IEEE

SONICS AND ULTRASONICS GROUP NEWSLETTER

NUMBER 54, April 1983

EDITOR: FRED S. HICKERNELL

G-SU National Lecturer

George A. Alers

The Administrative Committee of the Group on Sonics and Ultrasonics has announced the selection of Dr. George A. Alers as the G-SU National Lecturer for 1983-84. As the National Lecturer Dr. Alers will be available to speak before SU Chapters, graduate and undergraduate student university seminars and other appropriate local interested groups. Dr. Alers's topic for these talks will be:

QUANTITATIVE NONDESTRUCTIVE EVALUATION– A TIMELY CONFLUENCE OF SCIENCE, ENGINEERING AND ECONOMICS

The establishing of the National Lecturer program and providing a stipend to cover travel expense by SU is indication of the interest of the AD COM in supporting the activities of groups interested in sonics and ultrasonics. In addition to present SU Chapters, groups which are considering chapter formation, university groups and other IEEE groups which have an SU interest are encouraged to schedule the national lecturer. It is urged that interested groups should contact the national lecturer as early a date as practical so that he can organize his talks and schedules to best fit the groups' needs. Please feel free to Xerox or extract from the full page announcement given in this newsletter. Dr. Alers may be reached at Magnasonics, 215 Sierra Drive SE, Albuquerque, New Mexico 87108, (505) 265-7828.

Ad Com Briefs

The G-SU AdCom met on October 26, 1982 at the Town and Country Hotel in San Diego, CA, presided over by W.D. O'Brien. Twenty people attended, which included elected and ex-officio members, and future Symposia Chairmen.

W.D. O'Brien reported that negotiations were held with representatives from the U.S. Army Electronics Technology and Devices Labatory (ERADCOM) in Fort Monmouth, NJ regarding G-SU co-sponsorship of their annual Frequency Control Symposium. A memorandum of understanding has been drawn up which was presented to AdCom. Extensive discussions were also held with LRW Associates (headed by Larry R. Whicker) regarding Conference Management and Registration Services that LRW proposes to provide to G-SU. At present the only services being considered are to maintain and update our various non-member mailing lists. Conference Management and Proceedings preparation and mailing will have to be negotiated with the Symposia Chairmen and Proceedings Editor, and thus will become part of the Symposium budget approval process on a year-to-year basis.

H. van de Vaart reported that the G-SU income and expenses for the period 1/1/82 to 8/31/82 were $98.4K and $74.9K, respectively, for a surplus of $23.5K. The net worth of the Group as of 8/31/82 was $130.1K, up from $109.1K at the same time last year.

The Symposium Proceedings remains a best-seller. 1100 copies of the 1982 Proceedings will be printed, of which the IEEE will buy 525 copies for the Book Broker program. The budgeting and financial accounting for the Proceedings will be put on a more formal footing, however, and will run concurrently with the Symposium financial cycle. Consequently, the Proceedings editor will become a member of each Symposium Committee.

B.R. McAvoy as general chairman of the 1982 Symposium reported that 257 preregistrations were received, up from 208 in 1981. Because of this, he expected a record-breaking attendance, also in view of the larger than normal number of papers. A full report will be presented at the March AdCom meeting.

A preliminary budget for the 1983 Symposium in Atlanta was presented by M. Levy, General Chairman. It projected a small surplus, but it was pointed out that the budget as presented did not include the Proceedings, nor did it include exhibits, which are planned for the first time. Because loans from the G-SU to Symposium organizers have been increasing and it has become necessary to contact outside services earlier and earlier, it was decided that starting with the 1984 Symposium both the Symposium and the Proceedings budget be approved by AdCom one year in advance at the Fall AdCom meeting, instead of a half year in advance at the Spring AdCom meeting, as had been the case up to now.

The 1984 Symposium will be held November 14, 15 and 16 at the Dallas Hilton, Dallas, TX. The dates were changed from those originally announced to avoid conflict with holidays. L.T. Claiborne will act as General Chairman, with W.J. Tanski as Program Committee Chairman.

Beyond 1984, firm arrangements have been made for San Francisco, CA in 1985 in the Cathedral Hill Hotel (formerly the Jack Tar) for October 16, 18 and 18, and for Williamsburg in 1986 in the Williamsburg Conference Center for November 17, 18 and 19.

Again the question of having a Symposium in Hawaii was discussed. It was finally decided that the risk would be too great, and Hawaii as the site for 1987 was voted down. Instead, the AdCom selected Denver, CO.

As was mentioned above, the upcoming Symposium in Atlanta will feature an official exhibit. The exhibit will be organized by LRW Associates. R.S. Kagiwada, who has canvassed several companies about participation, estimated that about 15 companies would buy a booth.

W.D. O'Brien presented the Memorandum of Understanding (MOU) which was drawn up by the G-SU and the U.S. Army Electronics Technology and Devices Laboratory (USAET&DL), Fort Monmouth, NJ as guidelines for co-sponsorship of the Frequency Control Symposium, starting in 1984. While the complete MOU is too long to quote in its entirety, it basically calls for the appointment of two Administrators, one from G-SU and one from USAET&DL, who will appoint a General Chairman and a Technical Program Committee Chairman for each Symposium. Financing will be handled the same as with the Ultrasonics Symposium; a loan for up-front expenses may be obtained for each Symposium from G-SU which must be repaid after the Symposium and, for each Symposium, the surplus, if any, must be deposited with the G-SU and the deficit, if any, will be covered by G-SU. The only item that prompted discussion was that the Army wants to retain the right to call classified sessions. However, it was pointed out that the Frequency Control Symposium has never had any classified session, and that the IEEE has specific rules on how to handle these. It was the general feeling of AdCom that the Frequency Control Symposium is highly regarded in the technical community and that there always has been a lot of good will between USAET&DL and industry/universities, which should lead to a fruitful co-sponsorship of the Frequency Control Symposium between G-SU and USAET&DL. The MOU has been forwarded to the IEEE Technical Activities Board for approval.

G.W. Farnell reported that 13 students were awarded travel assistance to attend the 1982 Ultrasonics Symposium. All students had submitted papers. This program is considered a great success, and AdCom voted to make it permanent.

The next International Symposium on Applications of Ferroelectrics (ISAF) is scheduled for June 1-3, 1983 at the National Bureau

of Standards in Gaithersburg, MD. The first call for papers was mailed in July 1982, and responses in the form of requests for additional information and submission of proposed paper titles have been exceptionally good, especially from the European ferroelectrics community. This ISAF is being co-sponsored by the National Bureau of Standards, which also handles most of the meeting management activities, and the Army Research Office in conjunction with IEEE G-SU.

R.A. Moore, Chapters Chairman, reported that he had received responses from three foreign groups about the formation of local G-SU chapters. These are: Paris-France, Helsinki-Finland, and Caracas-Venezuela. He is also attempting to form a chapter in Tokyo.

