

IEEE

# NEWSLETTER



## SONICS & ULTRASONICS GROUP

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### HOME OF BEAN AND COD Hosts 1972 IEEE Ultrasonics Symposium

The 1972 Ultrasonics Symposium of the G-SU will be held in Boston, Mass., on October 4, 5, and 6, 1972, at the Statler Hilton Hotel.

Papers will be presented on new discoveries, recent advances, new devices, and applications in all areas of sonics and ultrasonics. A partial list of topics includes: acousto-electric and acousto-optic interactions, acoustic imaging, biological and medical ultrasonics, industrial ultrasonics and acoustic emissions, materials, physical acoustics, surface wave devices and applications.

Special sessions have been organized to discuss important topics in applications of sonics and ultrasonics. ACOUSTIC EMISSIONS and BIOLOGICAL ULTRASONICS will be subjects of special tutorial sessions.

A PROCEEDINGS OF THE SYMPOSIUM will be published. The authors of all papers accepted for presentation will be requested to provide a copy of their manuscript for this purpose at the Symposium. Manuscripts not received at the time of the Symposium will not be included in the Proceedings, and abstracts only of these talks will be used. The Proceedings will be edited by J. de Klerk of Westinghouse Research Laboratories, Pittsburgh, Pa. 15235, to whom all inquiries should be directed.

The CALL, FINAL CALL, and advance PROGRAM were AUTOMATICALLY MAILED to all MEMBERS of the IEEE Group on Sonics and Ultrasonics. In addition, the CALL and FINAL CALL have been mailed to an outdated list of nonmembers. This year, to get the advance PROGRAM, NONMEMBERS MUST SEND A REQUEST WITH their address, including ZIP CODE, to the Technical Program Committee Chairman, address shown below.

Dr. L. T. Claiborne  
Texas Instruments Incorporated  
P. O. Box 5936, MS 118  
Dallas, Texas 75222

For IEEE MEMBERS who are not already members of the Sonics and Ultrasonics Group, a special reduced membership fee of \$2.50 (regularly \$5.00) will again be available to you at this year's Symposium. By joining the Group, you not only become

able to receive the Group's Transactions, but you also demonstrate your support of the Group's efforts in organizing the Ultrasonics Symposium. If you find the Transactions and Symposium useful, please consider taking advantage of this special offer.

### G-SU \ G-MTT SPECIAL ISSUE: Microwave Acoustic Signal Processing

The major goal of this special issue is to present design methods and examples for the use of acoustic devices in signal processing applications. Invited are papers dealing with a variety of acoustic phenomena (e.g., volume and surface acoustic waves, magneto-acoustic and acousto-optic interactions, etc.). All papers must emphasize: 1) known or suggested signal processing applications, 2) comparison of device parameters with application requirements, and 3) where possible, advantages and disadvantages of acoustic signal processing with competing methods. The words "microwave acoustic" are used in their broad sense; papers considering frequencies well below the usual microwave range will be considered as long as microwave methods and techniques are used.

A further goal of the issue is to illustrate the wide variety of signal processing functions available with acoustic devices. Current applications research includes:

- |                        |                           |
|------------------------|---------------------------|
| - Transversal filters  | - Large time-bandwidth    |
| - Resonance Filters    | recirculating memories    |
| - Matched filters      | - Nonlinear acoustic wave |
| - Programmable filters | interaction               |
| - Spread spectrum      | - Waveguides and couplers |
| - Signal encoders      | - Acoustic holography     |

Both new application of older devices and potential applications of new devices are being sought for this special issue.

The deadline for contributed papers is 1 September 1972. Prospective authors must send three complete manuscripts to:

T. M. Reeder, Guest Editor  
United Aircraft Research Laboratories  
East Hartford, Connecticut 06108  
or

Prof. F. J. Rosenbaum, Editor  
IEEE Trans. on Microwave Theory & Tech.  
Department of Electrical Engineering  
Washington University  
St. Louis, Missouri 63130

Length and Style of papers should be in accordance with the "editorial policy statement", MTT-20, Trans. on Microwave Theory and Techniques, March 1972.

The special issue is scheduled to appear as the regular April 1973 issue of both the G-MTT and G-SU Transactions.

# G-SU OUTLOOK

by L. W. Kessler, President

## Announcements

Congratulations to our three newly elected AdCom members - Dr. Robert Adler, Zenith Radio; Prof. H. John Shaw, Stanford U; and Prof. Richard M. White, U of California at Berkeley.

Sincere thanks to Stan Jacke, Norm Foster and Ernie Stern whose elected terms have come to an end. However, Norm Foster and Ernie Stern continue to serve G-SU AdCom in ex-officio capacities.

The 1973 Ultrasonics Symposium will be held in Monterey, Calif. at the Naval Postgraduate School. John Neighbours will act as General Chairman.

## Pending Business

A copy of G-SU's constitution has been mailed to each AdCom member. Please read it thoroughly and make notes of any recommendations you may have. We know that this document is in desperate need of updating and revision. Please send comments to L. W. Kessler and/or N. F. Foster as soon as possible.

G-SU is considering the publication of a book (consisting of a collection of important papers) on the subject of Surface Waves. Steve Wanuga has offered to edit this for "IEEE Press".

The 1973 Budget Estimate must be prepared. Please send your inputs to Bill O'Brien. Furthermore, if you have in mind tentative proposals for G-SU activities that would require special funding, please ripen the ideas quickly so that we can either incorporate an estimate into the budget or apply to IEEE for a special allocation.

Cliff Jones, Meetings Committee Chairman, has submitted the following recommendations for future Annual Ultrasonics Symposia:

<u>Year</u>	<u>Location</u>	<u>General Chairman</u>
1974	Chicago, Illinois	Dr. M. Levy, U of Wis. at Milwaukee
1975	Los Angeles, Calif.	Dr. R. Stern, UCLA
1976	New York City	Not identified

Two additional sites have been offered, but tentative recommendations for dates are not being made by the Meetings Committee at this time. Boulder, Colorado and Phoenix, Arizona were suggested by Mr. J. McElroy and Professor I. Kaufman, resp., who would also be willing to act as General Chairmen.

It's time again to suggest potential nominees for three year terms on G-SU AdCom beginning in 1973. Six nominees must be selected, from which three will be elected by the membership at large. Please send recommendations to Don Hammond, Chairman of our Nominations Committee.

For the 1973 IEEE Ballot, Dr. Leo Young and Dr. Rudy S. Engelbrecht have been nominated for Director of Division 4. Recall that Division 4, the "Electrosiences Division" is comprised of the following G-ED, S-Mag, G-MTT, G-PHP, G-AP and G-SU.

The next AdCom meeting will be held in Boston, Mass. at the time of the Ultrasonics Symposium. The date and time will be announced. Plan to attend.

Emmanuel Papadakis has requested articles for the next newsletter. Please send it to him ready for photo-reproduction as follows: Text single spaced, double spaces between paragraphs, use a good typewriter and leave wide margins such that the column will never exceed 5-3/4 inches!

# Report from the PRESIDENT

L. W. Kessler, June 1972

## G-SU Ad Com at a Glance

As you know, G-SU is a small IEEE Group that is concerned with high technologies and broadly based interests. The extent to which this is true among its membership is indicated by the fact that 92% also belong to other IEEE Groups. The topics of major interest to G-SU are acoustic-electrics, acoustic imaging and holography, acousto-optics, electromechanical delay lines and filters, ferroelectrics, frequency control devices, industrial ultrasonics, medical ultrasonics, non-destructive testing and physical acoustics. Soon every one of these interest areas will be formally represented on Ad Com through one or more of the following: Technical Committees concerned with standards, Associate Editors representing the Transactions, and Ad Hoc Committees defining G-SU's participation and possible contributions to the field in the forms of special issues, symposia, etc.

For its size, the G-SU has a relatively high level of activity. The Transactions on Sonics and Ultrasonics has just published a huge special issue devoted to the applications of ferroelectrics (April 1972). Another special issue is planned for April '73 on the subject of microwave acoustic signal processing (in collaboration with the Microwave Theory and Techniques Group). As a result of the success of the Invited Proceedings of the 1970 Ultrasonics Symposium (some copies are still available, IEEE Catalog no. 70 C 69 SU), a conference proceedings is planned on a regular basis starting with the Boston meeting (October 4-7, 1972).

Aside from its Transactions G-SU takes great pride in its annual Ultrasonics Symposium, its Ferroelectrics Symposium and its recent co-sponsorship of the International Symposium on Acoustical Holography. Each of these meetings is internationally recognized as a leading forum in its field. One of the other co-sponsors of the Acoustical Holography Symposium, by the way, was the Acoustical Society of America. We look forward to, and would like to encourage future such collaborations which result in benefit for the scientific and technical community at large.

