



EDITOR: J. B. Horton

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NOTE: FROM BYLAWS & PROCEDURES COMMITTEE

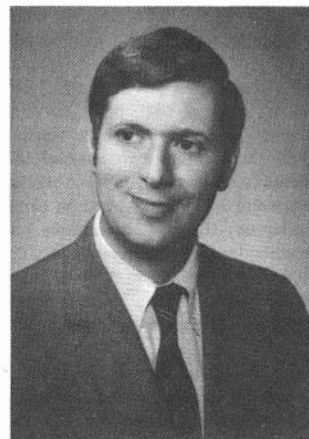
Your CONSTITUTION and BYLAWS are printed in this issue in the form of a handy "pull-out" so that you may retain them for easy reference. Their printing at this time serves two useful functions: first, each of you now has a copy of the "working documents" for our Group; and, second, since several recent changes have been made in our Bylaws, you are invited to comment on the revised version within 30 days in accordance with Article IX, Section 2 of the CONSTITUTION.

Your attention is directed especially to the major changes that have been made most recently in both documents. In September, 1969, the ADCOM approved an amended version of our Field of Interest, ARTICLE III of the CONSTITUTION. Then, a year later, the ADCOM approved a revised version of the BYLAWS. These revisions include several changes which reflect the more recent working structure of your ADCOM and the IEEE as a whole. They also include a new award for outstanding achievement, to be known as The W. W. Hansen Award, described in Section VI-C of the BYLAWS. This award has associated with it a \$1,000 stipend; however, as you are all well aware of the current financial problems facing the IEEE, it may be a year or two before the award can be administered.

Once again, please keep this issue, containing your CONSTITUTION and BYLAWS, handy; and the ADCOM welcomes your review, criticism, and comments in regard to these documents.

M. C. Horton
Chairman, Bylaws and Procedures
Operations Committee, ADCOM

INSERT - G/MTT
CONSTITUTION & BYLAWS



FRED J. ROSENBAUM

ROSENBAUM NAMED TRANSACTIONS EDITOR

Sy Okwit, Chairman of ADCOM, recently announced that Fred J. Rosenbaum has been appointed Editor of the IEEE Transactions on Microwave Theory and Techniques, effective July 1, 1971. The present Editor, George Haddad, has assumed the duties of Chairman of the ADCOM Publications Committee. The NEWSLETTER joins ADCOM and all G/MTT members in expressing thanks to George for his work as Editor of the Transactions over the past three years.

Fred J. Rosenbaum was born in Chicago, Illinois on February 15, 1937. He received the B.S. (1959), the M.S. (1960) and the Ph. D. (1963) degrees in electrical engineering from the University of Illinois. His graduate work was in the area of electromagnetic interactions between electron-beams and matter. From 1963 to 1965 Dr. Rosenbaum was a research scientist at the McDonnell Aircraft Corporation, St. Louis, where he worked in the areas of ESR instrumentation, cavity and traveling wave masers, and ferrite devices. In 1965 he joined the Electrical Engineering Department of Washington University, St. Louis, where he currently holds the position of Associate Professor. Dr. Rosenbaum, has authored more than twenty technical articles, many of which have been published in the G/MTT Transactions, and has been awarded two U.S. patents. He has served on the Editorial Review Board of the Transactions and has also reviewed papers for the IEEE Transactions on Electron Devices. In September, 1970, he was elected to the G/MTT ADCOM. Dr. Rosenbaum is married and has two young daughters.

After July 1, 1971 all manuscripts for the Transactions should be sent to:

Professor F. T. Rosenbaum
Department of Electrical Engineering
Washington University
St. Louis, Missouri 63130

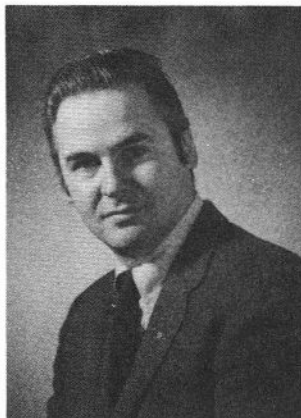


EDITORS NOTES

by J. B. HORTON

This issue is the first of two special issues this year to deal with the Group's structure and background. The Constitution and Bylaws appearing in this issue were first approved on October 7, 1952 and have been amended seven times, the last amendment on September 27, 1969. Details of the latest amendments are given in M. C. Horton's notes. The second special issue will contain the history of the Group. This is being compiled by Ted Saad. Both of these issues will contain inserts which can be removed intact for permanent records.

In reviewing the Group activities since our last Newsletter, I sense a deepening concern over the economy and a renewed interest in budgets and financial status of the microwave industry. This issue reflects this concern, in the Chairman's Viewpoint, the ADCOM Report and in the report on the Washington Symposium. In spite of the present state of economy, the Washington Symposium was successful and from my own point of view, a very enjoyable meeting. Congratulations and thanks to the Washington Chapter for a good job.



CHAIRMAN'S VIEWPOINT

by SY OKWIT

In my last Chairman's Viewpoint, one of the topics I had discussed was that of the importance of voluntary page charges to the health of the MTT. After discussing this topic with many MTT members, I was surprised to find how many were not really aware or fully understood the page charge concept.

Several months ago, E. K. Gannett (Woody), Director of IEEE Editorial Services, had written a special note on page charges to the authors of accepted publications. Unfortunately, the distribution of this note has been very limited. The insight this note gives into the concept is worth bringing to the attention of the MTT member. Consequently, I would like to take the liberty in this message of communicating the spirit of this letter.

A SPECIAL NOTE ON PAGE CHARGES TO AUTHORS OF IEEE PUBLICATIONS

The voluntary page charge represents a concept that is of major importance but yet is sometimes not fully understood. This is in spite of the fact that a substantial number of engineering and technical societies have instituted page charges.

IEEE page charges are voluntary, so they play no part in the editorial determination of whether a manuscript merits publication. The review of your paper by experts in its field revealed it contained information of sufficient importance to your fellow workers and to the profession that it should be a part of the permanent printed literature. Hence it will be published - whether or not page charges are paid.

But I ask you to look beyond this fact. The Institute exists to advance the theory and practice of electrical engineering, and a principal means of achieving this is through the publication of journals. During the past few years the costs for printing have gone up sharply at the same time that the volume of worthy material to be published has increased. During the last five years the number of IEEE journal pages has increased by nearly 30 percent. The Institute's editorial and printing costs are now approaching \$3,000,000 per year.