The decline in our membership seems to have ended. W.J. Tanski, Membership Chairman, reported that G-SU membership is currently 2084; an increase of 2.8% from the same time last year. However, we have not returned yet to our 1980 peak of 2138. Because of the success of offering a one-year free membership in the G-SU to persons attending the Symposium, AdCom voted to continue doing this at every Symposium.

One of the main tasks of the Technical Activities Committee (TAC), chaired by A.D. Ballato, is to maintain Sonics and Ultrasonics related standards. Six standards are presently being reviewed or formulated. These are: Piezoelectricity; Definitions of Methods of Measurements for Piezoelectric Vibrators; Piezoelectric and Ferroelectric Crystals; Definitions of Ferroelectric Terms; Magnetostrictive Materials: Piezoelectric Nomenclature; Definitions of Ultrasonic Delay Lines; and Ultrasonic Field Parameter Expository Standards. TAC has presently five subcommittees: Subcommittee on Surface Acoustic Wave Devices (E. Mariani), Subcommittee on Delay Lines and Acousto-Optic Devices (A.A. Comparini), Subcommittee on Piezoelectric Crystals (T.R. Meeker), Subcommittee on Industrial Ultrasonics (R.S. Woollett), and Subcommittee on Ultrasonics in Medicine (F.W. Kremkau).

Based on the direction of thd last G-SU AdCom meeting, G-SU has participated in the formation of a new IEEE Journal of Lightwave Technology, which is the result of the efforts of the ad hoc IEEE Committee on Fiber Optics. The representatives of G-SU are T.G. Giallorenzi and D.L. Hecht. T.G. Giallorenzi was also appointed as the first Editor of the new Journal. The first issue is planned for March 1983, which will include four invited papers. G-SU members may order the Journal at the annual rate of $8.

As this was the last AdCom meeting of the year, elections were held for officers for 1983. Both W.D. O'Brien and G.W. Farnell were unanimously re-elected for a second term as President and Vice-President, respectively. H. van de Vaart was reappointed Secretary-Treasurer.

H. van de Vaart
G-SU Secretary-Treasurer

PRESIDENTIAL PRONOUNCEMENTS

The IEEE Group on Sonics and Ultrasonics (G-SU) has developed a number of programs to provide useful services and opportunities to its members. These include the newly acquired Frequency Control Symposium, exhibits for the first time at the Ultrasonics Symposium, the student travel support program, the G-SU National Lecturer program, to mention a few.

FREQUENCY CONTROL SYMPOSIUM: I am happy to announce that this very successful technical meeting is now a G-SU sponsored meeting. An agreement has recently been signed between G-SU and the Army in which G-SU will be a principal sponsor. We look forward to the continued success of this meeting which will be held the first week of June, 1983 in Philadelphia.

EXHIBITS AT THE ULTRASONICS SYMPOSIUM: In order to provide additional technical services to our members, a technical and scientific exhibit will be part of the 1983 Ultrasonics Symposium, October 31 - November 2, 1983 in Atlanta. Some two dozen organizations will exhibit their products. As always, the technical program will meet the high standards which G-SU members have come to expect.

STUDENT TRAVEL SUPPORT: Your organization believes that students are an essential component of a viable and healthy technical community. For the third year now, the G-SU AdCom is providing funds for support of students to travel to the Ultrasonics Symposium. This has been one of our most successful programs and continues to receive strong G-SU support. Consult the 1983 Ultrasonics Symposium Call for Papers for details on how a student may apply for these funds.

G-SU NATIONAL LECTURER: This program was established to promote and publicize the technical areas of G-SU to G-SU Chapters and engineering schools. The past three national lecturers have each averaged over two dozen lectures. The fourth G-SU National Lecturer is Dr. George Alers and his topic deals with quantitative nondestructive evaluation. You are encouraged to schedule the G-SU National Lecturer into your program for next year.

G-SU CONSTITUTION REVISION: Your AdCom has been busy revising the G-SU Constitution. One of the important changes involves a greater degree of participation in the G-SU AdCom by our members from outside of North America. In the future you will be asked to vote for representatives to the G-SU AdCom such that world wide representation is assured.

1983 ULTRASONICS SYMPOSIUM: Our internationally recognized meeting is scheduled for October 30 - November 2, 1983 in Atlanta. Come to Atlanta, experience southern hospitality and attend the leading ultrasonic conference.

William D. O'Brien, Jr.
G-SU President

New AdCom Members

EMMANUEL P. PAPADAKIS

RICHARD C. WILLIAMSON

ROBERT S. WAGERS

COMMUNICATE WITH ADCOM

Our new AdCom members will be serving a three-year term which began January 1, 1983. They are your representatives. Let them know your suggestions and feelings about G-SU so that it can serve you more effectively. They can be reached as follows:

Emmanuel P. Papadakis
Ford Motor Company
Manufacturing Development Center
24500 Glendale Avenue
Detroit, MI 48239
313/592-2040

Robert S. Wagers
Texas Instruments, Inc.
P.O. Box 225936
Dallas, TX 75265
214/995-4619

Richard C. Williamson
Room C-317
MIT Lincoln Laboratory
P.O. Box 73
Lexington, MA 02173
617/863-5500 X7852

MEMBERSHIP

The Sonics and Ultrasonics Group membership is currently 2136, an increase of 2.5% from the same time last year. Our membership has now returned to the peak level previously attained in 1980. The current grade distribution of our membership is as follows: Fellows (4%), Senior Members (11%), Members (69%), Associate Members (5%), and Students (11%).

Starting with this article, we wish to describe review various aspects of the IEEE and the Sonics and Ultrasonics Group in order to help the reader to remain fully aware of the value of membership. For too many members the only real connection they have with the IEEE and the Group is through the publications, and this appears to be of limited value since many of these publications are archival in nature and they are usually available in a local library. As we shall see the IEEE in conjunction with the various technical Societies and Groups is a truly comprehensive professional organization which services every aspect of a member's professional needs.

The first aspect we will discuss is the membership Grade structure. Four grades are available by application depending upon members' educational background and length of service in the field. These are: Student, Associate (generally for persons with less than a Bachelor's degree), Member, and Senior Member. A person must have 10 years' involvement in the field to become a Senior Member and three references must be obtained. This is a grade which we believe too few members make the effort to apply for, and this is unfortunate since this grade confers the recognition and status which senior engineers and scientists generally deserve. We therefore strongly encourage anyone eligible to apply for this grade. Application forms may be obtained from the IEEE, this author, or at the yearly Ultrasonics Symposium.

The grades of Fellow and Honorary Member are conferred by the governing groups of the IEEE. These grades recognize outstanding levels of achievement and contributions to the field, and the grade of Fellow is a signi ficant benefit resulting from membership in a particular technical society or group.

William J. Tanski
GSU Membership Chairman

EDITORS THANK YOU

The editor appreciates the articles from various members which make-up this issue of the G-SU newsletter. Newsworthy articles from any G-SU member are welcomed.