As you can see Ad Com faces a continual challenge to provide service to its membership and to the scientific-technical community. At the same time, however, it must remain a viable entity financially. A few years ago we tried to estimate the number of years we had left in light of skyrocketing costs of operation and limited funds. To a large extent our financial problems were typical of that of a small Group within IEEE, further complicated by an identity crisis. The identity crisis led to a self analysis of G-SU's role and function and resulted in very strong desire for continuation as a separate entity. Corners were cut, procedures were modified, and last year, instead of a projected deficit of \$4000.00 G-SU essentially broke even. The estimate for 1972 and 1973 are similar, however, there is no time to relax since Ad Com wants to provide G-SU members with more substantial services such as: periodic review and update papers in the Transactions, comprehensive coverage of all the various interest areas enumerated above, publication of newly written or revised standards papers in the Transactions, and the possibility of G-SU developing short courses in the more popular areas of ultrasonics today. In order to be able to do these things we need support. It is a fact of life, and an expensive one at that, G-SU derives income from two principal sources, the sale of Transactions and the collection of membership fees. The largest expense item and also the principal attraction for membership is the Transactions. From the administrative viewpoint, the more subscribers and members, the greater in size and

# AdCom Notes

by W. D. O'Brien, Jr., 1972 Secretary-Treasurer

The following is a brief account of the GSU Ad Com meeting of March 23, 1972, which was held during the 1972 IEEE International Convention in New York.

GSU has received a commitment from TAB that the IEEE financial allocation procedures to groups and societies would be looked into prior to the 1973 budget.

The 1971 Ultrasonic Symposium, J. E. May (Bell Labs., North Andover, Mass.), General Chairman, was a financial success in that it showed a \$3400. surplus. The reason was the Symposium had been planned on a break even basis with an attendance of 200, whereas actual attendance was 329.

The 1972 Ultrasonic Symposium will be held October 4-6, 1972, at the Boston Sheraton, Boston, Mass. Dr. Mel G. Holland (Raytheon Res. Labs., Waltham, Mass.) is General Chairman and Dr. Lewis T. Claiborne (Texas Instruments, Dallas, Texas) is Technical Program Chairman.

Dr. L. W. Kessler (Zenith Radio Corp., Chicago, Ill.), GSU President, reported that IEEE has delineated what cooperation and co-sponsorship of a meeting actually entails. Cooperation of an IEEE entity means that this entity will encourage its members to take part on an individual basis. The entity may supply mailing address labels of its membership, it will advertise the meeting in its journal or newsletter and when IEEE is mentioned, it will be indicated that the entity is cooperating. Co-sponsorship of an IEEE entity means all the above in addition to this entity will have appropriate membership on the meeting's technical program committee and that there will be financial considerations.

Dr. N. F. Foster (Bell Labs., Allentown, Pa.), Publications Committee Chairman, reported that as of the July, 1972, issue of the IEEE Transactions of Sonics and Ultrasonics, the page charge will be reduced to \$40 and so indicated on the Transaction's back page. This is a result of going to off-set printing, known as Method B.

A special issue of the Transactions entitled "Microwave Acoustic Signal Processing" is being planned jointly with GMTT and GSU. Dr. T. M. Reeder (United Aircraft, Hartford, Conn.) is Special Editor of this issue with support from F. Rosenbaum, GMTT Editor, and S. Wanuga, GSU Editor. There will be a September 1, 1972, submission deadline for papers so that the issue can be published in April, 1973.

A policy statement which deals with the situation when GSU co-sponsors a meeting and a publication results was approved. In summary it says: (a) if GSU co-sponsors a meeting, any publication from such meeting will be an IEEE publication, and this will be a requirement, and (b) a written agreement between all parties concerned will be executed prior to the meeting specifying all necessary actions including the maximum financial responsibility of each party concerned.

The GSU Ad Com approved that the IEEE standard #319-1971, "IEEE Standard on Magnetostrictive Materials: Piezomagnetic Nomenclature," be published in the GSU Transactions. This action resulted because the IEEE Executive Committee has changed its policy of supporting the publication of Standards in the Transactions. The policy now is the publication of the standards generated must be self-supporting.

It is scheduled that the 1972 Conference Proceedings be published as soon after the 1972 Ultrasonic Symposium as possible. This will be accomplished by having all manuscripts submitted to Dr. J. de Klerk (Westinghouse Res. Labs., Pittsburgh, Pa.), Proceedings Editor, at the Symposium. Further, the proceedings will be open to all contributed and invited papers.

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# FINANCIAL REPORT

by W. D. O'Brien, Jr., 1972 Secretary-Treasurer

The 1972 GSU Statement of Financial Operations is detailed below. Included are the 1972 budget and the financial condition as of March 1, 1972.

	1972 Budget	Fin. Condition as of 3/1/72
<b>INCOME</b>		
Membership Fees	\$ 6,100	\$ 5,235.00
Publication Sales	6,400	5,839.42
Meeting Receipts	5,400	0
Reserve Interest	0	697.00
IEEE Support	4,300	4,300.00
	<u>\$ 32,200</u>	<u>\$ 16,071.42</u>
<b>EXPENSES</b>		
Publication Expenses	\$ 18,900	\$ 5,093.56
Member Services	7,600	7,435.57
Meeting Expenses	5,400	0
Committee & Other	200	0
	<u>\$ 32,100</u>	<u>\$ 12,529.13</u>

Net Work, January 1, 1972	\$11,661*	
Net Operating Surplus, March 1, 1972	3,542	(INCOME-
Net Worth, March 1, 1972	15,203	EXPENSES)
Less Outstanding Loans	0	
Cash Balance, March 1, 1972	15,203	
Less Transaction Estimates	12,700	
Uncommitted Balance, March 1, 1972	2,503	

\*Includes the 4K special appropriation for the Special Ferro-electric Symposium issue.

# EDITOR'S REPORT

by Stephen Wanuga, Editor

The transition of editor and associate editor is now fully realized and processing is now running smoothly and efficiently. Two associate editors have indicated their desire for retiring. They are Vincent Salmon, "Industrial Applications" and Bill Cook, "Measuring Techniques". Both said they would send me prospective candidates for replacements.

The SU-19 No. 1 January 1972 issue consisted of 10 papers, plus a short "In Memoriam" letter. The issue had 64 pages.

The special issue on the June 1971 Meeting on "Ferroelectrics" was originally scheduled to be published as part B of our SU-19 No. 1 January 1972 issue. However, due to its size, about 278 pages, it will now be published as our regular SU-19 No. 2 April 1972 issue.

The originally scheduled SU-19 No. 2 April 1972 issue will now be published as our regular SU-19 No. 3 July 1972 issue. It will consist of 9 papers (44 pages) and abstracts of our 1971 Ultrasonic Symposium (28 pages).

IEEE inadvertently printed in the March issue of Spectrum, the list of papers originally scheduled for the SU-19 No. 2 April 1972 issue. I have asked them to place an errata in the next issue of the Spectrum to state the April issue as being the special issue on Ferroelectrics.

The SU-19 No. 4 October 1972 issue is completely prepared for sending to the IEEE. All the planned papers have been completely processed. The issue will consist of 10 papers, plus a short book review by Dr. W. P. Mason on "Ultrasonic Transducers" by Dr. Y. Kikuchi. All the authors have been advised that their manuscripts, photos and biographies are on hand and that their papers have been approved for publication. They have not been notified as to publication date. This will be done in April.

## Papers in Processing

Three papers have been rejected and one has been sent back to the author with recommendation for publishing in another Group. There are presently 13 papers in various stages of processing, that is reviewing, etc.

Final page charge statistics show we have a 69% return rate on our 1971 page charges. This is 20% above the average. It should give us more of a dollar return for 1972 since my special pleas to authors was relevant only to the July and October issues of 1971.

A special issue of "Microwave Acoustic Signal Processing" is being planned jointly with G-MTT and G-SU for April 1973. There will be a single printing which would indicate the sponsorship of MTT and G-SU subscribers with the appropriate Transactions covers. At present the following have been discussed:

1. Each Group would pay for its own printing and mailing costs.
2. a. The Editorial charges would be shared in a ratio proportional to the number of members of each Group or the number of pages we had planned for our April 1973 issue.  
b. If G-SU could not absolutely meet condition 2a because of severe financial reasons, then Fred Rosenbaum, Editor G-MTT has informed me that G-MTT would pick up all the editorial charges.
3. Tom Reeder would be Special Editor of this issue, with support from Fred Rosenbaum and myself.

# BOSTON Section Report

by H. van de Vaart, Chairman, Boston Section

This was the second year of operation for the Boston Section of the S-U Group. Seven meetings were held, of which three were in combination with other groups such as Engineering in Medicine and Biology, Communications Technology, and the American Society for Nondestructive Testing. Despite the fact that the Boston Area has the largest S-U membership of any IEEE region in the U.S. (only Tokyo has more) the attendance is relatively poor. However, all meetings have been quite successful and rewarding to those who attended. In addition, the pre-meeting dinner has provided an excellent opportunity to exchange information between the various members of the group.