The publication of technical papers, while of vital importance, is a costly business. It is possible because the expenses are shared. The journal subscriber rightfully pays some, but not all, of this cost. IEEE income from other sources pays a part. The page-charge concept rests on the belief that author's companies or institutions should also bear some of the cost of publication since a research or development project is not complete, and its full value is not realizable, until the results have been disseminated to the engineering and scientific community. For this cost-sharing policy to be successful, it is important that all organizations able to pay these voluntary charges do so.

Payment of voluntary page charges by your organization will help to ensure that technical merit rather than cost constraints will continue to determine what is published in IEEE journals. I feel that you, your organization, the profession, and society at large are all the beneficiaries of this policy.



EXCERPTS FROM ADCOM MEETING

by A. CLAVIN

The G/MTT Administrative Committee Meeting was held in Washington, D. C., just prior to the 1971 Symposium.

S. Okwit, ADCOM Chairman, reported on the situation relating to QEC becoming a Group. ED ADCOM had asked that QEC be made a part of ED. A discussion followed in which Walter Kahn stated that QEC preferred to become a Group. G/MTT ADCOM endorsed this move.

Chapter Chairman's Reports

Reports were received from the following chapters:

Dallas
Fort Worth
Baltimore
Tokyo
Southeast Michigan

Professor Okamura of the Tokyo Chapter requested that microwave engineers who are planning to visit Japan and can make a technical presentation, contact him at least one month prior to visiting so that the Tokyo Chapter can arrange a meeting. Professor Okamura's address is:

Professor S. Okamura
University of Tokyo
Hongo, Bunkyo-Ku
Tokyo, 113, Japan

Finance

E. Torgow reported that the optimism shown in the March 22 budget was expressed in a fee income based on a total membership of 6799. Actual membership as of April 1, 1971 was 5604. The March 22 budget also assumed that economies would be realized on the cost of headquarters' editorial services, and that income from publications sales would increase.

S. Okwit recommended that corporations should be asked to support page charges. S. Okwit also indicated that we have two ways to go to cover expenses: (1) have Group increase dues to cover expenses, (2) have IEEE increase dues to cover expenses. A preliminary vote by the ADCOM favored the first approach.

Publications Committee

Transactions - G. I. Haddad reported that he is planning to hold to the 992 page recommendation for this year. To accomplish this he has postponed the special issue on "Automated Microwave Measurements" to January 1972. The September, October, and November issues will be approximately 40 pages each. The December issue, which is the Symposium issue, will be about 100 pages. He estimates that by the February 1972 issue, a back log of approximately 200 pages will exist. F. Rosenbaum will be the next editor and his duties will start by the January 1972 issue.

Meetings and Symposium Committee

1972 G/MTT Symposium - B. Knox reported that all was going well.

Social Technology - A. Clavin asked whether the ADCOM would be interested in providing an input to the IEEE National Convention Technical Program on the use of microwave techniques related to social problems. Topic, for example, could be microwave radiometry applied to measurement of earth resources. S. Okwit indicated we should get involved.

Operations Committee

Awards - D. D. King reported that Group endorsement was given to a substantial number of Fellow Award nominees. The selections for the Microwave Prize will begin after the June issue of the Transactions appears. D. D. King was requested to come up with a plan to regenerate the W. W. Hansen Award.

By-Laws Revision - M. C. Horton reported that the next Newsletter will publish the ByLaws - Field of Interest Section. A draft of the Handbook of Procedures will be completed by the September meeting.

History and Records - T. Saad reported that he is still working on this material.

Membership Services

Chapter Activities - G. P. Rodrique indicated that the annual Chapter Chairman's meeting would be held after the ADCOM meeting.

Newsletter - J. B. Horton reported that the April Newsletter had a special feature on the 1971 Microwave Symposium. However, problems in the Dallas, Texas, Post Office prevented the Newsletter from reaching members on time.

Membership Survey - A. Clavin reported that the results of the survey indicated that membership wants exhibits at meeting, and would like ADCOM sponsored one day symposia. The question again arose relative to exhibits at symposia. D. King indicated that at the CLEA Symposium exhibits came off very well. P. Rodrique indicated that this worked well at other symposia. A. Clavin requested that the Chairman appoint a committee to present this question to the ADCOM at a future meeting with recommendations. A. Clavin was requested to establish such a committee and make such a presentation.

Professional Action Committee - R. Rivers reported that the committee has had two meetings since the last report. A proposal for an IEEE Member Recruitment - Employment Service was presented for ADCOM consideration. Comments on the job proposal were that we should proceed with care. S. Okwit queried the ADCOM as to whether they agreed in principle with the concepts as set forth in the proposal. The answer was yes. The MTT is concerned with unemployment even though it is not in the charter. IEEE is in the same situation. S. Okwit moved that R. Rivers try to set up a mechanism for implementing the proposal with IEEE Headquarters. Motion carried with one negative vote.

TAB Activities

S. Okwit indicated that unemployment tear out cards in the Spectrum had netted 1200 replies and that 1200 had asked for 1/2 dues. He announced that if anyone is planning to tour Europe and is a good speaker the IEEE may pick up part of the tab for the individual to lecture.

New Business

The ADCOM unanimously voted their expression of appreciation to George Haddad for his outstanding performance as the transactions editor.

The next meeting is scheduled for 13 September 1971 at the IEEE Headquarters in New York City.

REFLECTIONS ON THE 1971 SYMPOSIUM

by L. R. WHICKER AND R. V. GARVER

The 1971 International Microwave Symposium was held in Washington, D.C. on May 17-19 at the Marriott Twin Bridges Motel. The Symposium, in spite of the present economic situation, was both a technical and financial success. A total registration of 460 was obtained, resulting in a profit of about \$3,000 which will be forwarded to ADCOM. The success of the Symposium is attributable in part to the strong technical program and the extensive national and local publicity campaign. Approximately half the Symposium attendees were from the Baltimore-Washington area.

A good turnout of 114 filled the hall for the banquet which had good food and a rather short (good) program. Bob Rivers served as Master of Ceremonies, highlighting his introductions with a witty and interesting performance to show that sometimes even engineers and scientists can act like humans.