The editor also gratefully acknowledges the work of Bob Mills who patiently typed this newsletter.

IEEE FELLOWS

Four members of the Ultrasonics Group were made fellows last year: Mr. Eric Herz (for contributions to the development and management of information systems for testing aerospace vehicles and for valuable services to the Institute); Dr. Kenneth Laker (for contributions to filter design and microcircuit implementation); Professor Toru Maruhashi (for research on the analysis and simulation of high frequency inverters and other power electronic circuits); Dr. Tsuneo Nakahara (for contributions to the development of microwave transmission lines, traffic control systems, and fiber optics); Dr. Takashi Sugiyama (for developments in precision power measurement techniques and for leadership in electronic measurement and control industries); and Prof. Chen Shui Tsai (for contributions to acousto-optic devices for wideband real-time signal processing and for acoustic microscopy).

It is always gratifying to see the number of people in our group who are qualified for this great honor. As chairman of the Fellow Committee of the Sonics and Ultrasonics Group, I encourage you to submit nominations of qualified candidates for fellow of the IEEE. Individuals whose names are submitted must have been senior members of the IEEE for at least three years, and they should have attained distinction by their research or by a lead part in the development of new types of important devices or systems. At least five references will be required from IEEE fellows. You should submit nominations to IEEE headquarters before April 15th and request support for the nomination from the local chapter and group(s) to which the nominee has made his major contributions.

Gordon S. Kino, Chairman
G-SU Fellows Committee

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John de Klerk
1917 - 1983

John de Klerk died on the afternoon of January 18, 1983 in Lewisburgh, PA. He is survived by his wife Ann, daughter Sussan and son Peter. John had retired as Consulting Scientist from the Westinghouse R&D Center in 1979. He had served GSU as President and Editor of the Proceedings which he started in 1972. He was the recipient of the first GSU Achievement Award given by the group.

John's gift was that he loved his work. For him tomorrow was always another day with another challenge and that was reason enough to look forward to it. He imparted that feeling. Because of it we liked to be around him.

An article In Memorium will appear in the Group's Transactions.

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1982 Ultrasonics Symposium Report

Total paid registration for the 1982 Ultrasonics Symposium was 446. The total attendance was 544 with 32 guests, 43 students and 23 sponsors and complimentary registrations. Overseas registration was 89 plus 7 students for a total of 96. The registration figure for California residents was 107 or nearly 20% of the total. The international character of the Symposium was attested to by participants from Cape Town (South Africa), Brazil, Egypt, and China to name a few.

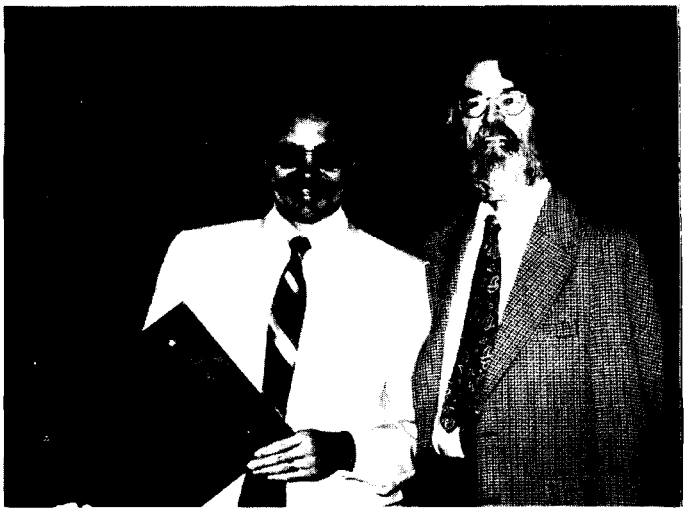
A special outing was held on the first night of the Symposium (Wednesday, October 27) at the Wild Animal Park which is owned and operated by the San Diego Zoological Society. As the World's Largest Zoo with a night "safari" trip which is unique we thought it would be a worthwhile offering. An excellent dinner with wine was provided for 178 paid plus 4 guests. In addition to the safari and dinner the bird show was presented to our group and was, we believe, an outstanding attraction. As the Financial Chairman's report shows, the cost per person of $21.00 covered nearly all costs except transportation.

I believe the Conference Management staff of the Town and Country Hotel is to be complimented for the way in which they accommodated our "last minute" need for extra conference rooms and five parallel sessions on Thursday (October 28). This expansion required extra equipment and pushing and shoving during the Symposium. Two audio visual firms had to be employed to provide for the GS-U President's Speaker and the additional AV load.

Without the excellent cooperation of a local team it would not be possible to have a meeting run by out-of-towners. Special compliments should go to R.C. Badewitz and Harper Whitehouse for a job well done.

We have heard few negative comments about the Technical Program of the 1982 Symposium. That success was due to Bob Wagers, Technical Program Chairman, whose very competent efforts together with that of his committee made it possible.

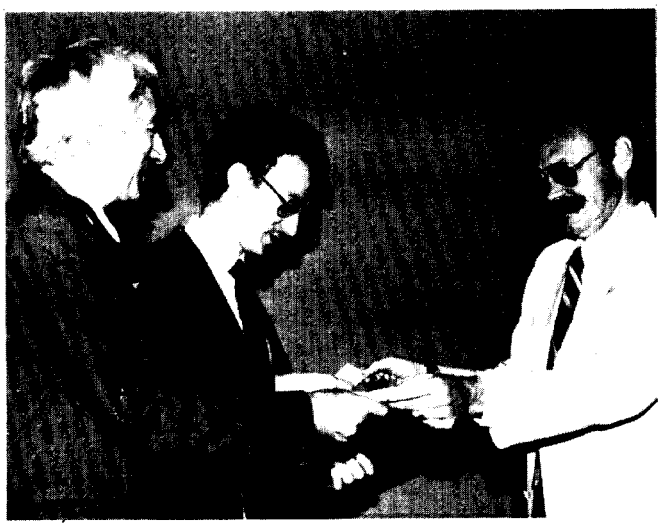
B.R. McAVOY
General Chairman



Herbert J. Shaw, Stanford University accepts GS-U Achievement Award from W.D. O'Brien, Jr. "For Many Contributions, Through Research and Education, to Ultrasonics Technology."

Frank E. Barber, Harvard Medical School, hits the road as the GS-U National Lecturer. His title: "Ultrasonics in Medical Diagnosis and Biomedical Research."

Scenes from the 1982 Ultrasonics Symposium



S.D. Bennett, Stanford University (center) and E.A. Ash, University College, London (left) accept GS-U Best Paper Award presented by W.D. O'Brien, Jr. GS-U President. The paper is entitled "Differential Imaging with the Acoustic Microscope."

