IEEE GROUP ON
MICROWAVE THEORY
AND TECHNIQUES

NEWSLETTER

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EDITORS NOTES

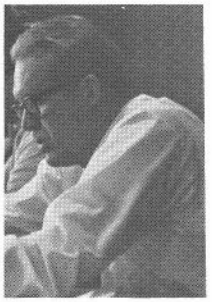
UNIONISM

In recent discussions with engineers I have found growing acceptance of the idea of unions for collective bargaining purposes. Traditionally, engineers have been opposed to collective bargaining and, for the most part, have desired to bargain individually for their salary and fringe benefits. The apparent acceptance of unionism today stems from the growing unemployment in our industry. Unionism appeals to the fears of the individual. As the number of engineers on lay-off lists increases, his fears increase. He looks to unionism and collective bargaining as a means of acquiring security.

I am afraid that this desire for security through unionism is a facade and that engineers will be hurried into an action that they may later regret. It is my belief that most engineers are not necessarily dissatisfied with their employers; they are dissatisfied with the Government customer and its methods of procuring services. They feel that the companies, by and large, treat them fairly. There may be some difficulties, i.e. in terms of their building equities, which I discussed in a recent note, but they realize companies must make a profit to sustain their activities. Feather-bedding or creating jobs for which there are no requirements will eventually mean the demise of all companies that are afflicted by such policies. This may well result in less jobs for engineers rather than more jobs.

What is needed, more than unions, are professional societies, as distinguished from technical institutes such as the IEEE. In many of these notes I have urged the IEEE to become more of a professional society to represent the engineer in the things important to him in non-technical as well as technical areas. It may be necessary, in order to do this effectively, to form a "super" professional society coordinating all engineering activities. This society would include not only electrical engineers, but mechanical, chemical, and civil engineers as well. Certainly this size an organization could influence legislation more easily than just the IEEE alone.

Be careful about the idea of unionism; don't be stampeded into an organization which would handicap the companies by make-work and feather-bedding practices. This would provide no security in the long run. The engineers of this country represent a problem solving resource; there are many problems to be solved. What is needed is a method to get the problems and the solvers together. A professional society may be able to accomplish this by the proper use of politics and public relations to let Congress know more about our problem-solving capabilities.



CHAIRMANS VIEWPOINT

by John H. Bryant

IEEE DIVISION 4 NOW HAS A NAME

At the May 21, 1970 TAB meeting a formal motion that Division 4 be known as the Electrosciences Division was approved. Of the six Divisions (Spectrum, December 1969, page 122), this is the only Division to date to adopt a name. There are five Groups in addition to

G-MTT in the Division, namely: Antennas and Propagation; Electron Devices; Magnetics; Sonics and Ultrasonics; and Parts, Materials and Packaging. Included in the Division is the Quantum Electronics Council. In addition, a new Group on Manufacturing Technology has been assigned to this Division.

The following is a statement prepared by William M. Lang, Director of this Division, to define the scope:

> "The six Groups which comprise Division 4 are concerned primarily with the electrosciences and their practical applications in electrical and electronics engineering. The areas of interest of the Group lie principally within the physical sciences (physics, chemistry, and metallurgy). Emphasis is placed on gaining a better understanding of physical phenomenon as well as the development of new devices, their performance characteristics, the materials used for their construction and their operation in circuits and systems. Within their areas of interest, the activities of the Groups range from those that are theoretical and conceptual in nature to those that are concerned with manufacturing processes."

I am sure that Dr. Lang would welcome comments on the above statement.

A subject receiving considerable attention at present by IEEE is Membership Services, or, more plainly, what does and what can IEEE do for the individual member. As you know, IEEE has a dual character to its organization. There are 10 Regions which are organized on a geographical basis containing Sections. Each Region has a Director and operates under the Regional Activities Board (RAB). The Technical Activities Board (TAB), has the responsibility for all of the Groups, the publications and other technical matters. There is considerable discussion and investigation at present on how the two organizations relate to each other and how they may better relate for the benefit of our members; also what other societies do for their members. A very interesting editorial appears in the April, 1969 issue of Civil Engineering, published by the American Society of Civil Engineers. For anyone interested in this subject, I commend it to your reading. If anyone wishes a copy, I would be glad to Xerox and send it to him. I also recommend a study of the IEEE Constitution and Bylaws.

TECHNICAL PLANNING COMMITTEE

The TAB organization for handling new technical areas is under the Vice-Chairman of TAB, Professor John Whinnery. Current topics include: transportation; urban problems; manufacturing technology; cable TV; super conductivity/cryogenics; high temperature, high density plasmas; electro-optical systems, art and technology, electronic aids to crime prevention, information display, and electrography. Any group that is interested can be represented on councils and committees involved in the particular areas.

GROUP PARTICIPATION IN IEEE ANNUAL CONVENTION PROGRAM

Frank Blecher, Program Chairman for the 1971 IEEE Convention gave a very interesting presentation on his committee's outlook and plans for the March, 1971 Convention program. He stated he believes that highly specialized, highly technical sessions are better left to the Group symposiums, and that IEEE should be left for the broad gauge (sic) Engineer. He describes a program of approximately 20 sessions in subjects relating to our Division's interest, 20 sessions in computers and communications, 12 sessions on aerospace, education, bio-medical electronics and so forth. As before there will be Technical Applications Sessions at the Coliseum; tentatively planned to have about 16 sessions compared to 8 sessions last year, attention being given to adequacy of the facilities. At the G-MTT AdCom meeting May 10, preceeding our Symposium, it was the consensus that Groups should return to being more involved in the programs of the IEEE Annual Convention.

GROUPS CAN PETITION TO BECOME SOCIETIES WITHIN IEEE

The Computer Group has petitioned for Society status and has received approval to become a Society within IEEE. The Automatic Control Group has also submitted their petition. The Power Group is near to entering a petition to become the Energy Systems Society of the IEEE.

1970 G-MTT SYMPOSIUM

Attendance at our meeting was 582, which may be considered excellent under the present economic conditions. A resume of the sessions is given on page 7 of the Newsletter.

ADCOM REPORT

(ADMINISTRATIVE COMMITTEE)

by Sy Okwit

On the 10th of May the AdCom Committee met at the Newporter Inn, Newport Beach, California, the site of our 1970 International Symposium.

IEEE COUNCILS

A. QEC

The QEC at its last meeting indicated a willingness to transfer up to $25,000 of surplus funds to the G-ED and G-MTT groups. The amount to be distributed between the groups will be in accordance with prorated readership of the JQE. The Council is also considering the possible conversion of the Council into a new group. R. Rivers moved that the G-MTT go on record as being favorable to QEC becoming a group and support them to that end provided that there is an equitable distribution of the surplus funds. This motion was passed unanimously.

B. SSCC

H. Cooper presented a report concerning a list of comments on the draft of the SSC constitution submitted by R. Emberson. Action on the proposed constitution will be taken at the Council meeting in August.

C. CADAR

CADAR is now a part of G-ED and will be dropped from future Agendas.

CHAPTER CHAIRMAN'S REPORT

Chapter reports were presented by D. Stelzer (Phoenix), L. Whicker (Washington), L. Dickens (Baltimore), G. Rodrigue (Atlanta), L. Davis (Houston), H. Oltman (Los Angeles) and J.B. Horton for R. Sparks (Boston), K. Baker (Buffalo), T.N. Anderson (Connecticut) and F. Emery (Dallas). The chapters, as usual, were very well represented at the AdCom meeting.

STANDARDS COORDINATING COMMITTEE

Leo Young reported that S.I. Sherr is the new Secretary of the IEEE Standards Committee.

Leo Young presented a brief report on the activities of the Microwave Magnetics Committee. He indicated that the units of quantity magnetization are still generally given in gauss (CGS units) by manufacturers of ferromagnetic materials as well as by engineers who should use MKSA units according to IEEE.