In the program area this year, a special effort was made to have papers in the area of future applications of microwaves. The result was papers on automobile radar and millimeterwave communication systems. The paper by Harokopus on "Automobile Radar" showed a system costing about the same as an automobile air conditioner which avoids collisions and can warn of autos in the driver's blind spot. The paper out of U. S. Department of Transportation by Roberts, "Microwave Applications to Transportation," showed more on automobile applications and details of applications to other modes of transportation such as rail and air. A paper by Brown, "The Status of the Technology and the Applications of Free-Space Microwave Power Transmission," gave the system considerations of obtaining massive quantities of power from space. The microwave part of the system relaying the power to earth would not require much advance in the state-of-the-art. The critical area in making a space power source is the development of inexpensive photoelectric cells.

Interest in ferrite limiters and phase shifters has been rekindled as fulfilling the need to control high RF power at high frequencies with solid-state devices.

The 1971 Symposium tried several new things which appear to have merit and should be considered for future meetings. Some of these include:

1) A press room was maintained and one-page summaries of each technical session were given to members of the press. A press breakfast was held also.

2) A student paper competition was held and an excellent paper by T. A. Saponas, University of Colorado, was selected. The paper is titled: "Generation of Confined Spectrum Pulses Using an Absorption PIN Diode Modulator."

3) A nontechnical session, held on May 17 with Bob Rivers as Moderator, was well received, with an attendance of approximately 120 persons. The conclusion of the panel was really the most significant thing about the session. The general feeling has been expressed by IEEE members in the past that IEEE should be more active looking out for the welfare of its members - by lobbying on Capitol Hill - by instituting a portable pension plan - by doing something about the job market. From the panel discussion, it became apparent that one just does not suddenly decide to do these things and be any good at it. Those who make any progress at it are well developed specialists. We, the IEEE, are well developed specialists at exchanging technical information. Are we to dilute our efforts where we are successful to become amateurs in another field? It would seem that those of us who are inclined toward social action should also join organizations that are well developed at it and thus help them be more effective.

Many compliments on the Digest have been received. Each paper in the Digest, text and figures, could be fully viewed without having to continually turn pages. Each paper was complete on two 8-1/2 x 11" facing pages. The authors, editor, and his committee made a very useful and information-packed publication as a permanent record of the conference. Those in attendance strongly favored the journal size and two-page paper format. IEEE members may obtain copies of the Digest from IEEE Headquarters by sending \$5.00 for IEEE Catalog No. 71-C25M "G/MTT Symposium Digest" to IEEE, 345 East 47th Street, New York, N.Y. 10017.

The Ladies Program for the Symposium was successful, with up to 26 ladies participating in the tours. The tour of Annapolis and the Naval Academy drew the largest group.

CHICAGO ANNOUNCES PLANS FOR THE 1972 IEEE INTERNATIONAL MICROWAVE SYMPOSIUM

A magnificent new hotel situated in a suburban sports park will be the site of the 1972 IEEE International Microwave Symposium. Conveniently located just fifteen minutes northwest from O'Hare Airport and thirty minutes from the Chicago Loop, the Arlington Park Towers Hotel will provide conference attendees a convenient location as well as luxurious accommodations. The conference dates, May 22-25, 1972, are coincidental with the opening weeks of thoroughbred racing at Arlington, which will provide a colorful backdrop for the Symposium. Because the hotel is new and management was seeking early bookings, the Symposium Steering Committee has obtained favorable room rates for the conference. Participation of wives is particularly encouraged as an interesting and varied Ladies' Program is planned.

Bob Knox, Steering Committee Co-Chairman, reports that a student papers contest will be featured again at the 1972 Symposium. Undergraduate students are eligible to submit papers in the field of microwave technology. The student papers deadline is 1 February 1971. Papers should be sent to: Prof. J. J. Hupert, DePaul University, Dept. of Physics, 1215 W. Fullerton, Chicago, Ill. 60614.

P. P. Toullos, Chairman of the Technical Program Committee, has announced that the following subject areas will be included in the Call For Papers:

1. Microwave Integrated Circuits
2. Applications of Microwave Acoustics
3. Solid-State Microwave Devices
4. Computer-Aided Microwave Practices
5. Microwave Components
6. Millimeter Solid-State Devices and Systems
7. Low Noise Microwave Receivers
8. New Transmission Line Techniques
9. Microwave Measurements
10. New Microwave Civil/Industrial System Applications
11. Devices and Circuits for Gigabit Data Rates

Deadline for submission of a 500-word summary will be January 7, 1972. Summaries should be sent to:

Dr. P. P. Toullos, Chairman
Technical Program Committee
IIT Research Institute
10 West 35th Street
Chicago, Illinois 60616

Additional information on the Symposium is available from the Steering Committee Co-chairmen:

R. M. Knox (312/225-9630)
IIT Research Institute
10 West 35th Street
Chicago, Illinois 60616

L. H. Hansen (312/349-3300)
Andrew Corporation
10500 W. 153th Street
Orland Park, Illinois



CONSTITUTION AND BYLAWS OF THE IEEE GROUP ON MICROWAVE THEORY AND TECHNIQUES

CONSTITUTION IEEE MICROWAVE THEORY AND TECHNIQUES GROUP

ARTICLE I NAME AND OBJECT

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

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

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

ARTICLE II MEMBERSHIP

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

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

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

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

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

ARTICLE III FIELD OF INTEREST

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

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

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

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

ARTICLE IV CHAPTERS

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

ARTICLE V FINANCIAL SUPPORT

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

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

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

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

ARTICLE VI OFFICERS AND MANAGEMENT

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE VII NOMINATION AND ELECTION OF ADMINISTRATIVE COMMITTEE

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

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

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

ARTICLE VIII MEETINGS

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

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

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

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

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

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

The names of the elected members shall be transmitted to the Chairman of the Technical Activities Board. Unless disapproval of such elected members is received within 60 days of such transmittal, the elections shall become final.

Each eligible holdover member shall submit a ballot listing his choice for filling the six elective positions. The votes shall be counted by a teller's committee appointed by the Chairman of the Administrative Committee, no member of which is either eligible to vote or a candidate for election. All votes shall carry equal weight. Any candidate receiving a plurality on the first ballot is elected. Additional ballots shall be held, listing as candidates those nominees who have not received a plurality of votes. Candidates who have received less than two votes may be removed from consideration by the teller's committee if sufficient candidates remain to fill the remaining vacancies. This process shall continue until all six vacancies are filled. In the event that two successive ballots do not result in the filling of a vacancy nor the reduction in the number of nominees under consideration, the holdover members of the Administrative Committee may elect to remove from the ballot candidates having the fewest number of votes on the previous ballot, and provided that all candidates having received that number of votes are removed from the ballot.