Pierre Tournois, ASM, Thomson-CSF accepts GS-U Best Paper Award - Honorable Mention for D. Boucher, GERDSM, M. Lagier and C. Maerfeld, Thomson-CSF. Their paper was entitled "Computation of the Vibrational Modes for Piezoelectric Array Transducers Using a Mixed Finite Element - Purturbation Method."

L.A. Crum, 1982 G-SU President's Speaker, grapples with acoustics problem. His talk "Acoustic Cavitation in Liquids" was very well received.

Four "Birds" (one real one) discuss Symposium affairs at Wild Animal Park outing.

IEEE 1983
ULTRASONICS SYMPOSIUM

AN INTERNATIONAL SYMPOSIUM

ATLANTA, GA.

OCTOBER 31, NOVEMBER 1, 2

General

The 1983 Ultrasonics Symposium will be held October 31 through November 2, at the Marriott Hotel in Atlanta, Georgia. This symposium is one of the most prestigious of the IEEE International conferences and is devoted to both applied and fundamental aspects of ultrasonics. This year's symposium will include both a technical program and exhibits. The technical program will continue to cover the wide range of interests encompassed by the SU group by means of invited and contributed papers. The exhibits, organized for the first time, are designed to provide additional benefits to the symposium attendees.

Technical Subjects

Sessions are planned in the following areas:

AE Acoustic Emission
AM Acoustic Microscopy
ACE Acousto-Electric Effects and Devices
AO Acousto-Optic Effects and Devices
AOS Acousto-Optic Signal Processing
ABS Arrays and Beam Steering
BB Bioeffects and Biophysics
BW Bulk Wave Effects and Devices
CU Consumer Ultrasonics
DMC Defect and Material Characterization
IU Industrial Ultrasonics
PF Piezoelectric and Ferroelectric Materials
IS Inverse Scattering
HT Hyperthermia
MSW Magnetostatic Waves and Devices
MU Medical Ultrasonics
NDE Nondestructive Evaluation
PAS Photoacoustics
PA Physical Acoustics
SFT SAW Filters and Transducers
SMP SAW Materials and Propagation
SRO SAW Resonators and Oscillators
SSP SAW Signal Processing
SSA SAW System Application
TFA Thin Film Acoustic Technology
TC Tissue Characterization
SEN Sensors
PM Porous Media

Deadline for receipt of abstracts is July 1, 1983.

Symposium-Exhibit

A professionally managed exhibit to accompany the symposium is being organized. The exhibit will be held immediately adjacent to the Technical Sessions in the Atlanta Marriott Hotel to provide good interaction between symposium attendees and exhibitors. Currently more than ten companies, from manufacturing acoustic substrates, devices to equipment, have signed up for the symposium exhibit.

Andersen Laboratories, Inc.
Crystal Technology, Inc.
MEA
Panametrics Industries, Inc.
Phonon
PiezoCrystal, Inc.
RF Monolithics, Inc.
SAW Tek, Inc.
SAWYER Research Products, Inc.
Sonoscan, Inc.
Valpey-Fisher
Westinghouse Defense & Electronic Systems Center.

Companies interested in participating in symposium-exhibits can obtain information by contacting LRW Associates, 1218 Balour Drive, Arnold, MD 21012, Tel. (202) 767-3312 or (301) 647-6034.

Student Travel Assistance

Some limited travel assistance is available to support student attendance at the 1983 Ultrasonics Symposium in Atlanta. To be eligible, students must be registered in a degree program (graduate and undergraduate) and be interested in the ultrasonics area. Preference will be given to authors or co-authors of papers submitted for presentation at the Symposium.

Application forms can be obtained from G.W. Farnell, Dean, Faculty of Engineering, McGill University, 817 Sherbrooke Street, West, Montreal, Canada H3A 2K6 (Telephone 514-392-5859). The deadline for the submission of applications is July 15, 1983.

Atlanta

Atlanta is the transportation, financial, and technical hub of the southeastern United States. The population is nearing two million in the metropolitan area, which now sprawls over a seven county area of central Georgia.

For the month of November the average temperature in Atlanta is 51°F, with an average high of 62° and an average low of 41°. During the month of November the average relative humidity is 70% and the average rainfall is 3.4 inches.

Airline service is through Atlanta's new Hartsfield International Airport facility. The airport is approximately 12 miles south of city center. Taxi, limousine, and airport bus service is available between the airport and all major hotels. Taxi fare to the conference hotel will be about $15, while limousine and airport bus fares will be about $5.50 per person.

Atlanta Attractions

*SIX FLAGS OVER GEORGIA - Acres and acres of great rides, spectacular live shows,

exhibits, historic attractions, spectacular flowers and landscape. Open weekends October and November, 10 AM - 6 PM.

*ATLANTA MEMORIAL ARTS CENTER - One of the largest arts centers in the United States and houses the Atlanta Symphony; the High Museum of Art; the Alliance Theater and the Studio Theater.

*THE CYCLORAMA - The most moving and impressive memorial of the battle which sealed the fate of the Confederacy is the Cyclorama of the Battle of Atlanta which occurred on July 22, 1864.

*STONE MOUNTAIN MEMORIAL PARK - Stone Mountain is the world's largest piece of exposed granite with a magnificent 90-foot-high Confederate Memorial carved in relief on the side of the mountain.

Further information concerning the Symposium and Exhibits can be obtained by contacting:

General Chairman
Moises Levy
University of Wisconsin-Milwaukee
Department of Physics
Milwaukee, WI 53201
(414) 963-4168

Technical Chairman
Reynold S. Kagiwada
TRW, R6/1563
One Space Park
Redondo Beach, CA 90278
(213) 535-5515

FORTHCOMING ULTRASONIC SYMPOSIA

1984 Dallas
Dallas Hilton
November 14-16
L.T. Claiborne

1985 San Francisco
Jack Tar Hotel
October 16-18
W.R. Shreve

1986 Williamsburg
Conference Center
November 17-19
J.S. Heyman

FREQUENCY CONTROL SYMPOSIUM

The 37th Annual Frequency Control Symposium is being co-sponsored by the Group on Sonics and Ultrasonics. It will be held this June 1, 2, and 3 at the Marriott Hotel in Philadelphia, Pennsylvania. This year's general chairman is J.R. Vig of U.S. Army ERADCOM. Several topics will be covered including the theory and design of piezoelectric resonators, resonator process technology, SAW devices, atomic and molecular frequency standards, filters and signal processing and laser frequency standards. There will be exhibits and anyone wishing to participate in this activity should contact Michael Mirachi, Brinley Plaza, Rte 38, RD1 Box 352, Wall Township, NJ 07719, (201) 280-0410.

NATIONAL LECTURER SCHEDULE

Frank E. Barber our National Lecturer on "Ultrasonics in Medical Diagnosis and Biomedical Research" has had a busy speaking schedule. Contact Frank at 617/732-3582 if you wish to hear him before his tour of duty ends on June 30th.

