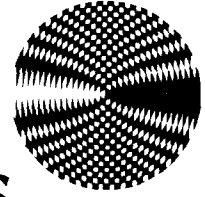




IEEE



SONICS AND ULTRASONICS GROUP NEWSLETTER

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EDITOR: FRED S. HICKERNELL

GEORGE ALERS—NEW GROUP PRESIDENT

INCOMING PRESIDENT'S MESSAGE

It is a privilege to follow John DeKlerk into the Presidency of the Sonics and Ultrasonic Group. As Vice President for the past two years, I have become familiar with the responsibilities of the office and will certainly try to carry them out with diligence and fair play. As the primary point of contact between our Group and the other Societies and Groups of the IEEE, it will be important for me to transmit our needs and desires for the profession onto the general organization as well as to interpret their problems to the membership of our Group. Such issues as the role of registration, the apportionment of Institute funds, the development of advisory documents and standards, and the enhancement of Engineering as a Profession will certainly have to receive some attention during the coming year.

Closer to home, our Group should seek ways of improving communication between its members to enhance the synergistic effects that make ultrasonics such a widely useful field. New developments in medical ultrasonics and surface wave devices must quickly find their way into nondestructive testing and physical acoustics. Our Transactions and our annual meeting must be kept in close contact with the interests of the membership so that their support by each of us will be a valuable experience for us.

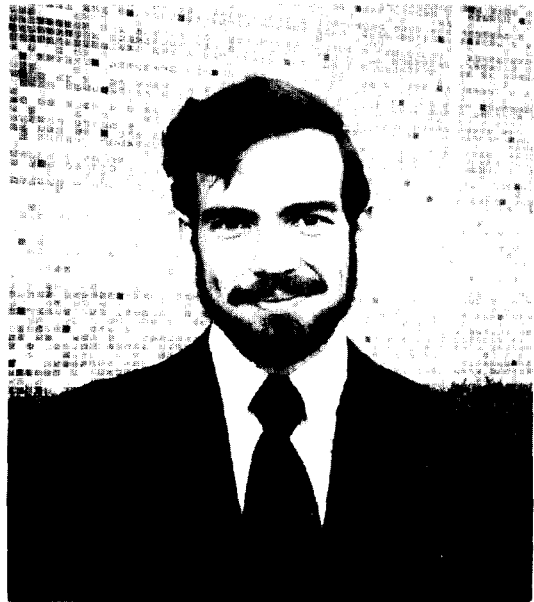


George A. Alers
President

BIOGRAPHICAL SKETCH
GEORGE A. ALERS

George Alers was born in a small mining town in Arizona and grew up in West Texas. After getting a BA degree in Physics from Rice University, he went to the State University of Iowa in Iowa City, Iowa, where he received his Ph.D. in 1954 as a Physics major. Early professional interests centered on the mechanical properties of metals which he studied as a "metal physicist" in the Metallurgy Department of the Westinghouse Research Laboratories. This work initiated a long and fruitful involvement with the Metallurgical Society of AIME where he was a Key Reader for the transactions of that society, served on the Physics and Chemistry of Metals Committee (Chairman, 1966), and organized symposia on microstrain phenomena on anharmonic properties of solids and on dislocation damping processes. After moving to the Scientific Laboratory of the Ford Motor Company in 1956, George concentrated all of his research efforts in the field of ultrasonics by measuring the elastic constants of single crystals as a function of temperature, pressure and magnetic fields. These activities established his reputation in physical acoustics as he was among the first to observe or to study the effects of dislocations, superconductivity, Fermi surfaces, phase changes, magnetostriction and polycrystalline textures on the velocity and attenuation of ultrasonic waves in metals. His measurements of the elastic moduli of single crystals at low temperatures have provided a basis for several comparisons between lattice dynamics theory and experiments. In 1968, the challenge of applied research caused him to join the staff of the Rockwell International Science Center in California where he now holds the title of Principal Scientist. While at this laboratory, his ultrasonic studies became directed toward development of advanced techniques for the ultrasonic inspection of structural materials and include measurements of wave propagation in anisotropic, layered media, defect characterization by ultrasonic wave scattering, electromagnetic methods of transduction in metals and Rayleigh wave interactions with surface flaws. He is currently a member of the Sonics Committee of the ASNT and served the IEEE Sonics and Ultrasonics Group as Technical Chairman of the 1975 Ultrasonics Symposium in Los Angeles as well as being Vice President of the AdCom from 1976 to 1978.

