

# IEEE

# NEWSLETTER



## SONICS & ULTRASONICS GROUP

NO. 35 MARCH 1972

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### 1971 ULTRASONIC SYMPOSIUM

The 1971 Ultrasonics Symposium was held at the Carillon Hotel, Miami Beach, Florida, December 6th through 8th. A total of 329 persons attended, making the meeting a financial as well as a technical success.

The technical program of the 1971 Ultrasonics Symposium consisted of 172 papers delivered in 17 technical sessions. The largest number of papers were devoted to surface wave physics and devices. Seven technical sessions were dedicated to surface wave papers. Sessions were also dedicated to bulk delay lines, resonators, acousto-optics and physical acoustics. Three sessions (1.5 each) were dedicated to industrial and biomedical ultrasonics.

The Symposium Program contained an experimental tutorial session on allied technologies - bubbles, charge coupled devices, integrated optics, liquid crystals. Both the attendance at and the comments on this session were very good. The tutorial session on general ultrasonics was not well attended although the two papers given were of excellent quality. The evening tutorial session on spread spectrum communications and surface wave devices had a large audience.

### 1972 ULTRASONIC SYMPOSIUM PLANNED

The 1972 Ultrasonics Symposium will be held in Boston at the Statler-Hilton Hotel on October 4-6. The General Chairman for this meeting will be Dr. M. G. Holland of the Raytheon Research Laboratories. The Program and Local Arrangements Chairmen have not been chosen at this date.

Proposals will be provided to the Program Chairman of the 1972 International Meeting for sessions on ultrasonics. These will include medical and industrial ultrasonics, and new device and materials work.

### REPORT OF OUTGOING CHAIRMAN

by William J. Spencer

The last two years have been a period of self-examination and reevaluation of goals for the Group on Sonics and Ultrasonics. The G-SU is one of the smallest Groups in the IEEE, approximately 1250 members, with a relatively stable membership. The main problems facing the G-SU during the past two years have been financial. To a certain extent this stems from the small size of the Group and certain charges that are made by IEEE headquarters for Group expenses, irrespective of the Group's size. Our main expense currently is, and has always been, the publication of our Transactions. Although we were one of the first Groups to institute page charges, the income from this source has not offset the increased publishing costs. The annual Ultrasonics Symposium has been run on a break-even basis and has not been a source of any additional income. Thus, with the decrease of support from IEEE the G-SU, along with other Groups in the IEEE, has suffered severe budgetary problems. The silver lining to these financial clouds was very close examination of the G-SU functions and the successful initiation of new programs to improve services, improve our image, and improve our financial position. Major changes in G-SU have been

1. A new method for lower cost publishing
2. A revamping of review procedures and expansion of associate editors for the Transactions
3. A careful look at the G-SU finances and the methods IEEE uses in disbursing funds to the Groups
4. Increased income from our annual Ultrasonics Symposium and the initiation of a published proceedings
5. The complete reorganization of the Administrative Committee of G-SU

As outgoing Chairman let me review some of the effort put into these areas and propose some ideas for directions in the very near future.

Under the able leadership of Norman Foster and Steve Wanuga, the publishing procedure for the G-SU Transactions have been completely overhauled. Oskar Mattiat had served as the Editor of our Transactions from its inception until 1970. Under his editorship, the G-SU Transactions had grown to be an internationally recognized journal with an annual publication in excess of 250 pages. However, due to the method of publication the cost of our Transactions far exceeded the income to the Group as a whole. By changing to photo-offset printing in place of the more expensive letterpress printing which had been used in the past, a substantial reduction in cost was obtained. This change was accomplished with no reduction in the quality of the Transactions and will provide a method for expansion of our publication in the future while keeping our budget in the black. A large amount of credit goes to Norman Foster who spent a great deal of time and effort in tracing down publication costs,

Continued

# 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 Holosonics 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.

# "INVITED" PROCEEDINGS 1970 ULTRASONICS SYMPOSIUM

JUST OFF THE PRESS

IEEE CATALOG NUMBER \$10.00 NON-IEEE MEMBERS  
70 C 69 SU \$ 7.50 IEEE MEMBERS

This volume contains detailed written versions of many of the "tutorial" and "invited" talks presented at the Ultrasonics Symposium; these are not just extended abstracts! Being a valuable source of useful reference material, this volume will be a worthwhile addition to your personal and/or institutional libraries. Here is the table of contents:

SURFACE WAVE THEORY. B. A. Auld .....	
A NEW VIEW OF THE ELASTIC THEORY UPON WHICH	
ULTRASONIC TESTING IS BASED. R. A. Nickerson.....	
SPIN PHONON INTERACTIONS IN SOLIDS. R. L. Melcher.....	
ACOUSTIC SURFACE WAVE FILTERS. R. H. Tancrill and	
M. G. Holland.....	
INDUSTRIAL ULTRASONICS. S. E. Jacke .....	
ULTRASONIC THERMOMETRY. L. C. Lynnworth and	
E. P. Papadakis.....	
MATERIALS FOR SURFACE WAVE APPLICATIONS. J. de Klerk ..	
EVALUATION OF NEW SINGLE CRYSTAL PIEZOELECTRIC	
MATERIALS FOR SURFACE WAVE APPLICATIONS. J. H.	
Collins, P. J. Hagon and G. R. Pulliam .....	
ULTRASONICS IN COMMUNICATIONS. K. D. Bowers .....	
AN ASSESSMENT OF MICRO SOUND TECHNOLOGY. E. Stern...	
INTERACTIONS BETWEEN ACOUSTIC SURFACE WAVES AND	
ELECTRONS IN SOLIDS. A. Bers.....	

Order from IEEE Headquarters, 345 East 47 Street, New York, N. Y. 10017.

## ADCOM NOTES

by L. W. Kessler  
1971 Secretary-Treasurer

Here is a brief account of highlights and actions from the December 6, 1971 meeting of the G-SU Ad Com.

G-SU will sponsor an award for the "Best Paper of the Year" appearing in the Transactions on Sonics and Ultrasonics. The recipient of this award for 1971 will be announced shortly. All papers that appeared in the 1971 Transactions are automatically being considered. Co-Chairmen of our Awards Committee are Dr. T. R. Meeker (Bell Telephone Labs, Allentown, Pa.) and Prof. W. P. Mason (Columbia University, New York, N.Y.).

Thanks are due to the 1971 Ultrasonics Symposium Committee for a successful meeting. Specific acknowledgments are made to the General Chairman, Dr. J. E. May Jr. (Bell Telephone Labs, North Andover, Mass.), the Technical Program Chairman Dr. H. Matthews (Sperry Rand, Sudbury, Mass.), the Local Arrangements Chairman, Dr. W. Horton (Piezo Technology, Orlando, Fla.), and to Special Assistant, Miss J. Hollingsworth.

The 1972 Ultrasonics Symposium will be held in Boston, Mass. October 4-6. Dr. M. G. Holland (Raytheon, Waltham, Mass.) is General Chairman.

Local Chapters of G-SU are being formed in various cities around the country. If you are interested in having a chapter form in your city, contact Prof. Ernest Stern, MIT, Lincoln Labs, Lexington, Mass. 02173.

Congratulations to the following G-SU members who were recently elected to the IEEE grade of "Fellow" -- D. A. Berlincourt, W. J. Spencer, M. Ibuka, S. W. Tehon and H. E. Thiemann.

G-SU will publish a (large size) special issue of the Transactions this year which is devoted to the subject of Ferroelectrics. Special thanks to the IEEE Technical Activities Board for an allocation to cover a portion of the publication costs.

The financial status of G-SU for the year ending December 31, 1971 is approximately \$3,000 deficit. Not included in this estimate, however, are net proceeds from 1) the sale of the "Invited Proceedings of the 1970 Ultrasonics Symposium", 2) the Ferroelectrics Symposium and 3) the 1971 Ultrasonics Symposium. Collectively, the net proceeds from these 3 items will constitute a positive number. For the years 1971 and 1972 combined, G-SU anticipates "break even" operation and our projected net worth for January 1, 1973 is of the order of \$8,000, barring unforeseen circumstances, of course.

The new Ad Com Officers for 1972 are:

President: Dr. Lawrence W. Kessler  
Zenith Radio Corporation  
Chicago, Illinois 60639

Vice-President: Dr. Norman F. Foster  
Bell Telephone Labs  
Allentown, Pa. 18103

Secretary-Treasurer: Dr. William D. O'Brien, Jr.  
Bureau of Radiological Health  
Rockville, Md. 20852

Sincere thanks to Dr. William J. Spencer and to Dr. Emmanuel P. Papadakis, outgoing officers, for their jobs well done for the last few years.

# THE CROSS OF GOLD REVISITED

Men are out of work. Men with the capabilities to create the wealth of nations are laid off. Men who know how to generate power, transmit information, transport multitudes, and invent consumer goods are pounding the streets. One continues to hear of the closing of research laboratories, the paring of staffs, the termination of contracts. Commendable efforts to increase employment are slow in taking effect.

One also hears about "overproduction of engineers" and the "glut of excess scientists". We are told to retrain, to go into pollution instead of space. The individual, however, may be selling shoes or real estate or insurance or pumping gas or trying to eke out another year of post-doctoral work. In general, the coverage in the public press is more sympathetic and understanding than the articles in Spectrum or Physics Today. The learned societies have seemed singularly lacking in (1) sensitivity, (2) political savvy, (3) gumption to act. A slow metamorphosis toward activism can be detected, however.

Concerning politics, it can be stated that our technical unemployment problem is political. Unemployed scientists and engineers are the victims of an economic theory put into practice by political means. The economic theory, now abandoned, was that inflation could be stopped through tight money with its concomittant effects: (1) higher cost of doing business, leading to a slow-down and lay-offs, (2) higher cost of mortgages, leading to less home-buying and less home-building and hence lay-offs, (3) resultant lower profits to spill back into expansion, causing lay-offs of those in industries supplying expansion. With lower profits and less wages to spend, it was thought that prices should stop increasing because less money would be around to bid them up, and that wages couldn't increase due to fear of lay-offs. Lay-offs and unemployment were part-and-parcel of the political plan to implement the economic theory.

So what happened? The economy slowed down. Unemployment occurred. Taxable income went down. Hence federal revenues went down. Government had to cut corners where it could. The most cuttable was research, followed by new engineering programs. Other things couldn't be touched. The military needed its hardware and its salaries; the farmers needed their subsidies. Bureaucracy did not trim itself but maintained its own number, trimming instead purchases and outside contracts. As with families in hard times, so with government. The discretionary expenditures were pared while the fixed outlay remained.