PUBLICATIONS COMMITTEE

George Haddad reported on the status of the Transactions and indicated that publications were coming out on time.

A short note from H. Schrank on information services was forwarded to AdCom. He indicated that he was collecting suggested revisions and additions to the IEEE "key word" list. He is preparing a proposal to AdCom which will include a cost estimate.

FINANCES

E.N. Torgow submitted and discussed the Group financial report and budget. He requested that each of the Committee Chairman notify him of their funding needs by 1 June 1970.

A letter from R.M. Emberson, dated 5 May 1970, was discussed. This dealt with the drop in IEEE and Group membership. J.B. Horton moved that we offer the Solid State Circuits Journal at $6 addition to the G-MTT. If the G-ED goes to $7 then we offer the S.S.C.J. at $7 additional to the G-MTT. R. Rivers seconded the motion. The motion did not carry.

E.N. Torgow moved that we offer the S.S.C.J. in lieu of the G-MTT Transactions at $6. After a second, the motion was carried. E.N. Torgow will so notify R.M. Emberson.

R.E. Henning moved that we accept the H.Q. rate for add-on fee provided G-ED and other member Groups accept the same rate. W. Mumford seconded the motion. The motion was carried. E.N. Torgow moved that we accept G-MTT's proportionate share of the $25,000 surplus returned by the QEC to member Groups. After a second, the motion was carried.

MEETINGS AND SYMPOSIA

Leo Young noted that the following meetings were to be held in the near future:

a. International Microwave Power Institute
   October 7-9, 1970 in Holland

b. 1971 European Microwave Conference
   August 23-28, 1971 in Stockholm, Sweden

c. Region 8 Convention
   October 18-24, 1971 in Palais De Beaulieu, Lausanne, Switzerland. H. Bosma represents us on the organizing committee for this Convention.

OPERATIONS

Leo Young, the Chairman of the Operations Committee, expects to be away on a year leave of absence starting in August 1970. R. Rivers agreed to serve as Chairman for the remainder of the 1970 term.

D.D. King reported on the activities of the Awards Committee. It was agreed that the G-MTT would provide a $1000 field award and would work out a procedure so that the nominee would be acceptable to the G-MTT and IEEE. A. Oliner moved that the W.W. Hansen Award be established for presentation at G-MTT Symposia as an IEEE field award. The candidate shall be mutually acceptable to the G-MTT AdCom and the IEEE Awards Board. D.D. King seconded the motion and the motion was carried.

R. Henning has prepared an announcement for the Newsletter calling for nomination for AdCom in time for the elections in September. He will not be able to continue as Committee Chairman owing to pressure of business. The new Nominations Committee Chairman will be K. Tomiyasu.

MEMBERSHIP SERVICES

National Lecturer - J.B. Horton indicated that candidates for the 1971 G-MTT National Lecturer are being solicated. Suggestions for the subject and speaker should be sent to him by 15 June 1970.

G-MTT Symbol - A. Clavin reported that the IEEE HQ have the matter of the symbol under consideration. He moved that if the first choice of symbol is not accepted by the IEEE HQ that we press for adoption of the second place symbol. Motion was seconded and carried.

Membership Survey - A. Clavin moved that we approve a budget of $800 for a membership survey which was previously approved at the 15 December 1969 meeting. Motion was seconded and carried.

NEW BUSINESS

The next meeting of the AdCom will be held on 17 September 1970 in New York City.

CALL FOR NOMINATIONS

Every year 6 members of G-MTT are elected to serve on its Administrative Committee (Ad Com) for a 3-year term. Those elected to serve this year will, together with the 12 hold-over members and ex-officio members as provided in the Bylaws, guide G-MTT to new and what we expect will be ever greater accomplishments in the next years.

It behooves every member of G-MTT to give serious consideration to who can best serve his or her professional interests as well as those of the Group as a whole in the future – a future which we must expect will be marked by an increasing rate of change technologically and otherwise. Our Constitution and Bylaws provide G-MTT members with the means to implement their recommendations as follows:

1. Candidates must be IEEE member grade or higher and be a member of G-MTT.

2. Candidates must be willing to serve a 3-year term (and therefore must be able to travel to Ad Com meetings – normally 4 per year).
3. Term of office commences January 1.
4. Nominations by petitions, signed by 25 members of the G-MTT Group will be received by the Administrative Committee on or before its annual meeting to be held in September.
5. There is also a Nominating Committee charged with the responsibility to select a slate of at least two candidates for each vacancy which is to be transmitted to the Chairman or Ad Com prior to the annual meeting.

In accordance with the above, you, as an G-MTT member, have two avenues to express your choice:

A. You can recommend your candidate for consideration by the Nominating Committee. Such recommendations should be addressed to:

Dr. Kiyo Tomiyasu
General Electric Company
Valley Forge Space Center
P.O. Box 8555
Philadelphia, Pennsylvania 19101

B. You can file a petition signed by you and 24 of your fellow G-MTT members. Such petitions should be addressed to:

Dr. John H. Bryant
Omni Spectra, Inc.
24600 Hallwood Ct.
Farmington, Michigan 48024

Our Bylaws provide that the 12 hold-over members (those not eligible for re-election) elect the new Ad Com members from the slate presented by the Nominating Committee and the candidates nominated by direct petition.

IEEE MEMBERSHIP SERVICES INTERIM REPORT

by Dr. Arthur Goldsmith

1. Introduction

At the behest of TAB/OP COM the Ad Hoc Committee on Membership Services has identified services which could be implemented at little or no cost. The basis for these items is the report of Dr. W.W. Lang of 5 December 1969, and several additional suggestions from members of TAB. Three possible sources of services were considered: Groups, Divisions, and Headquarters. (None was identified in the second category.) From a cost standpoint the choice criterion was that the services have little or no budgetary impact or that it is essentially self-sustaining.

2. Group Services

2.1 Bibliographies - Each Group should develop a bibliography (or, preferably, a compendium) on their specialized field or fields. The bibliography could then be published in their Transactions or separately. It should then be periodically updated.

2.2 Critical Reviews - The purpose of this would be to give wider dissemination to publications in specialized areas and also help those who are not directly involved in a particular area to identify key papers. The reviewers would have to be obtained through the Groups. The abstracts, culled on a highly selective basis, could then be published in Spectrum.

2.3 Tutorial (Review) Papers - Tutorial papers introducing new fields, disciplines and technologists or reviewing developments in existing areas can fulfill a need for "short courses" by many engineers. Articles of this type appear in many trade magazines and some of the special issues of the Proceedings have had such articles. The Groups should identify such articles and/or authors and encourage preparation of same. Then, depending on how widespread the prospective audience, have the article published in the Group Transactions, Proceedings, or Spectrum.

2.4 Annual Review - Annually publish in each Transactions a brief review on the area of interest of the Group including major developments during the year, the state of the art, and current major problem areas.

2.5 Article Seminars - These would be a meeting between the author of a published article and interested readers. These could be set up in conjunction with conventions or other scheduled meetings. The Groups would have to make the necessary arrangements.

3. Headquarters Services

3.1 Book Discounts - A service to obtain professional books at a discount would be welcome by the many engineers who have to purchase their own. While this would entail an additional service by Headquarters, a slight additional fee could make it self-sustaining.

3.2 Counseling - Many high school students, college engineering students, and young engineers are in need of career choice guidance or career counseling. The IEEE has an experienced manpower pool which could provide this service. However, it is basically an Institute-wide (geographic) rather than a Group (technical) problem. The effort would have to be organized through the Sections and coordinated with the Student Branches and with a similar effort by ECPD. A guide and package of material would have to be developed for use by the counselor. The Groups could assist in developing the material and providing counselors.