The following meetings were held:

1. September 22, 1971. (Jointly with Group on Engineering in Medicine and Biology) "The Application of Ultrasound in Medical Diagnosis," D. E. Robinson, Commonwealth Acoustic Labs., Australia and MIT.
  2. October 27, 1971. "Theory and Application of Broad-band Surface Acoustic Wave Delay Lines," T. M. Reeder, United Aircraft, Hartford, Conn.
  3. November 17, 1971. "Ultrasonic Spectroscopy," O. R. Gericke, Army Materials and Mechanics Research Center, Watertown, Mass.
  4. January 19, 1972. (Jointly with Group on Engineering in Medicine and Biology and American Society for Nondestructive Testing) "NDT Techniques in Diagnostic Medicine: Ultrasonic Echo-Ranging," H.E. Van Valkenburgh, Automation Industries, Inc., Danbury, Conn.
  5. February 16, 1972. "A Recent Visit Behind the Iron Curtain as a Guest of the Soviet Academy of Sciences," J. de Klerk, Westinghouse Research Labs., Pittsburgh, Pa.
  6. March 8, 1972. (Jointly with Group on Communications Technology) "Surface Acoustic Wave Spread Spectrum Modems," M. G. Unkauf, Raytheon Co., ED/CSL, Norwood, Mass.
  7. April 11, 1972. "Anisotropic Acoustic Surface Wave Diffraction," T. L. Szabo, AFCRL, Bedford, Mass.
- The 1972/73 officers, elected at the April 11, 1972 meeting are:
- Chairman - Lawrence C. Lynnworth, Panametrics  
Vice-Chairman - Paul H. Carr, AFCRL  
Secretary-Treasurer - Robert C. Addison, American Optical.

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# Division 4 OUTLOOK

by Leo Young, Division Director

Just to review, TAB (Technical Activities Board) consists of the TAB chairman and vice chairman, the 31 Group (or Society) Presidents, the two Council chairmen, the six Division directors, plus sundry TAB committee chairmen (finance, publication, standards, long-range planning, technical meetings), almost 50 people. Its executive committee, known as OpCom (Operating Committee), consists of the TAB chairman and vice chairman, the Division directors and principal committee chairmen, for a more manageable total of about a dozen people.

Recent developments at TAB and TAB OpCom include the following. TAB has been considering the application of electro-technology to social problems, and the division directors have been asked to propose suitable areas for consideration. For Division IV, I have proposed the topic of radiation hazards. As many of you know, this subject has received considerable attenuation, and will become more important as more transmitters come into operation, from radio stations to futuristic car radars, from microwave ovens to satellite antenna farms collecting energy from the sun and transmitting it to the ground over microwave beams. What is a safe level? The Russian and Eastern European standards are 1000 times lower than the U. S. Is the potential hazard only due to heating, or through the nervous system also? There is also the question of radio "pollution" of the atmosphere. We would like to report on this (a) in more detail for the engineering community, (b) in a "popular" article that would be of interest to the general public. Related to this is the question of whether the IEEE is willing to accept invitations to give expert advice on these and related matters to legislators, or should leave such activity to the AMA (American Medical Association) as in the past.

I would welcome any assistance on any of these questions from anyone interested and knowledgeable in the area of radiation hazards.

Last year TAB had about twenty ad hoc technical committees on very diverse subjects, all reporting to the TAB chairman. This year they are being transferred to Divisions or Groups as far as practical. We welcome the Committee on Electronic Materials, under Dr. Harold Jacobs, to Division IV. Materials are of interest to many Groups, but none more so than those in Division IV. We will attempt to coordinate the Committee's activities with similar activities in various Groups or Societies.

Professional Action has been discussed not only at TAB and TAB OpCom meetings, but even more so at meetings of USAC. (United States Activities Committee) and the Board of Directors. USAC consists of the six U. S. region directors, and Vice-President Chestnut in the (non-voting) chairman. Division directors have been invited to attend as guests, but so far I have been the only division director to accept the invitation. Our Division IV Professional Action Committee (PAC) under Bob Rivers is of course very interested. I have thus tried to improve communications between USAC and PAC.

The Board meeting in January approved a new bylaw authorizing fees for the regions, both U. S. and non-U. S. Funds raised in this way would support an IEEE office in Washington (paid for by members in Regions 1-6) and in Canada (paid for by members in Region 7). If an overseas region wants a special service, e. g., bulk air freighting of IEEE publications for quicker delivery, then that region can, if it so wishes, assess regional fees for this purpose.

The Board meeting in March was almost exclusively devoted to discussing the results of the questionnaire, and drafting a constitutional amendment to Article I, Sections 2 and 3, which define the purpose of the IEEE. This amendment will be placed on the ballot for a vote by the membership. In essence the amendment, which was approved by the Board, adds to the present "scientific and educational" purpose another one, a "professional" purpose.

# YOUNG & ROWE

## Candidates in Division 4 Runoff

FOR DIVISIONAL DELEGATE/DIVISIONAL DIRECTOR, 1973-1974

### DIVISION IV

JOSEPH E. ROWE

Chairman and Professor  
Electrical and Computer Engineering Department  
The University of Michigan  
Ann Arbor, Michigan

Dr. Rowe has been associated with the University of Michigan since 1951, engaging in fundamental research on microwave systems, microwave devices, noise theory, electromagnetic field theory, plasmas and solid-state phenomena and devices, and has published widely in these areas. Formerly a lecturer, assistant professor, and associate professor of electrical engineering, he is now a professor of electrical and computer engineering and since 1968 has been Chairman of the Department of Electrical and Computer Engineering at the University. From 1958 to 1968 he served as Director of the University's Electron Physics Laboratory, concerned with research on microwave electron beam tubes, beam-plasma systems and solid-state phenomena and devices. He still retains an active affiliation with this research laboratory. During his administration as chairman, the department developed its offerings in a number of areas including computers and now offers two baccalaureate degrees; the department name was subsequently changed to reflect this addition. Dr. Rowe's consulting activities include numerous government, educational and industrial organizations.

IEEE Activities - (S'48-M'51-SM'61-F'65) OFFICES: Editor, Proceedings of the IEEE, 1971-72. COMMITTEES: Ad Hoc Meetings, Chairman, 1970; Electron Tubes, 1960; Electronics, 1961; ISRC Subcommittee on Cultural and Scientific Exchanges, 1971-72; Long Range Planning, 1971; New and Specialized Technologies, 1965-66; Publications Board, 1971-72; Proceeding Editorial Board, Chairman, 1971-72; Technical Activities Board, 1968-69. SECTIONS: Detroit, Communications Technology Committee, 1955-56; Southeastern Michigan, Electron Devices/Microwave Theory and Techniques/Antennas and Propagation Chapter, Vice Chairman, 1962-63, Chairman, 1963-64. GROUPS/SOCIETIES: Electron Devices, Administrative Committee, 1963-72, Chairman, 1968-70, Chapters Chairman, 1966-68, Membership and Publicity Chairman, 1970-72, Nominating Committee Chairman, 1970-71. CONFERENCES: Conference on Electron Tube Research, Chairman, 1961; Electron and Laser Beam Symposium, Co-Chairman, 1966; International Microwave Symposium, Co-Chairman, 1968; National Electronics Conference, Board of Trustees, 1971-72, Board of Directors, 1972. REPRESENTATIVE: Delegate to Popev Society, Moscow, 1970. STUDENT BRANCH COUNSELOR: University of Michigan, 1958-60. CURRENT GROUP/SOCIETY MEMBERSHIPS: Antennas and Propagation, Circuit Theory, Engineering Management, Electron Devices, Computer, Microwave Theory and Techniques, and Education.

FOR DIVISIONAL DELEGATE/DIVISIONAL DIRECTOR, 1973-1974

### DIVISION IV

LEO YOUNG

Program Manager, Microwave Techniques  
Stanford Research Institute  
Menlo Park, California

Dr. Young holds degrees in physics, mathematics, and electrical engineering. Before joining Stanford Research Institute in 1960, he had been head of the antenna laboratory at Decca Radar and advisory engineer at Westinghouse Electric Corporation. He has published extensively in the area of microwave filters and couplers; he has also directed research in antennas, phased arrays, ferromagnetic devices, solid-state circuits, microwave integrated circuits and acoustic surface waves, and has participated in technological forecasting. He has edited several books on microwave topics, including one written by Japanese authors; he has taught at Stanford University and was visiting professor at Leeds University, England, in 1966, and at the Technion (Israel Institute of Technology), Haifa, Israel, in 1970-71. He has been consultant to the Stanford Linear Accelerator Center and various industrial, educational and government organizations.