When research and new engineering programs were cut, the burden of unemployment fell exceptionally heavily on the creative people in those fields, because it increased from 0% to 3 or 4%

among them while gross unemployment increased from the vicinity of 4% to a high of around 6% or so. Pockets of technology are worse off.

We must reiterate that unemployment in general was deliberately caused in order to try to slow down inflation.

It only happened (but should have been predicted) that scientists and engineers were hit hardest.

Why is new knowledge, either for its own sake or for production, treated as discretionary while land banks and caches of grain (for example) are inviolable? In a democracy, it is the number of votes one can muster, and the lobbying capability of his organizations, which control the purse-strings of government. Why should a farmer get up to \$50,000 a year for producing something unwanted, or for putting his land into non-production, while an aeronautical engineer sells his split-level and moves in with his in-laws? Can it be because the votes of scientists and engineers are insufficient and disorganized, or because their organizations lack independence and flexibility to be for or against anything?

Why shouldn't an engineer (if he is laid off) have the right to demand a job at a good salary doing unwanted research? A farmer can demand a subsidy for growing unwanted crops! Think about the implications of this.

For another thing, why are there excess scientists and engineers? Isn't it because a great number of collegians were motivated to become scientists and engineers by government policy and government money in the recent past, and now find the appropriations cut? Doesn't the government have a responsibility to bail them out, and help the older fellows, too, who are thrown into competition with the younger set for the available openings?

Next time, I am sure the tactics of fighting inflation will be different. The tactics have changed already. Now, the problem is to undo the damage done to our technological capabilities and to put people back to work. If we are to talk about going into pollution instead of into space, then the EPA needs massive funding for subsidized MS programs with family stipends, and it needs large appropriations for contracts which will employ these people once retrained. Ditto for DOT and ground transportation, HEW for health sciences, etc. The IEEE should think positively about ways and means to motivate the Federal Government to carry out such programs. Benefits will accrue to society in general and to the IEEE membership in particular.

# LETTERS TO THE EDITOR

July 15, 1971

To the Editor:

I have been prevented by illness from replying earlier to your Newsletter for July, 1971, request on page 2. I hope the following suggestions concerning the wording of "Goals for Group on Sonics and Ultrasonics" are not too late to be considered. My suggested wording is as follows:

The principal objects of this Group are the advancement of theory and practice in the fields of sonics, ultrasonics and phonon technology, and the promotion of high standards of research and exposition on the part of its members and contributors. The Group will coordinate its activities with those of other IEEE groups and related societies, especially in order to avoid redundant effort. It will cooperate with other related national and international organizations. In all its activities the Group will act within the rules set by the constitution and bylaws of the IEEE.

I have omitted two sentences from your proposed version. First with regard to the one beginning "Recognizing..." I would say that we are all, of course, interested in improving our environment, but I don't see how this worthy object can appropriately be mentioned as a "principal object" of this Group.

The sentence beginning "Likewise..." does not make sense as it stands. Should the word "bringing" be placed between "by" and "their"? If so, the sentence would seem to say that the Ad Com will

all any particular problem of any member of the Group to the attention of the IEEE or other organizations. This is a pretty big mouthful. As it seems to me, the sentence had better be omitted. I may be wrong but in any case the sentence calls for revision. Note especially that I have omitted the word "literary". We are not primarily a literary society, though of course we want to promote the use of good English. Is not this matter sufficiently covered by my phrase "high standards of exposition?"

With friendly greetings I am

Yours sincerely,

---

Walter G. Cady  
127 Power Street  
Providence, Rhode Island 02906

(Editor's Note: The suggestions and objections of Dr. Cady were discussed at the Ad Com meeting in Miami in December. It was decided to let the references to "environment", "literary", and the "best interests of its members" stand. See the article on GOALS elsewhere in this Newsletter. Environmental concern was acknowledged as part of Zeitgeist '72, but was redefined to include also the work environment and employment security environment of the Group members. It was not at all clear in the discussion how ultrasonics could improve the ecological environment. Possibly generating proposals to EPA on environmental monitoring would be a way. NB: There was a proof-reading error after "Likewise..." in the July article "Why Bother?" My apologies.)

To the Editor:

I won't trouble you with a detailed commentary on the version of the SU budget presented in your July 1971 Newsletter, but I do feel it important that you correct for your readers a misimpression that can easily be gained from footnote number 1) to that column.

In that footnote it is implied that a "net support" can be derived by subtracting "IEEE Headquarters Expenses" from the support actually granted to the group by the Institute. This is erroneous. The item identified as "IEEE Headquarters Expenses" in the newsletter column is actually the item identified in the budgets as "General Services". This represents payments made by the groups for services rendered to them by headquarters. It is not a charge made against the groups for headquarters expenses devoted to some unrelated activity.

It is, of course, important that these services be performed as economically as possible, and headquarters is continually striving to do a better job assisted by a not inconsiderable group of volunteer helpers. If a bad job is being done, these people should be replaced, but one should first make a fair evaluation of the calibre of the services provided.

Sincerely yours,

Robert G. Mills, Chairman  
TAB Finance Committee  
Princeton University  
Plasma Physics Laboratory  
P.O. Box 451  
Princeton, New Jersey

(Editor's Note: This matter was referred to L. W. Kessler, treasurer for 1971. It seems that the various aspects of the flow of money between IEEE Headquarters and the various professional Groups and Societies is an ongoing controversy.)

# DAVID L. ARENBERG,

## 1915 - 1971

David Lewis Arenberg, pioneer in the design and fabrication of bulk-wave ultrasonic delay lines, was found dead on September 8 in his home in Rochester, Massachusetts, at the age of 56. He had been brutally beaten and robbed.

After taking a bachelor's degree at the University of Massachusetts at the age of 19, Dave obtained master's degrees in physics at Clark University in 1936 and M.I.T. in 1942. As a graduate student at M.I.T., he worked on the modulation of light beams by ultrasonics, and thus was drawn into the Radiation Laboratory to work on delay devices for radars unresponsive to stationary clutter, at a time when the principal reference for bulk waves in solids was a 19th-century treatise on seismology. Having developed an ultrasonic delay line with photoelastic readout for obtaining adjustable delay, he patented the use of similar devices in pairs for obtaining the product of two signals, with the possibility of sampling one waveform at time  $t$  and the other at  $t - \tau$ . This was the second of his 18 patents; his last, filed in 1953, covers the generation of pretersound in a quartz rod by action of the electric field in a micro-wave cavity.

After the war, Dave worked in Navy laboratories and at Brown University, but in 1950 he set up in business for himself, with the idea of producing quartz and silica delay lines commercially and using the proceeds to support his research. His designs were outstanding; his optimization of the angles and faces of an asymmetrical multifaceted delay line was the first industrial application of linear programming on the Whirlwind II computer. By the time he became willing to relinquish the delay-line business to firms more interested in production schedules than he was, he found there was a market for the electronic test equipment that he had developed for his own laboratory. It is now in worldwide use.

Dave was treasurer of G-SU in 1957 and 1958; he served on the AdCom from 1958 to 1964, and was its chairman in 1961. He was general chairman of the 1965 Ultrasonics Symposium. He received the G-SU Best Paper Award in 1956, and the Fellow award in 1968. Among other honors that he valued was a colonelcy on the staff of the governor of Kentucky. He never married, but is survived by three nieces and by Arenberg Ultrasonic Laboratory, Inc. He will live long in the memory of his friends, and of many of the urban poor to whom he offered warmth as well as counsel and material help.

# G-SU COMMITTEES NEWS AND GOALS

## G-SU PUBLICATION COMMITTEE

N. F. Foster, Chairman

This is a newly formed Committee, presently consisting of A. R. Braun, E. P. Papadakis - Newsletter Editor, I. Mattiat - Outgoing Editor, S. Wanuga - Incoming Managing Editor, and W. J. Spencer.

### GOALS

The goals of the Committee are to plan and supervise the publication of the Group Transactions, Newsletters and Special Issues, to provide useful high quality media for the Group members, and others in the field, to communicate with each other and with the scientific community; and to do so at a cost consistent with the financial resources of the Group.

### PLANS

The following plans have been made to implement these goals:

- 1) Reorganize the Editorial Staff to fill vacancies created by the resignations of members whose work assignments have necessitated changes in their field of activity, and to include specialists in new areas of interest in the field. We have been fortunate in getting good support from our members in this area, and the present Editorial Staff lineup is

Managing Editor      S. Wanuga, G. E. Company  
Chief Technical Editor      J. deKlerk, Westinghouse

#### Associate Technical Editors

A. R. Braun	B. T. L.
Bill Cook	U. of Houston
F. J. Fry	U. of Illinois
E. G. Lean	I. B. M.
A. Metherell	Douglas
V. Salmon	S. R. I.
M. B. Shultz	Raytheon
F. S. Welsh	B. T. L.
R. S. Woollett	U. S. N. Underwater Sound Lab.

- 2) Reduce publication costs by changing the method of printing the Transactions. This is a two-step program. The first step is to attempt to have the October 1971 issue printed outside the IEEE, probably by photo-offset from typeset or typewriter composition. The second step is to go to photo-offset from author types mats next year as this seems to be the only process which will allow the Group to serve the publication needs of its members at a cost it can afford.
- 3) With the lower printing cost, we will be in a position to provide an increased coverage of the more engineering aspects of the field, and the Editorial Staff will be encouraged to solicit high quality papers of this nature to broaden the scope of the Transactions.
- 4) We are presently making arrangements with G-ED to jointly publish a special issue covering the papers to be presented at the forthcoming Ferroelectric Symposium.
- 5) Our Newsletter is to be put onto a regular schedule, starting with 2 issues/year with the hope of increasing to 4 issues/year if sufficient material is forthcoming. This publication, we feel, is important in creating a Group identity and should have added emphasis.

As many of you may have noticed, the October issue of our Transactions was, for the first time in recent years, typewriter composed and reproduced by photo-offset printing. This process has been implemented through the IEEE Editorial Department which is now offering three alternative publication methods; Method A - full editing, regular typesetting and printing as per our previous issues; Method B - typewriter composition and photo-offset printing as per our October 1971 issue; and Method C - author prepared copy directly reproduced by photo-offset printing. The savings realized by using Method B rather than A are expected to be about 40%, or about \$35/page. This saving should enable the Group to remain financially solvent, subject to reasonable funding policies by IEEE Headquarters, and still publish at least 200 pages/year in our Transactions. This broadening of the publication services offered by IEEE has been brought about largely as a result of the efforts by members of the G-SU Ad Com, and in particular by our Publications Chairman, Norman Foster; Treasurer, Larry Kessler; and Chairman, Bill Spencer. Our Group, and I believe many other IEEE Groups who are also fighting high publication costs, will benefit considerably from their work.

