin
- 1040 ACTIVE INTEGRATED DEVICES ON DIELECTRIC
L-6 SUBSTRATES FOR MILLIMETER WAVE
APPLICATIONS
R. Mittra, B. Kirkwood and N. Deo, University of Illinois at Urbana-Champaign
- 1100 AN 88-100 GHz RECEIVER FRONT END
L-7 A. Hislop, Naval Ocean Systems Center
- 1120 FREQUENCY STABILIZATION TECHNIQUE FOR
L-8 MILLIMETER-WAVE MICROSTRIP OSCILLATORS
D. Rubin, and D. Saul, Naval Ocean Systems Center
BREAK - 1140-1330

Cape Canaveral Room

SEMICONDUCTOR CONTROL

- Chairman: J. White, Microwave Associates
- 0830 PRACTICAL DESIGN TECHNIQUES FOR C-BAND
M-1 MIC DIODE PHASE SHIFTERS
K. Hinai and S. Kamihashi, Toshiba Research and Development Center, Japan
- 0850 A FAST SWITCHING 12-GHz PIN PHASE SHIFTER
M-2 REQUIRING LOW DRIVING POWER
B. Glance and N. Amitay, Bell Laboratories
- 0910 RECTIFIED RF FOR HIGH POWER PIN DUPLEXING
M-3 H. Maddix, D. Broderick and A. Winston, Omni-Wave Electronics Corporation

- 0930 BIASED PIN FOR 45 KW, X-BAND DUPLEXING
M-4 B. Sarkar, Tata Institute of Fundamental Research, India
BREAK - 0950-1020
- 1020 SELF ACTUATED, 20 KW, X-BAND BULK EFFECT
M-5 SEMICONDUCTOR DUPLEXER
G. Morris, V. Higgins and G. Hall, US Army Electronics Technology & Devices Laboratory;
Y. Anand, R. Bilotta and F. Jellison, Microwave Associates, Inc.
- 1040 NEW MM-WAVE FIN LINE ATTENUATORS AND
M-6 SWITCHES
H. Meinel and B. Rembold, AEG-Telefunken, Ulm, Germany
- 1120 GaAs SAMP DEVICE FOR K_u-BAND SWITCHING
M-7 P. Fleming, T. Smith, H. Carlson and W. Cox, COMSAT Laboratories
- 1140 WIDE BAND, DUAL GATE GaAs FET OUTPUT
M-8 LIMITERS
R. Hamilton, Jr., AvanteK, Inc.
BREAK - 1200-1330

Broward Room

MICROWAVE FILTERS

Chairman: S. Cohn, S.B. Cohn Associates, Inc.

- 0830 A 14-GHz HIGH POWER FILTER
N-1 A. Atia, COMSAT Laboratories
- 0850 REALIZATION OF DUAL MODE BAND REJECTION
N-2 FILTERS
R. Snyder, Premier Microwave Corporation
- 0910 TE₀₁₁ MODE SECTORIAL CIRCULAR CYLINDRICAL
N-3 CAVITY FILTERS
P. Karmel, COMSAT Laboratories
- 0930 CYLINDRICAL TE₀₁₁/TM₁₁₁ MODE CONTROL BY
N-4 CAVITY SHAPING
H. Thal, Jr., General Electric Company
BREAK 0950-1020
- 1020 WIDE BANDWIDTH COMB-LINE FILTERS WITH HIGH
N-5 SELECTIVITY
P. LaTourrette, Frequency Sources
- 1040 QUARTER WAVE DIELECTRIC TRANSMISSION LINE
N-6 DIPLEXER FOR LAND MOBILE COMMUNICATIONS
K. Wakino, T. Nishikawa, H. Matsumoto, Y. Ishikawa, Murata Mfg. Co., Ltd., Japan
- 1100 RECTANGULAR WAVEGUIDE-TYPE VARIABLE
N-7 BAND-PASS FILTERS
S. Toyoda and M. Ozasa, The Osaka Institute of Technology, Japan
- 1120 A NUMERICALLY OPTIMIZED CONTIGUOUS
N-8 DIPLEXER
R. Mole, Hughes Aircraft Company
BREAK - 1140-1330

TUESDAY AFTERNOON, MAY 1, 1979

Osceola Room

SOLID STATE POWER COMBINING

Chairman: M. Cohn, Westinghouse Defense Electronics

- 1330 15-WATT INTERNALLY MATCHED GaAs FETs AND
O-1 20-WATT AMPLIFIER OPERATING AT 6 GHz
K. Honjo, Y. Takayama, T. Furutsuka, A. Higashisaka and F. Hasegawa, Nippon Electric Co., Ltd., Japan
- 1350 A 10-WATT BROADBAND FET COMBINER/
O-2 AMPLIFIER
M. Cohn and E. Geller, Westinghouse Electric Company;
J. Schellenberg, Hughes Aircraft Co.
- 1410 A 25 KW SOLID STATE TRANSMITTER FOR L-BAND
O-3 RADARS
K. Lee, Westinghouse Electric Corporation
BREAK - 1430-1500

- 1500 O-4 MULTICHIP IMPATT POWER COMBINING: A SUMMARY WITH NEW RESULTS
C. Rucker, Georgia Institute of Technology
- 1520 O-5 TRAPPED INVERTED MICROSTRIP (TIM) CIRCUITS FOR COMBINING THE OUTPUTS OF HIGH-POWER IMPATT OSCILLATORS
R. Bera and R. Wallace, Raytheon Company Research Division
- 1540 O-6 EFFICIENT POWER COMBINING
M. Dydyk, Motorola, Inc.
- 1600 O-7 POWER COMBINING IN EVANESCENT MODE RESONATORS
J. Reich and K. Schunemann, Technische Universitat Braunschweig, West Germany

BREAK - 1620-1830

Lake Room

JAPANESE SESSION

Chairman: Prof. T. Suetake, Tokyo Institute of Technology
Organizer: Prof. T. Makimoto, Osaka University