IEEE Activities - (M'54-SM'56-F'68) OFFICES: Board of Directors, 1971-72. COMMITTEES: Antennas and Waveguides Standards, 1965-66; Computer Aided Design Analysis and Realizability, 1966-67; Constitution, 1972; New Technical and Scientific Activities, 1966-67; Nominations and Appointments, 1972-73; Standards Coordinating Committee 14 (Quantities and Units), 1970-72; Technical Activities Board, 1969, 1971-72; United States Activities Committee--Professional Activities Committee, 1972. SECTIONS: Baltimore, Antennas and Propagation-Microwave Theory and Techniques Chapter, Secretary, 1959-60; San Francisco, Microwave Theory and Techniques Chapter, Chairman, 1963-64. GROUPS/SOCIETIES: Microwave Theory and Techniques, Administrative Committee, 1965-72, Chairman, 1969, Vice-Chairman, 1968, Transactions Editorial Board, 1959-72, Operations Committee, Chairman, 1970, Microwave Magnetics Standards Committee, Chairman, 1969-70, Microwave Measurements Standards Committee, Chairman, 1968-69, Technical Committees Coordinator, 1968-69, National Lecturer, 1968; CONFERENCES: IEEE International Convention, Program Committee, 1968; International Microwave Symposium, Program Committee, 1963-72, Chairman, 1966; International Solid State Circuits Conference, Program Committee, 1968. REPRESENTATIVE: Joint Societies Employment Advisory Committee of California, 1971-72. CURRENT GROUP/SOCIETY MEMBERSHIPS: Antennas and Propagation, Circuit Theory, Aerospace and Electronic Systems, Electron Devices, Microwave Theory and Techniques, Sonics and Ultrasonics, and Electromagnetic Compatibility.

REPORT FROM THE PRESIDENT  
CONTINUED FROM PAGE 2

coverage the Transactions can be. All the additional income is reapplied towards services. If each member would ask his technical library to subscribe to the G-SU Transactions and ask his colleagues to join G-SU, the benefits of being a member would certainly increase very shortly thereafter.

Ad Com Announcements

As you may have noticed in a recent issue of the Transactions (inside front cover) three members to Ad Com were newly elected. They are Dr. Robert Adler (Zenith Radio, Chicago, Illinois), Prof. H. John Shaw (Stanford University, Stanford, California) and Prof. Richard M. White (University of California, Berkeley, California). Congratulations.

Sincere thanks to Stanley Jacke, Norman Foster and Ernest Stern, whose elected terms have ended. Norm and Ernie continue in their ex-officio capacities with Ad Com.

The 1973 Ultrasonics Symposium will be held in Monterey, California, at the Naval Postgraduate School. John Neighbours will be General Chairman

ADCOM NOTES  
CONTINUED FROM PAGE 3

Dr. Leo Young (Stanford Research Institute, Menlo Park, Calif.), Division IV Director, was re-nominated for a second term by the GSU Ad Com.

The GSU "Best Paper of the Year Award," was awarded to W. S. Jones, C. A. Hartmann and L. T. Claiborne for "Evaluation of Digitally Coded Acoustic Surface-Wave Matched Filters," published in the January, 1971, GSU Transactions. There were also three honorable mention papers.

Dr. W. D. O'Brien, Jr. (Bureau of Radiological Health, Rockville, Md.), reported that the group broke even financially in 1971, even though the year end statement indicated a 3.7K surplus. The explanation is the 4K special allocation for the Ferroelectric Symposium should have been credited to 1972, not 1971, thus yielding a 0.3K deficit, i. e., approximately broke even. It also seems that GSU will break even in 1972.

EDITOR'S REPORT  
CONTINUED FROM PAGE 4

I believe this is an excellent idea and have expressed concurrence to both Fred Rosenbaum and Tom Reeder. Other final details are being presently worked out.

Drs. Dirk Kuizenga and A. E. Siegman authors of "FM and AM Mode Locking of Homogeneous Lasers" Part 1 and Part 2, Journal of Quantum Electronics November 1970, were the recipients of the W. R. G. Baker Award as the best paper in the IEEE Group Transactions for the period July 1, 1970-June 30, 1971.

ADCOM MEMBERS  
CONTINUED FROM PAGE 5

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(IEEE Dir. of Tech. Serv.)

DIVISION 4 OUTLOOK  
CONTINUED FROM PAGE 5

It is a truism to say that IEEE is run by people. The constitutional amendment is important, and the new constitution, if approved by the membership, will give IEEE far-reaching opportunities to serve its membership - but this will be of little use if we don't avail ourselves of these opportunities. That is why I am particularly pleased with the selection of Hal Chestnut and John Guarrera as the Board's nominees for President and Vice-President. John is now director of Region 6, and was instrumental in setting up USAC and in getting it going. We wish them both all the best.

# EDITORIAL: LONG-RANGE CONSEQUENCES OF UNEMPLOYMENT

It is little-known by the public but well-documented by large business organizations which have kept good statistics that an average scientist or engineer beginning his career around the time of the Great Depression continued at a depressed salary throughout his working life vis-a-vis his younger and older counterparts. The same is true of civil servants and university personnel because of the lack of openings, promotions, and salary increments at the time. These people, highly motivated by self-imposed standards and by the desire to keep their jobs at all costs, were a great boon to the organizations for which they worked because of their high motivation to put out work on one hand, and because of their depressed salary scale on the other hand at later times when the organizations became more affluent and they themselves became too old to hop jobs due to loss of pension rights, etc. At the same time, individuals who had lost their jobs and pension rights (if any) could be rehired at a depressed level as conditions improved slightly. Also, it was common for one person to be doing the jobs of several just to keep himself and his organization viable.

In this period, governmental action such as Social Security, unemployment compensation, and various welfare programs brought a certain measure of security and equanimity to the common man including the salaried professional. However, the conditions of depressed professional salaries continued. It was rational from the point of view of self-interest for every employing organization to get employees for the lowest possible price. To rectify the situation for their own self-interest, labor unions fought for privileges with raw power. Professionals chose not to do so.

The conditions of professionals as enumerated above persisted to varying degrees in different technical segments of our society through the postwar period and up to 1957 or so. From '57 to '69 (roughly) we experienced an Interregnum of unparalleled prosperity in science and technology. Salaries, fringe benefits, and prestige went up, but nothing was done to cement these gains.

When government policy slowed down the economy, many professionals found themselves out of work. Emotional reactions in Congress and among state governments on many issues from student riots to stratospheric pollution by the SST to the proliferation of concrete all over the countryside for superhighways caused simultaneous reductions in outlays for schools, airplanes, and highways, depressing conditions further. The "reorientation of priorities" has caused massive cuts only partly compensated by new commitments. In general, the scientific and engineering community has been hurt by government economic policy on one hand and by government scientific non-policy on the other.

Although the present recession (some claim it is over) cannot be compared to the Great Depression, it is interesting to speculate on the parallels. Will professional salaries be forced into the doldrums again, with negative raises created by uncompensated inflation? Will many unemployed professionals simply find themselves unable to return to their chosen field, either through lack of jobs or because of age making them unemployable? Will the squeeze result in a permanent condition of N people doing the work of N + 1? Will many retire with nothing but Social Security because their pensions have evaporated due to unemployment? It is too early to see the final result, but the possibilities are not all good.

As implied above, employment is a function of government, both policy and non-policy. To initiate a new era of stability, it would seem necessary for a new body of law to be enacted on the Federal level to protect professionals and others from the sometimes deliberate, sometimes-capricious hand of government, and from economic conditions not of their own making. This is the time to do it, just as the Great Depression was the time to enact Social Security. Professionals will have to act in unison to achieve the privileges and immunities they seek, like Freedom from Want and Freedom from Fear.

1. First and foremost, the need is for portable pensions. These must be fully funded from the first year of employment, and held in escrow by a Federal agency. Unemployment or change of employment must have no effect upon the accumulated credit.
2. Persons self-employed or working for employers offering inadequate pensions (or none) must be permitted tax deductions for all payments into voluntary pension funds. These funds must be regulated and guaranteed/insured by the government against failure of the fund. As another method, the person could pay into the Federal escrow account mentioned under (1) above, the payments being tax-deductible.
3. Tenure. This is a real can of worms, but the central core idea is that a professional should not be turned out on the street without an income except for malfeasance. Tenure as I see it for an industrial environment would have to be a gradually decreasing pay scale underwritten by the Federal government when a person became unemployed due to economic conditions. I would suggest 4/5 salary the first year, 3/4 the next, then 2/3, then 1/2, etc. This would give the individual a decent opportunity to find suitable employment, to retrain, or to do something independent. (In government, the corresponding policy is "bumping" by seniority.) It would also give the government an incentive to stabilize employment.
4. Something self-consistent and long-term must be done about science and engineering policy at the highest levels of government to put the Executive and Legislative branches of the government in tune with each other and with the needs of the nation and its people.
5. A short-term solution must be found to the present unemployment situation which does not seem to be responding to the present economic stimuli.
6. A solution must be found to assure that the present unemployment among professionals does not depress their economic position vis-a-vis other segments of society over the long run, as happened previously.

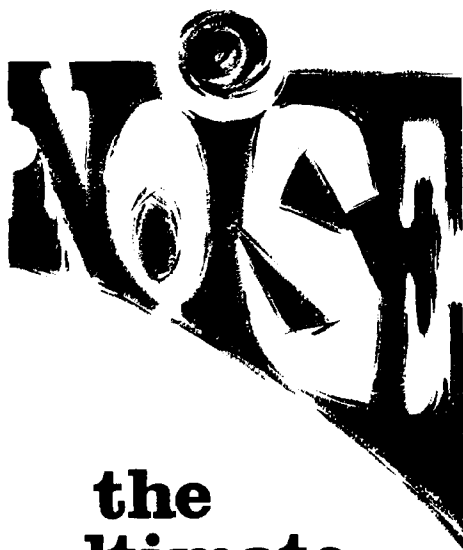
## Why Do I Belong To The G-SU?

by A. J. Bahr, Chairman, Membership Committee

If those of you reading this newsletter would write in with an answer to that question, most likely it would be "because I want to receive the Transactions and the other publications of the Group." However, it is precisely because of your membership in the Group that these publications, as well as the Ultrasonics Symposium, can exist. Thus it seems to me that the best answer to the above question is "I want to lend my support to a group that promotes technical advancement in the field in which I am interested." In other words, the Group exists to serve its members, and conversely, the Group must have members in order to exist.