NEW ADCOM
MEMBERS ELECTED



WILLIAM R. SHREVE

Dr. Shreve received his B.S. degree with distinction in Engineering Physics from Cornell University (1969). He earned his M.S. (1971) and Ph.D. (1974) degrees in Applied Physics at Stanford University for work on nonlinear interactions of Rayleigh waves. From 1974 to 1978, he worked in the Surface Wave Technology Branch of the Central Research Laboratories at Texas Instruments on surface wave resonator and RAC devices and on the application of SAW devices to signal processing. In 1978, he joined the Physical Acoustics Laboratory of Hewlett-Packard Laboratories to work on surface wave resonators. Dr. Shreve has been an active contributor to the SAW device field through participation in Ultrasonic Symposia and publications.

Bill is married with two small daughters which keeps him busy at home. He enjoys snow skiing, backpacking and family fun at the beach. Jogging keeps him in shape. He also plays in a slow-pitch softball league.



STEWART K. KURTZ

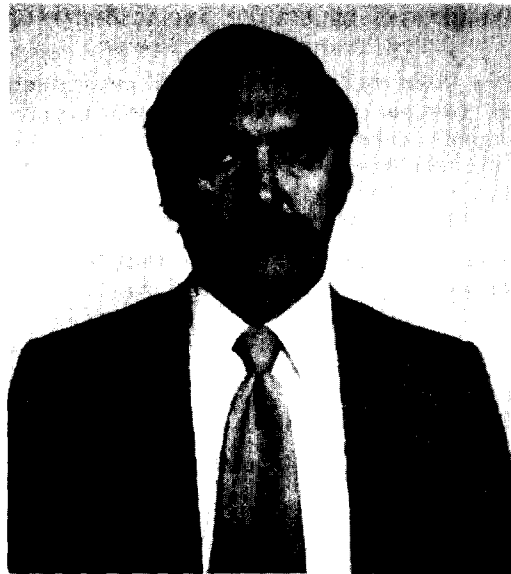
Stu Kurtz has had a varied and eventful career in materials science and applied physics. During his nine years at Bell Laboratories in Murray Hill, New Jersey, he worked on the electrooptic applications of ferroelectrics. He developed predictive theories for both electrooptic and nonlinear optical materials, as well as a rapid powder method using a laser to evaluate the predictions. This work led to the introduction of several useful classes of materials for electrooptic devices. He also started his continuing work on the accurate measurement of second harmonic generation coefficients and the establishment of an absolute scale.

In 1969 he joined Philips Laboratories in Briarcliff, New York, where he built and directed an exploratory research team working on materials for electronic displays and pyroelectric imaging systems. During a sabbatical year in the Netherlands in 1976, he developed a statistical theory of normal grain growth and did experiments on ferrite ceramics to test it.

Recently, he joined the Clairol Appliance Division of Bristol-Myers as a Vice President in charge of Research and Development.

As a senior member of IEEE, he has been active in promoting the engineering applications of ferroelectrics, first as Secretary (1968-1972) and then as Chairman of the Committee on Ferroelectrics (1972-1978). He has been a guest editor of several journals, including an issue of the Proceedings of the IEEE on Materials for Display Devices. For several years he has been a guest lecturer in the Visiting Physicist Program of the APS.

Other interests include collecting minerals, cavecrawling, carpentry and traveling. Stu and his wife Dora reside with their sons in Chappaqua, New York.



KENNETH M. LAKIN

Kenneth M. Lakin was born in Grand Rapids, Michigan, in 1941. He received B.S.E. degrees in Electronics, Physics, and Mathematics in 1964, and in 1967, the M.S.E. degree from the University of Michigan, Ann Arbor. In 1969, he received the Ph.D. degree in Applied Physics from Stanford University, Stanford, California.

Dr. Lakin joined the University of Southern California Materials Science and Electrical Engineering Departments in 1969, where he is now an Associate Professor conducting research on surface acoustic wave materials and devices, NDE transducers, transducer characterization, acoustic imaging and acoustic image processing, and implementation of digital image processing techniques. Dr. Lakin is a consultant at Northrup and the Naval Weapons Center. He is also faculty advisor for Mortar Board.

Ken enjoys the outdoors through backpacking and camping experiences. He is an amateur radio enthusiast (K8CQL) and faculty advisor for the Radio Club at USC. Ken is married with two children, a boy six and a girl three.

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The G-SU Ad Com officers and committee members are at your service. Please contact them with your suggestions, ideas or criticisms. They are always seeking ways to improve the IEEE Group on Sonics and Ultrasonics to better serve its members.

TRANSACTIONS ON SONICS AND ULTRASONICS
1978 Transactions Summary

There were fifty-six papers published in the six issues of the 1978 Transactions. Five papers were rejected during this period; three on the basis of the work and paper content and two for being previously published with little new work included.