3.3 Charter Flights - The IEEE would probably constitute an "affinity group" with the CAB definitions and thus qualify for reduced rate charters for trips. This type of activity could be arranged through a travel agency and would entail no expenditure by the Institute.

MINUTES OF MEETING ON COMPUTER-AIDED DESIGN

On March 26, 1970 a special meeting was held at the New York Hilton to discuss coordination of support for the computer-aided design interests of the IEEE groups.

Attending the meeting were: C. Freitag, W. Newell, R. Rohrer, D. Varon, S. Levine and R. M. Emberson.

It was generally agreed that the present CADAR Committee and Newsletter no longer met the interests of the respective groups of the IEEE. Therefore, it was recommended that the Committee be abolished and that the Newsletter be discontinued. It was agreed, however, that another issue would be sent to the mailing list of the CADAR Newsletter to inform them of this action and to also indicate that subsequent information will be available through the newsletters of the different groups in the IEEE that might have an interest in computer-aided design.

It was also generally agreed that computer-aided design was a developing area of interest to many of the groups. Committees on computer-aided design have been established within Circuit Theory; Electron Devices; MTT; Reliability & Computer Groups and there is activity in the Systems Science & Cybernetics and Power Groups.

It was also agreed that computer-aided design was still in its developing stage and that there was a strong need for interchange among developers as well as a need to provide information to potential users.

It was agreed that at the present time the best mechanism for coordination of these interests among the various groups would be to establish an Ad Hoc Coordinating Committee with representation from the interested groups.

Dr. Harlow Freitag, Chairman of the Design Automation Committee of the Computer Group, agreed to take the responsibility for organizing this Ad Hoc Committee.

The functions of the Committee would include dissemination of information for publication in the respective newsletters of the participating groups and also the coordination of joint activities such as workshops or conferences.

It was also agreed that representatives from the respective groups would be asked to participate in an editorial capacity on a special issue of the Proceedings of the IEEE on computer-aided design scheduled for November 1971.

OPINIONS

SHORT LIFE OF A SMALL COMPANY

26 May, 1970

Donald L. Margerum
Formerly Vice President
Raven Electronics, Inc.
Burbank, California

Four years ago several of us decided to start a new company. We had been shunted aside in a reorganization, and rather than continue impotently or scatter to other jobs in other companies, we wanted to keep a talented team together. And we had something to prove.

We didn't have much cash, but we could work for a year at subsistence level and take shares in the company instead. We didn't have a contract lined up, but we had ideas and know-how and we could attract top people who would also take stock in the company in lieu of some salary.

It surprised us when we survived three months. After four months we got our first contract. Then the groundwork began to pay off and other contracts broke ... for blade antennas, stripline filters, power supplies ... and for a sophisticated direction finder and frequency measuring sensor.

As we saw a major contract coming up based on the sensor development, the big question was could we hire the talented engineers fast enough? After a competitive struggle we got the million dollar CPFF development contract. And the components business was also growing.

In two years we had exceeded our somewhat optimistic growth plan, and we had 90 people working long hours. At this point 20% of the company was sold to a top New York investment banker for a $400,000 injection of cash.

Five months later the contraction started. The program for which our sensor was a key part was in danger of losing its funding, so we rushed to deliver the six prototypes in an attempt to save the program. But there were bigger considerations than our sensor, and the funds were lost. The sensor portion of our business had been 75% ... it now went to 10% in two months.

The component sales were still increasing, however, so the personnel was only cut from 90 to 60 ... we would break even again after a three month crunch. There would be further losses in this period, but the core of our sensor systems capability would be preserved. Two new sensors we had invested in were just entering the field tests and the future looked bright.

Profits were negative the first two years ... these were years of growth and investment in the future. But now the expected profit for the third year was fleeting. To fill the gap, a highly profitable precision machine shop was acquired, and for stock, a printed circuit house with good past profits, but a currently depressed backlog.

These acquisitions, unfortunately, contributed even more to the losses as the machine shop business severely contracted, and the rebuilding of the circuits business soaked up much more dollars and management time than had been anticipated. Total losses began to look grim, accounts payable became very slow, and our creditors were getting uneasy.

We had bet on one aircraft program heavily, and had managed to win four contracts on the Cheyenne helicopter. When this program was cancelled in mid-1969, half of our backlog went with it.

Our sensor systems were working out well technically, but funds for follow up contracts dried up or were stretched out. We joined in a cost share program with a larger company rather than drop the capability altogether. Some of the less sophisticated products were causing sub-

stantial losses in production. Pushing the state of the art in open loop S-Band solid state oscillators seemed to endlessly consume engineering hours on a program with no progress payments.

Financially we had to make a critical choice: either sell off the acquisitions at a big loss and reduce the remaining operation to a bare bones manufacturing company, or maintain the larger operation with its potential for profit, but with the possibility of continuing losses. The latter was only possible if we could obtain further financing through a public offering of stock.

Going public with a history of losses we had thought would be tough, but we were shown examples of successful underwritings for companies that made us look like blue chips in comparison. A firm underwriting agreement was signed in July 1969 and the S-1 Registration was filed with the SEC in November 1969.

The losses did continue, and the creditors were pacified only with the knowledge that the public offering was anticipated in February 1970.

In early February the SEC suggested withdrawal of the Registration statement and the filing of a new one ... with a consequent 90-day delay. We then realized that our alternatives had narrowed to voluntary or involuntary filing under the federal bankruptcy laws. We then hoped to operate under the protection of Chapter XI, but our bank would not go along, and the show was over.

What lessons were learned? Mainly, than when times are changing, you had better change your business philosophy at an equal pace. The slogans that reflected our business wisdom during the first two years were ones such as:

"A company is really people; with a good team success is assured."

"Invest in tomorrow, keep ahead of a rapidly changing technology."

"The government over-specifies its systems and then finds it can't afford them, so work on the alternatives they can afford."

Today's slogans are more likely to be:

"It's better to lose the contract than take a chance on its becoming a big loser."

"Follow-on potential usually remains just that."

"To bid on anything with a significant engineering content, make sure you have at least a 50% gross margin."

"Even when people are working long hours to get their jobs done, you can get by somehow with fewer of them."

This is small company philosophy, and only slogans, which are obviously over-simplifications.

After developing what I am convinced is the best direction finder and frequency measurement sensor in existence for a company that is now out of existence, I find one slogan, that used by the politician; "my first responsibility is to get elected" particularly appropriate.

CHAPTER ACTIVITIES

By J. B. Horton

On Sunday evening, May 10, 1970, we held our second Chapter Chairmen's meeting at the 1970 G-MTT International Symposium. Fifteen chapters were represented, with an attendance of twenty representatives including ADCOM members. Most of the items discussed at the meeting concerned chapter meetings and chapter membership, both of which are of concern to all G-MTT members. Reports from the chapter representatives present indicate that special activities such as one-day meetings, etc., by the chapters were successful and in general these meetings had better attendance than regular meetings. This is not surprising, but it does indicate the importance that a special meeting can have to the overall year's activities for a chapter. I would like to encourage as many chapters as possible to plan a special activity during the next year.

I am happy to report that four new chapters have been started during the last year. Atlanta (G.P. Rodrique, 404-873-4211) and Houston (L.E. Davis, 713-528-4141) were formed during the latter half of 1969; Fort Worth (L.J. Langston, 817-732-4811) had its first meeting in May 1970; and organization of a chapter at Dayton (W.J. Edwards, 513-255-4831) was started this spring. Members in these new chapters are encouraged to participate in the chapter's activities, and to keep informed of the activities planned for the next year.