We are planning on a two-part issue for our January Transactions next year. Part 1 will contain our regular papers and Part 2 will be devoted to papers on the applications of ferroelectrics which were presented at the conference on the Applications of Ferroelectrics held in June of this year at IBM, Yorktown Heights, N. Y. This meeting was sponsored by our Group and was organized by the Subcommittee on Ferroelectrics, a Subcommittee of the G-SU Committee on Transducers and Resonators. Many of these papers feature the renewed interest in the electro-optic properties of ferroelectric materials and the device possibilities using these effects. Devoting a sizable fraction of next year's publication effort to this work represents a conscious attempt to broaden the scope of our Group by including new, relevant and allied activities as they develop.

The 1970 Ultrasonics Symposium Proceedings is now in print and is available for sale through IEEE Headquarters, N. Y. C. It bears catalog number 70C69SU.

## AWARDS COMMITTEE REPORT

by T. R. Meeker

### I COMMITTEE STRUCTURE

W. P. Mason, Cochairman - Columbia  
T. R. Meeker, Cochairman - Bell Labs  
T. M. Reeder - Stanford

### II GOALS

Develop awareness of available Awards in G-SU members.  
Encourage competition and nominations for awards.  
Consider G-SU sponsored awards.  
Increase participation in Award Committee activities.

### III PLANS

Submitted an article for G-SU Newsletter.  
Consider candidates for Edison medal.  
Try to find candidates for W.R.G. Baker Prize for outstanding G-SU paper.  
Find one additional committee member from midwest or northeast.  
Paper award.

Continued

## G-SU COMMITTEES NEWS AND GOALS (Continued)

### IV ACTION

1. Fellows from G-SU elected as of January 1, 1972
  - a. D. A. Berlincourt
  - b. W. J. Spencer
  - c. Y. Takeda
2. A nomination for W. R. G. Baker Prize Award for outstanding paper in any of the IEEE Transactions issued between July 1 and June 30 has been made for a paper by J. J. Hannon, P. Lloyd and R. T. Smith entitled, "Lithium Tantalate and Lithium Niobate Piezoelectric Resonators in the Medium Frequency Range with Low Ratios of Capacitance and Low Temperature Coefficients of Frequency", IEEE Transactions on Sonics and Ultrasonics, vol. SU-17, pp 239-246, October, 1970. Watch for outcome of this nomination.
3. The Administrative Committee of the G-SU plans to award a prize for the best paper in the Transactions on Sonics and Ultrasonics issued in 1971. The winner of this prize will be announced later this year.
4. Nominations are requested for the best paper in G-SU Transactions issued in 1972. Please send nominations and supporting comments to Awards Chairman of the G-SU Ad Com.
5. Please make a special effort to nominate qualified people for IEEE awards. Most of these awards are described in the November 1971 issue of Spectrum. The following schedule is appropriate for nominations:

Field Awards	- before April 1, 1972
Medal of Honor	- before June 1, 1972
Major Annual Awards	- before June 1, 1972
Prize Paper Awards	- before September 15, 1972

Further details on nominations can be obtained from IEEE Headquarters or from the Awards Chairman of the G-SU Ad Com.

Thyrgve R. Meeker  
Awards Committee  
Ad Com G-SU IEEE  
Bell Telephone Labs  
Allentown, Pa. 18103  
(215) 439-6838

### TECHNICAL COMMITTEE ON TRANSDUCERS AND RESONATORS PROGRAM AND GOALS

J. E. May, Jr., Chairman

The Technical Committee on Transducers and Resonators (TC-T&R), organized under the G-SU sponsorship in 1968, includes many of the members of the former IRE Piezoelectric and Ferroelectric Crystals Committee and continues much of the program of that Committee. The purpose of the TC-T&R is to foster the technical interests of the members of the Group on Sonics and Ultrasonics. This is accomplished through such activities as the organization of special symposia, or specially directed sessions at symposia of more general interest, the stimulation and generation of tutorial or review papers on topics of special interest, the modernization of existing standards and the generation of new standards. The former IRE Piezoelectric and Ferroelectric Crystals Committee generated a number of standards documents which have become primary references in the field of piezoelectricity and ferroelectricity. In the current IEEE nomenclature these documents are:

- IEEE #176 Piezoelectric Crystals: Definitions of Axes, Crystal Plate Orientation and Piezoelectric Relations, Symbols and Units (ASA C83.3-1951, R 196), (49 IRE 14 S1)
- IEEE #177 Piezoelectric Vibrator: Definitions and Methods of Measurement (May 1966 revision of 57 IRE 14 S1)

IEEE #178 Piezoelectric Crystals: Determination of the Elastic, Piezoelectric and Dielectric Constants - The Electro-mechanical Coupling Factor (ASA C83.23-1960), (58 IRE 14 S1)

IEEE #179 Piezoelectric Ceramics, Measurements of (ASA C83.24-1962), (61 IRE 14 S1)

IEEE #180 Ferroelectric Crystal Terms, Definitions of (62 IRE 14 S1)

The IEEE Standards Committee has assigned responsibility to TC-T&R for periodic review of IEEE Standards 176, 178, 179 and 180.

### ORGANIZATION OF TC-T&R

Technical activities of the TC-T&R are concentrated in six subcommittees as follows: Piezoelectric Crystals, A. H. Meitzler, Chairman; Piezoelectric Ceramics, P. L. Smith, Chairman; Ferroelectric Crystals, C. F. Pulvari, Chairman; Piezomagnetism, R. S. Woollett, Chairman; Delay Lines, J. H. Eveleth, Chairman; Medical Ultrasonics, G. Myers, Chairman.

A major overlap of interest with that of the Committee on Frequency & Time, sponsored by G-IM, occurs in the field of piezoelectric crystals and here the responsibilities are shared through a joint Subcommittee on Piezoelectric Crystals.

Interests in the field of medical ultrasonics are shared with G-EMB through joint membership of the Subcommittee on Medical Ultrasonics.

Interests in the field of surface wave delay lines are shared with G-MTT through joint members of the Subcommittee on Delay Lines.

Membership of TC-T&R and the various subcommittees is attached.

The Technical Committee on Transducers and Resonators through its chairman maintains liaison with the IEEE Standards Committee and through liaison members with the following ANSI committees:

C83	Components for Electronic Equipment
S1	Acoustics
S2	Mechanical Shock and Vibration
S3	Bioacoustics

Our liaison representative with IEC is John D. Holmbeck, U. S. representative on TC-49, Technical Committee on Piezoelectric Crystals and associated devices.

### CURRENT PROGRAM

At the 1970 Ultrasonics Symposium a workshop session on fabrication techniques for bulk and surface wave delay lines was sponsored by the Subcommittee on Delay Lines. A Symposium on Applications of Ferroelectrics will be held June 7-8, 1971 organized by the Subcommittee on Ferroelectrics and sponsored jointly with IBM and Army Research Office, Durham, N. C. Sponsorship of a workshop session on nonlinear effects in piezoelectric ceramics at the 1971 Ultrasonics Symposium is planned by the Subcommittee on Piezoelectric Ceramics.

In the field of standards, the subcommittees have at various states of preparation the following standards documents:

- I Standard on Piezomagnetic Nomenclature, Subcommittee on Piezomagnetism. Approved by IEEE Standards Committee December 3, 1970, awaiting final publication.
- II Standard on Measurements of Piezomagnetic Materials, Subcommittee on Piezomagnetism, incomplete draft available, complete draft expected in 1972.
- III Standard on Piezoelectricity, Subcommittee on Piezoelectric Crystals. A proposal for this Standard which will replace IEEE 176 and 178 was favorably reviewed by IEEE Standards Committee in April 1970, projected completion date is in 1972.

Continued



- IV Standard on Piezoelectric Ceramics (revision of IEEE-179), Subcommittee on Piezoelectric Ceramics, preliminary outline available.
- V Definitions on Ferroelectric Crystals, Subcommittee on Ferroelectric Crystals, revision of IEEE #180 is being planned.
- VI Definitions on Delay Lines, Subcommittee on Delay Lines, preliminary drafts have been prepared on nondispersive and dispersive analogue delay lines and acousto-optic devices, complete draft planned for 1972.
- VII Standard on Pulsed Ultrasonic Diagnostic Equipment, Subcommittee on Medical Ultrasonics, draft available, preliminary publication as a tutorial paper is planned.
- Standard on CW Diagnostic Devices, Subcommittee on Medical
- VIII Ultrasonics, outline in formative stage.

## FUTURE GOALS

As indicated in the previous section, much of the standards activity currently under way will occupy the various subcommittees for the next two to four years before the standards are finally issued.

Following the completion of the definitions in the field of delay lines and acousto-optic devices, it can be anticipated that there will be probably a need for the generation of standards in the fields of ultrasonic delay lines, surface wave delay lines and acousto-optic devices.

In the field of medical ultrasonics it is anticipated that future work will be concerned with standards on both pulsed and cw therapeutic equipment operating at intense ultrasonic power levels. Additional medical standards work will be concerned with development of basic standards and their relationship to NBS calibration facilities. In the field of the biological effects of interaction with ultrasound it is not clear whether a standard is appropriate, but there is considerable interest in correlation of information from various sources on the effects of interaction of ultrasound with biological structures, and it can be expected that a tutorial paper in this field will be forthcoming.

A major interest of many S-SU members presently inadequately covered by the TC-T&R organization is in the field of industrial ultrasonics. Formation of a subcommittee in this area is planned in the near future and consideration will be given to the need for generation of standards in this area of interest.

Future activities can be anticipated in the general fields concerned with the development and application of piezoelectric devices such as mechanical filters, transducers of all types, energy conversion devices, piezoelectric medical devices and apparatus, bulk wave and surface wave acousto-optic interaction devices.