2. CHAIRMAN AND VICE-CHAIRMAN

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

3. HONORARY LIFE MEMBER

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

a) Eligibility

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

- (1) He shall have made significant technical contributions in the field of interest of the Group.
- (2) He shall have performed outstanding service to the profession and to the IEEE.
- (3) He shall have been a member of the Group for at least five years.
- (4) He shall have been an Elected Member of the Administrative Committee.

b) Payment of Fees

Group fees for Honorary Life Members shall be paid from the Group Treasury. The Secretary shall arrange for this with IEEE Headquarters.

C. APPOINTMENTS

1. SECRETARY

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

SECTION II ADMINISTRATIVE COMMITTEE MEMBERSHIP

A. ELECTED MEMBER

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

B. EX-OFFICIO MEMBER

An Ex-Officio Member shall serve on the Administrative Committee as provided for by these Bylaws. An Ex-Officio Member of the Administrative Committee has all discussion and voting privileges on all matters before the Administrative Committee, except that he may not vote to elect members to the Administrative Committee nor to elect the Chairman nor Vice-Chairman of the Administrative Committee. An Ex-Officio Member is not included in a quorum count. An Ex-Officio Member may serve on standing and Ad Hoc committees.

C. HONORARY LIFE MEMBER

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

D. PAST CHAIRMAN

A Past Chairman shall be an Ex-Officio Member of the Administrative Committee for three years following his term of office as Chairman of the Administrative Committee, provided that he remains a member in good standing of the Group. Any remaining years of a Past Chairman's elective term on the Administrative Committee will be vacated, and he will be ineligible for re-election to the Administrative Committee for the duration of this Ex-Officio status. His vacated Elected Member seat will be filled in accordance with Article VII, Section 3, of the Constitution. Election of a member to fill this forthcoming vacancy shall take place during that meeting of the Administrative Committee at which the annual election of members of the coming year is held.

E. TRANSACTIONS EDITOR

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

F. NON-VOTING MEMBER

A Non-Voting Member of the Administrative Committee may participate in discussions of all matters before the Administrative Committee. He does not have a vote on any Administrative Committee business. He shall receive notifications of meetings and copies of the minutes of meetings. A Non-Voting Member may serve on standing or Ad Hoc committees.

G. SECRETARY

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

H. CHAIRMAN OF A STANDING COMMITTEE

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

I. CHAPTER CHAIRMAN

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

J. CHAIRMAN OF AN AD HOC COMMITTEE

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

K. CHAIRMAN OF QUANTUM ELECTRONICS COUNCIL

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

L. CHAIRMAN OF THE SOLID-STATE CIRCUITS COUNCIL

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

M. REPRESENTATIVE TO IEEE HEADQUARTERS, TAB

The Representative(s) to IEEE Headquarters, TAB, and/or Division 4, if he is not a member of the Administrative Committee, shall be a Non-Voting Member of the Administrative Committee during his tenure of that office.

N. ADVISORY COMMITTEE

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

SECTION III COMMITTEES

A. STANDING COMMITTEE

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

1. MEETINGS AND SYMPOSIUM COMMITTEE

The Meetings and Symposium Committee shall, as required, assist the respective program committees in planning and selecting programs within the field of interest of the Group for the IEEE International Convention, WESCON, and the annual G/MTT Symposium. Upon instruction of the Administrative Committee, the Meetings and Symposium Committee also cooperates with the committees responsible for other meetings, conventions, and symposia.

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

2. PUBLICATIONS COMMITTEE

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

a) TRANSACTIONS Editor

The TRANSACTIONS Editor is responsible for the technical and editorial content of the IEEE TRANSACTIONS ON MICRO-WAVE THEORY AND TECHNIQUES. He is also responsible for coordination with the IEEE facilities for publication. The TRANSACTIONS Editor shall appoint and be Chairman of the TRANSACTIONS Editorial Board. The TRANSACTIONS Editor will continue to serve until such time as a successor is named by the Chairman of the Administrative Committee, and for such time thereafter as may be necessary for his successor to assume the duties of Editor.

b) Associate Editor of the TRANSACTIONS

An Associate Editor of the TRANSACTIONS shall carry out the duties assigned to him by the TRANSACTIONS Editor.

3. SCHOLARSHIPS COMMITTEE

The Scholarships Committee shall be responsible for instituting and administering education-aid programs to be wholly or partially sponsored by the Group.

4. OPERATIONS COMMITTEE

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

a) Bylaws and Procedures Subcommittee

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

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

b) Awards Subcommittee

The Chairman of the Awards Subcommittee shall hold the grade of Fellow of the IEEE. This Subcommittee shall cooperate with the IEEE in recommending members of the Group for IEEE awards, shall select for the Administrative Committee the recipient of the Microwave Prize, and shall suggest the recipient of the W. W. Hansen Award.

The Chairman of the Awards Subcommittee is empowered to submit the name(s) of candidates for any award except The Microwave Prize and the W. W. Hansen Award to IEEE Headquarters without prior approval of the Administrative Committee, but shall promptly advise the Administrative Committee of such action.

c) Nominations Subcommittee

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

5. FINANCE COMMITTEE

The Finance Committee shall be responsible for planning, establishing, and administering budgetary control and disbursing of finances for the Group in accordance with the Constitution and the rules of the IEEE. The Committee shall also be responsible for planning and soliciting Group incomes such as from Institutional Listings in the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES. The Chairman of the Finance Committee shall be a member of the Administrative Committee.

6. STANDARDS COORDINATING COMMITTEE

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

7. LONG-RANGE PLANNING COMMITTEE

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

8. TECHNICAL COORDINATING COMMITTEE

The Technical Coordinating Committee shall investigate, evaluate, and, in some instances, promulgate new or peripheral technologies of interest to the Group. The Technical Coordinating Committee shall coordinate with the Meetings and Symposium Committee to afford the latest technical coverage in all meetings of interest to the Group. The Chairman of the Technical Coordinating Committee shall appoint Ad Hoc Technical Committees to deal with specific areas requiring technology emphasis. The Chairman of the Technical Coordinating Committee will be an advisory member of all Technical Committees. The Chairman of each Technical Committee shall report to the Chairman of the Technical Coordinating Committee any significant developments (such as special sessions his Technical Committee is helping to arrange and organize at the G/MTT Symposium, special issues of the TRANSACTIONS that are being planned, etc.) for possible inclusion in the minutes of the Administrative Committee. The Chairman of each Technical Committee should report to and advise the Chairman of the Technical Coordinating Committee each year, prior to the December Administrative Committee meeting, as to the continuation of that Technical Committee during the next year.