- 1350 P-1 RECENT PROGRESS OF MICROWAVE INTEGRATED CIRCUITS IN JAPAN
K. Miyauchi, Yokosuka ECL, NTT
- 1400 P-2 AN APPROXIMATE DISPERSION FORMULA OF MICROSTRIP LINES FOR COMPUTER AIDED DESIGN OF MICROWAVE INTEGRATED CIRCUITS
E. Yamashita, K. Atsuki and T. Ueda, University of Electro-Communications
- 1420 P-3 AN ACTIVE MICROWAVE FILTER WITH DIELECTRIC RESONATORS
H. Matsumura and Y. Konishi, NHK Tech. Res. Labs
- BREAK - 1440-1510
- 1510 P-4 400 Mb/s 4-PSK MIC REGENERATOR AT CARRIER FREQUENCY USING GaAs MESFET
O. Kurita and S. Komaki, Yokosuka ECL, NTT
- 1530 P-5 HIGH-POWER MIC DIODE LIMITERS FOR S- AND X-BAND RADARS
S. Hori, M. Kuroda, K. Kanema and S. Okano, Toshiba Corp.
- 1550 P-6 UHF HIGH-POWER LOW-DISTORTION TRANSISTOR AMPLIFIER WITH HIGH-DIELECTRIC ($\epsilon_r = 39$) SUBSTRATE
Y. Kajiwar, T. Noguchi, T. Sugiura, H. Takamizawa, K. Hirakawa, and K. Sasaki, Nippon Electric Co., Ltd.
- 1610 P-7 4-8 GHz MINIATURIZED GaAs FET AMPLIFIER
S. Yamamura, N. Hidaka, Y. Tokumitsu and M. Fukuta, Fujitsu Laboratories Ltd.

BREAK - 1630-1830

Cape Canaveral Room

COMPUTER AIDED DESIGN

Chairman: B. Spielman, Naval Research Laboratory

- 1330 Q-1 FIN-LINE PARAMETERS CALCULATED WITH THE TLM-METHOD
W. Hoefer, University of Ottawa; A. Ros, Universite de Nice
- 1350 Q-2 SPECTRAL DOMAIN ANALYSIS OF DOMINANT AND HIGHER ORDER MODES IN FIN-LINES
C. Chang and T. Itoh, The University of Texas at Austin
- 1410 Q-3 APPROXIMATION OF COMPLEX FUNCTIONS BY VECTOR PROJECTION USING LEAST MEAN-SQUARE METHODS
W. Gopfert, Siemens, West Germany
- 1430 Q-4 IMPROVED DEVICE MODELING FOR MATCHING NETWORK SYNTHESIS
M. Medley, Jr., TRAK Microwave; J. Allen, University of South Florida
- BREAK - 1450-1520
- 1520 Q-5 COMPUTER AIDED DESIGN OF THE MICROWAVE BROADBAND LINEAR PHASE MODULATOR WITH VARACTOR DIODE
J. Modelski, Warsaw Technical University

- 1540 Q-6 THE IMPACT OF GENERALIZED SYMMETRY IN COMPUTER AIDED DESIGN OF CASCADED STRUCTURES
J. Bandler, R. Biernacki and M. Rizk, McMaster University, Canada
- 1600 Q-7 REALISTIC TOLERANCE ANALYSIS OF MICROWAVE NETWORKS
H. Tromp, University of Ghent, Belgium
- 1620 Q-8 SIMULATION AND DESIGN OF MICROWAVE CLASS-C AMPLIFIERS THROUGH HARMONIC ANALYSIS
F. Filicori and V. Monaco, Universita de Bologna; C. Naldi, Politecnico di Torino

BREAK - 1640-1830

Broward Room

MICROWAVE FERRITES

Chairman: G.P. Rodrigue, Georgia Institute of Technology

- 1330 R-1 FUTURE DIRECTIONS FOR MICROWAVE FERRITE COMPONENTS
L. Whicker, Naval Research Laboratory
- 1440 R-2 ACCURACY STUDY FOR A MODERATE PRODUCTION QUANTITY OF RECIPROCAL FERRITE PHASE SHIFTERS
C. Boyd, Microwave Applications Group
- 1420 R-3 OPTIMIZATION AND DESIGN OF MILLIMETER WAVELENGTH PHASE SHIFTERS
E. Gimonet and B. Chan Song Lint, O.N.E.R.A.-C.E.R.T., France
- BREAK - 1440-1510
- 1510 R-4 THE EDGE GUIDED MODE NONRECIPROCAL PHASE SHIFTER
D. Bolle and S. Talisa, Brown University
- 1530 R-5 NEW EDGE GUIDED WAVE ON FERRITE STRIP
Y. Naito, K. Araki and S. Enjoji, Tokyo Institute of Technology, Japan
- 1550 R-6 HIGH POWER X-BAND FERRITE FREQUENCY DOUBLER
L. Dubrowsky, D. Buck, A. Kern and D. Schubert, Westinghouse Electric Corporation

BREAK 1610-1830

WEDNESDAY MAY 2, 1979

Osceola Room

FETs AND FET MODELING

Chairman: B. Berson, Hewlett-Packard Company

- 0830 S-1 AN X-BAND GaAs MONOLITHIC POWER AMPLIFIER
R. Pucel, P. Ng and J. Vorhaus, Raytheon Company
- 0850 S-2 TECHNIQUES FOR IMPROVING THE STABILITY AND AMPLIFIER PERFORMANCE OF X-BAND GaAs POWER FETs
S. Temple, Z. Galani, R. Healy and B. Hewitt, Raytheon Company
- 0910 S-3 HIGHLY RELIABLE GaAs MESFETs WITH A STATIC MEAN NF_{min} OF 0.89 dB AND A STANDARD DEVIATION OF 0.07 dB AT 4 GHz
T. Suzuki, A. Nara, T. Ishii, S. Mitsui and K. Shirahata, Mitsubishi Electric Corporation
- 0930 S-4 HIGH FREQUENCY PERFORMANCE OF IMPLANTED Si-MOSFETs
C. Tsironis and U. Niggebrugge, Technical University Aachen, FRG
- BREAK - 0950-1020
- 1020 S-5 A PRACTICAL AC LARGE-SIGNAL MODEL FOR GaAs MICROWAVE MESFETs
A. Madjar and F. Rosenbaum, Washington University
- 1040 S-6 QUASI-STATIC APPROACH TO SIMULATING NON-LINEAR GaAs FET BEHAVIOR
C. Rauscher and H. Willing, Naval Research Laboratory