Members of Technical Committee on Transducers and Resonators  
(TC-TR)

J. E. May, Chairman	D. L. Hammond
J. H. Armstrong	J. D. Holmbeck
H. G. Baerwald	W. H. Horton
R. Bechmann	H. Jaffe
D. Berlincourt	W. P. Mason
J. L. Bleustein	A. H. Meitzler
W. G. Cady	G. Myers
A. R. Chi	C. F. Pulvari
W. A. Edson	P. L. Smith
S. L. Ehrlich	W. J. Spencer
J. H. Eveleth	R. A. Sykes
E. A. Gerber	H. F. Tiersten
E. Hafner	R. S. Woollett

List of TC & TR Members

## Subcommittee on Piezoelectric Crystals

A. H. Meitzler, Chairman

R. Bechmann	R. T. Smith
D. Berlincourt	H. F. Tiersten
J. L. Bleustein	A. W. Warner
G. A. Coquin	F. S. Welsh, III
E. M. Frymoyer	

## Subcommittee on Piezoelectric Ceramics

P. L. Smith, Chairman

D. Berlincourt	P. D. Wilcox
I. D. Groves	C. LeBlanc
G. E. Martin	

## Subcommittee on Piezomagnetism

R. S. Woollett, Chairman

H. G. Baerwald	P. L. Smith
S. L. Ehrlich	C. M. van der Burgt
R. L. Harvey	R. H. Whymark

## Subcommittee on Delay Lines

J. H. Eveleth, Chairman

D. B. Armstrong	J. Hammer
H. Aronson	M. G. Holland
A. J. Bahr	J. Margolin
P. A. Bauer	F. A. Olson
M. G. Cohen	S. Rittenburg
J. H. Collins	E. Stern
R. Conly	W. S. Tehon
T. J. Geoghagen	A. Warner
A. F. Greenlaw	

## Subcommittee on Medical Ultrasonics

G. Myers, Chairman

J. F. Belford	W. F. O'Brien
C. A. Hoer	J. M. Reid
F. Lizzi	M. Ziskin

## Subcommittee on Ferroelectric Crystals

C. F. Pulvari, Chairman

G. Burns	A. H. Meitzler
E. Cross	R. E. Nettleton
S. E. Cummins	D. B. Silverman
H. Jaffe	A. W. Smith
S. K. Kurtz	H. L. Stadler
C. E. Land	G. W. Taylor
W. N. Lawless	H. H. Wieder
I. Lefkowitz	

## G-SU CHAPTERS COMMITTEE

Ernest Stern, Chairman

## GOALS

Apparently only one out of ten to fifteen members of the local chapter attend local chapter meetings of IEEE professional groups. It seems desirable to have an audience of

Continued

twenty or more for a meeting. Consequently a meeting should be sponsored by a sufficient number of local chapters to yield a net membership of 200 or more. The number of members of Sonics or Ultrasonics or any given area are less than this critical number, with the possible exception of the greater New York City area. Consequently, local chapters should co-sponsor meetings of common interest with other professional groups.

Co-sponsored meetings by their nature are likely to provide talks of general interest. Such meetings will not satisfy the need of members for timely talks on ultrasonic topics with satisfactory technical content. Such talks are necessary for many members who are unable to attend the yearly Ultrasonics Conference. The local chapter could arrange for several tutorial sessions on a specific subject of current technical interest. (The experience of the Boston IEEE has been that tutorial sessions are attended to a greater degree than regular meetings.) A tutorial session is given by an expert, and a series of lectures covers the topics. Usually a small fee is charged to participants to defray expenses. The Ad Com should help local chapter chairmen organize tutorial sessions.

#### PLANS

The committee on chapters will

1. Seek chairmen in the New York City, San Francisco, and Los Angeles area.
2. Solicit topics suitable for tutorial sessions.
3. Enlist local speakers residing on the Eastern and Western seaboard for tutorial talks.
4. Meet regularly during the Spring IEEE convention and the Fall Ultrasonics Symposium to discuss these matters.

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#### GOALS OF GROUP ON SONICS AND ULTRASONICS

W. J. Spencer  
Chairman, 1970 and 1971

The principal goals of the Group shall be scientific, literary and educational in character. The Group shall strive for the advancement of the theory and practice of electrical and electronic engineering and of the allied arts and sciences, and the maintenance of a high professional standing among its members, and with special attention to such aims within the field of interest of the Group which is sonics, including ultrasonics and phonon technology. Recognizing the responsibility of its members to society, the Group will strive to improve our environment with whatever means fall within our field of interest. Likewise, through its Administrative Committee, the Group will attempt to provide for the best interests of its membership by bringing their particular problems to the attention of the IEEE and/or other organizations within the scientific and engineering community. The Group will coordinate its activities with other IEEE groups and societies to prevent redundant effort. To further sonics and ultrasonics, the Group will also participate with other scientific, literary and academic institutions on a national and international basis. In all activities the Group will act within the rules set by the constitution and bylaws of the IEEE.

To achieve these goals, the Ad Com will formulate both long-range and annual plans. Revised versions of these plans will be submitted annually on or about December 31 to the Technical Activities Board of the IEEE.

#### Plans

The goals of the Group on Sonics and Ultrasonics will be carried out principally through the committee structure of the Ad Com. This administrative structure is shown in the attached matrix. Some general comments will be made here which reflect the

overall planning implemented by the Ad Com. These comments reflect the current state of affairs and will be updated when the final version of goals and plans are submitted to the Technical Activities Board on 31 December 1971. Plans and goals of the remaining committees will be included at that time.

The Ad Com of G-SU has done some serious investigation of their current status and the future direction that the Group should take during the past nine months. Several areas where changes were needed have been found and action has been initiated to correct or change past procedures. These actions are principally in the area of publications and finance. Details of the changes are in the individual committee plans. Briefly these changes were: 1) to go to photo-offset printing of author prepared mats for our Transactions and 2) to make IEEE aware of financial procedures which not only denied the small group of support but also taxed them. Institution of these changes put the 1972 G-SU budget back into the black with a comfortable contingency.

It also became clear that the image of G-SU was to a large extent reflected in our Transactions. Our Transactions had grown steadily over the eighteen years of its existence and improved in quality. Little emphasis had been placed on special issues covering new technology and our editorial staff had not been broadened as the scope and interest of the membership changed. Also the original editor asked to be relieved of his responsibility during 1971. The entire editorial structure of the Transactions has been updated and with the lower cost of photo offset printing should better be able to meet the publication needs of the group.

The Technical Subcommittees in the Technical Committee on Transducers and Resonators have been a strong part of the G-SU. These Subcommittees have been responsible for producing Standards and generating sessions at the Ultrasonics Symposium, other IEEE meetings and even separate meetings in the case of Ferroelectric Crystals. Current revision of existing Standards and preparation of several new documents for approval as Standards are under way. Excellent relations have been maintained with national and international Standards groups and many of the G-SU Standards have been accepted on a world wide basis.

The annual Ultrasonics Symposium continues to be recognized as the leading international forum for work in this area. The meeting is well attended and draws the best work, particularly in the fundamental aspects of ultrasonics, in the field. The scope of the meeting is being broadened to include more industrial and medical applications. Joint sponsorship of other meetings with overlapping interest in ultrasonics has been done in the past and will continue. Examples are in Acoustical Holography and possible in Frequency Control.

An active committee has been formed to look at awards for the G-SU. The annual best paper award is being reinstituted and candidates for other IEEE awards are being sought. In particular a very strong candidate for one of the IEEE Field Awards is being nominated for 1972. A separate committee handles Fellows and has initiated or jointly sponsored more nominations in 1971.

Long range plans for the G-SU are now beginning to take shape. The Ultrasonics Symposium is planned at least three years in advance. Financial planning is being done to insure a sound foundation for future G-SU programs. An active committee structure within the Ad-Com has increased efficiency and shortened reaction times in the G-SU. Use of the telephone and conference calls helps handle administrative matters between the regular Ad Com meetings. A recent survey to sample member attitudes was very successful. The use of the computer to collate and for correlation of the survey results offers a powerful method of getting the maximum information from sophisticated surveys in a very short time.

Although the membership in G-SU is relatively small (~1200) and stationary, there is a high interest in the field. The G-SU is certainly recognized as the leading group in the field internationally. Our Transactions attracts a large percentage of foreign papers and subscribers. The demise of the G-SU would be a loss to

Continued

## G-SU COMMITTEES NEWS AND GOALS (Continued)

the engineering community as a whole and the present Ad Com is using every means to continue its existence. Due to the large number of cross group memberships in IEEE, it would also indicate the institute would lose by discontinuing small groups. They would lose cross membership fees, and presumably from non-member subscriptions as the number of Transactions are decreased. For this reason, and since the Ad-Com feels that the G-SU is sound technically and financially, there are no plans for merger or discontinuing the group.

### G-SU FINANCE COMMITTEE

#### MEMBERS

L. W. Kessler - Chairman, Ad Com  
W. J. Spencer  
S. Wanuga - Transactions Editor

#### GOALS

The goals of the Finance Committee of the G-SU are:

1. Manage all financial matters of the group.
2. Consult with other Committees within the Group regarding financial commitments.
3. Through the financial committee of TAB, work to monitor the Group finances and express opinion on IEEE financial policy.

#### PLANS

1972: The G-SU budgets for 1970 and 1971 were both deficit. An analysis of IEEE financial policy indicated that small groups were losing a portion of their membership dues although TAB was on a whole supporting the groups. A request has been made that, at least, the membership fee be made available to each group. This change in policy combined with a new method of publishing the G-SU Transactions will put the Group financially in the black for 1972 with about a 15% contingency.

Other fund raising methods are being investigated. Registration fees at the annual symposium are being increased. Consideration is being given to publication of a symposium Proceedings. Industrial contribution and industrial displays at G-SU sponsored meetings are other areas where additional funds may be found.

Future financial planning will be affected by the outcome of several of the ventures currently under way. Financial viability is being given the greatest attention.

### G-SU MEMBERSHIP COMMITTEE GOALS

A. J. Bahr, Chairman

The primary goal of the membership committee is to maintain the membership of the group at a level that is consistent with the group's requirements for viability. To accomplish this, the committee will organize and promote activities for attracting new members. In addition, this committee will interact with the other committees of the group, particularly with regard to matters relating to the group image.

The following plans have been made to implement these goals:

- (1) An up-to-date list will be maintained of non-group members who are interested in the group's activities. This supplementary list will be placed in the computer at IEEE headquarters to facilitate the mailing of announcements and other correspondence. If we are to attract new members it is important that the group's activities be well publicized.

- (2) A membership drive will be conducted at the annual symposium. Group memberships to IEEE members will be offered at one half the usual price. The difference in fee will be made up from the symposium income.
- (3) Group members who drop their membership will be contacted and encouraged to rejoin the group. A copy of a recent letter of this type is attached.
- (4) Group chapters will be contacted and encouraged to solicit new members.