Normally, new members are recruited through the activities of the local chapters. Although several new chapters are being formed, at present the Sonics and Ultrasonics Group has only one active local chapter. Thus you members in the Group must be considered as a "chapter at large," and your help is solicited in recruiting new members. If you have a colleague or a friend who is interested in the sonics and ultrasonics field, please take a moment to encourage them to join the Group. Point out to them that they not only receive the publications of the Group, but that by lending their support to the Group they assist in advancing the state of the art in their field.





## the ultimate insult



U.S. ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

U.S. GOVERNMENT PRINTING OFFICE : 1972 O - 462-129

*Testimony at Chicago Noise Hearings, sponsored by Environmental Protection Agency, Office of Noise Abatement and Control, July 28-29, 1971, presented by Dr. Alfred Etter, Naturalist, The Morton Arboretum*

(Editor's Note: This EPA document is reprinted since it has some relevance to the G-SU expression of purpose on the environment.)

I speak today for a little girl who recently visited the Morton Arboretum where I am the Naturalist. On the floor of a wood she discovered a small piece of a tree. Unable to recognize wood that had never been sawed or nailed she asked what it was. When she learned that it was a piece of a genuine tree, just the way God made it, she was so delighted that she embraced it like a doll and carried it home to the ghetto with her on the bus. That is how ignorant of nature our people, especially our children, have become. For many of them, the unnatural has become the usual - so it has been with noise.

I think I speak not only for this little girl, but for people of every age who, because of rising levels of noise everywhere, are searching for something they feel they have lost. Without knowing it, they need to walk and sit together in a quiet place and look at the earth, listen to how the birds sing, and perhaps to puzzle about how much growing, and developing, plants can accomplish without ever making a sound.

When I requested permission to testify at this hearing, I was asked whether I wanted to testify as an expert. How does one qualify as an expert in these matters? Must he have a PhD to speak out against the inhumanity of man's noise? Isn't just being alive enough? Aren't ears sophisticated enough to tell the difference between what is strident and what is soothing? Aren't irritation and anger as good a measure as decibels?

If it helps impress someone, then yes - I have a PhD. I have spent eight years in college and the rest of my life in studying the earth, and the life on it. I have made it my responsibility to understand how the world is put together - and not a little of this understanding has come from listening to the sounds of nature - the silent sounds of stars, the timeless flowing of rivers, the enthusiasm of wrens, the gnawing of squirrels as they husk walnuts in the fall.

In the past fifteen years of my life, I have traveled among the largest cities in the nation, and so I have become somewhat expert not only on sounds but on noise. I have heard most of the sounds of nature obliterated from the lives of people - worse than that, the sound of the people has been obliterated too.

Now that I am living at the Morton Arboretum in Lisle, I am receiving an involuntary post-doctorate in suburban noise. Though people have a vision of the Arboretum as a nice, quiet, green island somehow immune to progress, that vision is false. Hemmed in by ever-mounting traffic of every sort, it is already a victim of the noise that people and industry bring with them when they are fleeing the inhumane conditions they themselves had created in the deeper city.

A short time ago we had a ceremony on the grounds of the Arboretum. Many in the audience were disappointed that they were unable to hear because of the traffic on Highway 53 where trucks, attempting to satisfy the insatiable demand of people for a new environment, pace back and forth like caged tigers.

I live on the Arboretum and my bedroom window faces south overlooking the East-West Tollway about 1000 feet away. The Burlington Railroad is nearly a mile further south. Jets often fly by only a few thousand feet overhead. I have no choice in summer but to leave the window open, and all night I toss and turn and have my own violent thoughts about how I can outwit the vibrations that shake not only the sky but the earth even from those distances.

I wonder how many others toss and turn, and grow angry along with me. Yet I am far more fortunate than most. What tortures of noise are inflicted upon those who are trapped in the breathless city forced to open their windows to the excretions of industry, the hot exhaust of vehicles, and the exhalations of countless office and apartment air conditions that heat rather than cool the environment? Is it any wonder these people revolt, burn, vandalize, seek refuge on Government property by the lake, as Mike Chosa and his Indian followers tried to do? The Indians still have enough instinct left to recognize the kind of environment a human being needs - what kills and what lifts the spirit.

At the Arboretum on field trips I often try to tell children's groups how we should take care of the earth. What hypocrisy! My words and their questions are drowned out by banging vehicles and rasping tires. The sounds of frogs or birds or squirrels might as well not even be. Not long ago there was national concern about a silent spring. We have solved that threat with a greater one. Who knows whether the spring is silent or not amid the pandemonium of modern vehicles?

Not long ago I spent a morning at the Ogden Avenue School in La Grange with a group of young people, trying to show them what there was of nature left on their own school yard. Amid the acceleration and deceleration of trucks and jet noise overhead, I could hardly make myself heard when I tried to communicate some of my excitement at finding a honey bee nest in an old maple tree.

For the sake of economy, several school buildings in the Chicago area are now being used 12 months of the year. Have you ever tried to teach, or learn, in a hot school with all the windows open and the noise of the traffic and road repairs boiling up from the streets? What is gained by wasting pupil's and teacher's time trying to fight the domination of today's traffic? How many of the other so-called fruits of civilization, the art museums, the peaceful parks, the opportunities for visits and strolls in the neighborhood have succumbed to the omnipresence of noise?

On a farm where I lived and did research, it was an everyday observation that vibrations of every frequency were constantly being exchanged between animals, men, and the earth - but this communication was only possible when everything was quiet. Life is absolutely dependent on quietness. Animals and birds depend upon it to make their living, to find their mates, to protect themselves from attack. Embryos still in the egg, communicate with their siblings in adjacent eggs and so synchronize their hatching. Have you ever watched a robin lean down to listen for a worm? What happens to the radar of the bats, the trilling of toads, the prolonged symphonies of the thrushes when their home ranges are invaded by raucous man-made racket? For the most part, they give up.

Last fall I watched a string of sandhill cranes wending their way southward over their ancestral route, suburban Chicago, once a land of marshes and lakes and clean streams, now become a checkerboard of streets blanketed with polluted haze threaded with the webs of jets, helicopters and small planes. How much longer will the wild cries of the adults keep the young of the flock on course until they find a sanctuary?

Continued...

# NOISE - the ultimate insult

When animals are made to listen to noise, they grow sullen, unresponsive, erratic, or violent. Is it any wonder we have violent, despondent, indifferent people when they cannot hear in their neighborhood, the once familiar events by which they timed their day, conjured up visions of friends passing by, of tradesmen plying their routes, of church services or children at recess? People need sounds to stimulate the joys of expectation, to reassure them that they are part of a system, a pattern, or to challenge them to be alert and observant - and to hear sounds, they need quiet.

It was James Russell Lowell who said "...heaven tries earth if it be in tune..." Who can tell, amid the cacophony of today, whether the earth be in tune or not? I suspect that dissonant worlds have a way of producing dissident people. Three years ago I was in Washington, D. C. and participated in the so-called "Poverty March" on "Solidarity Day". It was a memorable experience. I found a lot of people sharing a lot of unhappiness, peacefully. We were not complaining just of poverty, hunger, discrimination, or bossism. Among us was a down-deep resentment for the kind of world that was being forced upon us. Few could epitomize their feelings - there was only a kind of vague malevolence threatening us, bringing us together.

As we stood there, several hundred thousand of us, hoping to hear some wise speaker who might diagnose the problem, the malevolence suddenly revealed itself as it broke out upon us from every direction as the careful, soulful, often beautiful, even crying words of the speakers received lash after lash of violent noise from descending jets, hovering helicopters, and flatulent buses. Reverend Abernathy's cries of "soul power" were impotent in the face of noise power, in the swish and boom and scream of propellers and exhausts and sirens. Prayers, hymns, anthems, and even the courageous voice of Coretta King were cut down with impunity.

Little wonder, I wrote in my notes, that the people of America are becoming violent, sullen, plotting and addicted - for they are being dominated by the technological impudence of machines.

Noise is the ultimate insult. It belittles us. It gives us nothing at which to strike back. It kills what is left of many things that we have loved - music, beauty, friendship, hope and excitement - and the reassurance of nature. Traditionally noise is used to ridicule, embarrass, denigrate, and curse - while silence is used for worship, respect, anticipation, and love. Do we hate each other as much as our noise level indicates?