Harold Sobol, 1970 G-MTT National Lecturer, reports that his schedule of this fall is complete. He plans to talk at the following chapters:

Chicago, September 15
Denver, September 16
San Francisco, October 5
Orange County, October 6
San Diego, October 7
Schenectady, October 20

Many of the chapters will install new officers during the summer. I would like to encourage the new officers to keep in touch with ADCOM activities and ADCOM members. The 1970 G-MTT Committee Directory contains ADCOM members names and addresses, and ADCOM meeting dates. If you have misplaced your copy of the Directory, or wish to have additional copies, I will be happy to forward copies to you.

In reviewing the chapter activities since May 1969, I see an increase in activities at the chapter level. From chapter reports at ADCOM meetings and the Chapter Chairmen's meeting at the 1970

G-MTT International Symposium, there appears to be a trend toward further increase of these activities over the next year. I see this trend as a healthy sign of growth for both the chapters and G-MTT.

by Dr. Sam Sensiper

THE 1970 IEEE G-MTT INTERNATIONAL SYMPOSIUM MAY 11-14, 1970 - NEWPORT BEACH, CALIFORNIA

I. INTRODUCTION

Despite shrinking programs and economic difficulties in the microwave field, the Symposium was well attended with a total of over 580 registrants. The Newporter Inn in Newport Beach provided an ideal location for the Symposium; this setting was enchanced even further by the pleasant weather. Although there were a few last minute crises, the Fourth Decade of Microwaves was initiated in reasonable, if not elegant, style. If the four day schedule with many multiple sessions seemed overly long to some, it had the advantage of permitting a wide range of papers and subjects to be presented. The listed technical program was chosen on an almost one for two basis (one chosen for two submitted); it was supplemented by several late news items which were added to appropriate sessions.

We were honored by the attendance of Dr. John Granger, President of the IEEE, who delivered the Keynote Address, a timely and thought-provoking discussion of current problems in our industry. This talk, on the opening Monday of the Symposium, was preceded by welcoming remarks by Dr. S. Sensiper, Mr. H.G. Oltman, and Dr. J.H. Bryant.

Very nearly half the total registration was pre-symposium, with the remainder occurring during the four days of the meeting. There were brisk sales of additional Digests during Registration, possibly the result of the attendees obtaining copies for their coworkers who could not attend.

Many Committee meetings were held during the Symposium, including AdCom and Chapter Chairmen. The many meeting rooms available at the Newporter made such gatherings easy and convenient.

II. TECHNICAL PROGRAM

During the four day Symposium a total of 92 scheduled papers, including 8 invited papers plus 8 Late News Items, all presented in 15 Sessions with three Panel Discussions on two evenings, made for a very busy program. To accommodate the program it was necessary to arrange for parallel sessions on all but two afternoons. The meetings were held in the Monte Carlo Room and the Empire Room at the Newporter. These were sufficiently far apart to preclude interference, but sufficiently close to allow attendees to move from one to the other in a very short time. Both rooms were of substantial size with adequate seating available at all times. Aside from an occassional problem of a blown projector bulb and the some-time problems of a PA system, the audio-visual aids were generally quite good indeed.

The panel discussions were well attended as they have been in the past. The non-technical but important panel discussion on Monday evening on the subject, "The Engineer, Technology, and Society," held the attention of over 150 persons for the substantial part of the evening. It was evident that several persons attending wished to expand the discussion to include the subject of "The Engineer' Current Economic Status and Survival," but this topic was not considered appropriate for this panel meeting and was deferred to another time.

The more technically oriented panel discussions on Tuesday evening, one on "The Microwave Engineer and the Computer," and the other on "Applications of Microwave Integrated Circuits," were also heavily attended. The computer session was enhanced by several demonstrations of microwave design via remote time sharing computers using temporarily installed access devices. The Integrated Circuit panel discussion members covered a wide range of recent advances and demonstrated beyond doubt that this approach to microwave system assemblies is a current practial reality.

The regularly scheduled sessions were well attended and covered a wide diversity of subjects including not only the more traditional ones of filters and couplers, ferrite devices, millimeter wave devices, microwave integrated circuits, but also microwave imaging, Gunn Devices, avalanche diodes, and microwave acoustics.

As is usual, a number of foreign papers were presented at the 1970 Symposium with representation from West Germany, Canada, Japan, Netherlands, France, and Great Britain.

It had been intended to have separate Late News Items Sessions, but since only a few papers in this category were accepted, these were included with the most appropriate regularly scheduled sessions. Also, it had been intended to have a HANG-UP session; but apparently none of the attendees had unsolved problems (!?!), or at least they had none they were willing to submit and discuss. Consequently, this innovative idea didn't get exploited. Let's try again next year.

Pleasant interludes during the long meetings were the coffe and soft drink breaks. We wish to thank those industry sponsors who assisted in supporting these refreshment "stops."

III. DIGEST

Despite the large number of papers, the total page count of the Digest was kept to 426. It retained the now standard 5-1/2" x 8-1/2" size and was enhanced by the "Southern California - View from Apollo 9" picture on the cover. The selling price of the Digest for 1970 was kept the same as for 1969; it was a "hot item" at the Sumposium but copies should still be available from IEEE headquarters as IEEE Catalog No. 70C10-MTT. Of the 1500 copies originally printed, aside from a few culls, Headquarters received not only an original shipment of about 200, but the remainder not sold at the Symposium

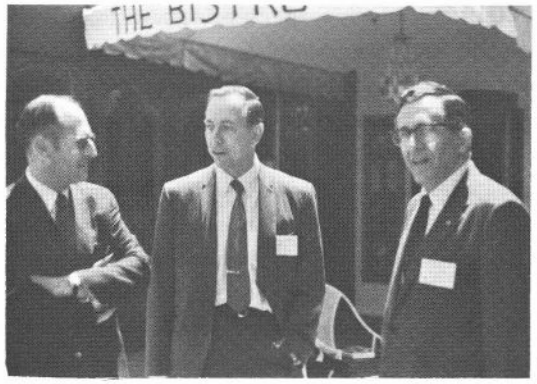
Forty-nine institutional listings were in the Digest and we wish to thank all the organizations who participated for supporting the Symposium in this manner.

IV. SOCIAL FUNCTIONS

Old-Acquaintance Party: This traditional get-together started the social functions. Although the attendance did not seem high, the opportunity to meet old friends and learn what's new was taken by many.

continued on pg. 10.

1970
SYMPOSIUM PHOTOS
NEWPORT BEACH, CALIFORNIA

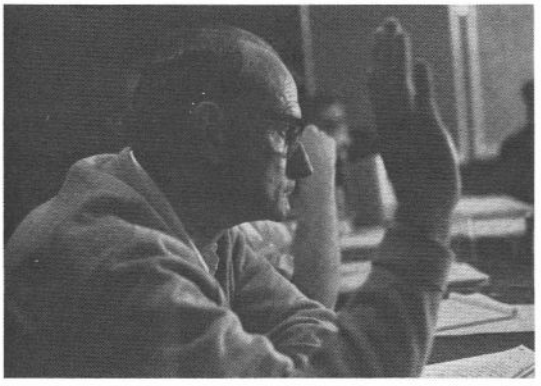


G. Torgow, C. Chandler, and Ted Saad relax during a morning break.

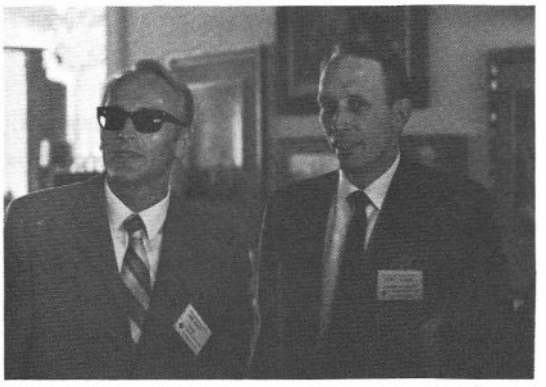
John Granger, IEEE President and Symposium Key Note Speaker, enjoys breakfast at the Newporter.