9. MEMBERSHIP SERVICES COMMITTEE

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

a) Newsletter Editor

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

b) Chapter Activities Subcommittee

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

(1) National Lecturer

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

(2) Membership Drive Subcommittee

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

B. AD HOC COMMITTEES

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

SECTION IV MEETINGS AND SYMPOSIA

A. MEETING NOTICES

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

B. MEETINGS IN ABSENCE OF QUORUM

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

C. SYMPOSIUM

The Group shall sponsor an annual Symposium. Each annual Symposium shall be organized by the Administrative Committee, or under the supervision of the Administrative Committee, by a Chapter of the Group chosen as the host of the meeting. The annual Symposium shall be held in May unless majority approval is given by the Administrative Committee. Selection of the site shall be made in the following manner:

1. PROPOSED SUBMISSION

Proposals by a Chapter to sponsor the Symposium for a given year should be submitted to members of the Administrative Committee between the 24th and the 20th month prior to the date of the proposed meeting, but not later than September 1.

2. CONSIDERATION OF PROPOSALS

The Administrative Committee will consider proposals received by September 1, at the annual meeting in September. The Administrative Committee may consider proposals received after September 1, if agreed by a majority of the Members present.

3. SELECTION OF SITE

The Administrative Committee will select the site of the Symposium before the end of the calendar year of submission.

4. CHAPTER NOTIFICATION

Group Chapters are to be informed of these provisions via the "Newsletter" by the Chairman of the Membership Services Committee in January of each year.

D. OTHER TECHNICAL MEETINGS

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

SECTION V FINANCES

A. BURSAR

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

B. FEES

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

C. AUTHORIZATION FOR PAYMENT OF BILLS

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

D. AUTHORIZED BUDGETS

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

E. SYMPOSIUM ADVANCES

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

F. SYMPOSIUM FINANCES

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

SECTION VI MISCELLANEOUS COMMITTEE BUSINESS

A. ADMINISTRATIVE YEAR

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

B. THE MICROWAVE PRIZE

The Group shall present an award known as "The Microwave Prize" annually. The prize shall be awarded to the author of that paper, published in the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, PROCEEDINGS OF THE IEEE, or other official IEEE publication, which is judged to be the most significant contribution in the field of interest of the Group. The paper must have been published during the year ending June 30th preceding the award. The selection of the recipient of "The Microwave Prize" will be the responsibility of the Operations Committee, who will make their recommendation to the Administrative Committee at the annual meeting of the Administrative Committee. The Chairman of the Administrative Committee shall inform the recipient of "The Microwave Prize" as soon as possible after the Administrative Committee has approved the award.

C. THE W. W. HANSEN AWARD

The IEEE will present an award, sponsored by the Group, known as the W. W. Hansen Award. The Award will be presented on an unscheduled basis, although candidates will be considered annually for the Award.

The Award shall be made to an individual who is judged to have made a most significant contribution, by publication in official IEEE technical journals in the field of interest of the Group; by lectures in the field of interest of the Group; by outstanding contributions to the technology; by outstanding service to G-MTT/IEEE in both local and national functions; by outstanding contributions to the microwave industry; or other contributions to be considered in conjunction with any or all of the areas of contributions mentioned above.

There is no specific time period in which the contribution must have been made. A suggested selection of the recipient of the W. W. Hansen Award will be the responsibility of the Operations Committee which will make its recommendation to the Administrative Committee at the annual September meeting. Nominations for the Award can be submitted by any IEEE Fellow or Senior Member who is a member of the Group, or by other IEEE-sanctioned nominations. The Chairman of the Administrative Committee shall inform the Chairman of the IEEE Awards Committee as to the recommended recipient of the W. W. Hansen Award as soon as possible after the Administrative Committee has approved the Award.

The W. W. Hansen Award shall consist of a suitable certificate, a cash sum of \$1,000, and feature publication in the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES.

SECTION VII CHANGES TO THE BYLAWS

Changes to these Bylaws shall be made in accordance with Article IX, Section 2, of the Constitution of the Group.



CHAPTER NEWS

Atlanta Chapter

Date: April 20, 1971 (19)
 Speaker: Carl Blake
 Title: Application of Solid-State
 Microwave Power Sources
 Affiliation: Lincoln Labs, MIT

Newly Elected Officers for 1971-1972 are:
 Chairman: T. J. Lyon
 Electromagnetic Sciences

Vice Chairman: T. G. Hickman
 Scientific Atlanta
 Secretary: H. A. Ecker
 Electronic Div.,
 Georgia Tech

Member at Large: R. D. Hayes
 School of E. E.,
 Georgia Tech

Baltimore Chapter

Newly Elected Officers for 1971-1972 are:
 Chairman: B. A. Sichelstiel
 Vice Chairman: G. Klein
 Secretary: L. K. Staley

Dallas Chapter

Date: May 20, 1971 (30)
 Speaker: R. J. Wenzel
 Title: Synthesis of Microwave Filters
 Affiliation: Wavecom, Inc.

Los Angeles

Date: June 19, 1971 (37)
 Speaker: Dr. Lawrence Parker
 Title: Non-Thermal Effects of Micro-
 wave Radiation
 Affiliation: U. S. Public Health Service

Newly Elected Officers for 1971-1972 are:
 Chairman: Nat Pelner
 Vice Chairman: Bob Hautzik
 Secretary/
 Treasurer: Ross Lohr

Orlando

Date: May 18, 1971
 Speaker: Alan D. Sutherland
 Title: Variational Methods Applied to
 Microwave Problems
 Affiliation: U. of Florida, Gainesville, Fla.

Phoenix

Date: April 19, 1971 (22)
 Speaker: R. Gary Daniels
 Title: The Electronic Wristwatch:
 An Application for Silicon Gate
 CMOS Integrated Circuits
 Affiliation: Motorola, Inc.