Collapsing Rome didn't give a damn how much noise it made any more than we do. Read Juvenal - and weep with him:

"Insomnia causes more deaths amongst Roman invalids than any other factor... How much sleep, I ask you, can one get in lodgings here? Unbroken nights - and this is the root of the trouble, are a rich man's privilege. The wagons thundering past through those narrow twisting streets, the oaths of draymen caught in a traffic jam - these alone would suffice to jolt the doziest sea-cow of an Emperor into permanent wakefulness."

Will the noise of modern man jolt the doziest sea-cow of all, the American city where the sounds of Ancient Rome have been magnified a hundred fold? Unless it does, I see no future for man.

Whom do I blame? I blame no one. I blame everyone. I blame all the people, including myself, who have come to Chicago to find a place to live, a job to do, and in the process have destroyed nature and created a tumult of noise borne of their demands for every convenience and every novelty and every protection from exercise, from chance, from weather. We each demand too much. It is our demands that destroy us, that keep the trucks roaring and the jets rocketing and giantism proliferating.

Like the little ghetto girl who had been nothing but boards all her life, we have become so used to living in this noise-torn world

that we accept the dissonant and the sonorous as part of our environment. We no longer recognize quietness, nor know how to use it. But while I am aware that some can adapt to noise, as to other irritants, no adaptation is achieved without sacrifice. I think that if people every rediscover quietness again, they will embrace it, like the little girl embraced her piece of tree, and treasure it as something that is not sawed and nailed and misshapen by man, but which contains within it some of the secrets of life and some of the explanation of why we are here.

## IEEE Board Recommends Expansion into Non-Technical Areas

New York, N. Y., March 24, 1972. Robert H. Tanner, the President of the Institute of Electrical and Electronics Engineers, announced today that the IEEE Board of Directors at a special meeting yesterday had agreed in principle to recommend to the membership a change in its Constitution which would permit entry into non-technical fields, while continuing its present scientific and educational functions. The action came after analysis by the Board of 57,000 replies to a questionnaire mailed to members in the United States early this year. The details of the questions and a tabulation of 47,000 replies appear in the March issue of IEEE SPECTRUM.

The U. S. members were asked whether they would favor IEEE becoming more active in political and economic matters of concern to the electrical engineering profession. The response was affirmative by a vote of better than 2-to-1. Other matters included in the questionnaire were the preparation by IEEE of position papers, recommendations on professional employment practices, pension plans, salary surveys, public relations, technological forecasting, continuing education and career guidance. With few exceptions the returns indicated a desire on the part of the U. S. membership to enter or enlarge programs in these areas. President Tanner reported that some of these activities, such as technological forecasting and career guidance, are permitted under the present Constitution and the IEEE has active programs now under way in these areas. Professional activity in economic, social, legislative and ethical areas of the profession is, however, barred by the present Constitution. He reported to the Board a legal opinion that the proposed amendment to the Constitution would permit the Institute to enter all of the areas dealt with in the questionnaire. He noted that the proposed amendment would expressly bar IEEE from engaging in collective bargaining, customarily dealt with by labor unions.

The wording of the proposed amendment will be released after review by legal counsel and after a program of specific implementation, which would be undertaken if the members adopt the amendment, is acted on by the Board at its May meeting. Thereafter, publication of the amendment and the program in IEEE SPECTRUM is planned, followed by presentation of the amendment to the members for vote, in ballots to be mailed in September. If approved by the required two-thirds of the members voting, a further step, a conforming modification of the Charter under which IEEE is incorporated in New York State, must be taken, after which implementation of the new amendment can legally occur.

# LETTERS to the EDITOR

## WHITHER THE PUBLICATION OF STANDARDS IN THE TRANSACTIONS?

Dear Emmanuel:

The following letter was sent to Sava Sherr of the IEEE Standards Committee in protest of their policy to discontinue the funding of the publication of Standards in "Transactions". A reply was received from Joe Dillard, Vice President Technical Activities and I would like to make both viewpoints available to the membership for comment.

If you can spare the room please put this into the next newsletter. Thank you.

L. W. Kessler

Dear Mr. Sherr:

At its last meeting, the G-SU AdCom expressed concern over the recent TAB/OP COM decision to discontinue funding the publication of Standards in the Transactions of the Groups and Societies. In this communication no issue is being taken with the concept of putting the "Standards Committee" on a self-sustaining basis; however, it is felt that the present implementation has undesirable consequences as regards the Groups and Societies if such publication must depend upon Group financing. Further, it is implied by this action that the Standards Committee doesn't want the Standard to appear in the Transactions.

Under the new system although a new "Standard" will be available for purchase, the circulation of the document will, doubtless, be very limited in comparison to the previous arrangement. Our AdCom feels that the "Standard" should be embodiment of a pertinent, archival, technical journal in order that it be more rapidly incorporated into general usage. It is worth questioning whether the average worker in the field will be willing to suffer the additional effort and delay of purchasing the standard even for a nominal fee, as compared to the ease of referring to it in an archival journal.

The subcommittee workers generating the "Standard" are devoted volunteers who do a great deal of work and get relatively little recognition for their efforts. Their satisfaction may come from within their own selves knowing that their "product" is published and in the hand of fellow workers in the field. Withdrawal of funding by IEEE may imply to them that this activity has been lowered in importance and priority. Consequently some may feel that "Standards" is a less desirable activity in which to devote time. It is already difficult to find people to engage in this activity without this new complication.

Another important factor is that a small Group or Society cannot always afford to publish these documents without further trimming the number of papers published in the Transactions. Groups and Societies are already financially squeezed. Thus a Group or Society that feels an obligation to provide these documents to its members at its own expense through the Transactions may be further penalized.

With regards to possible alternative implementations, the following suggestions are made:

1) IEEE Standards Committee might consider the feasibility of adopting a less costly method of publication, as some of the Groups and Societies are now doing and as G-SU has already done. The savings can then be applied towards funding the Groups' publication of the document.

2) If only hot type is acceptable, then it should be possible to run off extra copies for the Groups to incorporate into their Transactions for a relatively small cost.

3) TAB could consider establishing a separate fund or "support item" for the publication of Standards in the appropriate Journal, Transactions or Record.

4) The Division level might be a likely responsibility center, i.e. to provide the necessary funds for such publications. Although the original budgeting plans called for discretionary allocation of Groups and Society support at this level, most Divisions are still set up strictly by formula as in past years.

It is hoped that these arguments will be considered further and that a suitable alternative solution be sought.

Sincerely,

L. W. Kessler  
President, G-SU AdCom

and J. E. May, Jr.  
Chairman  
G-SU Technical Com.

Dear Mr. Sherr:

I read with interest L. W. Kessler's letter of March 6 expressing concern over our recent decision to discontinue funding publication of Standards in the Transactions of the Groups and Societies. The concern of the G-SU AdCom is understandable, but the financial situation of IEEE is such that we can ill-afford duplicate publication of any material. It is also important that our activities be put on some sort of cost-center basis so that we can identify the functions really desired by the membership.

I continue to feel that if a Standard is of value, those wanting it will write in to buy it. Perhaps the G/S Transactions might serve their members in the Standards area by carrying on the back cover a list of all the Group's current Standards for sale. The reader then knows they are available and how to obtain them.

Our new system of charging for Standards should be a measure of whether preparation of the Standard was worthwhile. If nobody buys it, that might be an indication that it should not have been written, or that it is outdated. This economic measure should give us guidance on how to better perform the Standards function.

Sincerely,

J. K. Dillard  
Vice President - Technical Activities

## WELFARE IN REVERSE, or, THE FINANCIAL PLIGHT OF THE SMALL IEEE GROUP

Dear Emmanuel:

The following letter was sent to the Chairman of the TAB Finance Committee, Mr. B. H. Schneider, in order to demonstrate how the small IEEE Groups are hurt financially by the present procedures for distribution of IEEE support and charge back for Headquarters Expenses. Several alternate procedures are recommended and we hope that TAB will approve a suitable policy change.

I would appreciate your placing this in the next G-SU newsletter if possible. Thank you.

L. W. Kessler

Dear Mr. Schneider:

I enjoyed meeting with you at the last TAB meeting in Philadelphia, and as you suggested, I am following up our conversation with this correspondence. I hope that this will acquaint you with a pending policy decision to be made as regards revision of proration formulas for Support (line 8.2 of G/S Budgets) and/or for Headquarters expenses (line 11.3 of G/S Budgets). This matter was brought before TAB on August 1971 and was formally presented to the TAB Finance Committee on September 13th. Basically the problem is as follows: Total Headquarters expenses (line 11.3) have been arbitrarily divided into two 50% pieces, (a reasonable choice at the time). One of the 50% pieces, which is paid to IEEE on a per group basis, amounted to about \$5600 in 1971. The other 50% piece is divided by the number of Group memberships and charged to each Group in proportion to its size. This came to roughly \$1.40 per member in 1971. Total Support, on line 8.2 on the other hand, was prorated on a simple "per member" basis and returned to the Groups and Societies according to their respective sizes. Comparing Support and Headquarters expenses as far as the groups and societies are concerned, a break even point arises at a membership level of about 3000. That is, all groups of smaller than this membership (of which there are 14) must run the rest of their operation on a profit basis in order to pay this difference to IEEE. The 16 larger groups and societies have it easier since they receive net money from IEEE by virtue of their size. Figure 1 illustrates the distribution of lines 11.3 and 8.2 in graphical form for 1971. It is worth pointing out that in 1971, as far as IEEE was concerned, it gave the Groups and Societies a total of 427,000 on line 8.2 whereas it charged them only 360,000. This net difference of \$67,000 went to the larger groups; however, an additional \$20,500 also went to the larger groups from the treasuries of the small groups. This latter figure represents the sum of all line 11.3's minus the sum of all line 8.2's for the 14 small groups.