### G-SU MEETINGS COMMITTEE

W. J. Spencer, Chairman

#### Members

C. K. Jones  
F. S. Welsh

#### GOALS

The goals of the Meetings Committee of the G-SU are:

- 1) Plan the annual Ultrasonics Symposium. Coordinate this meeting with other related symposia and insure that the highest standards of technical and engineering excellence are maintained.
- 2) Determine the role of G-SU participation in other meetings than the annual Ultrasonics Symposium. Recommend to the Ad Com G-SU sponsorship of related symposia and meetings such as the Ferroelectrics and Acoustical Holography meetings.
- 3) Generate and update guide lines for the General Chairman and Program Chairman to insure continued excellence and economies in the annual symposium.

#### PLANS 1972

The 1972 Ultrasonics Symposium will be held in Boston at the Statler-Hilton Hotel on October 4-6. The General Chairman for this meeting will be Dr. M. G. Holland of the Ratheon Research Laboratories. The Program and Local Arrangements Chairmen have not been chosen at this date.

Proposals will be provided to the Program Chairman of the 1972 International Meeting for sessions on ultrasonics. These will include medical and industrial ultrasonics, and new device and materials work.

#### 1972 MEETINGS

The G-SU Ad Com has tentatively agreed to sponsor the Acoustical Holography meeting in 1972. The meeting will be held in February 1972, at the University of California at Santa Barbara, California. Professor G. Wade is the Negotiations for G-SU sponsorship of the Annual Frequency Control Symposium are currently under way. This meeting emphasizes the use of ultrasonic devices for filters and oscillators. It would nicely complement the more fundamental papers given at the Ultrasonics Symposium. Joint sponsorship with G-IM is being considered since the Frequency Control Symposium also covers atomic and molecular clocks.

#### FUTURE

The annual Ultrasonics Symposia for future years are as follows:

Year	Location	Chairman
1973	Monterey, California	Prof. John R. Neighbours
1974	New York City	no chairman chosen
1975	Boulder, Colorado	Dr. J. T. McElroy

The time of the 1974 Ultrasonics Symposium will be coordinated with the 8th International Congress on Acoustics.

Continued

## FUTURE PLANS

A draft of a guide for the General and Program Chairman is in existence. These drafts will be finalized and kept current. A formal proposal for future Ultrasonic Symposia will be written. This will make available additional information for Ad Com decisions for symposia locations.

Discussions are currently being held with the sponsors of the Annual Frequency Control Symposium to consider joint IEEE sponsorship. The discussions include representatives from G-IM as well as G-SU.

## G-SU UNIVERSITY RELATIONS COMMITTEE

by R. Stern, Chairman, and A. Eller

This is a newly-formed committee and as such is proceeding cautiously as to members, goals and plans.

## GOALS

The purpose of the University Relations Committee is to represent the members of the G-SU in all activities which relate to University and educational projects. Thus the primary goal of the Committee is to help plan and coordinate the internal and external educational activities of the G-SU with respect to group affairs. A second goal is to establish a means by which personnel in industrial organizations and governmental agencies may interact with the faculty of Universities with respect to mutual problems of interest in the field of acoustical research.

It is also the intention of the Committee to interact as much as possible with the Education Committee of the Technical Activities Board of the IEEE.

## PLANS

A. Immediate: Establish a list of areas of acoustical research that represent the current technological needs and, if possible, the technological needs for the next five years. The list would be established by contacting pertinent governmental agencies and industrial organizations. A summary of the list would be distributed to the appropriate faculty members of those Universities with acoustic programs. It will be suggested that new courses could be initiated on current courses modified such that if the demand for skills arose in these fields, scientists and engineers might be better prepared. It may be possible to include a syllabus and bibliography for some of the newer fields with the list.

B. Future: The following suggestions are being considered for possible future plans. Due to the newness of the committee the list is not exhaustive, and may be altered in order to take advantage of the expertise of new members of the committee.

1) The committee could act as a clearinghouse by which government agencies, industrial organizations and the general public could be put in contact with individual members of the G-SU for information concerning the specialty of that member. For a small organization such as the G-SU, the task could be handled by a committee without the need for a computer. The committee would act only as an agent in attempting to bring the interested parties together but would not take further part in the exchange.

2) The committee might coordinate lectureships throughout the country as a means by which members of the G-SU might volunteer their services to give seminars.

3) A bibliography of the classical papers in specific areas of acoustics might be prepared and made available. Possibly a reprint-type publication would be considered.

4) Magnetic tapes in specific fields might be prepared using experts in the subject. As the video-tape market emerges, the committee may wish to expand its area of interest into this form of educational activity.

5) The committee might coordinate the preparation of syllabi for courses in specific areas of acoustics.

6) The committee might prepare a packet of information concerning the setting up of student chapters of the G-SU at the University level and make itself available for further help. A "critical mass" is obviously necessary for each chapter.

7) The committee might interact with the Education in Acoustics Committee of the Acoustical Society of America in projects of mutual interest.

For more information, contact

Professor R. Stern  
Engineering and Applied Science  
University of California  
Los Angeles, California

Professor A. Eller  
Physics Department  
Naval Postgraduate School  
Monterey, California

## SUMMARY OF G-SU GOALS AND PLANS (1965 - 1975)

	1965	1970	1971	1972	1973	1974	1975
<u>Membership</u>	1148	1396	1250	1300	1350	1400	1500
<u>Chapters*</u>	0	1	-	-	-	-	-
<u>Meetings**</u>							
Ultrasonics Symp.	-	S.F.	Miami	Boston	Monterey, Calif.	to be set	to be set
Ferroelectrics	-	-	IBM, Yorktown Heights	-	-	to be set	-
Acous. Holography	-	-	-	San. Barbara	-	-	to be set
Freq. Cont. Symp.***	-	-	-	-	Atlantic City	same	same
<u>Publications</u>							
Transactions (pp)	138	276	240	400	275	300	325
Newsletter	aperiodic	2	2	3	3	4	-
Proceedings		-	1	1	2	2	-
<u>Financial</u>							
Income	4,563	38,130	36,000	32,000	34,000	35,000	36,000
Expense	3,092	42,142	37,000	30,000	33,000	34,000	34,000
Balance	6,342	7,932	6,932	8,932	10,000	11,000	12,000

\* See Chapter Plans and Goals

\*\* Does not include participation in annual IEEE meetings such as N.Y. International Convention

\*\*\* Joint sponsorship with G-IM

# EDUCATION COURSES, BOOKS, MATERIALS

## IEEE ANNOUNCES ONE-DAY SHORT COURSES

Location: United Engineering Ctr., 345 E 47 St., NYC

Time: 1972 IEEE International Convention, March 20-25, 1972.

A one-day short course on **FREQUENCY SYNTHESIS-APPLICATIONS AND TECHNIQUES** will be offered on Monday, March 20, 1972. The purpose of this course is to introduce the practicing electronics engineer to the problems, applications, and realization techniques of frequency synthesis.

A one-day short course on **Computer Aided Network Analysis and Design** will be offered on March 21, 1972. The course is presented by the IEEE Educational Activities Board in co-operation with the IEEE Circuit Theory Group; its purpose is to familiarize the practicing electronics engineer with the state-of-the-art methods of utilizing the computer in the analysis and design of electronic circuits.

A one-day short course on **ACTIVE INDUCTORLESS FILTERS: THEORY AND PRACTICE** will be offered on March 22, 1972. This course is being presented by the IEEE Educational Activities Board in co-operation with the IEEE Circuit Theory Group. The purpose of this course is to familiarize the practicing electronics engineer with the design and applications of state-of-the-art active inductorless filters.

This one-day short course entitled "Introduction To Modern Control Logic" offers not only a conceptual approach in presentation and course notes, - but also makes available to the registrants a special package of Integrated Circuit components complete with sockets and experiments which parallel the course topics. The course will be offered on March 23, 1972.

A one day short course entitled "Integrated Circuits: A CONCEPTUAL APPROACH" will be offered on March 25, 1972. The course is designed to give the practicing engineer an overview of IC Technology.

For registration, contact the

Educational Registrar  
IEEE  
345 East 47 St.  
New York, N. Y. 10017  
(212) 752-6800

Registration must be in by March 10, 1972. The fees per course are \$20 for members, \$15 for students, and \$35 for non-members

## "PSYCHOACOUSTICAL TERMINOLOGY"

### PUBLICATION

Copies of the booklet, "Psychoacoustical Terminology" by Martin Sonn, are still available free, on request from Raytheon Company, P. O. Box 360, Portsmouth, R.I. 02871 (attention, Miss Joanne Pimental, Box 188). The booklet, published in 1969, is 67 pages in length and represents part of an effort to provide a unified compilation of data on hearing for use by workers in acoustics.

## GUIDANCE ON HEARING, HEARING AIDS GIVEN IN LATEST NBS CONSUMER INFORMATION BOOKLET

Persons having difficulty with their hearing and wondering what to do about it can get help from a new booklet issued today by the U. S. Department of Commerce.

It is estimated that over 20 million living Americans have faced this problem. In its continuing efforts to help consumers make intelligent decisions in the marketplace, and specifically to inform those with hearing losses of the help that is available to them, the Department's National Bureau of Standards prepared the new booklet, Facts About Hearing and Hearing Aids.

The National Bureau of Standards in preparing Facts About Hearing and Hearing Aids has gone to considerable effort to provide the best and most reliable information available on the subject of hearing. Key illustrations have been prepared by one of the nation's leading medical artists. Medical advice and data, as well as information on hearing aids, have been supplied by the American Speech and Hearing Association; the American Academy of Ophthalmology and Otolaryngology; the Army Audiology and Speech Center, (Walter Reed General Hospital), Department of the Army; the National Institute of Neurological Diseases and Stroke of the National Institutes of Health, Department of Health, Education and Welfare; the Prosthetic and Sensory Aids Service, and Auditory Research Laboratory, Veterans Administration; and the National Association of Hearing and Speech Agencies.

Facts About Hearing and Hearing Aids, written by Edith Corliss and edited by James E. Payne, may be purchased, like its three predecessors in the Consumer Information Series, from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, or from the nearest Department of Commerce field office or Government book store. Price: 60 cents a copy. The booklet may also be obtained from Consumer Product Information, Washington, D. C. 20407.