The papers published were received from the following countries: U.S.A. (33), Japan (7), Netherlands (2), India (2), Canada (2) and France, Scotland, Sweden, Egypt, Poland, Switzerland, Belgium and Norway with (1) each. The Transactions do have broad international representation.

The voluntary page charge returns for 1978 were 55%.

Copyright Law

As of September 1978, if the IEEE does not receive the author signed copyright form, the paper will not be published. It is imperative that all authors include a signed copyright form when they submit papers for review. Included in this newsletter and in the January 1979 Transactions issue are a copyright form that may be machine copied, and used to send in with authors submitted manuscripts. Again, IEEE will not begin to typeset the manuscript unless they have a signed copyright form for the paper.

Transactions Manuscripts

All authors are requested to fully read the "Statement To Contributors" on the outside cover of any of our Transactions. Publication of a paper will be speeded up if these guidelines are followed. Of special importance are: send an original double spaced manuscript plus three copies; include separate sheets of a list of figure captions and references; be consistent in equation symbols (lower and upper case etc.); include a recent photograph and biography and include a signed copyright form with the original manuscript submission. In addition, if a manuscript is returned for revision, return the revised version posthaste. Following these simple rules will (1) cut down on the time and expenses required for unnecessary correspondence (via mails and telephone) between editor, IEEE, associate editor, reviews and authors, (2) will speed the reviewing process and (3) will result in prompt publication.

The Transactions are presently in need of technical papers of recent work in all of our areas of interest. Review papers and correspondence articles are also welcome. There are 472 pages budgeted for 1979. At present, our backlog is low and every effort will be made to give prompt reviews and fast publication. If any author has any questions

regarding new or old submissions, please call the Editor on (315) 456-2027.

There is a joint MTT/SU special issue on the application of SAW devices planned for August-September of 1980. Our immediate needs are to solicit papers in all of our areas of sonics and ultrasonics work.

Stephen Wanuga
Editor

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SILVER SOUNDS

The Group on Sonics and Ultrasonics celebrated its 25th anniversary last year. It was in March of 1953, during the IRE Convention, that a "grass roots" meeting was held to determine the need and feasibility of an IRE Professional Group on Ultrasonics Engineering. The immediate enthusiastic response at the meeting signified that such a Group was needed and that rapid expansion was assured.

On May 6, 1953, the first Administrative Committee meeting was held in Washington, D.C. Officers were elected and committees were appointed. The first chairman was Amor L. Lane of the Naval Ordnance Laboratory, White Oak, Maryland. It was decided that the Group would be primarily concerned with ultrasonic application, devices, techniques and associated circuitry. Emphasis was to be placed upon the engineering aspects of ultrasonics.

By the end of 1953, membership in the group was approaching 200 with substantial representation in the Boston, New York and Washington areas. There was international representation from five countries outside the U. S. Sixty-nine percent of this original membership was from industry, sixteen percent from government laboratories, ten percent from educational institutions and five percent from other categories.

The Group grew and diversified making its impact felt in several areas through publications and conferences. In 1963 the name was changed to the Professional Group on Sonics and Ultrasonics. Today there are over 1800 members from throughout the world. The Group on Sonics and Ultrasonics has seen a lot of technological changes take place in its first 25 years. As we launch out on our next twenty-five we wonder what new and exciting discoveries will take place and what paths will be taken in seeking to apply ultrasonics technology to the service of mankind.

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U-102

AD COM BRIEFS

The G-SU Ad Com held its bi-annual meeting September 24, 1978, at the Cherry Hill Hyatt House, Cherry Hill, New Jersey, during the 1978 Ultrasonics Symposium. The G-SU President, J. de Klerk (Westinghouse Research Labs), announced appointments of J.E. May (Bell Labs) as liaison to Standards Board and E. P. Eerniss (Sandia) as Chairman of Technical Activities Committee. The new piezoelectric standard will be published in the G-SU Transactions with funds for publication coming from the Ad Com.

Vice President G. A. Alers (Rockwell International) attended the August 26, TAB meeting in Vancouver and reported on matters which directly affect G-SU, such as funding of IEEE and the possibility that groups and societies will be asked to donate funds to IEEE in proportion to their surpluses to help offset a 1979 deficit. The G-SU Ad Com voted to not contribute any of their reserves.

IEEE Division 4 Director R. Damon (Sperry Research Center) and IEEE Technical Activities Director N. D. Pundit (IEEE HQ) contributed significantly to the entire meeting.