1120 INTERMODULATION DISTORTION IN MICROWAVE
S-7 MESFET AMPLIFIERS
R. Gupta, C. Englefield and P. Goud, The University of
Alberta

1140 EXTENSION OF EXISTING MODELS TO MESFETs
S-8 WITH ARBITRARY DOPING DENSITY PROFILES
P. deSantis, Selenia S.p.A., Italy

BREAK — 1200-1330

Lake Room

ACTIVE AND PASSIVE COMPONENTS

Chairman: H. G. Oltman, Hughes Aircraft Company

0830 COMPUTER SIMULATED DESIGN OF AN ACTIVE
T-1 MICROWAVE ALL-PASS NETWORK
S. Sussman-Fort, North Carolina A & T State University

0850 HIGH-SPEED VARACTOR-TUNABLE MICROWAVE
T-2 FILTER-ELEMENT
A. Presser, RCA Laboratories

0910 TEMPERATURE COMPENSATED BaTi₄O₉ MICRO-
T-3 STRIP DELAY LINE
Y. Lee and W. Childs, COMSAT Laboratories

0930 A CONTINUOUSLY VARIABLE COAXIAL-LINE
T-4 ATTENUATOR
E. Cristal, Hewlett-Packard Company

BREAK — 0950-1020

1020 MULTILAYER HYBRID IN CIRCULAR WAVEGUIDE
T-5 E. Harkless and D. Zuckerman, Bell Laboratories

1040 A HYBRID COUPLER FOR MICROSTRIP
T-6 CONFIGURATION
S. Hopfer, General Microwave Corporation

1100 IMPROVED LARGE APERTURE WAVEGUIDE
T-7 COUPLING THEORY
R. Levy, Microwave Development Labs., Inc.

BREAK — 1120-1330

Cape Canaveral Room

MICROWAVE HIGH POWER

Chairman: H. Goldie, Westinghouse Electric Corp.
Organizer: K. Tomiyasu, GE Valley Force Space Center

0830 A HIGH-POWER LOW PASSIVE INTERMODULATION
U-1 (PIM) UHF DUPLEXER FOR SPACE APPLICATION
C. Kudsia, K. Ainsworth, and J. Heierli, Com Dev Ltd.,
Canada; F. Daniels, Government of Canada

0850 ULTRA RELIABLE 2.5 kW SOLID STATE L-BAND
U-2 AMPLIFIER
G. Hanley and R. Viola, Sperry Gyroscope

0910 MICROWAVE NANOSECOND PULSE BURNOUT
U-3 PROPERTIES OF GaAs MESFETs
J. Whalen, M. Thorn, State University of New York at
Buffalo; M. Calcaterra, Air Force Avionics Laboratory

0930 AN ELECTRON-BOMBARDED SEMICONDUCTOR
U-4 (EBS) MODULATOR AND SWITCH DRIVER
T. Perkins, III, Sanders Associates, Inc.

BREAK — 0950-1020

1020 THEORETICAL AND EXPERIMENTAL STUDY OF
U-5 RELATIVISTIC MAGNETRONS
M. Fuchs and V. Nechajev, USSR Academy of Sciences

1040 OPERATION OF PULSED MILLIMETER WAVE-
U-6 LENGTH EXTENDED INTERACTION
OSCILLATORS
G. Ewell, D. Ladd and J.C. Butterworth, Georgia
Institute of Technology

1100 POWER COMBINING IN AN ARRAY OF MICROWAVE
U-7 POWER RECTIFIERS
R. Gutmann and J. Borrego, Rensselaer Polytechnic
Institute

1120 MONOPULSE ANTENNA NETWORKS FOR A MULTI-
U-8 ELEMENT FEED WITH INDEPENDENT CONTROL OF
THE THREE MONOPULSE MODES
S. Pizette and J. Toth, Raytheon Company

BREAK — 1140-1330

Broward Room

FIBER AND GUIDED WAVE OPTICS

Chairman: W. Chang, Washington University

0830 ACOUSTO-OPTIC RADAR SPECTRUM ANALYSIS
V-1 FOR ELECTRONIC WARFARE APPLICATIONS
T. Giallorenzi, Naval Research Laboratory;
M. Hamilton, Air Force Avionics Laboratory

0910 AN ANALYSIS OF NONRECIPROCAL LIGHT
V-2 COUPLER
I. Awai, S. Miyazaki and J. Ikenoue, Kyoto University,
Japan

BREAK — 0930-1000

1000 EVANESCENT WAVE METHOD FOR PROPAGATION
V-3 IN GRADED INDEX SLAB WAVEGUIDES
E. Navon and L. Felson, Polytechnic Institute of New
York

1020 AN ELECTROMAGNETIC ANALYSIS OF THE TRANS-
V-4 MISSION PROPERTIES OF RADIAL OFFSETS IN
ROUND OPTICAL FIBERS
E. Bianciardi and V. Rozzoli, University of Bologna, Italy

1040 MODE DISPERSION IN GRADED-INDEX OPTICAL
V-5 FIBER WITH NEAR PARABOLIC-INDEX PROFILES
H. Ikuno and H. Watanabe, Kumamoto University, Japan

1100 FUNDAMENTAL MODE PROPAGATION OF
V-6 DIELECTRIC FIBERS OF SOME NONCIRCULAR
CROSS SECTIONS
E. Kuester and R. Pate, University of Colorado

1120 STUDY OF SUBMILLIMETER WHISKER STRUC-
V-7 TURES BY MICROWAVE EXPERIMENTAL SIMULA-
TION AND THE GEOMETRICAL THEORY OF
DIFFRACTION
J. Bolomey, J. Cashman, and S. El Habiby,
C.N.R.S. - E.S.E., France

BREAK — 1140-1330

WEDNESDAY AFTERNOON, MAY 2, 1979

Osceola Room

ACTIVE MICROWAVE INTEGRATED CIRCUITS

Chairman: S. March, E-Systems, Inc.

1330 12 GHz 1 W GaAs FET AMPLIFIER FOR SHF TV
W-1 SIGNAL TRANSMISSION
S. Aihara, Y. Fujiki, S. Fukuda and I. Haga, Nippon
Electric Co., Ltd.