For 1972 the figures are somewhat different but conceptually just as weighted against the small groups. IEEE Support will, no doubt, continue to dwindle even further during the next few years along with further cost increases in running the IEEE business office.

Unless either the financial burden of these Headquarters expenses are more fairly distributed among the Groups and Societies within IEEE or the proration policy on support is changed, the monetary outlook for small groups may be bleak. When IEEE finances were in better shape the Groups and Societies were not severely affected. Now, however, the situation is different and it seems that the proration formulas deserve revision in order to more adequately balance the needs of all the IEEE technical areas.

Several possible methods of proration formulas revision are suggested below and are illustrated for the 1971 budgets: Each suggestion is an independent one and combinations are, of course, possible but not necessarily intended.

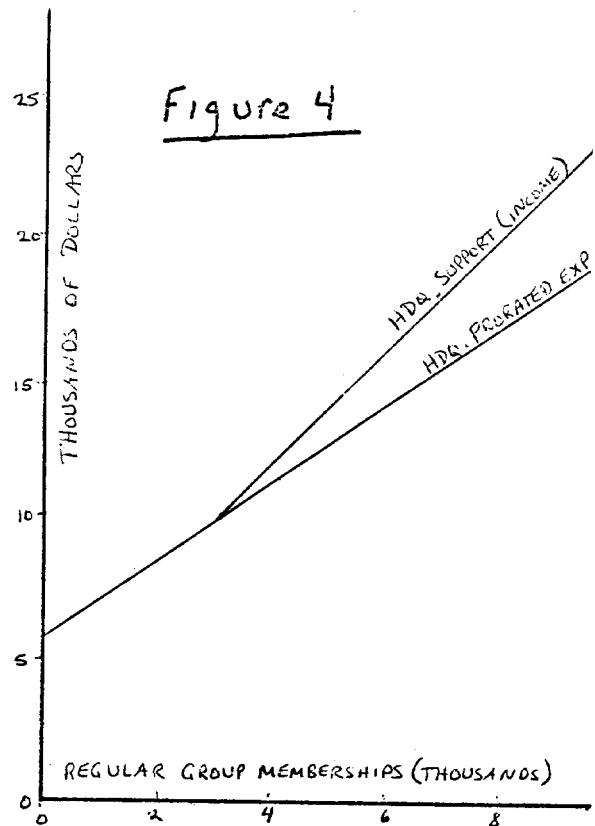
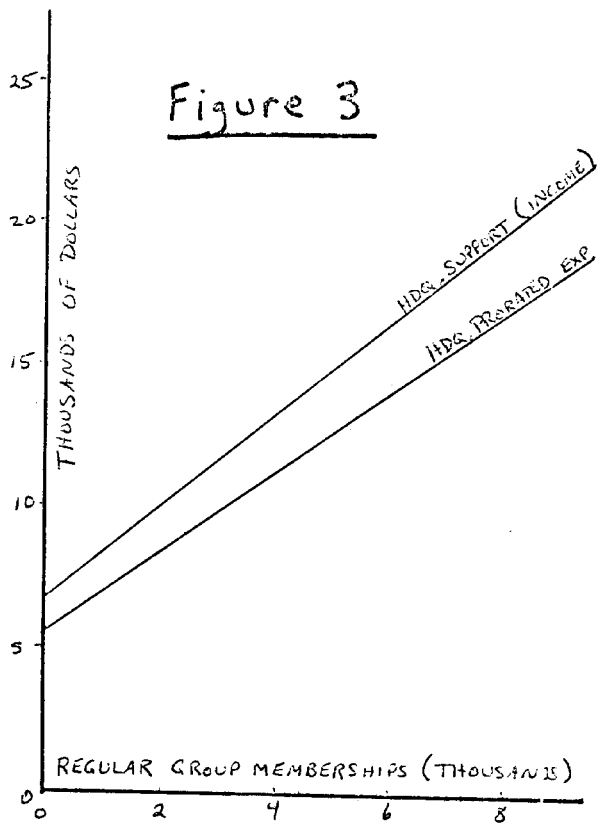
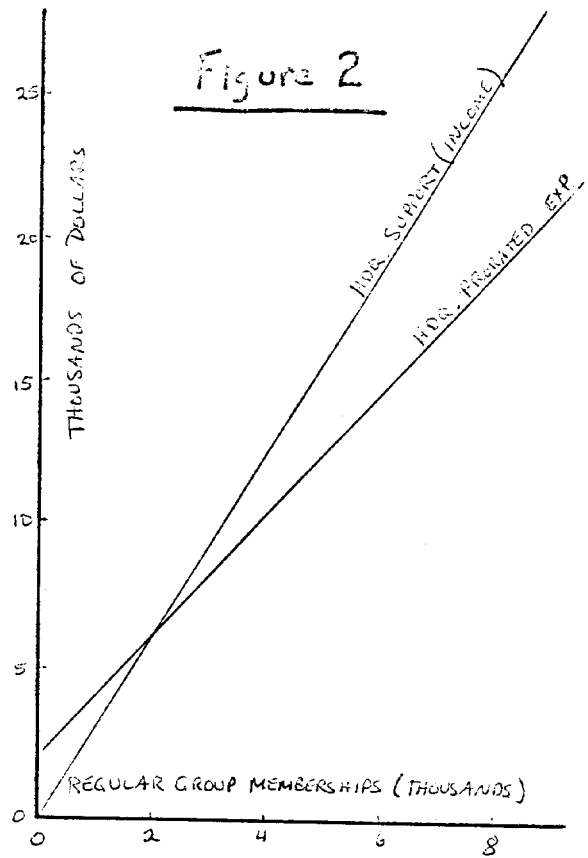
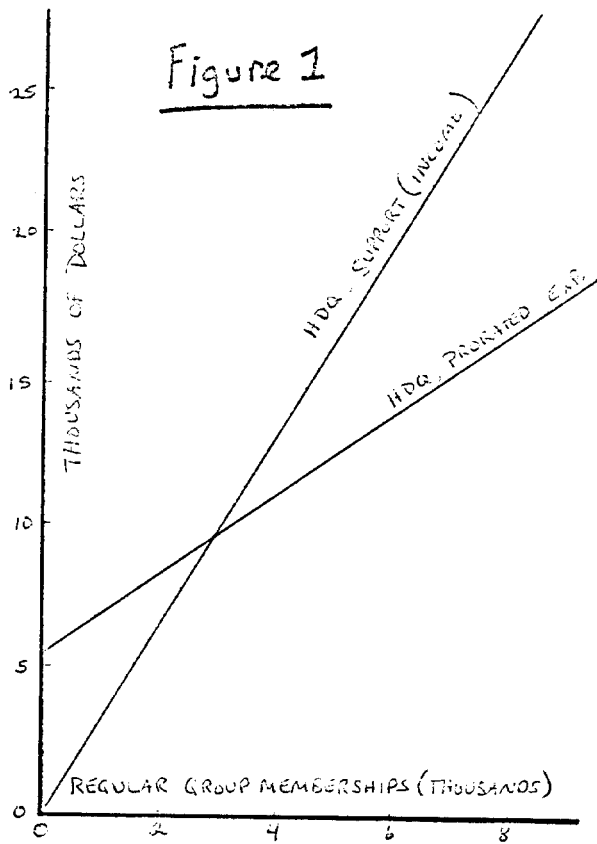
- 1) Line 11.2 can be divided into 2 unequal portions, i.e. 20% by Group and 80% by membership and leave line 8.2 on a per member basis. See Figure 2.
- 2) Line 8.2 can also be divided into two 50% pieces to be allocated by group and by membership, respectively. Now both lines, 8.2 and 11.3, would be allocated by "parallel" formulas. See Figure 3.
- 3) Arrange the support such that line 8.2 minus line 11.3 is not allowed to fall below zero for any group. This would guarantee each group a fair start, then any excess can be distributed by the 50-50 rule or by the 20-80 rule. See Figure 4 (50-50 rule).

The three suggestions are exemplary. It should be decided which is the optimum method of proration, then the 1972 and 1973 numbers and estimates can be put in. I strongly urge that this matter be taken care of before the first drafts of the 1973 budgets are computed.

I look forward to your reply and offer my further assistance.