Date: May 12, 1971 (22)
 Speaker: Lowell N. Shestag
 Title: TACAN Cylindrical Array
 Antenna
 Affiliation: RANTEC

Washington Chapter

Date: September 13, 1970 (30)
 Speaker: C. M. Johnson
 Title: The Safeguard Ballistic
 Missile Defense System

Date: October 10, 1970 (20)
 Speaker: W. J. Getsinger
 Title: Interactive Programs for
 Microwave Circuit Analysis
 Affiliation: Comsat

Date: January 11, 1970 (71)
 Speaker: W. P. Harokopus
 Title: Automobile Radar
 Affiliation: Bendix Research

Date: February 9, 1971 (9)
 Speaker: R. E. Hurley
 Title: Reciprocal Latching Ferrite
 Phase Shifter

Date: March 9, 1971 (18)
 Speaker: R. A. Sparks
 Title: Microwave Waveform Genera-
 tion and Signal Processing
 Affiliation: Raytheon Co.

Date: April 20, 1971 (51)
 Speaker: K. C. Kelly
 Title: Waveguide Modes for Casse-
 grain Antenna Efficiency

San Diego Chapter

Date: March 10, 1971 (21)
 Speaker: Dr. Rubin
 Title: IMPATT and TRAPATT
 Oscillators and Amplifiers
 Affiliation: NELC Microwave Laboratory

Date: April 14, 1971 (22)
 Speaker: Victor Galindo
 Title: Blindness in Array Systems
 Affiliation: TRW, Redondo Beach



PERSONALITIES

Dan Varon, Chairman of the Technical Committee on Computer Oriented Microwave Practices (MTT-1), has joined the Raytheon Company. His new address is Raytheon Company, Box 1R5, 528 Boston Post Road, Sudbury, Mass. 01776

R. C. Hansen has announced that he has entered the consulting business under the name of R. C. Hansen, Inc., Encino, Calif. 91316. Bob was formerly head of the Electronics Division of the KMS Technology Center, (Bob was a member of G/MTT ADCOM for a number of years and is active in several IEEE areas).

S. Okwit, Chairman of ADCOM, recently announced that Harold Sobol has been appointed Technical Committees Chairman for G/MTT ADCOM, effective immediately. Hal was 1970 G/MTT National Lecturer. His address is: RCA Laboratories, Princeton, N.J. 08540, telephone (609)452-2700.

S. Okwith has announced the formation of a new company, LNR Communications, Inc. The company is composed of S. Okwit (President), F. Arans (Vice President), H. C. Okean, Pete Lombardo and Carol Allen. (LNR stands for Low Noise Reception). Company address is: 35 Central Ave., Farmingdale, N. Y.

Professor Sogo Okamura, Chairman of the Tokyo Chapter of G/MTT, was guest speaker at the July 27, 1971 meeting of the Denver-Boulder Chapter. Professor Okamura spoke on "Characteristics of the Mixer in the Millimeter Wave Frequencies."

FREQUENCY BAND DESIGNATIONS

ABSTRACT - In 1969, the United States Joint Chiefs of Staff (JCS) directed use of a standard designation for Bands of frequencies ranging from zero Hertz to 100 Giga Hertz. These joint service designations are compared with the ITU, Waveguide and Microwave and Radar Band designations which have been in use since World War II.

INTRODUCTION

The microwave band designations which emerged from World War II Radar Security considerations have never been officially blessed by any industrial, professional or government organization, but rather have settled into widely agreed (and sometimes disagreed) upon limits by usage and unofficial promulgation¹.

In August 1969, the United States Department of Defense, Office of Joint Chiefs of Staff, by message to all Services and to the Joint US-Canadian North American Air Defense Command⁵, directed use of a new frequency band breakdown as shown in the chart, Figure 1. Most of the IEEE membership who deal with the US and Canadian Radar and ECM areas have been exposed to the new band designations. The purpose of this note is to further promulgate the JCS Band designations in the microwave community, discuss them in relation to the older band designations, and to recommend consideration for adoption of a modified version of the JCS Band designations by the IEEE.

BAND DESIGNATIONS

With reference to Figure 1, the two far left-hand columns present current Microwave, ECM and Radar usage in the United States and UK. The US usage is believed to fairly represent the band designations which have been in widest use, and as they are now contained in most Handbooks^{1,2}. The UK usage is that derived by observation by the writer³, as modified by limited attempts to unofficially standardize usage as have appeared in the literature^{4,5}.

However, the United States Services, by Joint Service Regulations, and in conjunction with the Canadian Air Force through NORAD, adopted in 1964 the Band designation shown in the centermost of Figure 1 primarily for use in training activities⁶. In August 1969, the Joint Chiefs of Staff directed mandatory use of the bands designated by the Joint Service Regulations.

Each of the JCS Bands are further divided into ten equal parts, or "channels", and the channels are numbered one (1) through ten (10) from low to high end of the Band. For example, in D-Band (or "Delta" band using the current phonetics) which is 1000-2000 megahertz, Channel 4 is the subband 1300 - 1400 megahertz, and this subband would be identified as "D₄" or "Delta Four."

The Radio Regulations of the International Telecommunication Union⁷ establish the official internationally accepted Band designations familiar to most Radio Engineers, and these Bands are included for comparison in Figure 1. The ITU band numbers are of course related to the Band limits in Hertz as powers of ten, i. e., Band number N extends from 0.3×10^N to 3.0×10^N Hertz.

Also included for comparison in Figure 1 are the series of Standard Waveguide bands as designated by the Electronic Industries Association (EIA). Some of these Waveguide Bands also bear Joint Army-Navy (JAN), British and IEC designations⁸.

DISCUSSION

Of all the Band designations shown in Figure 1, the only breakdown which has a direct physical basis is the Waveguide Band. The Waveguide Bands, as they are associated with the physical dimensions of the guide and hence related to TE₁₀ mode cutoff, rest upon firm engineering considerations. The Band edges are not in all cases round numbers of megacycles, however, and with the exception of the 8.2 to 12.4, 12.4 to 18, and 18 to 26.5 Gigahertz ranges, engineering practice has not resulted in any widespread use of the waveguide band divisions.

The ITU Bands, on the other hand, are very easy to remember, but also have not gained wide usage among Microwave engineers. This is perhaps because the Bands are much too broad for day-to-day application.

The "usage" band breakdowns which have resulted from over 30 years of practice are perhaps the most representative of what Engineers will use as shorthand identification of a range of frequencies.

Like the names of the colors and the popular names of aircraft, the designations "L", "S", "C" and "X" convey instant mutual understanding of hardware and propagation characteristics and evoke a visual conception of the problem in question based on experience. A new band designation will require a mental transfer process.