1350 A 12 GHz, 1W, GaAs MESFET AMPLIFIER
W-2 Y. Kadowaki, M. Nakatani and T. Ishii, Mitsubishi
Electric Corporation

1410 A 4 W, 56 dB GAIN, MICROSTRIP AMPLIFIER AT
W-3 15 GHz UTILIZING GaAs FETs AND IMPATT DIODES
V. Sokolov, M. Namordi and F. Doerbeck, Texas
Instruments, Inc.

1430 100 MILLIWATT OUTPUT UPCONVERTER USING 4
W-4 SCHOTTKY DIODES
B. Halford, Rockwell International

BREAK — 1450-1520

1520 AN X-BAND DUAL-GATE FET UPCONVERTER
W-5 W. Tsai, S. Paik, N. Gregory and P. Tanzi, Raytheon
Company

1540 FREQUENCY MULTIPLICATION WITH HIGH-POWER
W-6 MICROWAVE FIELD-EFFECT TRANSISTORS
M. Gupta and T. Lee, Massachusetts Institute of
Technology; R. Laton, MIT Lincoln Laboratory

1600 AN ACTIVELY BROADBAND MIC PARAMETRIC
W-7 AMPLIFIER
R. Pearson, G. Payne and D. Paul, Philips Research
Laboratories, England

1620 THE HYBRID PARAMETRIC AMPLIFIER
W-8 C. Aitchison and A. Wong, Chelsea College, England

1640 END OF SESSION

Lake Room

MICROWAVE DEVICES AND CIRCUITS FOR GIGABIT, DIGITAL SYSTEMS

Chairman: P. Greiling, Hughes Research Laboratory

- 1330
X-1 MSI HIGH-SPEED LOW-POWER GaAs ICs USING SCHOTTKY DIODE FET LOGIC
S. Long, B. Welch, R. Eden, F. Lee and R. Zucca, Rockwell International
- 1350
X-2 GIGABIT LOGIC PROSPECTS OF GaAs E-JFET INTEGRATED CIRCUITS
R. Zuleeg, J. Notthoff and A. Behle, McDonnell Douglas Astronautics Company
- 1410
X-3 APPLICATION OF JOSEPHSON PROCESSOR TECHNOLOGY
B. Troutman, IBM
- BREAK — 1430-1500
- 1500
X-4 REGENERATION OF 1 Gbit/s SIGNALS AFTER TRANSMISSION OVER AN OPTICAL FIBER
U. Wellens and B. Bosch, Ruhr-Universitat Bochum, West Germany
- 1520
X-5 PHASE SYNCHRONIZATION OF DIGITALLY MODULATED BURST CARRIERS IN TDMA SYSTEMS — A TECHNOLOGY OVERVIEW
C.L. Cuccia, Ford Aerospace & Communications Corporation
- 1540
X-6 TWO GBPS QPSK MODEM
G. DesBrusay, Jr., D. Horwood and G. Lee, Hughes Aircraft Company
- 1600
X-7 THE INJECTION-LOCKED-OSCILLATOR AS A MICROWAVE AMPLIFIER OF MSK MODULATED SIGNALS — PART II
S. Kumar, W. Chudobiak and J. Wight, Carleton University, Canada
- 1620
X-8 GIGABIT 4-PHASE MODULATION-DEMODULATION FOR MICROWAVE DIGITAL SYSTEMS
K. Miyauchi, S. Seki and K. Yanagimoto, Nippon Telegraph & Telephone Corp.
- 1640 END OF SESSION

Cape Canaveral Room

ACTIVE AND PASSIVE REMOTE SENSING

Chairman: T. Lane, Eglin Air Force Base

- 1330
Y-1 PASSIVE AND ACTIVE MICROWAVE SENSORS IN SATELLITES FOR REMOTE SENSING OF THE EARTH
K. Tomiyasu, General Electric Company
- 1440
Y-2 DUAL FREQUENCY MULTI-CHANNEL MILLIMETER WAVE RADIOMETERS FOR HIGH ALTITUDE OBSERVATION OF ATMOSPHERIC WATER VAPOR
J. Schuchardt, J. Stratigos, J. Galgiano and D. Gallentine, Georgia Institute of Technology
- 1420
Y-3 AN AIRBORNE REMOTE SENSING 4.5 TO 7.2 GIGAHERTZ STEPPED FREQUENCY MICROWAVE RADIOMETER
R. Harrington, R. Couch and J. Fedors, NASA Langley
- 1440
Y-4 REFLECTANCE OF ICE AND SEAWATER AT MILLIMETER WAVELENGTHS
N. Blue, Georgia Institute of Technology
- BREAK — 1500-1530
- 1530
Y-5 THE SEASAT — A SYNTHETIC APERTURE RADAR
R. Jordan and D. Held, Jet Propulsion Laboratory
- 1600
Y-6 THE SURFACE CONTOUR RADAR, A UNIQUE RADAR REMOTE SENSING INSTRUMENT
E. Walsh, NASA Wallops Flight Center; J. Kenney, Naval Research Laboratory
- 1620
Y-7 1.35 GHz MICROWAVE SCATTEROMETER
F. Ulaby, W. Stiles, D. Brunfeldt and E. Wilson, University of Kansas Center for Research, Inc.

- 1640
Y-8 EFFECTS OF SYSTEM PARAMETER VARIATIONS ON MICROWAVE INTRUSION DETECTOR PERFORMANCE
C. McGillem, Purdue University; H. Bostic, C. Frank, D. Gilbert and F. Hasseld, Naval Avionics Center
- 1700 END OF SESSION

Broward Room

MICROWAVE FIELD THEORY

Chairman: E. Yamashita, University of Electro-Communications, Japan
Organizer: T. Itoh, The University of Texas at Austin