Sincerely,

Lawrence W. Kessler  
President, G-SU AdCom



# Papers Wanted

## ULTRASOUND ENERGY DENSITY

The 84th Acoustical Society of America meeting will be held November 28 to December 1, 1972, in Miami Beach, Florida. At this meeting is planned a special session on "Energy Density and Power Measurements of Ultrasound." The tentative schedule of this session include the four basic methods of determining ultrasonic energy density and power, viz., radiation force, optical, calorimetry and piezoelectric. Tutorial, invited and contributed papers will present the advantage, disadvantage, accuracy, sensitivity, stability, etc., of each technique, in addition to the relative merits of each. Anyone wishing to contribute a paper to this special session on any aspect of ultrasonic energy density and/or power measurements should send an abstract, original and two copies, of not more than 200 words to the session coordinator:

Dr. William D. O'Brien, Jr.  
Bureau of Radiological Health  
12709 Twinbrook Parkway  
Rockville, Maryland 20852

The deadline for submission is August 29, 1972.

# National Environmental Information Symposium

**PURPOSE:** To provide a forum for producers and handlers of environmental data to identify and explain resources and methods in order to help users better meet their information needs; to bring together citizens' organizations, universities, libraries, professional and trade associations and governmental bodies to share objectives and interests related to the production, use, and dissemination of environmental information.

**SPONSOR:** United States Environmental Protection Agency

**HOST:** National Environmental Research Center  
EPA, Cincinnati, Ohio

**WHEN:** September 24-27, 1972

**WHERE:** Cincinnati, Ohio

**CONTACT:** Mr. Gilbert M. Gigliotti  
Director, Public Affairs Office  
National Environmental Research Center  
U. S. Environmental Protection Agency  
Cincinnati, Ohio 45268  
Telephone: (513) 871-1820, Extension 250

# Course Announcements

#1

## NOISE CONTROL COURSE

The fifth presentation of the Institute on Noise Control Engineering will be on August 6-11, 1972 at Le Chateau, a resort in the Pocono Mountains near White Haven, PA. The sixth presentation will be at the Fort Harrison Hotel in Clearwater, FL on February 11-16, 1973.

The Institute provides training in noise measurement and control for plant and design engineers, industrial hygienists and others responsible for compliance with governmental noise regulations. Prevention of occupational hearing loss caused by prolonged exposure to intense noise will be discussed along with other plant, office and community noise problems.

The five-day course will provide instruction in noise generation, transmission, measurement, effects and legal consequences. Analysis of noise problems to determine reduction methods will be emphasized. Characteristics of many noise sources common in industry will be described and examples of noise reduction discussed.

All lecturers will be prominent noise specialists who have full time experience in solving industrial and community noise problems. A special feature of the Institute is the daily luncheon where students can sit with a faculty member of their choice and discuss problems.

Tuition for the Institute will be \$340 at Le Chateau and \$375 at the Fort Harrison Hotel. For additional information contact: Institute on Noise Control Engineering, Box 3164, Bethlehem, PA 18017; (215) 694-6931.

## #2 NOISE CONTROL IN INDUSTRY AND TRANSPORTATION

September 11-15, 1972

**DESCRIPTION:** Public concern with noise pollution is bringing ever-increasing emphasis on means of controlling and reducing noise. This course is designed for engineers and scientists in industry and in the field of transportation who are concerned with methods of noise control. The contents of the course include fundamentals and basic theory of acoustics and vibration, human response to noise, noise criteria and noise abatement regulations, review of problems in transportation and industrial noise and methods of their control, acoustic and vibration measurement techniques and laboratory demonstration.

**SPONSOR:** The George Washington University, Washington, D. C., Continuing Engineering Education Program, School of Engineering and Applied Science.

**LOCATION AND HOURS:** Orientation will take place at 8:15 a. m., Monday, in Room 217, Pennsylvania House, 2424 Pennsylvania Avenue, N. W., Washington, D. C., at the edge of the George Washington University campus.

**COST:** The fee for the course is \$315. This includes lecture notes, supplies, and parking. Make all checks and purchase orders payable to George Washington University.

# MEETING REPORT

## ULTRASOUND AND BIOLOGICAL TISSUE

by Wm. D. O'Brien, Jr.

A workshop on the "Interaction of Ultrasound and Biological Tissue," was held at the Battelle Seattle Research Center, Seattle, Washington, on November 8-10, 1971. The workshop was co-sponsored by the Bureau of Radiological Health, the National Science Foundation and Battelle-Northwest. Approximately thirty invited participants discussed all aspects of interaction mechanisms of ultrasound from macromolecular through cellular to tissue and organs. Also, ultrasonic measuring techniques and existing, proposed and experimental uses of ultrasound in medical and biological applications were discussed. Position papers in the participant's particular speciality were invited prior to the workshop for distribution to all other participants. These papers were then summarized and discussed at the appropriate session.

The three day workshop was divided into six sessions, two per day. The first three sessions were concerned directly with the biological effects of ultrasound, viz., "Effects on Macromolecules," chaired by Dr. Peter D. Edmonds, IEEE Headquarters, "Effects on Cells," chaired by Dr. Wesley L. Nyborg, University of Vermont and "Effects on Tissues and Organs," chaired by Dr. Floyd Dunn, University of Illinois. The fourth session, "Measure of Power," chaired by Dr. C. R. Hill, Institute of Cancer Research Survey, discussed energy density measurements of ultrasound and cavitation detection. The last two sessions, "Uses of Ultrasound," chaired by Dr. John M. Reid, Providence Hospital and "Proposed and Experimental Uses of Ultrasound," chaired by Dr. Melvin R. Sikov, Battelle-Northwest, centered around the uses of present and future diagnostic ultrasound.

In addition to the above participants, about twenty observers were invited. The Bureau of Radiological Health will be publishing the position papers of this workshop, publication date sometime late Summer. Inquires for the proceedings should be directed to the Office of Information, 1900 Chapman Avenue, Rockville, Md. 20852. The proceedings will also contain summaries of each session by the respective chairman in addition to a list of investigative and research priorities, as determined by those in attendance.

## Acoustical Holography Progress Reported

The latest progress in acoustical holography and in the related research areas were discussed at the Fourth International Symposium on Acoustical Holography, held in Santa Barbara, California on April 10-12, 1972. More than 120 scientists from Europe, Asia, and America were in attendance to hear the thirty-seven scheduled papers and to take in the discussions. A number of startling advances, all made since the Third International Symposium in July 1970, were reported. Progress has been particularly impressive in the field of acoustical imaging. The Fourth International Symposium must represent a landmark conference in this regard.

The scope of this symposium is substantially broader than the term "acoustical holography" usually implies and encompasses the whole area of visualization, detection, and recording of sound fields whether with long wavelengths, microwaves, or with extremely short sound wavelengths. The work reported at the symposium dealt mainly with experimental and theoretical developments in these areas with application to seismic sensing, underwater imaging, non-destructive testing, real-time acoustic microscopy, and medical diagnosis.

Although the papers were of uniformly high quality, some of the most interesting from the standpoint of laboratory achievement were those which dealt with real-time acoustical imaging. For example, L. W. Kessler (President, G-SU), P. R. Palermo, and A. Korpel of Zenith described their progress in developing a practical acoustic microscope operating at 100 Mhz.

Much progress also was demonstrated in connection with a liquid-surface acoustical holography system developed by Hologonics and described by B. B. Brendon.

The capabilities of scanning non-real-time ultrasonic instruments have also shown marked improvement. P. S. Green, L. F. Schaefer and A. Macovski of Stanford Research Institute demonstrated a number of ultrasonic images formed of planes within internal organs.

From the standpoint of medical diagnosis, the work of Dr. Y. Kikuchi of Japan's Tohoku University, was of great interest particularly to those with medical backgrounds in attendance at the conference. The author and his colleagues have developed a unique method for medical diagnosis by means of using the acoustic pulse echo approach.

The organizing committee for the Symposium consisted of G. Wade, Chairman (University of California), E. E. Aldridge (A. E. R. E. Harwell, England), B. A. Auld (Stanford University), H. M. A. El-Sum (El-Sum Consultants), P. S. Green (Stanford Research Institute), A. Korpel (Zenith Radio Corporation), J. L. Kreuzer (Perkin-Elmer Corporation), A. Metherell (Actron Industries, Inc.), R. K. Mueller (Bendix Research Laboratory), and F. L. Thurstone (Duke University). The conference was sponsored by the Office of Naval Research, the I. E. E. E. and the Acoustical Society of America.

A Proceedings will be published as a hard-bound book by Plenum Publishing Corporation and will be available about mid-September 1972. The next symposium will be held in the San Francisco Bay Area in about one year with Philip Green of Stanford Research Institute as Chairman.

## BACKGROUND OF HOLOGRAPHY FEATURED IN PROCEEDINGS

The discovery of the holographic method and the development of holography in the subsequent quarter century are described in first-hand terms by Dennis Gabor, 1971 Nobel Laureate, in the June 1972 issue of the *Proceedings of the IEEE*. The article, which is adapted from the address given by Dr. Gabor on the occasion of his receiving the Nobel Prize for Physics, is entitled "Holography, 1948-1971." He presents this fascinating story in a very readable manner by making use of a large number of illustrations while completely avoiding mathematics and abstract graphs.



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