Date	City	Sponsor
9/15/82	Boston, MA	ATL
9/22/82	Stanford, CA	IEEE GSU Chapter
9/23/82	Palo Alto, CA	Hewlett Packard
10/19/82	Phila., PA	Philadelphia IEEE Section
10/20/82	Yorktown Heights, NY	IBM TJ Watson Res Lab
10/21/82	Briarcliff Manor, NY	Philips Labs.
10/21/82	Yorktown Heights, NY	Sigma Xi Society
10/27/82	San Diego, CA	IEEE Ultrasonics Symposium
11/8/82	Farmingdale LI, NY	IEEE L.I. Section & GSU Chapter
11/9/82	State College, PA	Penn State, Central Penn Section, IEEE
11/17/82	Lexington, MA	Boston IEEE GSU & EMBS
2/23/83	St. Louis, MO	Washington University Physics Dept.
2/24/83	Milwaukee, WI	IEEE MTT and EMBS
3/9/83	Boston, MA	ASNDT
3/15/83	Washington, DC	IEEE GSU Baltimore, Washington, No. Va.
4/6/83	New York, NY	Ultrasonic Industry Assn., Symposium

SUMMER COURSE

Non-Ionzing Radiations: Biophysical and Biological Basis, Applications, and Hazards in Medicine and Industry

Massachusetts Institute of Technology, Cambridge, MA
August 8 - 12, 1983

The course will emphasize practical considerations in safe and effective use of these modalities in Medical and Industrial practice, e.g. methods and instrumentation for power measurement, calibration, dosimetry, compliance with Federal and State regulations, etc.

For further information, please contact:

Director of Summer Sessions
Room E19-356, M.I.T.
Cambridge, MA 02139

Chapter Activities Reports

BOSTON

By May, the Boston Chapter will have had six meetings. Two of these meetings had talks on the very popular topic of ultrasonics in medical imaging. In November, Frank Barber, the National Lecturer, presented his talk on "Ultrasonics in Medical Diagnosis and Biomedical Research." In February, Tom Szabo from Hewlett Packard discussed transducer array design for the HP real-time ultrasound imaging system. In December, a joint meeting with the Microwave Theory & Techniques and Magnetics groups was held. The speaker was J. Douglas Adam of Westinghouse, who discussed recent progress in magnetostatic devices. On April 13, Don Lee of the University of Maine will discuss techniques for generating bulk waves with interdigital transducers. The remaining two of the six talks are on the subject of surface acoustic wave devices. In January, Richard Webster of RADC presented a talk on "Programmable Surface Acoustic Wave Filters," and in May, Gary Montress and Tom Grudkowski, from United Technologies Research Center will discuss surface acoustic wave devices on GaAs.

Thomas Parker
Chapter Chairman
617/863-5300 X3084

SANTA CLARA VALLEY

After three years of regular meetings, it is clear we are providing a forum for interaction among the ultrasonic community that is appreciated.

The Santa Clara Valley Chapter has had a schedule of monthly programs emphasizing imaging and medical applications of ultrasound. Our attendance this year has averaged 30 people of whom one-half to two-thirds are IEEE members. We usually hold our meetings on the third Wednesday of each month in the evening at Stanford University. Although the scheduled program lasts only an hour, after each meeting informal discussions often last an hour or more.

The program for this year is as follows:

"Ultrasonics in Medical Diagnosis and Biomedical Research," by Prof. Frank Barber, Harvard Medical School (National Lecturer) on September 22, 1982.

"Spectrum Analysis of Doppler Ultrasound in Real Time," by Frank W. Ingle, James Brennan, Norman Rogers, Meda Sonics Inc., on October 13, 1982.

"Magnetostatic Wave Devices and Applications," by Waguih S. Ishak, Hewlett-Packard Laboratories, on November 17, 1982.

"Recent Developments in High Resolution Ultrasonic Imaging - Engineering Consideration and Clinical Applications," by William J. Carrano, Cooper Medical Devices Corp., on December 15, 1982.

"Ultrahigh Resolution in the Acoustic Microscope," by Daniel Rugar, Dept. of Applied Physics, Stanford University, on January 19, 1983.

'Commercially Available SAW Devices and Their Applications," by William R. Shreve, Hewlett-Packard Laboratories, on March 16, 1983.

"Orthographic Ultrasonic Transmission Imaging' by Philip S. Green, SRI International, on April 20, 1983.

"Fiber Optic Ultrasonic Sensing," by Joseph Bucaro, Naval Research Laboratories, on May 18, 1983.

Anyone visiting the Bay Area at the right time of month is welcome to attend our meetings. If you will be in the area in the 83-84 academic year and would like to be a speaker at one of our meetings, please contact me.

William R. Shreve
Chapter Secretary
415/857-2664

WASHINGTON-BALTIMORE-VIRGINIA

The Washington-Baltimore-Virginia section of SU substantially expanded its program this year with a schedule of seven talks and dinner meetings. At the first of these, last October, R.K. Cook of the National Bureau of Standards presented an overview of sonics activity with "Sonics: Past, Present and Future." This was followed in November by Dr. Edward Neal's (E.G. & G) presentation of "Underwater Communication via Sonar." Then, in December, Dr. John Thorn from Texas Instruments presented his company's work on "Speech Synthesis" by candlelight, with demonstrations. The next meeting was held in February in conjunction with the Optical Society of America when Dr. Eugene Skurnick of the Riverside Research Institute (New York, NY) talked about "Acousto-Optics Technology and its applications to Laser Radar."

The most recent activity will have been to host Dr. Frank Barber, the IEEE SU National Lecturer from Harvard Medical School, on March 15, at the University of Maryland Adult Education Center where a majority of our programs are held. For further information, feel free to contact our secretary, Dr. Narendra Batra, at 767-3505.

G.V. Blessing
Vice Chairman

CHAPTERS

At this time of the year Chapters should be completing another successful year and be laying ground work for the 1983/84 year. Elections should, at least, be scheduled and time allocated to establish next year's program. Every Chapter should have had the pleasure of hearing Dr. Frank Barber, this year's National Lecturer and be planning to invite Dr. George Alers, next year's lecturer. The details of his talk are published in this newsletter.

Like all other organizations, Chapters do not stand still. They are either developing or digressing. Every year, every chapter should ask itself how it can better serve its members and thereby strengthen both their professional development and its own stature. In areas with a relatively small number of members, joint meetings with other IEEE or other similarly interested groups frequently proves fruitful. This both enhances the value of the meeting and opens vistas for SU members by increasing their familiarity with other areas related to their work.

Present Chapter Count

US Chapters	6
Organizing	1
Foreign Chapters	-
Organizing	3

Establishing a chapter requires first and foremost a person willing to provide the organizational glue and see to it that events happen. Usually these people have identified themselves, as our organization is much too large for the Administrative Committee to know of their interest. Once an organizer has volunteered, they usually find that there is an underlying intent which can be developed. We all like to have someone else take the lead. If there is significant acoustic activity in your area, why not consider a chapter. Three of our present chapters began in University environments and three were based on a broad community of interest in the area. Where technologies closely related to SU's activities occur in more than one University department or more than one company there may be a basis for chapter formation. Anyone interested is encouraged to contact the undersigned.