- 1330
Z-1 ANALYSIS OF OPEN DIELECTRIC WAVEGUIDES USING MODE-MATCHING TECHNIQUE AND VARIATIONAL METHODS
R. Mittra, Y. Hou and V. Jamnejad, University of Illinois at Urbana-Champaign
- 1350
Z-2 DIELECTRIC ANTENNAS FOR MILLIMETER-WAVE AMPLIFICATION
S. Kobayashi, R. Lampe, N. Deo and R. Mittra, University of Illinois at Urbana-Champaign
- 1410
Z-3 A NEW CLASS OF LEAKY MODES ON OPEN DIELECTRIC WAVEGUIDES
A. Olmer and S. Peng, Polytechnic Institute of New York
- 1430
Z-4 SOME RECENT THEORETICAL STUDIES ON OPEN MICROSTRIPS
E. Kuester and D. Chang, University of Colorado
- BREAK — 1450-1520
- 1520
Z-5 METHOD OF ANALYSIS OF SOME MICROWAVE PLANAR NETWORKS
R. Mehran, Gesamthochschule Duisburg, FRG
- 1540
Z-6 SYSTEMATIC DERIVATION OF VARIATIONAL PRINCIPLES IN ELECTROMAGNETIC FIELD THEORY
K. Kalistein, Hunter College of the City University of New York
- 1600
Z-7 A VARIATIONAL APPROACH TO COMPUTE THE EQUIVALENT CAPACITANCE OF COAXIAL LINE DISCONTINUITIES
L. Gogioso and M. Marchesi, Consiglio Nazionale Delle Ricerche, Italy; M. Parodi, University of Genoa, Italy
- 1620
Z-8 A VARIATIONAL EXPRESSION FOR THE SCATTERING MATRIX OF A STEP DISCONTINUITY IN A COAXIAL LINE AND ITS APPLICATION TO THE STUDY OF A MULTIMODE TEM CELL
I. Sreenivasiah and D. Chang, University of Colorado
- 1640 END OF SESSION



Preliminary Announcement of the 37th Annual DEVICE RESEARCH CONFERENCE University of Colorado, Boulder, CO, June 25-27, 1979

The 1979 Device Research Conference will be held at the University of Colorado, Boulder, CO. It is sponsored by the IEEE Electron Device Society.

The Electronic Materials Conference will be held at the same location on June 27-29 in order to continue the stimulating and fruitful interchanges between device and materials people.

As in the past, novel work of a basic or exploratory nature in all areas of device technology will be welcome. Work in the various optoelectronic disciplines will continue to receive emphasis. After a strong resurgence in 1978, we plan to continue to encourage the submission of papers on the physics and phenomenology of silicon devices, complementing the coverage of conferences emphasizing evolutionary and development work.

Support in the form of transportation for accepted student papers will be available on a limited basis.

Evening rump sessions will be held. A cocktail party and picnic are also planned. A CALL FOR PAPERS with more details will be sent out in the near future.

SCHEDULE OF EVENTS

SHERATON-TWIN TOWERS HOTEL

SHERATON-TWIN TOWERS HOTEL						
CONVENTION CENTER LOBBY		OSCEOLA ROOM	LAKE ROOM	CAPE CANAVERAL ROOM	BROWARD ROOM	EXHIBIT HALL
SUNDAY, APRIL 29TH						
	0830 VOLUSIA ROOM ADCOM MEETING					EXHIBIT SET-UP
1630 REGISTRATION	1500					
2130						
MONDAY, APRIL 30TH						
0730	0730 SPEAKERS'/CHAIRMEN'S BREAKFAST					0900

HOWARD JOHNSON'S HOTEL AT FLORIDA CENTER

1630 REGISTRATION 2030		WEDNESDAY, MAY 2ND		1730 SOCIAL HOUR 1900	
0730 REGISTRATION 1630		THURSDAY, MAY 3RD			
0830 ASSEMBLY ROOM SPECIALTY CONFERENCE ON GIGABIT LOGIC FOR MICROWAVE SYSTEMS SESSION I 1700		0830 DELEGATE ROOM WORKSHOP ON AUTOMATED RADIO FREQUENCY TECHNIQUES SESSION I 1700		0830 CAPITOL ROOM WORKSHOP ON FILTER TECHNOLOGY 1700	
0830 COMMITTEE ROOM WORKSHOP ON MODELING AND CHARACTERIZATION OF MICROSTRIP PARASITICS 1700					
0800 REGISTRATION 1000		FRIDAY, MAY 4TH			
0830 ASSEMBLY ROOM SPECIALTY CONFERENCE ON GIGABIT LOGIC FOR MICROWAVE SYSTEMS SESSION II 1300		0830 DELEGATE ROOM WORKSHOP ON AUTOMATED RADIO FREQUENCY TECHNIQUES SESSION II 1530		0830 STATE ROOM WORKSHOP ON POWER GaAs FET DEVICES AND CIRCUITS 1515	

FIRST SPECIALTY CONFERENCE ON GIGABIT LOGIC FOR MICROWAVE SYSTEMS

Thursday, a.m., May 3, 1979

Session A: Josephson Junctions

Chairman: A.H. Silver, The Aerospace Corp.

- (Invited) W. Anaker, Thomas J. Watson Research Center.
- Fast Analog-to-Digital Conversion with SQUIDS by J.P. Hurrell & D.C. Pridmore-Brown, The Aerospace Corp.
- High-Speed Superconducting Analog-to-Digital Converters by C.A. Hamilton & R.E. Harris, National Bureau of Standards.
- An Improved Current Switched Josephson Gate by T. Fulton, F.F. Pei, & L.N. Dunkleberger, Bell Laboratories.
- A 30-Picoseconds Josephson Current Injection Logic (CIL) Family by T.R. Gheewala, Thomas J. Watson Research Center.
- Current Switched Josephson Flip-Flop Logic by F.F. Pei, Bell Laboratories.
- Josephson Digital Research in a University Laboratory by T. Van Duzer, Dept. of Elec. Engrn. & Computer Sciences Univ. of California.

Thursday, p.m., May 3, 1979

Session B: Applications, Comparative Studies, and Silicon

Chairman: C. Ryan, Michigan Tech. Univ.

- Silicon Technology for Gigabit Applications (Invited) A.S. Templin, TRW Defense & Space Systems Group.
- A High-Speed Submicrometer CMOS/SOS Inverter by D.C. Mayer and W.E. Perkins, Hughes Research Laboratories.
- A 1 GHz 8-Bit Serial-to-Parallel Converter Using Poly-Ox Dielectric Isolation by K.H. Konkle, S.E. Bernacki, C.E. Woodward, J.I. Raffel, Massachusetts Institute of Technology.
- Multipurpose 1.28 Gbit/s Measuring Equipment by G. Hanke, Forschungsinstitut der Deutschen Bundespost (FI 42c)
- Hybrid Adaptive Array Processing Using Hi-Speed A/D Converters by L.J. Griffiths and C.W. Jim, Dept. of Elec. Engrn., Univ. of Colorado.
- Theoretical Comparison of Gigabit Rate Logic Devices Including GaAs NMOS and MESFETs by W.R. Curtice, RCA Laboratories.
- Switching Characteristics of GaAs and Silicon MESFETs by H.L. Grubin, United Technologies Research Center.
- Giga-Hertz Computer Architecture and Expectable Constructivity by H. Kamiuchi, Matsukawa-23, Maruoka-cho, Sakai-gun, Fukui-ken, JAPAN.