Nat Lipetz (AdCom Secretary) takes notes while talking to Dr. S. Cohn and Dr. Leo Young (former AdCom Chairmen).

Conrad Nelson and William Whistler enjoy coffee break between sessions.

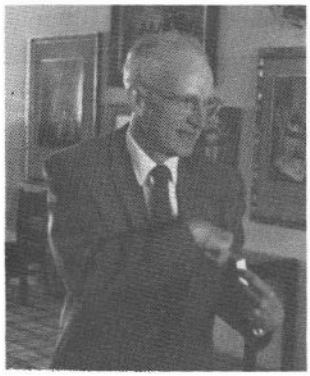


Dr. D. King seeks attention during AdCom meeting preceding the symposium.



George Oltman (Chapter Chairman, L.A. Chapter) and Dr. H. Maurer meet in the lobby of the Newporter.

M.E. Hines, session chairman on Gunn-effect devices, enjoys a technical presentation



Dr. H. Riblet in the Newporter Lobby

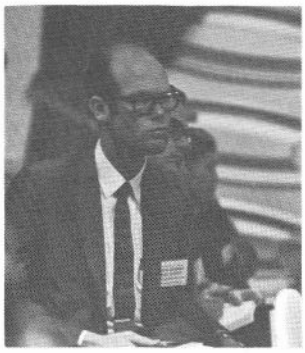
Professor Mittra relaxes near the Newporter "Bistro"

Sam Sensiper (Chairman of Symposium Steering Committe)welcomes the attendees

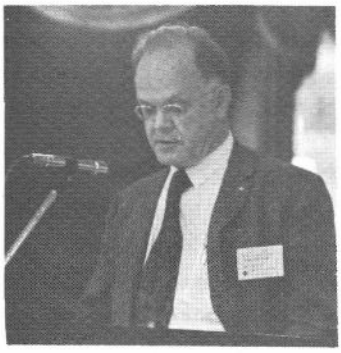
Sy Okwit (AdCom Vice Chairman) and Herman Chait (Ferrite Session Chairman) watch slide show. Herman seems to be blocking Sy's view

Jerry Aukland and Chuck Swift (local arrangements) discuss arrangements with Diane of the Newporter Inn. In the dim light of the cocktail lounge

Microwave's entrenpenours Jack Poplar and Robert Krausz (Banquet Master of Ceremonies) discuss business with Balboa bay as a background



G. Osterhues is itent during the presentation of a paper



Dean Anderson,Chairman of session on Millimeter waves, introduces a speaker

continued from pg. 7.

Cocktail Party: Prior to the Banquet which was served in the delightful Carousel Room, cocktails were served on the Terrace in view of the Newporter pool and the ocean. The weather was perfect, the drinks were excellent, and the festive setting was further enhanced by the music from a Mariachi band.

Banquet: If the attendance of only 175 perople at the Banquet was somewhat less than in prior years, this number fitted very comfortably into the Carousel Room; the group made up in conviviality what it lacked in numbers. Robert Krausz, Master of Ceremonies, kept the Banquet attendees in good humor through the head table introductions, recognition of Symposium Committee members, brief address and awards by John Bryant. Leo Young, Past AdCom Chairman was presented a Certificate, Richard Damon received the 1969 G-MTT National Lecturer Award, and John Rhodes was presented the Microwave Prize for his two papers on the April 1969 MTT Transactions.

The scheduled Banquet Speaker, Dr. Harold I. Ewen, unfortunately became seriously ill just prior to the Symposium. However, we were very lucky indeed to obtain Professor Marshall Cohen of California Institute of Technology as the speaker who addressed the gathering on "Advances in Radio Interferometry." His talk on the recent progress made in this field was both amusing and informative.

A highlight of the Banquet was the drawing for the Amana Microwave Oven won by K.H. Yen and R.C.M. Li of the Polytechnic Institute of Brooklyn, Paper 11-2 in the THAM-II Session.

Industry Sponsored Cocktail Party: The Symposium concluded in fine style with an industry sponsored cocktail party on the Terrace outside the Carousel Room. Drinks and hors d'oeuvres were compliments of several microwave industry organizations; our thanks to these sponsors for providing a deluxe climax to the Symposium.

V. LADIES PROGRAM

The ladies ran a well-organized and well received program this year with 25 full-time attendees and several others who joined in for a few of the activities. Starting with a Continental breakfast and microwave oven demonstration on Monday, they toured the Wayfarer's Chapel and Marineland with lunch at "The Galley West." The following day the program included shopping at Fashion Island with transportation via a London "double-dec" bus. On Wednesday a visit to world famous Laguna Beach with lunch at Victor Hugo's and a tour of Mission San Juan Capistrano occupied most of the day followed by the cocktail hour and Banquet. Finally on Thursday, the West Coast movie industry was observed via a visit to Universal Studios. Also visited were the Los Angeles Civic Center and the Plaza.

VI. SPECIAL SERVICES

Membership Desk: Following last year's practice, a membership desk was maintained near the Registration Desk. Twelve registrants took advantage of the arrangement to join IEEE at this time so as to be able to register for this Symposium at member rates.

Message Center: A message center with two charming attendants allowed the Symposium attendees to keep in touch with each other and their offices.

Transportation: Since not all registrants were staying at the Newporter Inn, regular bus transportation was provided to other local lodging facilities. Evidently this was not in great demand and we substituted a limousine for the bus after the first day. For a few days United Airlines maintained an airlines reservation counter in the Newporter Inn lobby to assist registrants with travel problems associated with all airlines.

Pressroom: No special pressroom was set up at the Symposium but representatives from several scientific and technical journals were in attendance.

VII. MEETING AND LODGING FACILITIES

Most of the on-site registrants stayed at the Newporter Inn and, indeed, we were almost the sole occupants for nearly the entire time of the Symposium. Several individuals who could not be booked at the Newporter were lodged in nearby motels. Evidently this was handled in a very smooth manner by the Newporter personnel; at least no complaints were heard. As already noted, local transportation which was not extensively used was provided for the "off-site" lodgers.

The meeting rooms were excellent, the food was outstanding, the service was good, and finally, the "continental" atmosphere all contributed to a pleasant and enjoyable meeting despite the somewhat hectic pace of the meeting schedule.

VII. CONCLUSION

Several arrangements from previous years were either maintained or reinstituted. The four-day meeting with parallel sessions and evening meetings is perhaps one of the more controversial items. Pros and cons can be and have been expressed in this matter; perhaps a reasonable compromise is a four-day meeting with fewer parallel sessions and consequently fewer scheduled papers, but with a free afternoon to permit informal interchanges in a more relaxed manner. The inclusion of selected Late News Items is an excellent idea and worked out very well. The Hang-up discussion is still considered a good idea and is worth another try; maybe we need some volunteers to get this started.

The support provided by Digest institutional listings is very important. This year, when it became evident that these were not coming in at the rate expected and required to meet printing deadlines, special telegrams were sent to selected individuals at the traditional participating companies; this resulted in excellent response.

Publicity for the Symposium was distributed through local, national and international sources. Advance programs were supplied to IEEE headquarters for mailing from there and were also distributed at the IEEE Convention in New York. When it became evident that the March mail strike had delayed the major distribution of the Advance Program, telegrams were sent to all the Chapter Chairmen urging that they remind G-MTT members who were planning to attend to register; this seemed to result in excellent response since our advance registration was quite good.

The idea of attracting members by offering membership registration rates at the Symposium by joining IEEE is an excellent idea, has gathered us additional members both last year and this, and should be continued.

The ladies put together an excellent program this year as they have in the past. This feature undoubtedly encouraged many attendees to bring their wives.