Anyone desiring activity with any of our present chapters should contact them directly as indicated in their reports. For information on the Irvine Chapter contact Dr. Chen S. Tsai (714) 833-5144 at the University of California, Irvine, CA. For information on the Pittsburgh Chapter contact Bruce McAvoy, Westingshouse R&D Center, Pittsburgh, PA (412) 256-7267. Contact H.R. Carleton, State University of New York, Stony Brook, NY (516) 246-5980 for information on the Long Island Chapter.

R.A. Moore
Chapter Coordinator
(301) 765-4027

IEEE TRANSACTIONS ON SONICS AND ULTRASONICS

The 1982 Transactions on Sonics and Ultrasonics had approximately 438 pages for the 6 issues. This fell short of our page prediction of 528 pages. Since the Transactions is a major, if not the major, benefit of our Group, I would like to solicit more papers from our Sonics and Ultrasonics professional community. We welcome all types of papers that cover basic physical phenomena, research, development and applications. The latter are especially welcome, since industrial corporations of all sizes are, by necessity, striving to make use of many technological advances that have already been researched and developed.

The 1982 Transactions did succeed (by plan) to publish a more even distribution of our technological areas of interest. Peruse through the 6 issues and you will find this to be evident. We are continuing to strive for more even and diversified coverage of all areas.

We have some excellent papers that will be published in 1983. Some of these are "Optical Fiber Repeatered Transmission Systems Utilizing SAW Filters" by R.L. Rosenberg et al, a review paper on "Laser Generated Ultrasonic Pulses in Both Solid and Fluid Media" by D.A. Hutchins, an historic paper of the early beginnings of SAW resonators right through to their present important system applications by P. Cross and W. Shreve, and a variety of papers in Acoustic Imaging. In addition, Special Issues on Digital Electronics for Acoustic Imaging, Acoustic Microscope and Biological Effects of Ultrasound are in the planning stages and calls for papers will be generated soon.

We welcome on board newly appointed Associate Editors, Jim Greenleaf of the Mayo Clinic, "Acoustic Imaging," Ed Staples of Rockwell Science Center, "Filters and Resonators," and Moises Levy of the University of Wisconsin, Milwaukee, "Physical Acoustics." At the same time, the entire Sonics and Ultrasonics community expresses deep gratitude to the outgoing Associate Editors, Manfuz Ahmed, Canyon General Hospital, Tim Pearman, Bell Labs, and Walter Mayer, Georgetown University, for their dedicated time and talents that they have given while serving in this capacity. Best wishes, thanks, and continued success to all.

Finally, another request to all, share your technical achievements and work throughout the world, write and submit papers for our Transactions on Sonics and Ultrasonics.

Stephen Wanuga
Editor, Transactions on
Sonics and Ultrasonics

IEEE - SONICS AND ULTRASONICS
NATIONAL LECTURER PROGRAM

QUANTITATIVE NONDESTRUCTIVE EVALUATION- A TIMELY CONFLUENCE OF SCIENCE, ENGINEERING AND ECONOMICS

George A. Alers
President
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ABSTRACT

Nondestructive Testing (NDT) is a stepchild technology because it uses many disciplines and sometimes exhibits a rather tenuous connection with science. It is, however, important because U.S. industry spends nearly $120 billion a year on preventing fractures in materials and repairing the damage caused by such failures.* In recent times, the demand for high reliability in aircraft and space vehicles coupled with the drive to reduce fabrication costs have led to the widespread use of Fracture Mechanics to guide designers in deciding when to accept or reject a part that is not perfect. (It is very expensive to produce structures that have absolutely no defects or to throw away parts that can continue to survive their intended function.) In order to apply Fracture Mechanics, it is important to know the size, shape, and orientation of cracks or other inhomogeneities in a part so that a mathematical prediction of the failure load or the fatigue lifetime can be made. Thus, the modern practitioner of nondestructive testing becomes an engineer who applies quantitative analysis to evaluate the properties of mechanical structures and devices. Hence, the modern appellation Nondestructive Evaluation (NDE).

Among the tools for inspecting a part for hidden flaws, ultrasonics ranks near the top because it can penetrate the interior of heavy sections and the sound waves reflected by an inhomogeneity carry back information about the mechanical properties of the reflector. Furthermore, the acoustic waves can be easily converted into electrical signals that can be processed quickly in computers to give desired information in real time. Thus the geometrical properties of a crack demanded by Fracture Mechanics can now be automatically deduced at high speed without having to make an X-ray photograph and analyze the image with the eye of a human.

The talk to be presented will emphasize how ultrasonic nondestructive evaluation uses a combination of physics, mechanical and electrical engineering as well as computer science to make structures and machines more safe. Physics gets applied in the description of how the ultrasonic waves propagate through inhomogeneous and anisotropic solids to become scattered and mode converted by a crack or sharp precipitate. Electrical engineering plays its role in designing the transducers to efficiently interconvert electrical signals and sound waves as well as to direct the sound beam in desired directions through the use of concepts found in optics and antenna theory. Computers are then used to process the signals so that the important information can be displayed or used to control the manufacturing process or to make an accept-reject judgment. Examples of the products of this interdisciplinary approach will be drawn from the problems of inspecting buried gas pipelines, railroad rails, ceramic parts, welded joints, composite materials, and adhesive bonds.

*Wall Street Journal, March 3, 1983

RESUME

Dr. George A. Alers received his BA degree in Physics from Rice University and his Ph.D. in Physics from the State University of Iowa. He has worked in industrial research laboratories all of his professional career beginning with the Westinghouse Research Laboratory where he was a metal physicist working on the basic mechanisms of fracture in high strength metals. Later, at the Scientific Laboratory of the Ford Motor Company, he used ultrasonic waves to study the elastic and anelastic properties of materials as a function of temperature, pressure, and magnetic fields. It was here that he developed methods for measuring very small changes in the velocity of sound and used the technique to better understand the thermodynamics of superconductors, to measure the third order elastic constants and to detect the stiffening effect of a magnetic field on the electron gas in metals. It was during his stay at the Science Center of Rockwell International that he applied ultrasonic wave concepts to nondestructive evaluation of such exotic materials as the thermal protection tiles for the Space Shuttle, fiber reinforced composites for aircraft and rubber windows for sonar systems. Currently he is President of a small company that specializes in research, development, and sales of electromagnetic acoustic transducers for the ultrasonic inspection of metals under high speed conditions and in remote locations.

Technical Activities Report

The G-SU TAC is currently responsible for five items, four standards and one "project" listed below. With our concurrence, project P426 "Definitions for Ultrasonic Delay Lines" was withdrawn by the IEEE Standards Board at their meeting on 9 Dec. 82.