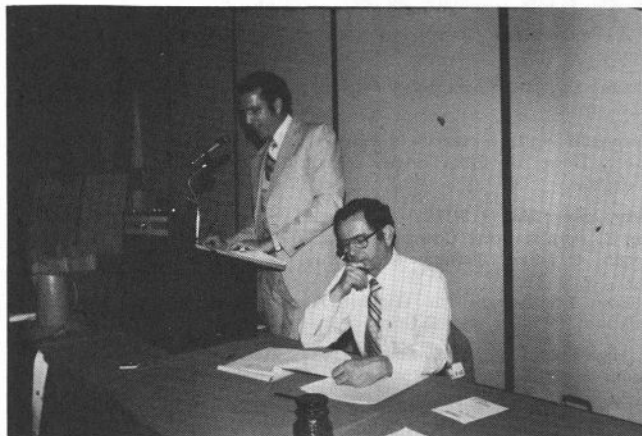
Friday, a.m., May 4, 1979

Session C: GaAs

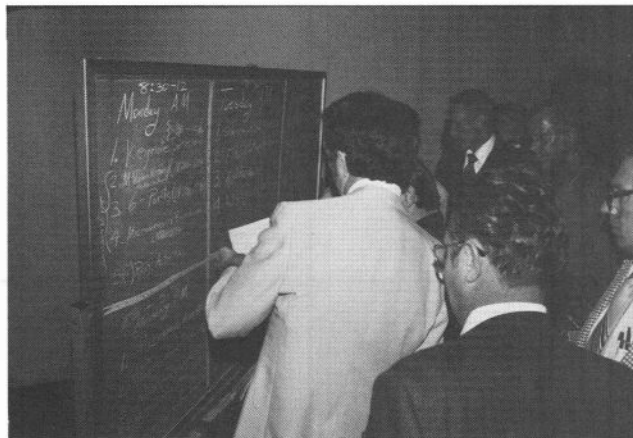
Chairman: L. Micheel, Wright-Patterson AFB

- (Invited) R.C. Eden, Rockwell Intn'l. Science Center.
- Speed-Power Tradeoff in GaAs FET Integrated Circuits by J. Maupin, P. Greiling, and N. Alexopoulos, Hughes Research Laboratories.
- On the Design and Feasibility of Multiple-Valued Logic Circuits Using GaAs MESFETs by J.G. Tront and L.F. Fuller, Virginia Polytechnic Institute and State Univ.
- An 80-ps Normally-Off GaAs MESFET Logic by T. Mizutani, M. Ida, and M. Ohmori, Nippon Telegraph & Telephone Public Corp.
- GaAs Enhancement Mode FET-Tunnel Diode Ultra-Fast Low Power Inverter and Memory Cell by K. Kehovec, Univ. of S. California.
- Optimum Design of Technological Parameters Relating to the Performance of LSI GaAs Logic Circuits by M. Rocchi, G. Durand, L.E.P.
- A GaAs Integrated Edge-Triggered D-Type Flip-Flop by M. Gloanec, G. Nozillat, C. Arnodo, and M. Peltier, Thompson - CSF; Laboratoire Central Recherches.
- Application of GaAs CCDs to High-Speed Signal Processing by I. Deyhimi, J. Harris, and R. Eden, Rockwell Intn'l. Science Center.
- Operation of GaAs Schottky-Barrier CCDs with 5-Micrometer Electrodes by U. Ablassmeir, W. Kellner, H. Herbst, and H. Kniepkamap, Siemens-AG.
- Monolithic Logic Circuits with Transferred Electron Logic Devices (TELDs) by L.C. Upadhyayula, RCA Laboratories.
- TELD Design for Gigabit Logic Applications by D. Claxton, TRW Defense and Space Systems Group.

SCENES FROM THE T.P.C. MEETING AND THE ADCOM MEETING



In command of the situation.



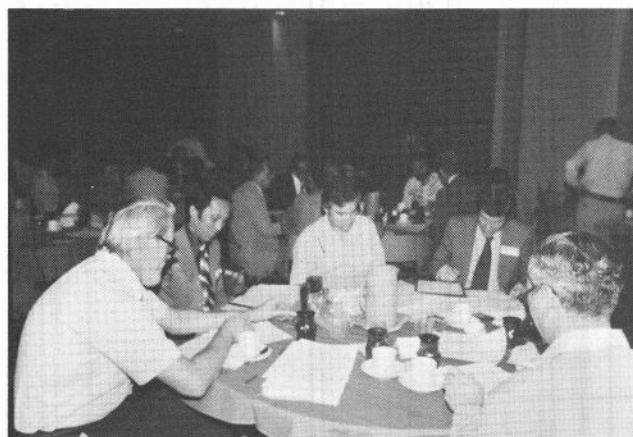
Finalizing the Program



Making a point.



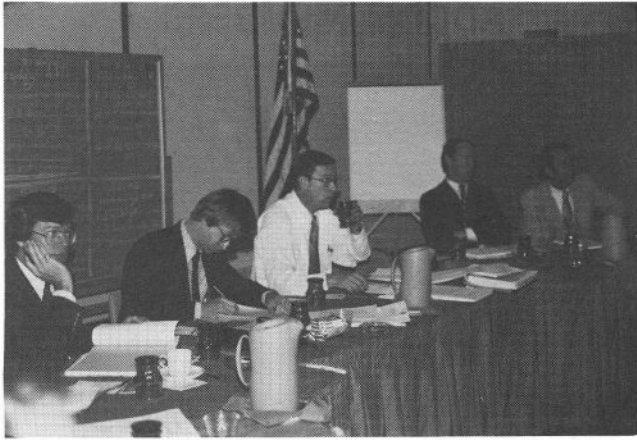
Selection of papers.