(Previous publications in the series were entitled Fibers and Fabrics, Tires - Their Selection and Care, and Adhesives for Everyday Use. In preparation are others dealing with care of books and documents, flooring, plywood, and a variety of other leading consumer areas.)

# VARIOUS CONFERENCES

## FOURTH INTERNATIONAL SYMPOSIUM ON ACOUSTICAL HOLOGRAPHY

The Fourth International Symposium on Acoustical Holography, sponsored jointly by the IEEE Group on Sonics and Ultrasonics and the Quantum Institute of the University of California, will be held at Santa Barbara, California in the Biltmore Hotel on April 10, 11, and 12, 1972. The interest of the symposium encompasses the whole area of visualization, detection and recording of sound fields as well as long-wavelength, particularly microwave, holography. The work reported at the three previous symposia dealt mainly with theoretical and experimental developments in the above area with application to seismic sensing, underwater imaging, non-destructive testing, sonar and medical diagnosis. The Symposium will be open to all who wish to attend. For Further information contact:

Professor Glen Wade  
Department of Electrical Engineering  
University of California  
Santa Barbara, California 93106

## CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS

The 1972 Conference on Precision Electromagnetic (CPEM) will be held June 26-29, at the National Bureau of Standards, U. S. Department of Commerce, Boulder, Colorado. The CPEM is held every other year and the goal for the 1972 CPEM is the advancement of electromagnetic measurements science and measurement technique which are critical to technology and beneficial to society.

The Conference on Precision Electromagnetic Measurements is sponsored by the National Bureau of Standards, Institute for Basic Standards; the Institute of Electrical and Electronics Engineers, Group on Instrumentation and Measurement; and the International Scientific Radio Union, U. S. National Committee. A cooperating sponsor is the Union Radio-Scientifique Internationale. The CPEM will follow the June 21-23, 1972, Joint Measurement Conference also being held at NBS in Boulder, Colorado.

For further information, contact D. F. Wait, 1-4655, National Bureau of Standards, Boulder, Colorado 80302.

## INTERNATIONAL CONFERENCE SPONSORED BY LA SOCIETE FRANCAISE DE PHYSIQUE

To commemorate the hundredth anniversary of Paul Langevin, a scientific colloquium will be held at Ecole Supérieure de Physique et de Chimie where Paul Langevin was first a student and later Director, and where he performed his pioneering experiments on generation and detection of ultrasonic waves.

### SCIENTIFIC PROGRAM

- Generation and Detection of Ultrasonic Waves (up to very high frequencies)
- Acoustic Holography
- Ultrasonics in some fields of Solid State Physics
- Surface Waves
- Non linear Effects

This program was motivated mainly by the actuality of these topics but also it emphasizes the scientific developments following from Paul Langevin's works in the field of Ultrasonics.

The sessions will include:

- invited papers of about 40 minutes
- contributed papers of about 20 minutes

### ORGANIZATION

The colloquium will be held on 13, 14, and 15th of September 1972, at the Ecole Supérieure de Physique et de Chimie, 10 rue Vauquelin, 75 Paris 5, France.

All the mail should be addressed to:

Professor Pierre Biquard  
Colloque Paul Langevin  
10, rue Vauquelin  
75 Paris 5e - France

The deadline for accepting papers is March 31, 1972. A scientific committee will select the contributed papers. Written communications will be published in a special issue of the Journal de Physique.

## POLLUTION CONFERENCES

The Society of Engineering Science, an organization devoted to the promotion and fostering of interdisciplinary scientific and engineering endeavors, announced that in addition to its usual annual technical meetings in the U. S., it will begin to sponsor a series of international conferences.

The first such conference will be the First International Meeting, to be held at Tel-Aviv University, in Tel-Aviv, Israel, during June 12-17, 1972. The subject of the meeting is: Pollution: Engineering and Scientific Solutions. The timing of the meeting is such as to allow for participants of the First United Nations Conference on the Human Environment to attend at the end of their deliberations. Also, this meeting will be followed, in Jerusalem, by the 6th International Conference on Water Pollution Research, a week later.

The meeting will feature distinguished invited speakers from all around the world, who will discuss a great variety of subjects in connection with pollution of all types, to the exclusion of water pollution only. In addition to the exact sciences and engineering, the fields of national and international law will also be represented. Contributed papers are desired.

For more information, please contact

Ervin Y. Rodin  
Meeting Chairman  
Washington University  
St. Louis, Mo. 63130

## JOINT MEASUREMENT CONFERENCE

A Joint Measurement Conference, the first in a potential series, will be held June 21-23, 1972, at Boulder, Colorado. The keynote of the Conference - THE ROLE AND VALUE OF MEASUREMENT - is also the theme of the opening address, to be presented by Lewis M. Branscomb, Director of the National Bureau of Standards, U. S. Department of Commerce.

The joint aspects of this Conference are indicated by the list of Sponsors:

American Society for Quality Control - Electronics  
Division/Metrology Technical Committee  
Institute for Electrical and Electronics Engineers -  
Group on Instrumentation and Measurement

Continued

## VARIOUS CONFERENCES (Continued)

Instrument Society of America - Metrology Division  
National Bureau of Standards  
National Conference of Standards Laboratories  
Precision Measurements Association

The purpose of the meeting is to promote the interdisciplinary exchange of technical and managerial measurement concepts.

The Conference, to be held at the NBS Boulder Laboratories, is organized into 6 consecutive half-day sessions. The general topic of the first day, The Why of Measurement, is explored in sessions on The Measurement Effort as a Resource for Management, and as a Technical Resource. The How of Measurement is covered in sessions on Physical Processes in Sensors/Transducers/Detectors, and Interdisciplinary Solutions to Problems, and the Where of Measurement is discussed in sessions on Systems Metrology and Measurement-Oriented Engineers from our Campuses.

Attendees of the Joint Measurement Conference have the opportunity to take in a "conference doubleheader," as the Con-

ference on Precision Electromagnetic Measurements meets in Boulder June 26-29.

For further information, contact:

George Goulette  
Director, Bureau of Conferences and Institutes  
University of Colorado  
130 Academy Bldg.  
970 Aurora Ave.  
Boulder, Colorado 90302

Phone: (303) 443-2211 Ext. 6485

## ULTRASONIC ACTIVITY AT INTERNATIONAL CONVENTION

The group on Sonics and Ultrasonics is sponsoring a session at the IEEE International Convention on "ROLE OF SURFACE ACOUSTIC WAVES IN DIGITAL SIGNAL AND DATA PROCESSING." There will be invited papers and a panel discussion. The session is at 9:30 AM on Wednesday, March 22 in the Suttan Ballroom South of the New York Hilton.

# IEEE GENERAL NEWS

## REPORT ON IEEE TECHNICAL ACTIVITIES BOARD MEETING NOVEMBER 3 AND 4, 1971

by N. F. Foster

Several topics reported here are of interest to G-SU members, so the whole report is being included.

- A. Mr. David Dobson reported on the economies of using Spectrum for advertising meetings, etc. This method had been used for publicizing the NEREM program at a substantial savings over individual mailings (see Attachment B). It was felt that this method could be used more widely.
- B. The report of the Ad Hoc Committee on Application of Electro-Technology to Social Problems was introduced and discussed at some length. This committee has been examining the existing and potential interactions between electro-technology and the county at large. In general, it concluded that although many individuals and groups have been working very hard to establish a close and meaningful dialogue there is a real need for an organized effort on a large scale. Their recommendations were for the formation of a permanent committee to examine the question, the preparation of IEEE technical review papers outlining the state of the art in socially important areas, and the formation of a PR government liaison office in Washington similar to the liaison groups maintained by other scientific disciplines. It was pointed out that the present PR department of IEEE consists of one girl!!! and that feedback from senators has indicated a serious lack of communications between government and the EE community.
- C. Ed Wolff reported on the Technology Assessment and Forecasting experiment which had been conducted with several groups in the Washington area. The experiment had been very well received and most of the groups felt that they had made real progress both in developing techniques of forecasting future technological trends and in formulating meaningful forecasts in their special areas. Ed expressed the belief that it would be worthwhile expanding these activities and suggested that they could perhaps be developed around the local chapters.

- 3.1 Hal Chestnut reported that IEEE as a whole will probably be \$300K in the hole next year and that the present (i.e., the 9/14/71 draft) has been prepared assuming that the groups (i.e., TAB) will take a \$100K cut. TABOPCOM does not approve of the cut and may be able to have it restored to the groups later (see Section 8.3).

The unemployment rate in IEEE was reported to be 3-4%.

- 3.2 Four (4) Groups, G-MAG, G-IGA, G-SMC, and G-COM Tech have had their petitions to become societies approved by TABOPCOM.  
  
G-AES is also preparing a similar petition. There is no restriction on the number of societies which can be formed. The name change petitions contained in the Agenda supplement were carried.
- 3.3 The receipt of plans and goals from the groups was very disappointing -- only one final and seven preliminary reports had been received. All final reports are due December 31. (G-SU has submitted its preliminary report and is in process of submitting the final one.)
- 4.1 Despite good advance interest indications, the planned management workshops at FEC and NEREM had to be canceled due to lack of support. Attempts will be made to run these courses early next year.
- 4.2 There was considerable further discussion on the question of what to do on the recommendation of the Ad Hoc Committee on Applications of Electro Technology to Social Problems. There was a quite strong movement to accept the first five recommendations which dealt with setting up a permanent committee but members of TABOPCOM opposed this as a hasty irresponsible action and succeeded in getting the motion tables. It seems that the social involvement of IEEE is a touchy political issue which will be difficult to get any action on.

## 5. FINANCES--BUDGETS

Support from IEEE to TAB has been going down in recent years. It was \$520K in 1971 and is expected to be \$378K in 1972. The formula for allocating support to the groups has changed this year, now being partly on a membership basis and partly on a number of pages published basis. This is a slight improvement as far as G-SU is concerned as we publish more than the average group in terms of pages/member. Another difference this year is that the money is allocated to divisions, the division chairman then allocates to the groups in his division. In our division (IV), the allocation was by formula but in divisions I and II, additional factors were included in the allocation. There is a general desire to encourage new ventures by holding some discretionary money at the division level to be allocated for such ventures. This creates a problem, however, in knowing far enough in advance if this special money will be available to permit sound planning. For this reason many felt that the annual budgets from TAB should be completely frozen early in the previous year so that decisions on raising dues, etc., to balance group budgets, could be made on the basis of a firm basis. This led into much discussion on how any extra money which might become available next year (anywhere from 0 to \$200K) should be allocated, this matter was taken up later (see 8.3) as lunch was ready.