Although final accounting is not complete, it is evident that the Symposium generated a significant surplus for the G-MTT to be used for membership benefits. This surplus resulted from the slightly higher fees charged this year, the excellent attendance which closely met our expectations, as well as substantial effort on the part of the various committees to achieve cost savings to offset cost increases.

Our thanks and appreciation go to the attendees, to the committee members, to the organizations who sponsored listings and Symposium refreshments, or assisted in other ways, and to others who helped to make this Symposium take its place with the successful ones of the past.

We express our best wishes to H.W. Cooper and his associates for an outstanding Symposium in Washington in 1971.

CHAPTER NEWS

BALTIMORE CHAPTER

Elected officer for the coming year are:

Chairman: Dr. Lawrence R. Whicker
Westinghouse Aerospace

Vice-Chairman: Mr. B.A. Sichelstiel
Westinghouse Aerospace

Secretary: Mr. D.G. Fordham
Dept. of Electrical Engineering
University of Maryland

CONNECTICUT CHAPTER

Past Meetings

Date: February 18, 1970
Attendance: Eight
Location: Burndy Library, Norwalk, Connecticut
Speaker: Dr. G.D. Bernard
Affiliation: Yale University
Abstract: Insect eyes contain structures that resemble diffraction gratings, multimode cylindrical waveguides, and periodically layered interference filters. The talk centered on the optical components of the insect eye, which were discussed in terms of antennas and wave propagation point of view.

Date: April 15, 1970
Attendance: Fourteen
Location: Bunker-Ramo Corporation, Trumbull, Connecticut
Speaker: Dr. H. Sobol
Affiliation: RCA, Somerville, New Jersey
Abstract: The various technologies and techniques used in the current MIC's were discussed. Examples of Subsystems and systems constructed with MIC components were shown.
Activities: Officers elected for the 1970-71 term.
Chairman: R.G. Mastroianni
Norden Div., U.A.C.,
Vice-Chairman: M. Teitelbaum
Hewlett Packard

OFFICERS FOR 1970-71

Chairman: Rudolph Mastroianni
Norden Co.
Vice Chairman: Myron G. Teitelbaum
Hewlett-Packard
Program Chairman: Rudolph Mastroianni
(temporarily)
Membership: Al Kusher
Times Wire and Cable

FLORIDA WEST COAST CHAPTER

Past Meeting

Date: May 21, 1970
Attendance: Seventeen:
Location: Ramada Inn, Clearwater
Speaker: Dr. A. M. Nicolson
Subject: Time Domain Techniques - A New Approach to Microwave Measurements
Abstract: The advent of sampling oscilloscopes with bandwidths up to 18 GHz has enabled accurate measurements to be made of the transient response of a microwave network when it is excited by an incident pulse with a risetime less than 0.1 nsec. By the use of fast Fourier transform methods these transient responses can be transformed to yield the scattering coefficients of the network over a broad range of frequencies.

LONG ISLAND CHAPTER

Date: December 3, 1969
Attendance: Twenty
Location: Polytechnic Institute of Brooklyn
Speaker: R.A. Lodwig
Wheeler Laboratories
Smithtown, New York
Title: "A Continuous Access Communications Waveguide for High Speed Ground Transportation Systems"
Date: January 27, 1970
Attendance: Thirty-eight
Location: Polytechnic Institute of Brooklyn
Speaker: Arthur A. Oliner
Polytechnic Institute of Brooklyn, Farmingdale, New York
Title: "Microwave Networks Methods Applied to Guided Acoustic Waves.
Date: April 7, 1970
Attendance: Forty
Location: Polytechnic Institute of Brooklyn

Speaker: Mr. William Todd, The United States Army Satellite Communications Agency, Fort Monmouth, New Jersey

Title: "A Look At Military Communications Via Satellite"

Future: One-day Seminar: the Garden City Hotel in Garden City Park, New York. The title of the meeting is "Seminar on Microwave Solid-State Power Generation." Speakers will cover the following topics: An Introduction which will include a discussion of Materials Technology and Multiplier Devices; Transistor Devices; Avalanche Diodes; Bulk Effect Devices; and Conclusions and Overview.

LOS ANGELES CHAPTER

Past Meeting:

Date: June 4, 1970

Speaker: J.B. Horton

Affiliation: Texas Instruments, Inc.

Title: Microwave Integrated Circuit Design Using Thin Film Techniques

Abstract: During the last few years construction of microwave circuits using integrated circuit techniques has evolved from a laboratory curiosity to a practical method of realizing microwave components and subsystems. Probably the greates contributing factors have been: 1) the use of microstrip transmission lines, 2) the development of unpackaged, surface-oriented, and planar devices for microstrip lines, and 3) the use of high dielectric constant, low loss, rigid substrate. During the discussion on microwave integrated circuits each of these factors was discussed along with techniques of fabricating circuits an d mounting the devices on circuits.

MILWAUKEE CHAPTER

Past Meetings

Date: April 7, 1970

Attendance: 123

Speaker: Dr. Harold Sobol

Affiliation: RCA

Abstract: Microwave Integrated Circuits

Date: April 20, 1970

Attendance: 28

Speaker: Wayne A. Schaefer

Affiliation: AC Electronics Division, General Motors Corp.

Abstract: Device Application in Night Vision Systems

Date: May 12, 1970

Attendance: 13

Speaker: Robert Green

Affiliation: Andrew Corporation

Abstract: Microwave Antenna and Waveguide Design

OFFICERS FOR 1970-71

Chairman: Dr. Stanley V. Jaskolski, Marquette University

Vice Chairman: Dr. Robert W. Lade, Marquette University

Secretary: Dr. Timothy R. Schlax, AC Electronics Division, General Motors Corp.

PHOENIX CHAPTER

Past Meetings:

Date: April 13, 1970

Attendance: Nineteen

Location: Holiday Restaurant, Phoenix, Arizona

Speaker: Louis G. Bullock

Affiliation: Sylvania Electronic Systems, Mountain View, California

Subject: Monopulse Direction Finding Techniques

Abstract: Mr. Bullock described the concept, theory of operation and accuracy of several monopulse direction finding (DF) techniques that operate over a wide frequency range and provide precision bearing angle information. Systems analysis and experimental hardware verification of DF approaches were discussed. DF schemes using wideband conical and flat spiral log periodic antenna elements were presented.

Date: May 18, 1970

Attendance: One hundred and six

Location: Holiday Restaurant, Phoenix Arizona

Speaker: Stanford R. Ovshinsky

Affiliation: Energy Conversion Devices, Inc., Troy, Michigan

Subject: Amorphous Switching Devices

Abstract: Mr. Ovshinsky outlined the history of amorphous switching, its theoretical background and practical applications and systems based upon amorphous materials. He attempted to place the field in its proper perspective.

ST. LOUIS CHAPTER

Past Meeting

Date: May 19, 1970

Attendance: 30

Speaker: Dr. Harold Sobol

Affiliation: Manager, Microwave Microelectronics, RCA Components Div.

Topic: Microwave Integrated Circuits

Abstract: The state-of-the-art of microwave integrated circuits (MICs) has advanced significantly in the past several years. Nearly every medium and low-power microwave function has been performed with MICs. Dr. Sobol discussed the various technologies and circuit techniques used in current MICs.