What then of the official JCS Band designations? Advantages:

- i.) The JCS designation clears up the P, L and K band usage inconsistencies.
- ii.) The numbers are mostly octave or half-octave, with finer breakdowns of the densely signal-populated "S" and "X" bands.
- iii.) The size of the bands roughly correspond to that size which has been demonstrated to be useful in practice.

There are perhaps changes which would improve the JCS Band breakdown; e.g., Band A, 0-250 MHz, carries the connotation "everything below 250 Megahertz", which is probably satisfactory for strictly microwave engineers but, at the least, is difficult to plot on a logarithmic scale. It may also be advisable to extend the Band designations above 100 Gigahertz into the "IR-Radio" gap.

However, in view of the widespread promulgation of the JCS breakdown as it is now designated, it is recommended that an appropriate committee of the IEEE consider the JCS Band designation for possible adoption by the Institute.

T. F. Curry,
Melpar Division, LTV Electrosystems, Inc.
Falls Church, Virginia

1. McNarmara, Leo V., "Letter-Code Designations for Microwave Frequency Bands" Electronics, June 2, 1961, p. 58.
2. ITT Staff, "Reference Data for Radio Engineers, Fifth Edition," Howard W. Sams and Co., N. Y., 1968, p. 1-3.
3. Curry, T. F., "Trends in UK ELINT System Design", Syracuse University Research Corporation Technical Report No. 18, August 1964 (classified).
4. Lewin, L., Transactions, PGMTT, Sept. 1964, p. 551.
5. Harvey, A. F., "Microwave Engineering", Academic Press, 1963, p. xxi.
6. Air Force Regulation 55-44, dated 27 Oct. 1964, Army Regulation 105-86, Opnavinst 3430.9B and MCO 3430.1, August, 1969.
7. ITU Radio Regulations, Article 2, Section II, Geneva Convention, 1959.
8. Ibid, Reference 2, p. 23-8.

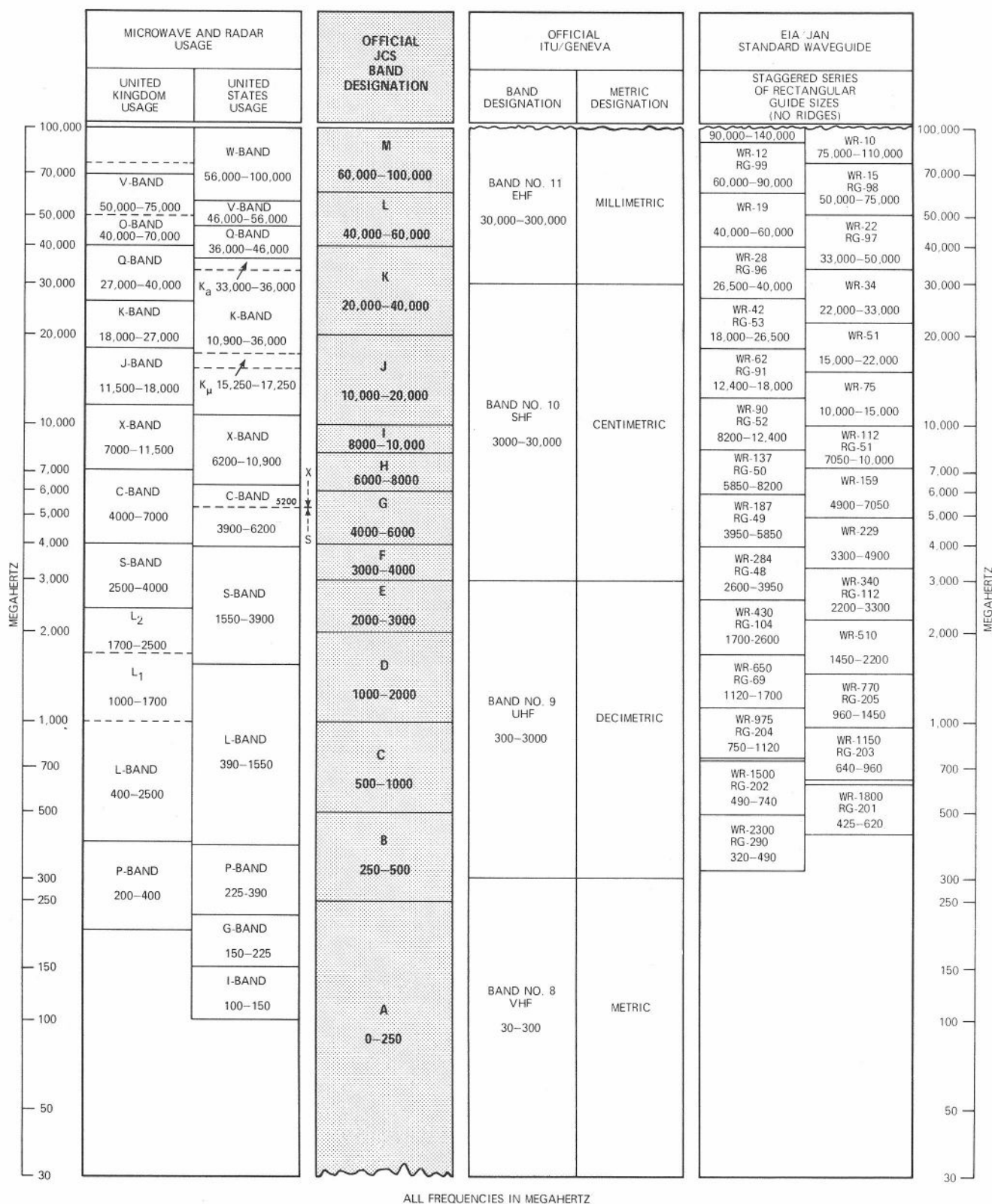
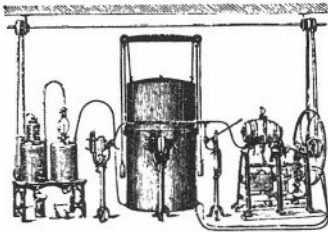


Figure 1. UK, US, ITU & JCS LETTER DESIGNATIONS FOR MICROWAVE BANDS



TECHNICAL NOTES

BOOK REVIEW

Antennas and Waves, Ronald W. P. King and Charles W. Harrison, Jr. The M. I. T. Press, 1969; 778 pages. Appendices, list of symbols, index, illus., \$15.00.