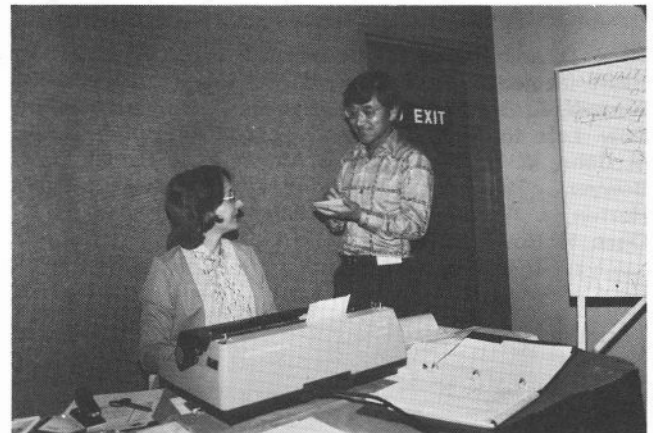
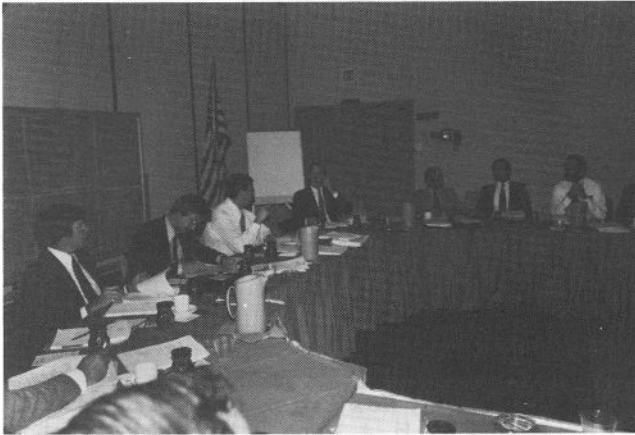
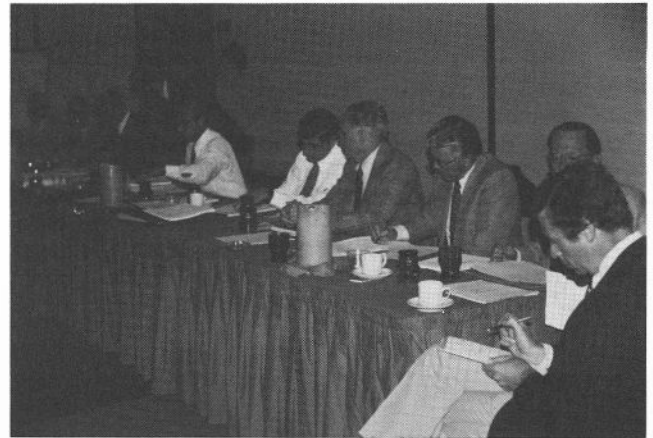
Solid state devices subcommittee at work



Checking with
the master file.



Adcom meeting in session.



Newsletter reporter/editor/photographer at work.



Happy faces at the end of the meeting.

TECHNICAL PROGRAM COMMITTEE



1979 Technical Program Committee. First Row Left to Right (Seated): K. J. Button, R. C. Van Wagoner, C. Chao, J. White, W. Cox, B. Berson, R. B. Hicks. Second Row Left to Right (Standing): R. C. Rosenfeld, R. S. Kagiwada, J. B. Horton, B. Potter, W. Steenaart, E. W. Matthews, R. A. Sparks, G. R. Harrison. Third Row Left to Right (Standing): J. J. Gallagher, D. T. Hodges, W. C. S. Chang, J. M. Cotton, Jr., H. J. Kuno, J. C. Wiltse (Co-Chairman), G. Chao.



1979 Technical Program Committee. First Row Left to Right (Seated): J. W. Dees, W. B. Day, T. Lane, J. R. Ashwell, A. E. Williams, C. T. Rucker, C. R. Boyd. Second Row Left to Right (Standing): M. Caulton, H. Sobol, M. Cohn, M. W. Medley, Jr., S. March, F. E. Reisch, D. N. Bowyer. Third Row Left to Right (Standing): M. C. Horton, J. Whelehan, R. H. Knerr, H. G. Oltman, R. G. Olsen, H. Howe, H. Goldie.



1979 Technical Program Committee. First Row Left to Right (Seated): J. Helszajn, R. Gilson, S. Adam, D. Parker, J. L. Allen (Chairman), P. Silvester, R. E. Henning. Second Row Left to Right (Standing): M. Yoder, D. M. Bolle, S. Okwit, J. Bandler, G. P. Rodrigue, E. L. Komarek. Third Row Left to Right (Standing): P. T. Greiling, W. R. Curtice, B. E. Spielman, T. Itoh, F. J. Rosenbaum.

ADCOM MEMBERS



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WORKSHOPS

Specialty Conference on Gigabit Logic for Microwave Systems

The First Specialty Conference on Gigabit Logic for microwave systems will be held (May 3, 4) in conjunction with the 1979 MTT-S International Microwave Symposium in Orlando, Florida.

The workshop will bring together engineers and scientists actively involved in the rapidly developing fields of gigabit devices and gigabit logic applications. Papers will be presented dealing with Gallium arsenide and silicon devices, Josephson junction devices, cold (77°K) logic, phased arrays, signal processing and A/D convertors.

The workshop is co-sponsored by the Microwave Society (MTT Technical Committee #9) and Electron Devices Society of IEEE and is expected to draw approximately 100 experts in the field.

The general chairman of the workshop is P. T. Greiling, Hughes Research Labs, Malibu, California. (213) 456-6411

Workshop on Automatic Radio Frequency Techniques

A workshop entitled "Automated RF Techniques" will be held May 3 and 4 in conjunction with the 1979 MTT-S International Microwave Symposium in Orlando, Florida.

The purpose of this workshop is to bring together engineers, scientists and hardware manufacturers to discuss state-of-the-art developments in simulation, measurement/calibration techniques and computer aided design procedures for RF systems.

In addition to technical presentations given by the participants, actual hardware demonstrations will be featured.

The workshop is jointly sponsored by MTT Technical Committee #1 and 11 as well as by ARFTG and is expected to draw approximately 100 experts in the field.