OFFICERS FOR 1970-71

Chairman: Reid Vann, Washington University

Vice Chairman: Art Lind, McDonnell-Douglas

Secretary: Norm Brennecke, Emerson Electric

Publicity Chairman: Jim Roe, McDonnell-Douglas

Membership Chairman:	Joseph DeKoning Monsanto
MTT Representative:	Robert C. Peirson University of Missouri at Rolla
Program Chairman:	Mickey Gliden
Program Committee:	William E. Hord Southern Illinois Univ. Fred Rosenbaum Washington University

WASHINGTON CHAPTER

OFFICERS FOR 1970-71

Chairman:	Richard C. Van Wagoner Radiation Systems, Inc.
Vice-Chairman:	C. E. H. Edwards Harry Diamond Laboratories
Secretary:	Willard F. Workman, Jr. Hewlett-Packard Company

ANNOUNCEMENTS

1970 INTERNATIONAL IEEE/G-AP SYMPOSIUM AND FALL USNC/URSI MEETING

14-17 SEPTEMBER 1970

The Ohio State University
P.O. Box 3115
Columbus, Ohio 43210

The final call for papers for the 1970 International GAP Symposium has been distributed. Papers were solicited in all theoretical, experimental and developmental fields of interest to GAP including the following: antenna theory, antenna designs and implementations, array technology, electromagnetic theory, numerical methods in electromagnetics, radio, IR and optical propagation, scattering and diffraction at radio, IR and optical frequencies, radio and radar astronomy and plasma and their electromagnetic effects.

URSI Commission I, II, III, IV and VI will meet at the same location September 15-17.

CALL FOR PAPERS

1970 CONFERENCE ON TRUNK TELECOMMUNICATIONS BY GUIDED WAVES TO BE HELD SEPTEMBER 29 - OCTOBER 2, 1970 --- LONDON, ENGLAND

The conference on trunk telecommunications by guided waves which was to have been held at the Institution of Electrical Engineers, Savoy Place, London W.C.2 in September 1969, and was postponed, will now be held from Tuesday, 29th September to Friday, 2nd October 1970.

The aim of the conference is to survey and to assess current achievements, problems and prospects in the development of trunk telecommunications systems by guided waves at millimetric and optical frequencies. Special attention will be paid to:

- Systems aspects, modulation and multiplexing techniques
- Guiding structures, transmission imperfections
- Installation and fabrication
- Terminal and repeater equipment
- Measurement techniques
- Components

CALL FOR PAPERS

A special issue of the PROCEEDINGS OF THE IEEE devoted to thick and thin film technologies for microelectronic (chip and substate), microwave, memory and optoelectronic applications is planned for publication in September 1971. Papers dealing with the preparation, evaluation and application of films in these categories are sought.

Authors wishing to submit papers for consideration are requested to provide detailed, unambiguous abstracts not exceeding 250 words in length, on or before October 15, 1970.

These should be followed by complete papers, to be received on or before January 15, 1971.

Guest co-editors for this issue to whom papers are to be submitted:

A. Reisman
IBM Thomas J. Watson Research Center
P.O. Box 218
Yorktown Heights, N.Y. 10598

K. Rose
Electrophysics Division
Rensselaer Polytechnic Institute
Troy, New York 12181

1970 IEEE ULTRASONICS SYMPOSIUM

October 21-23
Jack Tar Hotel, San Francisco

Papers are desired on new discoveries, recent advances, new devices, and applications in all areas of sonics and ultrasonics, including industrial ultrasonics, biological and medical ultrasonics, elasto-optic interactions, physical acoustics, materials, continuum mechanics and lattice dynamics.

In order to insure that the Symposium will serve as a forum for the most current work, the deadline for the submission of contributed papers has been set at the latest possible date. Every effort will be made to include a small number of post-deadline papers containing significant new contributions.

Deadline for Contributed Papers
August 1, 1970

Abstracts must be submitted to the Chairman of the Technical Program Committee:

W. J. Spencer
Bell Telephone Laboratories, Inc.
555 Union Boulevard
Allentown, Pennsylvania 18103

FIRST CALL FOR PAPERS

1970 IEEE INTERNATIONAL ELECTRON DEVICES MEETING

TO BE HELD OCTOBER 28-30, 1970 --- WASHINGTON, D. C.

The Annual Technical Meeting of the Electron Devices Group will be held at the Sheraton-Park Hotel in Washington, D.C. on Wednesday, Thursday, and Friday, October 28-30, 1970 sponsored by the IEEE Electron Devices Group.

This is the annual electron device meeting covering research, development, design, and manufacture of:

- Integrated Electronics
- Imaging and Display Devices
- Solid State Devices
- Quantum Electronic Devices
- Electron Tubes

G-MTT PLANS SPECIAL ISSUE ON MIC'S

G. I. Haddad, Editor of the IEEE Transactions On MTT, recently announced that a

special issue of the Transactions is planned for microwave integrated circuits. This issue is scheduled for July 1971 and will be devoted principally to applications of MIC'S in the design and development of active microwave components and systems. Guest editor is J.B. Horton. Papers deadline is November 15, 1970. Papers and correspondence items reporting new and significant developments in the field are solicited. In addition, several review papers will be invited to report the state of the art on research and development of microwave integrated circuits and related devices used in active microwave components and systems.

Suggested topics for this special issue could include, but are not limited to, application of microwave integrated circuits to small signal low noise transistor amplifiers, large signal transistor amplifiers, transistor oscillators, avalanche and Gunn diode amplifiers and oscillators, mixers and up-converters, parametric amplifiers, tunnel diode amplifiers, wide band components and systems, receiver and transceiver systems, techniques for achieving unilateral components such as circulators and isolators, and microwave switches. Papers dealing with slot-line and other topics related to microwave integrated circuits are considered appropriate to this special issue.

Length and style for the papers should be in accordance with the "Information For Authors" published in the Transactions. Four copies of each complete manuscript should be submitted for review not later than November 15, 1970, to the Guest Editor, Mr. J.B. Horton, MS 16, Texas Instruments Incorporated, Box 5012, Dallas, Texas 75222. Inquires may also be sent to Professor G. I. Haddad, Editor, IEEE Transactions On Microwave Theory and Techniques, The University of Michigan, Department of Electrical Engineering, Ann Arbor, Michigan 48104.

1971 CORNELL ELECTRICAL ENGINEERING CONFERENCE

"HIGH FREQUENCY GENERATION AND AMPLIFICATION - DEVICES AND APPLICATIONS"

AUGUST 17, 18, 19, 1971

The Third Biennial Cornell Electrical Engineering Conference will present the topic, "High Frequency Generation and Amplification - Devices and Applications." Since the original Cornell conference on this subject in 1967, there has been an extensive growth of the field and, in particular, new areas of application for solid state and quantum electronic devices are now being exploited. Of special interest is the use of these new devices in the public sector, for example, as applied to marine and vehicular navigational equipment including radars and transponders, the monitoring of pollutants, bioelectronics, and medical treatment and diagnostics. As in previous conferences of this series, contributed and invited papers will summarize the state of the art through seminar, tutorial and research presentations, and a Proceedings will be published.

1971 EUROPEAN MICROWAVE CONFERENCE

August 23-28, 1971,
Stockholm

International conference, organized by the Royal Swedish Academy of Engineering Sciences in cooperation with IEEE (England), IEEE (Region 8) and the Swedish National Committee of URSI.

The main topics of the conference will be:

Microwave solid state devices

Microwave components and computer analysis

Microwave integrated techniques

Microwave antennas

Microwave applications

Microwave acoustics

Call for papers and further conference details will be published in due course. Advance information is available from: Dr. H. Steyskal, Secretary General, 1971 European Microwave Conference, Fack 23, 104 50 Stockholm 80, Sweden.

CALL FOR PAPERS

for a Special Issue of the

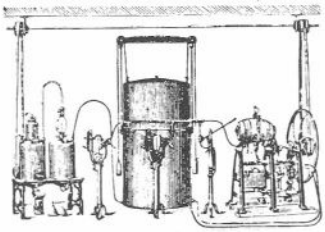
IEEE TRANSACTIONS ON ELECTRON DEVICES

on

INFORMATION DISPLAY DEVICES

A special issue of the IEEE Transactions on Electron Devices devoted to Information Display Devices is scheduled for the summer of 1971.