176-1978	Piezoelectricity (C83-1979)
177-1966	Definitions of Methods of Measurement for Piezoelectric Vibrators (C83.17)
180-1962(R1971)	Piezoelectric and Ferroelectric Crystal: Definitions of Ferroelectric Terms
319-1971(R1978)	Magnetostrictive Materials: Piezomagnetic Nomenclature
P790 9/27/79 PAR	Ultrasonic Field Parameter Expository Standards approved

Standard 319-1971, "Magnetostrictive Materials: Piezomagnetic Nomenclature" is due for review. It has been assigned to the Piezoelectric Crystals Subcommittee. A letter to the editor appears in our March Transactions giving some corrections and proposed additions to this standard. The procedure of using the letters section as an adjunct to the review process might speed the process and the subcommittee chairmen are urged to explore its use.

The following status reports reflect the activities of the current subcommittees:

Surface Acoustic Wave Devices - E. Mariani

A meeting of the subcommittee was held at San Diego. A list of terms and definitions was drawn up for review. These include those in IEC document 49 (Central Office) 149, "Terms and Definitions for Surface Acoustic Wave (SAW) Filters."

A PAR on "Surface Acoustic Wave (SAW) Devices" has been submitted thru IEEE Standards office for action by NesCom on 16 Mar. 83. If approved it will become P996 and become the main activity of this subcommittee.

Delay Lines & Acousto-Optic Devices - A. Comparini

A subcommittee meeting was held in San Diego, at which time it was agreed to divide into two groups - one to work on A-O Standards and one to work on Delay Line Standards.

A PAR will be submitted covering work leading to a standard on Definitions of A-O Terms. A second task has also been proposed - Testing A-O Devices; this will be considered in due time.

Piezoelectric Crystals - T. Meeker

It is planned to reprint Standard 176-1978 and distribute it with the SU Transactions mailing. In the accompanying Transactions, a Letter is planned to be published giving proposed additions and corrections to the standard, and calling for reader comments. At the March 1983 AdCom the financial aspects of reprinting Standard 176 should be addressed,while the Letter will be drafted at a subcommittee meeting to be held at the 37th Annual Frequency Control Symposium in Philadelphia in June 1983.

Ultrasonics in Medicine - F. Kremkau

A decision will be made in March 1983 whether P790 ought to be pursued or withdrawn; and if withdrawn, what is to be the work of this subcommittee.

Industrial Ultrasonics - R. Woollett

The English translation of document 29D (Secretariat) 18, on Magnetostriction Transducers, will be edited prior to printing. The next IEC meeting of WG-3 of TC-29 will be held in Paris during the Summer of 1983 to continue work on the preparation of a document on high-power ceramic transducers for industrial application.

Art Ballato, Chairman
G-SU Technical Activities

BECOME A SENIOR MEMBER

Each member renewing 1983 IEEE membership will have mailed to them a Member Record Confirmation form. This Autumn, members who may qualify for Senior Member grade will also have included with this mailing a Senior Member application request form. These members are urged to return the request form with their Member Record Confirmation form to assure receiving Senior Member grade information and application.

IEEE is interested in encouraging all members to hold the highest grade of membership for which they are qualified. If you're a Senior in the profession, you should be a Senior in your professional society.

When you renew membership and receive this important mailing, be sure to request a Senior grade application with the enclosed form.

HISTORIC PETITION BY SOCIETY PRESIDENTS

IEEE history was made in Los Angeles on February 17, 1983 when the Technical Activities Board (TAB) took a bold and unusual stand: it endorsed the adoption of a constitutional amendment requiring parity between the number of Technical Division Directors and Regional Directors. (At present there are 8 Divisional Directors and 10 Regional Directors in a total of 32 Directors; the constitution allows the total to be anywhere between 9 and 50.)

Later in the day several Society Presidents initiated a petition for such an amendment, in order to ensure follow-up action; and TAB went on record to support it. The petition is very simple and reads as follows:

We, the undersigned members of the IEEE, petition for an amendment to Article VI of the Constitution, adding the statement that "The number of Divisional Delegates/ Directors shall be equal to the number of Regional Delegates/Directors."

Let's summarize the reasons which led to the petition. IEEE is primarily a technical organization. Although not all members belong to technical Societies, those who do, subscribe to several Societies; the total number of Society memberships exceeds the total number of Institute memberships. The rub comes here: every member is assigned to a geographic region and there are 10 Regions; every Society member is assigned to a technical division and there are only 8 Divisions. Thus the larger technical membership ends up with a smaller representation on the Board.

The number of Regions and Divisions is arbitrarily fixed by the Directors and can be changed by them through a change of bylaws, without requiring a constitutional amendment. A bylaws change to equalize the two numbers would have been the simpler approach. However, recent experience has shown that the Board is highly unlikely to make such a change. In fact it took considerable pressure by the Computer Society and TAB to get the eighth Division Director starting in 1983. The Board approved it reluctantly after a long drawn-out debate and many attempts to sidestep the issue; it also attached a 3-year sunset provision, so that the number can revert back to 7 Divisions at the end of 1985.

The only sure way to get the desired change is through a constitutional amendment approved by the membership: there is no room for equivocation when the members have spoken!

Why is it so important to increase our representation on the Board? The answer is simple: the Board makes all decisions on matters of policy, budget, and administration. At present only 8 of the 32 Directors speak for the Technical Societies. Although other Directors are often highly technical individuals, they represent a different constituency when serving on the Board and have no obligation to us. We need a stronger voice to protect our interests.

Our under-representation can have serious implications, as we have found in several cases. For example, the budgetary allocations have often been unfavorable to Societies when the revenue from basic membership dues is divided among various entities. Similarly, Societies are often charged for services which they feel should be paid from general funds. Another significant issue is the policy governing new Regional conferences, which may harm some established conferences run by Societies. Although these conferences can be profitable, we feel it is necessary to give greater attention to Society interests and to develop formulas allowing Society participation in the form of technical and financial cosponsorship directly or through their local Chapters. Many other examples abound, where a Society feels the Board is not being fully aware of and responsive to its problems.

The proposed solution is attractive and feasible--and it will be a clear signal that the Societies want a greater voice on the Board.

1984 CENTENNIAL ACTIVITIES

The highlight of the IEEE centennial year activities will be the May 14, 1984, Centennial Day program at ELECTRO in Boston, Mass. Activities will include the IEEE awards presentation and reception for representatives of 100 invited societies or associations from around the world, and a major address and presentation of the Centennial Medal to past and present Institute Presidents, Medal of Honor recipients, and others.

Other key centennial year activities already scheduled include:

Jan. 30, 1984: Ceremonies at the IEEE Power Meeting in Dallas, Texas.

May 13, 1984: A special program to celebrate the anniversary of the May 13 founding of the American Institute of Electrical Engineers in 1884 and of the Institute of Radio Engineers in 1912, to be held in New York City with the help of the IEEE New York Section.