## 6. PUBLICATIONS

The general health of the publications operation was reviewed and stated to be in good shape. This is not consistent with the several week delay our October issue has encountered due to indexing delays.

The scale of page charges which has been suggested to the Executive Board is as follows: \$60/page for publications method A, \$40/page for method B and \$15/page for method C.

It was suggested that a mandatory page charge for Conference Proceedings paper be instituted for every page in excess of some minimum number. This it was felt would make it possible to budget for such Proceedings accurately. The suggestion was made to institute the same system for regular journal articles but this was made to institute the same system for regular journal articles but this was rapidly turned down.

The opinion of TAB was fought on a computerized individual information retrieval system experiment. This would run for about 3 years under the guidance of an expert at MIT who would use the experiment as a teaching tool and give his time and the computer time without charge. Subscribers would submit an interest profile and receive articles in any IEEE publication fitting this profile. Several members felt that these schemes had been tried before and had been proven unattractive economically, but in general there was sufficient interest to initiate a preliminary study using very limited IEEE funds.

- 7.2 A report was delivered to the TABOPCOM proposing that a full time staff position be created in the Washington area to provide technical inputs to governmental bodies on EE matters. This was being considered by OPCOM.
- 7.3 A new joint advisory committee has been formed including representatives from RAB and TAB Tech. Meetings Committee to review the whole regional meeting position. Such questions as: should the regional meeting be continued and/or be combined with group meetings? and should the regional meetings be renamed in a uniform way? are under consideration. A map showing the regions, memberships and meetings was presented and is attached as Attachment C.

It was also pointed out that the new advisory Committee would provide assistance to groups if requested, and was considering instituting conference organization training programs if this were wanted by group personnel.

- 8.2 Effective January 1, 1972 all group chief officers shall be called "President" rather than Chairman.
- 8.3 A motion was passed (although there was some doubt as to it there was still a quorum left at this time) that any additional funds made available to TAB should be allocated to the groups according to the formulae used for the 2nd draft of the 1972 budget.
- 8.4 A motion was passed to authorize the shipment of overseas Transactions by air freight for the remainder of 1971 to avoid excessive delays caused by the East Coast dock strike. Each group will be billed for the additional postage incurred by that group.
- 8.5 Nominations for the even numbered Division Directors are needed before April 30, 1972.
- 8.5 Next TAB meeting will be in early January, 1972.

## PROGRESS REPORT 1971 ELECTROSCIENCE DIVISION IV by Leo Young, Director

1971 has been an exciting year for IEEE in general, and the groups in our division in particular. We usually tend to become so wrapped up in our own problems, that we forget that other people and Groups face similar situations, and that we can often help one another by sharing each other's hopes as well as hang-ups. The end of 1971 and the beginning of 1972 brings in many new people to our Ad Coms and Committees, and so this seems a good time to share my thoughts with you. I'll try to list briefly for you some of the major developments during the past year.

## FINANCIAL

Financially it's been a trying year, especially for the smaller Groups. There were times when one or another of our Groups looked like ending up the year in the red. Nevertheless by discipline and hard work, every one of our six Groups and one Council have ended the year in the black, and in every case better than anticipated. G-ED, G-AP, QEC, and G-PHP have always been financially healthy for which they deserve our heartiest congratulations and thanks, while G-MTT, G-MAG and G-SU managed to avoid going in the red, G-MTT even ending up with a substantial surplus in spite of earlier less sanguine predictions.

The Technical Activities Board (TAB) Operating Committee (OpCom) decided earlier in the year to experiment by withholding certain 1972 funds normally allocated "by formula" to the Groups. (By a formula involving (1) the number of members, and (2) the number of pages published, for each Group. Such a formula is impartial and does not require value judgments. This of course has both its good and bad aspects.) The intention was to allocate some money (about \$100K) among the 31 Groups based on proposals for new activities which TAB OpCom requested them to submit. Thus it was hoped to encourage innovation. This decision was later rescinded mainly because the 1972 budget is very tight for almost every Group, and many important current activities will have to be curtailed even without encouraging new activities. This is particularly true of the Group's publication activities. The Group Transactions account for about 70 to 80 percent of a typical Group budget. In round numbers it costs about \$100 per Transactions page published, and budgets could almost be measured in "pages" instead of dollars. Thus, a budget of say \$60,000 could be thought of as worth 600 "pages". A new activity costing \$5000 could be financed by giving up about 50 Transactions pages. (This makes no allowance for page charges.)

As it stands now, any new activities will have to be funded out of each Group giving up something in exchange (e.g. Transactions pages), or by Groups getting together (e.g. in a Division) to undertake a joint project for which they pay collectively - rather than by competition for scarce funds among the 31 Groups. There is little

Continued



discretionary money left at the disposal of the chairman of TAB OpCom, but it is more in the nature of "emergency money," although one of it might still be used to fund special proposals. At this time I think it would be fair to summarize that such proposals from Groups would still be accepted, but are no longer actively solicited.

You might be interested in the IEEE overall financial picture in brief. We ended up 1971 with a surplus of a little over \$100,000, but we have a deficit budget for 1972 (in spite of numerous economies), much of it due to rising costs over the past year. The 1972 deficit is expected to be between \$200,000 to \$300,000. While this is not viewed with alarm, we clearly cannot operate this way indefinitely. One interesting possibility that is now under consideration (see later) that might avoid raising the IEEE (transnational) dues, is to let each IEEE region set its own regional dues and take over most regional activities from the (transnational) IEEE. (There are six regions in the U.S., four outside the U.S.) There are very different needs from Region 1 (Boston, New York, etc.) through Region 10 (Tokyo, etc.), which are best understood and funded by the regions themselves.

#### ELECTROSCIENCES DIVISION IV

As divisional director I have represented each of our six Groups and one Council before TAB OpCom and the Board of Directors, and have worked closely with each Group on a number of matters, only a few of which can be mentioned here. It has been my purpose, generously supported by the AdCom presidents, to draw together our Groups in common endeavors, while maintaining their identity, enthusiasm, and financial integrity.

#### EDUCATION CURRICULUM PROPOSAL

One of the more interesting proposals for a "new activity," that might also be undertaken jointly by the Groups in our Division, was made by Prof. Frank S. Barnes, 1972 Vice-President of G-ED. It was originally documented by him in a memo dated 5 October 1971 to the members of G-ED AdCom. In brief, it proposes to develop a curriculum for students, both undergraduate and graduate, under the three main headings of: Mathematics, Physics, and Electrical Engineering. Although originally conceived for work on Electron Devices, it was subsequently decided that it would be better to extend its scope. To encompass all subject areas of IEEE seemed too ambitious a project, at least for the moment. It seemed more practical to compromise by extending it immediately only to the "electrosciences" subjects in our Division. The study might later serve as a model for other or wider studies. The purpose of the study would be to help provide a modern up-to-date curriculum in light of likely future needs and developments.

I have suggested that each Group provide a contact man to work with Frank Barnes. After consulting with each Group chairman, they are: G-AP's Prof. Akina Ishimaru (U. of Washington, Seattle), G-MTT's Prof. Saul W. Rosenthal (Polytechnic Institute of Brooklyn, Farmingdale, N. Y.), G-SU's Dr. Richard Stern (UCLA, Dept. of Engineering Science), G-PHP's Dr. James W. Lathrop (Clemson University, Clemson, South Carolina 29631), and G-MAG's Dr. Henry Bourne (Rice University, Houston, Texas). Anyone having any inputs or interests, please contact Prof. Barnes or one of these gentlemen. Incidentally, Dr. Lathrop recently undertook a survey of hybrid circuit fabrication facilities in Colleges and Universities. For more information contact Jim Lathrop or Stan Stuhlbarg, President of G-PHP.

#### LONG-RANGE PLANNING & TECHNOLOGICAL FORECASTING

A problem faced by all the Groups that requires special attention in these days of rapid change is that of our future - as individuals, as engineers, and as IEEE members. The Groups can and should take a look at their own future. Why are some Group members leaving? Which new Groups do they join? Who are the new Group members? What is the future of the subject(s) our Groups are interested in? Should "my" Group merge with "your" Group?

Dr. Edward A. Wolff, Vice-Chairman of TAB, ran an interesting experiment and one-day Conference on Technological Forecasting in Washington, D. C. on 8 October 1971, which it was my privilege to attend. He wants to extend this experiment on an IEEE-wide basis, and I think he deserves our support. I would like to see this project supported by each of our Groups in the context of their own long range planning. This should allow each Group to forecast its own future, by working cooperatively with other Groups and with Ed Wolff. I suggest that we work through the chairmen of the long-range planning committees, who are G-AP's C. H. (Buck) Walter (Ohio State University, Columbus, Ohio 43210), G-ED's President John B. Singleton (BTL, North Andover, Mass 01845) or his designate, G-MTT's H. M. (Hal) Altschuler (NBS, Boulder, Col. 80302), G-SU's President L. W. (Larry) Kessler (Zenith, 6001 W. Dickens Ave., Chicago, Ill. 60639) or his designate, G-PHP's Darnall P. Burks (Sprague Elec. Co., Red River Expwy, Wichita Falls, Texas 76307), G-MAG's Emerson W. Pugh (IBM, Armonk, N. Y. 10598) or R. F. (Bob) Elfant (IBM, Hopewell Jcn., N. Y. 12533) and QEC's Chairman L. K. (Larry) Anderson (BTL, Murray Hill, N. J.) or his designate. Anyone knowledgeable or willing to contribute, please contact one of these gentlemen.

#### MERGERS

Several Groups have begun discussing merger arrangements with other Groups. I feel strongly that mergers should not be forced for administrative convenience, but should be based on a commonality of interests. I think that the moving closer together of our Groups, through common problems and projects, changing conditions, and the opportunity to form a stronger Society by merging Groups, will lead to some important combinations in the near future. I will be glad to continue to assist in any merger negotiations between Groups.

#### NEW SOCIETY

The Group on Magnetism, G-MAG, was the first Group in our Division to become a Society. Congratulations to Bob Byloff and G-MAG. There was a special case, in fact it unintentionally turned out to be a sort of test case. In general I have counselled our Groups not to rush into Society status, although several of our Groups clearly would have no difficulty qualifying. From an operational point of view it makes absolutely no difference whether you are a Group or Society. Usually there are more important matters to concentrate on than preparing briefs on Society application. It would be best to combine some major change (e.g. merger) with application for Society status. But that is for each Group AdCom to decide for itself.