This issue will cover all of the disciplines relevant to the research, development, and design of electronic display devices and applications. The following areas are of interest: cathode-ray tubes, solid-state light emitters, plasmas, liquid crystals, lasers, holograms, light valves, and projection displays. Related topics such as phosphors, fiber optics, electron optics, photochromics and electrochromics, recording media directly applicable to displays, new phenomena, pertinent operational characteristics, and measurement techniques are to be included. Papers on systems-related considerations and the display device-circuitry interface problem will also be considered.



TECHNICAL NOTES

Short Course on

MICROWAVE ANTENNA MEASUREMENTS

GEORGIA INSTITUTE OF TECHNOLOGY

July 20-24, 1970

This course is an intensive study of the measurement of microwave antenna radiation characteristics including directivity, gain, pattern, boresight, polarization and phase. Radome reflectivity measurements will also be treated.

The course covers the theoretical basis of the measurements as well as current techniques including the analysis of error. An important segment deals with the design and evaluation of antenna measurements facilities.

This will be the second in a series of yearly short courses which are anticipated to be offered alternately between Georgia Tech and San Fernando Valley State College. A text written for the series, and revised this year, will be used in the course.

The course fee of $275.00 includes a text and all classroom materials.

IEEE ANNOUNCES FURTHER EXPANSION OF ITS CONTINUING EDUCATION SERVICE VIA CASSETTE TAPES

New York, N.Y..... The Institute of Electrical and Electronics Engineers (IEEE) has announced two new items in its Continuing Education Service on cassette recordings to be available in the Spring of 1970. One inaugurates a new series for IEEE's 160,000 members throughout the world to carry the designation "SOUNDINGS."

Format for the series is designed to cover specific current development topics in electronics and electrical fields through round table discussions by experts and also to touch briefly on other areas of interest. For example, the initial offering will provide a penetrating look at "Systems Engineering Today." In addition, a short interview with a leading pioneer in electrical and electronics engineering will be presented as a special feature in a continuing series of vignettes designed to provide IEEE members with a permanent "living" record of historical achievements as described by the men who accomplished them.

SOUNDINGS will be issued quarterly at the outset, with an eventual schedule of six issues a year expected in the future. Tapes will be two-track monaural, each 60 minutes in length.

The second item will be an addition to IEEE Continuing Education Services' library of individual topics. Titled "Management Principles for Engineers," it offers an introduction and review of the principles of management by objectives and relates this topic to electrical and electronics engineers.

These items extend the established tape Continuing Education Services of IEEE known as CASSETTE COLLOQUIA which is a series of learning tapes up to 90 minutes in length and includes the subjects "Industrial Programming Languages" and "Future Air Traffic Control Systems."

COMMUNICATION SYSTEMS DESIGN

A communication systems design short course, combining practical and theoretical aspects, will be given from August 31 to September 4 at San Fernando Valley State College, Northridge, California.

The course will cover the four major areas of communication systems, line-of-sight, tropospherical scatter, satellite and optical.

The course will include study of factors affecting the performance of communication systems such as thermal and intermodulation noise and non-linear distortion, background and detection noise. Other topics to be covered are multiple access techniques for commercial satellite systems, an introduction to lasers and associated optical components, and propagation of electromagnetic waves, both microwave and optical.

Further information may be obtained from Dr. Edmond S. Gillespie, in the School of Engineering, San Fernando Valley State College, Northridge.

MICROWAVE SEMICONDUCTOR DEVICES AND CIRCUITS

University of Michigan, August 3-14, 1970

This course will provide practicing engineers with a basic understanding of the principles and design techniques for microwave circuits utilizing semiconductor devices. The solid-state elements which will be considered include Gunn-effect and avalanche devices, varactors, PIN diodes, tunnel diodes, microwave transistors and Schottky-barrier mixers. Lectures and discussion will emphasize the use of these devices for microwave generation, amplification, frequency conversion, multiplication and detection.

The course will present, through lectures and discussion, the fundamental principles underlying the behavior of semiconductor materials and junctions at microwave frequencies. Upon this basic foundation will be developed a detailed consideration of the several semiconductor devices listed above. The properties of these devices, their use in microwave circuit design, and their integration in miniaturized microwave circuits will be discussed. Lectures will also be presented on the subject of microwave acoustics.

General inquiries should be directed to Engineering Summer Conferences, Chrysler Center, The University of Michigan, Ann Arbor, Michigan 48105 (Telephone: Area Code 313, 764-8490)

PERSONALITIES

DR. JAMES H. MULLIGAN, JR. NOMINATED FOR PRESIDENT OF IEEE IN 1971

New York, June 4, 1970. Dr. James H. Mulligan, Jr., Secretary of the National Academy of Engineering in Washington, D.C. has been nominated for the office of President of the Institute of Electrical and Electronics Engineers in 1971. Dr. J.V.N. Granger, Director and Consultant of Granger Associates, Palo Alto, California is President of IEEE for 1970.

BOOK REVIEW

by Nathan Pelner

QUANTIFYING HAZARDOUS MICROWAVE FIELDS: ANALYSIS, by Paul F. Wacker, National Bureau of Standards Technical Note 391, issued April 1970, 19 pages; 30 cents.

This Technical Note analyzes the problems involved in measuring microwave field hazards. It shows that existing standards for microwave hazards based on far-field concepts may have little or no validity in the near-field situation where hazards are most common and dangerous.

QUANTIFYING HAZARDOUS ELECTRO-MAGNETIC FIELDS: PRACTICAL CONSIDERATIONS

by Ronald R. Bowman, National Bureau of Standards Technical Note 389, issued April 1970, 15 pages; 30 cents.

This Technical Note deals with the problem of making easy, reasonably accurate survey measurements of hazardous electromagnetic fields. It discusses the many issues involved in selecting a suitable field parameter for quantifying the hazards in general, and concludes that the electric field energy density is usually adequate, though the total energy density of the field is considered a better measure of the hazard.

LETTERS TO THE EDITOR

Editor, G-MTT Newsletter

- - -I wish to thank the editorial staff of this newsletter, as well as all fellow members who responded by casting their vote for this Group's symbol contest.

Especially I wish to thank those who acknowledged entry number 6, being the most suitable symbol to represent this Group.

Sincerely,
Raymond A. Patrin

Editor, G-MTT Newsletter

- - - Just received the latest newsletter. Thanks for your note about me.

Contrary to Leo's report that I would be here for 18 months, the plan is for me to stay one year. Of course, they bought me a 1-way ticket to Tokyo, so Leo could eventually be proven right.

Your editorial was good. It's time someone faced the facts, even if unpleasant ones. And we need to look for a way out of the mess short of changing National Policy, which seems almost impossible. With research down the drain, this country (the U.S.A.) could eventually lose its No. 1 position. And eventually might be sooner than we think.

So long for now; not sayonara
Bob Beatty

Editor, G-MTT Newsletter

At its last meeting the IEEE Quantum Electronics Council authorized the publication of a newsletter and, subsequently I was appointed editor. This newsletter will be distributed periodically to all subscribers to the IEEE Journal of Quantum Electronics, and will be designed to provide rapid dissemination of news of interest specifically to the quantum electronics community. Among the items to be included will be announcements and calls for papers for meetings oriented towards lasers and quantum electronics generally, news of Quantum Electronics Council meetings, notices of special issues of the Journal of Quantum Electronics, and generally any items which will be of interest to JQE readers and would benefit from prompt dissemination.

If you have suggestions for such news items please send them to me. The information need not be complete if you are sure to include the name and telephone number of the person to whom I can turn for more details. Since we hope to distribute the first newsletter some time in June, I would appreciate your sending items of current interest so as to reach me before May 29. They should be directed to:

Dr. L.K. Anderson
Editor, QEC Newsletter
Bell Telephone Laboratories, Inc.
Murray Hill, New Jersey 07974