Oct. 7-8, 1984: A centennial convocation at the Franklin Institute in Philadelphia, PA with a series of meetings and a convocation of former Medal of Honor recipients.

Plans also include a Technical Activities Board Centennial Conference and a West Coast Celebration, but the exact days and locations for these events have not yet been determined.

DIVISION IV REPORT

One of the activities that I am delighted to see move forward is the creation of the Journal of Lightwave Technology. This is a joint enterprise of the IEEE and the Optical Society of America, and it has taken some time and effort to gain agreement on the partnership. However, with the able leadership of Henry Kressel, the representatives of nine IEEE Societies (four of which are in Division IV) have developed a suitable organizational structure. Tom Giallorenzi, the editor of the new journal, is off and running with what will soon be the premier publication in the area of fiber optics technology and applications.

One aspect of the vitality of the IEEE technical structure is the ability to form new entities to address emerging technology areas. At the November meeting, TAB approved the formation of the Oceanic Engineering Society. Don Bolle has made an outstanding contribution to the profession through his leadership of this activity, which has previously been organized as a Council.

Over the past decade, the IEEE PRESS has published about eight books annually. Most of these have been selections of reprints, although there are some volumes of specially written material. Now there is to be a substantial expansion of the IEEE PRESS so that it can serve as the consolidated book publishing arm of the Institute. There are to be book series based on reprints, tutorials, and special issues of the Transactions and Proceedings. Both the volunteer and staff structure will be expanded, and a simpler and better royalty system will be used. Only hardcover books will be published, with a significant discount to the price for members.

The subject of conference activity has generated considerable debate at the Board meetings over the past two years. As the number of conferences increases, the perceived conflicts multiply by overlaps in time, location and technical area. The large regional shows have highlighted these problems. At the November Board of Directors meeting, the recommendation was made that an IEEE Conference Board be established, with appropriate staff support. With this mechanism, professional support to conference and symposium organizers could be provided, and conflicts could be arbitrated, with uniform treatment of all entities.

A major concern of those engaged in scientific and engineering disciplines is the transfer of technology. Recent actions by the U.S. government have generated debate on the effect of limiting the flow of information. In June 1982 IEEE Spectrum magazine held a round-table meeting on this subject with participants from industry and government. A report of this meeting is now available. It is titled Managing the Flow of Technical Information, and you can obtain a copy by writing to Ellis Rubenstein, senior editor, IEEE Spectrum, 345 East 47th Street, New York, NY 10017.

Several of the Societies are well along with their special activities for the IEEE Centennial year, 1984. Among the plans are histories of the Societies, plenary sessions at the annual conferences, special sessions on notable achievements, and historical exhibits. This is an excellent opportunity to involve the Life Members of the Societies as a resource to develop Centennial programs; very often they were at the birth of the Society or of some of the major technical accomplishments. I encourage you to aid your Society in our Centennial activities.

Congratulations are in order for the IEEE Fellows that have been selected this year. Looking toward next year, it is time to plan the submission of candidates for consideration in 1983. It takes a lot of time so don't put off the start.

I have enjoyed serving as your Division Director for the last two years. I've met a lot of dedicated and talented individuals who devote an extraordinary amount of time and effort to IEEE activities. I appreciate the help I've been given, and I hope that I have contributed to furthering the interests of the Institute and its members. Thanks for the opportunity.

Allen C. Schell, Director
Division IV

THOUGHTS ABOUT ENGINEERS

Comments by 8 to 10 year-olds published in MIT's Technology Review:

There are many different kinds of engineers, like electrical, chemical, and even civilized engineers.

The sanitary engineers are the cleanest of all engineers--or would like to be.

One day I hope to be a famous engineer and do it in my city's outer skirts, because that's where all the action is, if you know what I mean.

Engineers can't be nervous or nutty--their work is a serious business. One wrong move and it could mean phoof in the pipes.

A computer has five parts--input, output, and the rest is memory which I forgot.

Oscillators are things that only encyclopedias know for certain about.

The meaning of sextant is something I can't write about.

I want to be an engineer when I grow up. Tell me just how good I have to be in math, because if I have to be real good, don't count on me coming.

Reprinted from the June 1981 issue of the Electrical Insulation Newsletter.

VITA: APPROPRIATE TECHNOLOGY FOR THE DEVELOPING WORLD

An isolated village in Papua New Guinea needs a small, low-cost electric power plant: if it works, neighboring villages might also get inexpensive electricity.

The Tanzanian Water Ministry needs someone to design an inexpensive windmill pumping and generating system for irrigation.

Liberia needs a micro-hydro project.

Requests like the samples above are received everyday by Volunteers in Technical Assistance (VITA), an organization that provides technical assistance to Third World people. Begun in Schenectady, New York, by a handful of scientists and engineers, VITA was formally incorporated as a non-profit volunteer organization in 1960. Its headquarters now are in Mt. Rainier, Maryland, right outside of Washington, DC.

Today, VITA's volunteer engineers, businessmen, educators, and others number almost 4000. They lend their time and expertise to the solution of important problems for individuals and organizations in developing countries who otherwise might not have access to technical information.

Requests come by mail--over 100 a month. As an "agent" of the requestor, VITA coordinates the flow of information by tapping a variety of resources. A documentation center contains over 50,000 items on small-scale technology. VITA publications include over 100 manuals, handbooks, and technical bulletins, many of which have been compiled by the volunteers. A best seller, The Village Technology Handbook, has helped lay the foundation for many rural projects. The volunteer roster itself represents the backbone of the organization, a resource both of spirit and technical expertise.

The "brainchild" of those early engineers, VITA became known as a source of information on small-scale, village level technologies--"appropriate technology," before it was called by that name. Appropriate technology meets the financial, economic, and technical needs of a population without adversely affecting the environment or the culture. It is labor intensive, easy to maintain, simple to operate flexible and decentralized. It is technology that takes into account the low capital assets, limited technological infrastructures, and unskilled labor force in developing countries.

In a current wind energy project in Mexico, VITA is collaborating with General Electric to develop windmills tailored to Mexican conditions. Meteorological data collected by a VITA volunteer on-site in Cuernavaca will be included in the design criteria. The windmills will be low-cost hybrid types designed to be cost effective and durable.

VITA recently contracted with the Agency for International Development to promote the use of alternate sources of energy in ways that will benefit the rural poor. This project will support the development, transfer, and diffusion of technologies using solar, wind, water, methane, wood, etc. The energy project greatly expands VITA's potential to provide meaningful development assistance. Many more volunteers with expertise in energy fields are needed as consultants here and abroad to answer the growing number of energy related requests.

VITA's objective now, as it was 20 years ago, is to help improve the living conditions of people in Third World countries without affecting the delicate balance between basic human needs and the availability of resources and trained manpower. To make this information available, and to encourage the flow of expertise, requires continued help. Won't you join VITA in this important work? Become a VITA Volunteer today.

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