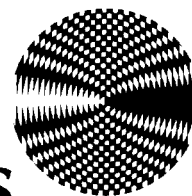




IEEE



SONICS AND ULTRASONICS GROUP NEWSLETTER

NUMBER 57, OCTOBER 1984

EDITOR: FRED S. HICKERNELL

Program
1982 ULTRASONICS
NOVEMBER 22-29



Program

1983 ULTRASONICS



1984 ULTRASONICS SYMPOSIUM
NOVEMBER 14-16
DALLAS, TEXAS

1984 ULTRASONICS SYMPOSIUM

Dallas, Texas
November 14 - 16

Symposium Information

1984 ULTRASONICS SYMPOSIUM ARRANGEMENTS

The IEEE 1984 Ultrasonics Symposium will be held at the Dallas Hilton Hotel on November 13, 14 and 15, 1984. Dallas is the seventh largest city in the United States and one of the more rapidly growing areas. The combination of high technology industry and the more traditional industries such as insurance and banking make this a dynamic economic area. Professional, college, high school and amateur sports are very important in Texas, and in November the weekend is filled with football games at all levels. Dallas has a fine symphony and a new Museum of Art. The nearby city of Fort Worth has a wonderful museum system with an outstanding collection of western art. Tours of Dallas and Ft. Worth will be provided for spouses and for those who can remain in Dallas over the weekend, a wide variety of sports and entertainment opportunities will be found.

TRANSPORTATION

The Dallas Hilton Hotel is located in Downtown Dallas at 1914 Commerce Street which is about 40 minutes from the Dallas-Fort Worth International Airport. There is a limosine service (SURTRAN) which leaves from the vicinity of the baggage claim areas of the major airlines approximately every 40 minutes. Take the Downtown SURTRAN. The fee is \$6.00 one way or \$10.00 for a round trip. Taxi fare is about \$20.00 one way for one person.

To reach the hotel by car (see map) take the South Airport exit to eastbound Highway 183, then southbound Interstate 35E to the eastbound Commerce Street exit.

AMERICAN AIRLINES

DFW International Airport is the home of American Airlines. Special rates can be obtained with 35% discounts by making reservations at least 45 days in advance. For later reservations a discount of 30% can still be obtained by making reservations at least 14 days in advance. To make the reservations call the number listed below and ask for STAR File #S-5825.

From Continental USA	800-433-1790
From Texas	800-792-1160
From Hawaii	808-523-9353
From Canada call the local American Airlines reservations number and ask to be transferred to the Meeting Services Desk.	

SOCIAL PROGRAM

The Symposium Reception will be held in the Grand Ballroom of the Dallas Hilton on Wednesday evening, November 14, 1984. Musical entertainment, hors d'oeuvres, and drinks will be featured. Coffee and dessert will be provided by R.F. Monolithics, Inc.

For Thursday evening, November 15, 1984, a trip to Big D, Texas, an entertainment ranch in the style of an 1880's Texas town, is planned. The evening's program includes a show (the Big D Review) a country and western band, drinks, and a Texas style barbecue dinner complete with tax and gratuity at \$26.00 per person. Free transportation from the hotel to Big D and back will be provided by the Symposium. Y'all come. Hear!!

SPOUSES PROGRAM

The Spouses Program will feature a complimentary continental breakfast on Wednesday morning, November 14, and on Thursday morning, November 15, before each of the two tours of the Dallas/Fort Worth area. Each tour will be provided at the reduced rate of \$14.00 for the spouses of the attendees of the IEEE 1984 Ultrasonics Symposium.

Tour 1: Wednesday November 14, 1984 -- Dallas/Southfork (5-6 hours with a local guide).

The itinerary includes downtown Dallas, selected residential areas of Dallas, Market Center, North Dallas, Southfork Ranch, and stops for lunch and a little shopping at the Galleria.

Tour 2: Thursday, November 15, 1984 -- Fort Worth (6-7 hours with a local guide).

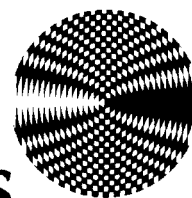
The itinerary includes the Japanese Gardens, the museum district down town Fort Worth, the old stockyards area, and a stop at the well-known Billy Bob's with time for lunch on your own.