Secretary-Treasurer W. D. O'Brien, Jr. (University of Illinois) reported that the 1978 G-SU financial condition was sound with a better than expected reserve at year-end. A committee was established to examine the utilization of G-SU's financial reserves to the benefit of the membership consistent with the goals and aims of the Group.

Publication's Committee Chairman G. W. Farnell (McGill University) discussed the new copyright law. G-SU Transaction's Editor S. Wanuga (General Electric) reported that voluntary page charges were good but a little off from the past, possibly due to mailing of copyright form with page charge letter. "Minimal editing" option is to be phased out over a two year period. A joint MTT/SU Applications of SAW Devices special issue is planned for mid 1980. Newsletter Editor F. S. Hickernell (Motorola Government Electronics Division) solicited information regarding the group's 25th anniversary for the Newsletter. Conference Proceedings co-editors J. de Klerk and B. R. McAvoy (Westinghouse Research Labs) have prepared and are accepting orders for three separate collections of papers from previous Conference Proceedings. The three topics are "Nondestructive Evaluation and Industrial Applications," 600 pages; "Medical and Biological," 700 pages; and "SAW and Signal Processing," 2200 pages.

D. McSherry (Digisonics), E. P. Papadakis (Ford Motor Company) and L. Lynnworth (Panametrics, Inc.) reported on the success of promoting the group and the symposium

through advertising in ultrasonic related journals.

B. R. McAvoy, Meetings Committee Chairman, examined three current meetings, one being the 1978 Ultrasonics Symposium, to compare whether we were "cramming" papers into our meeting and thus reducing valuable discussion time (both in session and during breaks). Guidelines are being prepared for symposia general chairman.

A tentative report was received from F. S. Welsh (Bell Labs), General Chairman, and T. M. Reeder (Tektronix), Technical Program Chairman regarding the 1978 Ultrasonics Symposium. G. A. Alers reported on the status of the 1979 New Orleans meeting. R. Stern (UCLA) will co-chair the meeting. Future meetings are scheduled as follows: 1980 in Boston with R. C. Williamson (MIT Lincoln Labs) and H. van de Vaart (Sperry Research Center); 1981 in Chicago with W. D. O'Brien, Jr. and L. W. Kessler (Sonoscan, Inc.); 1982 in San Diego with J. de Klerk and B. R. McAvoy; 1983 in Atlanta (?); 1984 in Dallas with L. T. Claiborne (Texas Instruments, Inc.); 1985 in San Francisco (?); and 1986 in Washington, D.C. (?).

The Ad Com approved the slate of 6 candidates, presented by M. Levy (University of Wisconsin-Milwaukee), Nominations Committee Chairman, for election by the G-SU membership for the three Ad Com positions. H. van de Vaart, Awards Committee Chairman, announced that R. F. Milsom, N. H. C. Reilly and M. Redwood won the 1977 SU Transactions (May) Best Paper Award. Each will receive \$300 plus a plaque. R. B. Thompson (Rockwell International), Membership Committee Chairman, observed that the group's growth appears to be leveling off. There did not appear to be any effect on membership because of group dues increase.

The Ad Com elected their 1979 officers: G. A. Alers (Rockwell International), President and T. W. Bristol (Hughes Aircraft Co.) Vice-President.

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

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It was good to learn that John DeKlerk, G-SU Past-President, is doing well after a heart attack and stroke in late December. He will be taking some good Arizona solar therapy in May. We all wish him the best.

CHAPTER NEWS

WASHINGTON/NORTHERN VIRGINIA/BALTIMORE CHAPTER

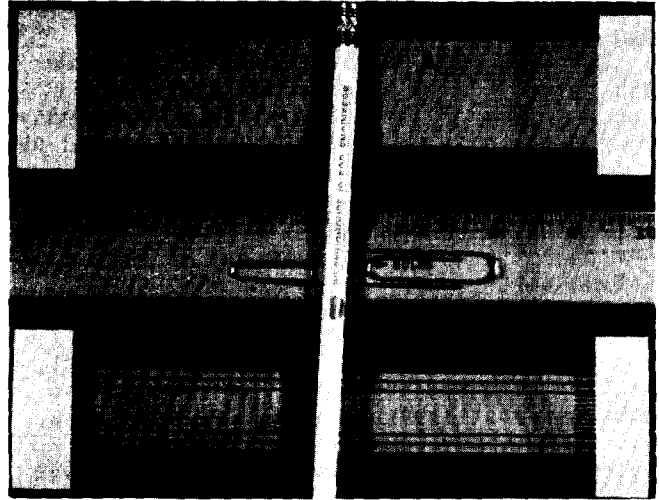
The Washington/Northern Virginia/Baltimore Chapter has planned three (3) meetings for this year. The first was held on December 14 and was sponsored jointly with the Electron Devices Society. Ernie Stern of Lincoln Labs spoke about signal processing with acoustoelectric convolvers, correlators, and SAW/CCD structures. At the second meeting, March 28, Dr. Joseph Clark of Catholic University will discuss holographic visualization of acoustic fields. The third meeting will take place April 25. Jesse Abzug of the Bureau of Radiological Health will describe instrumentation and transducer quality control for medical applications of ultrasound.