#### POSSIBLE DIVISION AWARD

As many of you will know, Jack Morton of BTL passed away on 11 December 1971. Dr. R. S. (Rudi) Engelbrecht, 1971 Chairman of G-ED, suggested to me that we sponsor an award in his memory. Jack Morton is well known for his development of integrated circuits and transistors, and many well-known engineers were trained by him.

There are at least three possibilities for sponsoring this award - through IEEE, through the Division, or through G-ED. This seems an auspicious time to make it our first Division award, since Jack Morton's contributions go beyond the area covered by any one Group, while they have impinged particularly on our interests in Division IV. If anyone wishes to help in any way, contact Rudi or me, or call Morgan Sparks, Vice-President of BTL, Murray Hill, N. J., Tel. 201-582-3248.

#### ADMINISTRATIVE BULLETIN

I have discussed the possibility of an administrative bulletin for our Division with Dr. W. J. (Bill) Spencer (BTL, Allentown, Pa.) and others. This administrative bulletin would reach more or less the same people as the ones to whom this memo is addressed, that is, the key administrative officers in our Groups. This includes the chapter chairmen, on whom we count so heavily to

Continued

reach our members everywhere. Let me add at once that this administrative bulletin would not compete with the Group Newsletters (which between them reach about 25,000 members in our Division). It would probably be a short four-page sheet published monthly. One of its purposes being the rapid dissemination of short news items, particularly late news. It is also intended to open communication channels and foster a community spirit among our Group officers in the Division, and thus hopefully make it easier for all of us to work together. Any Group President or committee or chapter chairman who wishes to make an important or timely announcement of general interest, will be welcomed in its pages. Please write to Bill Spencer for further details, or if you wish to publish any short announcements or news items to the administrative roster.

#### NEW JOURNAL (perhaps)

The adhoc committee on Optical and Electro-Optical Systems, under the chairmanship of Dr. Joseph W. Goodman, has just (December 1971) issued its Final Report on Optics and Electro-Optics in the IEEE. Its principal recommendation is that a new journal be published to be called either the IEEE-OSA Journal of Optical Electronics or the IEEE-OSA Journal of Opto-electronic Systems. It would be a joint venture between IEEE and OSA (Optical Society of America). The new journal is probably most closely related to JQE (Journal of Quantum Electronics) published by QEC, which in turn has two member Groups, G-ED and G-MTT. Whether the recommendation is implemented, and what organizational form it will take, is still under discussion. We would welcome the opportunity to work more closely with OSA.

#### PUBLICATION COSTS

All of us have been very much concerned about the rising costs of printing and other publication costs. Dr. L. W. (Larry) Kessler and Dr. N. F. (Norman) Foster of G-SU have spent much time looking into this and have brought down the cost of publishing the IEEE Transactions on SU, without compromising too much on appearance. Any editors or publication committee chairmen interested in reducing the cost of their Transactions might like to contact Larry or Norman.

#### A PUBLICATION EXPERIMENT

We are all overwhelmed by what has come to be known as the "publication explosion." It would be more convenient for some of us if the publisher (the IEEE or the Group) selected only those papers we wish to keep, for transmittal to us. That is the basis of an experiment proposed by Dr. Jordan J. Baruch of the Harvard Business School to the IEEE and to the National Science Foundation. He calls it "The Annals of the IEEE."

The match of interests would be determined from a Reader Interest Profile (RIP) filled out by each experimental subscriber and from a Paper Content Profile (PCP) filled out by the Groups or the IEEE prior to publication. I will try to summarize for you the proposal.

The program is divided into three phases. Phase I is Setup, which includes cost estimating, establishing a test population, and developing a large enough thesaurus for the RIP and PCP. The program might be discontinued at this point for lack of interest or if the cost is too high.

Phase II is to show Feasibility, and involves obtaining RIP's from a test sample, developing PCP's for sample papers previously published, and soliciting at least 3000 subscribers.

Phase III is Operation of the program, including distribution of papers, a questionnaire investigation, looking into pricing, developing an index for papers, and determining an interest distribution.

My summary has been all too brief and does not do justice to the rather long and detailed proposal. I am sure you will hear more about it when the test population is recruited, probably sometime before April 1972.

Any Transactions editors or Group publication committee chairmen desiring more information should contact Dr. Baruch.

#### PROFESSIONAL ACTION

The vote on the petition prepared by Dr. Victor Galindo is now history. World-wide, about as many IEEE members voted FOR as AGAINST (within a few tenths of one percent). (It would have required a two-thirds majority to pass.) In the U.S. taken alone there was a small majority (about 54 percent) in favor of the petition. Whatever your opinion, there might never have been a petition but for the pioneering work of G-AP's former committee on professional and economic well-being of the electrical engineer under Prof. Raj. Mitra, which did much to arouse interest in the economic plight of engineers. A similar committee on professional action was formed in G-MTT under R. A. (Bob) Rivers, and this committee has now been elevated to become a Division committee. The support of C. T. Tai and John Damonte of G-AP, and of Sy Okwit and Al Clavin of G-MTT were much appreciated. Bob Rivers or I would be happy to make his committee more representative of all the Groups in our Division.

I have stated my belief many times if the petition had passed, it would have been detrimental to IEEE. But I have felt much sympathy for the petitioners' motives if not always with their methods. Some of us have worked through the Board of Directors, which at its November 1971 meeting was responsive enough to pass several pregnant motions. No one can yet foresee the character of the emerging organization, but the promise of action is clearly there. It is now up to all of us, particularly the Division's committee on professional action, which inherits the mantle of G-AP's original committee, to see that these promises are followed up promptly. Let me enumerate for you (in my own words) the three relevant motions passed unanimously at the last IEEE Board meeting on November 19 in Hollywood, Florida.

- (1) An IEEE office in Washington, D. C., will be opened. It has been funded for the first year (for \$50,000).
- (2) Any region may assess its regional members dues, and they would then be billed through IEEE HQ.
- (3) The region directors of the six U. S. regions were asked to get together and come up with recommendations on professional action. (The chairman of this committee was subsequently appointed, and is Dr. James E. Storer.)

It seems to me that if properly developed these initial actions can lead to several permanent advantages, such as

- (a) The transnational character of the IEEE remains intact. Our non-U. S. members need not worry that we in the U. S. will lose interest in them.
- (b) Decentralization means that each Region is better able to cope with its own problems in its own way.
- (c) The six U. S. Regions can work together to protect the interests of U. S. engineers through action geared to U. S. conditions, for example they can continue to fund the Washington Office, now funded by IEEE for only one year.
- (d) Other regions can solve problems peculiar to them, for example Canadian IEEE members (Region 7) can maintain a Canadian IEEE office (initial funding for which was also voted by the Board on November 19).
- (e) IEEE (transnational) dues hopefully might not need to be raised in 1973 in spite of the large budgeted deficit for 1972 (and an almost certainly continuing annual deficit if there were to be no regional dues). The regions should be able to take over support of many regional activities now paid for from transnational dues, and would thus gain more local control.

Continued

There is a natural tendency in most organizations, especially successful ones like IEEE, to maintain the status quo. The Board action in November was most heartening to me, showing that the Board is indeed responsive to members' expressed wishes. (I fear wishes that are not expressed will not be heeded.) The petition on the ballot was an easy but ambiguous expression of opinion. I hope that you, the leaders in IEEE, will find better ways to influence the development of this first small step toward a new and better IEEE organization, that is more responsive to the needs of the individual member. I would be glad to hear from you, and I am sure so would Bob Rivers (Aircom, Route 16B, Nashua, N.H. 03887); a phone call or short letter to your regional director would surely not be amiss. I intend to continue to work with your help toward a better IEEE to meet our members needs. Region 1: Harold S. Goldberg, Operations Manager, Data Precision Company, Wakefield, Mass. 01880; Region 2: George F. Abraham, 3107 Westover Drive, S.E., Washington, D.C. 20020; Region 3: Grover F. Daussman, Staff Assistant for Advanced Research and Technology (Retired), George C. Marshall Space Flight Center, Marshall Space Flight Center, Alabama 35812; Region 4: Hansford W. Farris, Associate Dean, College of Engineering, The University of Michigan, Ann Arbor, Michigan 48104; Region 5: William E. Cory, Director, Department of Electronic Systems Research, Southwest Research Institute, 8500 Culebra Road, San Antonio, Texas 78206; Region 6: John J. Guarrera, President, Guide Scientific Industries, Inc., 11855 Wicks Street, Sun Valley, California 91352.)

#### CONCLUDING REMARKS

It has been a pleasure working with you in 1971, and I shall look forward to our continued cooperation in 1972. I am sorry that there aren't enough hours in the day to keep in touch with each one of you individually.

I wish each and every one of you a very successful New Year working for a still better IEEE.

#### ASME/IEEE EMPLOYMENT INFORMATION EXCHANGE

With space made available by the ASME, both the ASME and IEEE have opened an employment information office on the sixth floor in the United Engineering Center, 345 East 47 Street, New York City.

An inauguration meeting was held on October 25, 1971 and the ASME/IEEE Employment Information Exchange began its operations the next day. This office is functioning in the same way as the VEST (Volunteer Engineers Scientists and Technicians) program which has eight locations around the country, except California, where the program originated approximately 11 years ago as "Experience Unlimited" and still operates under this title with approximately 21 offices. These two programs are located in areas called "high priority" regions and get assistance under a Labor Department grant; the VEST program is overseen by the AIAA. The ASME/IEEE exchange, also open to all other organizations in the building, does not qualify for DOL assistance and has been established for the convenience of our members.

The ASME/IEEE Employment Information Exchange is manned by volunteer unemployed engineers from both organizations. One group stays in the office while the other group of volunteers goes into the field to arouse industry interest in the project and collect job openings. The volunteers sort out resumes received and try to match applicants to the available job openings.

While each office in the "Experience Unlimited" and VEST programs concentrates on getting jobs in its own area of operation, the ASME/IEEE Employment Information Exchange has no boundary and is able to solicit job openings anywhere in the U.S. To help in this venture, we would like to ask all employers to help the IEEE in its effort to alleviate the unemployment prevalent among our engineers - a virile segment of the community where unemployment has previously been unknown - by sending in descriptions of job openings in your firms. And we would like the unemployed engineers able to do so to volunteer their services to work in the Exchange to both help themselves and their fellow engineers. Write to Mr. John M. Kinn, Director, Educational Services, at IEEE headquarters.



IEEE

SONICS & ULTRASONICS GROUP

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