The Workshop chairman is R. W. Swartley, General Electric Valley Forge Space Center, Philadelphia, PA.

Workshop on Filter Technology

A workshop entitled "Filter Technology" will be held May 3 in conjunction with the 1979 MTT-S International Microwave Symposium in Orlando, Florida.

The object of the workshop is to bring together workers in filter technology to exchange ideas on new developments, with particular emphasis on dielectric resonator filters. There has been significant progress in developing ceramics with high Q, high dielectric constant, and very low temperature coefficient. The capabilities of different types of filters such as dielectric resonator, waveguide, coax, and stripline will be put into perspective.

The workshop is sponsored by MTT Technical Committee #8 and is expected to draw approximately 100 experts in the field.

The general chairman of the workshop is Dr. Ralph Levy, Microwave Development Laboratories, 11 Michigan Drive, Natick, Massachusetts 01760. Phone — (617) 655-0060.

Workshop on Modeling & Characterization of Microstrip Parasitics

A workshop entitled "Modeling and Characterization of Microstrip Parasitics" will be held May 3 in conjunction with the 1979 MTT-S International Microwave Symposium in Orlando, Florida.

The purpose of the workshop is to bring together practitioners in the field of microwave integrated circuits to stimulate and exchange ideas on microstrip circuit design problems. The emphasis will be on the characterization of microstrip discontinuities, losses, and radiation, both experimentally and by computer modeling.

The workshop is jointly sponsored by MTT Technical Committee #1 and 6 and is expected to draw approximately 100 experts.

The workshop chairman is C. Buntschuh, Microwave Associates, Inc., Burlington, MA 01803.

Workshop on Power GaAs FET Devices & Circuits

A workshop entitled "Power GaAs FET Devices and Circuits" will be held May 4 in conjunction with the 1979 MTT-S International Microwave Symposium in Orlando, Florida.

The workshop will bring together active research and development engineers involved in the areas of: GaAs FET technology, device modeling and characterization, broadbanding matching techniques and circuit optimization techniques for pulsed and CW operation.

The workshop is jointly sponsored by the Technical Committee on Microwave and Millimeter Solid State Device (MTT 7) and Microwave and Millimeter Wave Integrated Circuits (MTT 6).

The general chairman of the workshop is Frank Reich of Rockwell International, Richardson, Texas.

Microwave Specialty Conference Workshops Scheduled

Reflecting the current intense interest and rapidly expanding application areas of microwaves, four workshops and a specialty conference are scheduled for early May in Orlando, Florida. These meetings will be held in conjunction with the 1979 MTT-S International Microwave Symposium (30 April to 2 May).

The topic of the Specialty Conference is Gigabit Logic for Microwave Systems. The four Workshops are: 1) Automatic Radio Frequency Techniques, 2) Filter Technology, 3) Modeling and Characterization of Microstrip Parasitics, and 4) Power GaAs FET Devices and Circuits.

According to Dr. R. E. Henning of the University of South Florida and Steering Committee Chairman, each of the workshops is expected to draw approximately 100 international experts in their fields. The main symposium will attract over 1,000 engineers and scientists as well as industrial exhibitors.

The workshops and specialty conference are sponsored by IEEE (Institute of Electrical and Electronic Engineers) through the Technical Committee of the MTT-S.

CALL FOR PAPERS

SPECIAL ISSUE ON GIGABIT LOGIC FOR MICROWAVE SYSTEMS

The IEEE Transactions on Microwave Theory and Techniques is planning to publish a Special Issue on Gigabit Logic for Microwave Systems in May 1980. Papers are solicited that describe new and significant aspects of research, development, design or application in the following (but not limited to) areas:

- Depletion and Enhancement Mode Schottky—Barrier GaAs FET Integrated Circuits.
- JFET Integrated Circuits
- TELD Circuits
- Si Bipolar and MOSFET High—Speed Integrated Circuits
- Device and Circuit Modeling Techniques for Design and Optimization
- RF Testing Techniques for Design and Optimization
- Radiation Effects on High—Speed Performance
- Microwave Applications to Real—Time Signal Processing
- Matching Considerations Between High—Impedance, Lumped—Element Circuits and Distributed, Low Impedance Circuits

The deadline for submission of manuscripts is July 15, 1979. Authors are requested to submit five (5) copies of each manuscript to:

Guest Editor: Paul T. Greiling
HUGHES RESEARCH LABORATORIES
3011 Malibu Canyon Road
Malibu, CA 90265

**MICROWAVE THEORY AND TECHNIQUES SOCIETY
WORKSHOP ON
MODELING AND CHARACTERIZATION OF MICROSTRIP PARASITICS**

The MTT Technical Committees on Microwave Integrated Circuits (MTT-6) and Computer-Oriented Microwave Practices (MTT-1) are sponsoring a workshop on microstrip circuit characterization, to be held on Thursday, May 3, 1979, the day following the MTT Symposium, at Howard Johnson's, Orlando, Florida. The purpose of the workshop is to bring together practitioners in the field of microwave integrated circuits to stimulate and exchange ideas on microstrip circuit design problems. The emphasis will be on the characterization of microstrip discontinuities, losses, and radiation, both experimentally and by computer modeling.

During the morning session, three invited speakers will present tutorial overviews of their respective topics, as follows:

"Microstrip Discontinuity Equivalent Circuits", Anand Gopinath, Lincoln Lab, MIT

"Transmission Properties of Microstrip Discontinuities", Ingo Wolff, University of Duisburg

"Loss and Radiation in Microstrip Circuits", Ed Denlinger, RCA

Following each talk there will be a discussion period. In the afternoon the workshop will break up into a number of small groups for in-depth discussions of selected topics. Each participant is encouraged to contribute to the discussions by sharing from their own work. In fact, each is invited to submit reproducible copies of their favorite curves or tables on microstrip design. Then, if the response warrants it, we will edit the contributions and send each registrant a handy booklet of valuable MIC design information.

If you are interested in participating, please contact either:

Charles Buntschuh
Microwave Associates, Inc.
South Avenue
Burlington, MA 01803
(617) 272-3000, X1691

or

Barry Perlman
RCA, David Sarnoff Research Center
Princeton, NJ 08540
(609) 452-2700, X2661

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