The authors have compiled in their book, Antennas and Waves, a complete development of antenna theory from its fundamentals to applications of the theory. They have also included a sprinkling of experimental investigations of those applications. A major objective has been to analyze a number of special yet practical antennas which are in common use, but of which many have never been compiled into book form - and possibly not in the literature. Some specific examples are the Inverted-L and T antennas, the bent folded monopole or hairpin antenna, and the folded monopole and dipole antennas with and without center and top loading.

A second objective has been to analyze in substantial detail the effect of a dissipative medium on antennas and on propagation. This is an overall larger objective of analyzing some of the special conditions under which antenna elements are operated; i. e., in re-entry plasmas, or under the ocean, or mutually coupled to a number of sister elements, in an array, or in the transient electromagnetic field of a nuclear explosion. These subjects are discussed in separate chapters on ionized media and plasmas, coupled antennas, transient response of dipoles and loops, and electromagnetic shields.

One will find antenna patterns in the book, but only a few. Instead one predominately finds detailed developments of the driving point impedance and the antenna current.

Although the book could serve as a text for a course in advanced antenna theory, the book is well suited for the practicing engineer who wants a better understanding of the basis for the impedance he has been measuring, the coupling between elements of his array, the treatment of ionized media and plasmas, or the transient response or shielding.

Chapters 1 and 2 develop the basic electromagnetic theories for handling the subjects of the chapters which follow. Chapter 1 treats the elements of electromagnetic radiation, macroscopic electrical properties of matter, D'Alembert's and Helmholtz' equations, free-space Green's functions and the physical interpretation of the Space-Time Green's Function, scalar and vector potential, and energy and power in terms of the potential functions.

Chapter 2 extends these developments as necessary to handle ionized mediums and plasmas. This chapter covers the plasma spectrum from Debye length to collision cross sections to the Boltzman equation to transverse waves in a plasma to Alfvén waves.

Although the presentations are theoretically complete, the subjects chosen are of a more practical bent. For example, the infinitely thin dipole is not treated. Instead, the cylindrical antenna is analyzed first for the current and impedance in Chapter 3, and then for the radiation pattern in Chapter 4. But the practical bent doesn't stop here. The current, impedance and fields of the dipole are then developed for this antenna immersed in a dissipative medium. Chapter 4 ends with a discussion of an experimental study of the field of the half wave dipole in a dissipative medium.

Chapters 3 and 4 illustrate the theme carried throughout the book which to my mind is the outstanding feature of the book. The authors treat several practical antennas which are extensions of the simplified "theoretically ideal" antennas, and then investigate the various environments in which these antennas are sometimes found. These antennas are those particular practical antennas which many of us have used in the past, but could not justify the expenditure of the time to analyze (providing we had the where-with-all to do it). The authors treat some of the unusual aspects of antennas that have become especially important in the past two decades. An example is the previously mentioned dissipative media which is important in the re-entry to space vehicles - or going to a recurring but antedated application - communication with submarines. Another example is that of transient response of dipoles and loops which is treated in great detail (Chapter 11). This subject is treated (briefly) by only one other author to my knowledge¹. A third example of unusual treatments is that of electro-magnetic shielding. Here the authors were prompted by the problem of shielded conductors and antennas exposed to nuclear explosions and to the fields of nearby high power radars.

All of these subjects are relevant to today's technology and have been subjects of concern to many of us in the past. The authors have generated a book which covers a niche in the world of antennas not covered before.

H. George Oltman
Hughes Aircraft Company
Canoga Park, California

¹T. T. Wu in Chapter 8, Collin and Zucker, Antenna Theory, Part 1



LETTERS TO THE EDITOR

The following letter was received in response to an open letter on unemployment/employment from A. Clavin (published on p. 16 of the April Newsletter):

Dear Mr. Clavin:

This is in response to your open letter in the MTT Newsletter relative to unemployed microwave engineers.

I think the use of MTT in the way you propose is most appropriate, and I would be glad to refer inquiries I get to MTT for further action. If there is anyway I can otherwise help, please let me know.

Very truly yours,

R. F. Schwartz, Chairman
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Editor, G/MTT Newsletter (5/28-71)

You are doing a good job as editor and we all appreciate the work involved. However, one little complaint - my April, 1971 "Newsletter" arrived on my desk on Monday, May 24th.

I have no idea when the issue was mailed from Dallas, but it arrived a little late to remind me of the 1971 IEEE International Microwave Symposium at Washington on May 16!

Thus, a suggestion or question - should timely subjects such as conferences be included two months ahead of time to accommodate the third class mails?

Sincerely,

C. E. Burley, Director
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Comment: The Editor deeply regrets the lateness of the April Newsletter. The Editor, Printer and Mailing Service company were on schedule with the issue, but for unexplained reasons, the newsletter remained in the Dallas Post Office for a full two weeks before mailing. Your suggestion is an excellent one and we will make every effort to mail the April 1972 Newsletter prior to the Symposium.

-Ed.

Editor, G/MTT Newsletter (5/29/71)

This letter is prompted by your "Notes" in the current Newsletter. It is from an engineer completing 46 years of activity, 38 of which have been in instrumentation in a wide variety of fields - 67 years old and a Life Member of IEEE.

Over the years, I've often wondered who really gains by the shows at technical meetings. The engineer who wants to keep up to date must keep on top of as many of the state-of-the-art developments as he can find out about - no easy chore because of the many publishing media. The traveling vans used by some reps and manufacturers are a help in this area. In my own case, I cannot recall any instances of finding an instrument or other device at a show that I did not know about. However, although I'll soon be a dropout from the MTT group, if shows will increase the income of the group I'm all for them.

Also, over the years, being a member of the I and M group, also, there is much overlapping of areas of interest of these two groups. What are microwaves? The definition in use by the National Conference of Standards Labs when I was active in that organization seemed to be "Measurements at 1 GHz and higher." My own personal preference has been for a long time that the definition might well be one to cover those measurements wherein we can no longer consider lumped constants but must resort to distributed constants theory. I am convinced that that point is well below 1 GHz - possible, in some cases at least, as low as 1 MHz. Has any serious consideration been given to combining the two groups - or perhaps separating the various phases of the MTT group and combining them with other IEEE groups working in the same general fields? On the other hand, I can see a distinct need for a MTT group and hope that its financial troubles will soon end.

Respectfully,

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