Kenneth L. Davis
Secretary/Treasurer

BOSTON CHAPTER

The Boston Chapter of Sonics & Ultrasonics has had a full schedule of monthly meetings this year with an average attendance of 20 people at each meeting. The speakers in the fall included: Jim Sethares from RADC on Magnetostatic Wave Technology; Dale Flanders from Lincoln Labs on Submicrometer Fabrication Technology; William Tanski of Sperry Research Center on SAW Resonators as Frequency Control Elements. Since the first of the year, the speakers have been Bob O'Connell from RADC on New SAW Materials and Larry Coldren of Bell Labs on SAW Resonator Filters. The three remaining speakers are Dan Smythe from Lincoln Labs, who will be speaking on Acoustoelectric SAW/CCD Devices on Wednesday, March 21; J. E. Barger from Bolt, Beranek and Newman, who will be speaking to a joint SU and EMB meeting on Acoustic Propagation in Brain Tissue on Wednesday, April 18; Rich Ralston from Lincoln Labs, who will be speaking on the topic "Three-Signal Acoustoelectric Processing in Integrating Correlators" on Wednesday, May 23. Anyone from the SU community who may be in the Boston area at the times of these talks is cordially invited to attend.

Leland Solie
Chairman



SUPER-SAW

The GSU Newsletter was given the exclusive rights to announce a break-thru in SAW Audio Technology. (See photograph) Engineers (unnamed) report a 6" x 8" SAW cross-over filter (woofer to microwave) which should reduce the cost of audio components substantially. It was reported, however, that there is an impedance matching problem.

FELLOWS ELECTED

Among the IEEE members elected to the grade of Fellow as of January 1, 1979 were the following members of GSU and/or workers in the ultrasonics field.

Dr. J. Lionel Boulet
Dr. Paul H. Carr
Dr. Gene H. Haertling
Professor Morio Onoe
Professor Ikuo Tanaka
Dr. Teruhiro Umezu

Our heartiest congratulations to those accorded this honor.

1979 IEEE INTERNATIONAL ULTRASONICS SYMPOSIUM

New Orleans, Louisiana

The 1979 IEEE International Ultrasonics Symposium will be held at the Monteleone Hotel in New Orleans, Louisiana, on Wednesday, Thursday and Friday, September 26, 27 and 28. The last three days in the week were chosen so that the attendees would feel free to linger over the weekend to enjoy the sights, sounds and scenes that make New Orleans a famous place to visit. As an additional feature, the headquarters hotel has been chosen to be in the center of the famous French Quarter so that little or no effort will be required to sample the cuisine and entertainment that are unique to that area. Needless to say, spouses and friends are welcome to accompany you on this trip but remember that our group will nearly fill the hotel so it is advisable to get your reservations in early.

Technically, June 1 has been established as the deadline date for submission of abstracts. It is anticipated that an expansion of the use of Poster Sessions and a limitation of the number of invited papers to 15 or 20 papers will be able to accommodate the increased number of submittals that natural growth and the site are expected to produce. Because of considerable success with a new format for Poster Papers that was used by the Acoustical Society in their Hawaii meeting, it is planned that

each poster author will be given 3 to 5 minutes to verbally introduce his paper at the start of the session. In this way, the audience can more judiciously utilize its time during the balance of the session, and the author can have the opportunity to advertise his results to a larger cross section of the society.

Prof. Richard Stern of UCLA will be the General Chairman and Dr. George Alers of the Rockwell Science Center will be the Technical Chairman. This is the same team that organized our Symposium in Los Angeles in 1975. This time, however, they will be assisted by Dr. R. S. Kagiwada of TRW who will handle publications and Mr. Bill Aicklen of Nelson Engineering in New Orleans who will handle the local arrangements.

Since the number of foreign participants has been growing for the past several years (it reached 24 percent of the papers in 1978) the title of the symposium will now include the word "International." To emphasize this change, Dr. B. R. Tittmann of the Rockwell International Science Center will assume the specific task on the Program Committee for encouraging and coordinating papers that originate in laboratories outside of the United States and Canada.

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