(additional symposium information and map on page 18)



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Program
1962 ULTRASONICS
NOVEMBER 20, 21



Program

1963 ULTRASONICS



1964 ULTRASONICS SYMPOSIUM
PAPERS AND AUTHORS
NOVEMBER 5-7, 1973

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Dallas, Texas
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(additional symposium information and map on page 18)

Meet Your Symposium Committee

General Chairman



LEWIS T. CLAIBORNE

Dr. Claiborne was born in Holly Grove, Arkansas. He received his B.S. in physics and mathematics from Baylor University in 1957 and his Ph.D. in physics from Brown University in 1961. His thesis topic was "A Study of the Attenuation of Ultrasonic Shear Waves in Superconducting Aluminum."

After serving for a year as a Research Associate at Brown University, Dr. Claiborne joined the Central Research Laboratories at Texas Instruments Incorporated in Dallas, Texas. His work in the Physics Research Laboratory was concerned with electron-phonon effects in both superconductors and semiconductors. Beginning in 1968 he was active in the development of surface acoustic wave devices. He was coauthor of the paper "Evaluation of Digitally Coded Acoustic Surface Wave Matched Filters" which received the award as Best Paper in Sonics and Ultrasonics for 1971. In 1972 Dr. Claiborne was Technical Program Chairman for the IEEE Ultrasonics Symposium in Boston and in 1976 he was the president of the Administration Committee for the IEEE G-SU.

Dr. Claiborne is the Director of the System Components Laboratory at Texas Instruments. The activities of this laboratory include the development of GaAs microwave and digital circuits, surface acoustic wave devices, optical components including spatial light modulators, and other analog and digital components. He is a member of the American Physical Society and the Institute of Electrical and Electronics Engineers.

Technical Chairman



WILLIAM J. TANSKI

William Tanski was born in Morristown, NJ, and received his B.S. (Cum Laude) in Electrical Engineering from Penn State. Following a tour in the Navy, he attended graduate school at Georgetown University, receiving an M.S. and a Ph.D. in Physics. He did his Ph.D. thesis in the fields of ultrasonics and acousto-optic interactions.

Much of his recent work has involved the development and application of Surface-Acoustic-Wave devices, specializing in research on resonators for oscillator stabilization and for use as narrowband filters. Among his technical contributions are: the development of configurations and fabrication techniques for GHz range SAW resonators, the invention of frequency trimming techniques, the perfection of resonator design techniques on quartz, and the development of six-pole SAW resonator filters. He has authored numerous papers, holds five patents, and was the first to apply SAW resonators in a shipboard radar system and a communication earth-satellite. Other work includes the development of transversal SAW filters, and the application of SAW resonators to pressure sensors.

Dr. Tanski is a senior member of the Institute of Electrical and Electronics Engineers, the American Vacuum Society, and Tau Beta Pi. He has served in a variety of assignments with the IEEE Group on Sonics and Ultrasonics including: Chairman of the Membership Committee, membership on the Advisory Committee, and six years on the Ultrasonics Symposium Technical Program Committee.

Symposium Committee

Finance



W.D. DANIELS

Mr. Daniels was born in Selma, Alabama, on December 1, 1947. He received his B.S. and M.S. degrees in Electrical Engineering from the University of Alabama in 1971 and 1972 respectively. After graduation, he joined Texas Instruments Equipment Group.

His initial design work involved the development of surface acoustic wave pulse compression devices for airborne radar and distance measuring equipment (DME). In 1976 he was given the responsibility for the development of a channelized receiver employing 144 unidirectional SAW filters. Following this program, he executed the development of a Dual-Mode Missile Seeker. This system used a high accuracy (4-mrad), wideband, direction finding RF seeker boresighted with an imaging infrared (I²R) seeker. Flight tests were conducted with this system nose-mounted in a helicopter and flown against target simulators.

Mr. Daniels is manager of the Acoustic Signal Processing Branch which is part of the Microwave Laboratory, Equipment Group. This Branch is primarily concerned with the development of SAW components which include reflective array compressors, L-band delay lines, monolithic elastic convolvers, unidirectional filters, and pulse compression filters. Programmable transversal filters using medium scale integrated linear circuits on GaAs are also under development. Mr. Daniels is a member of Eta Kappa Nu and IEEE.

Local Arrangements



GROVER C. WETSEL

Dr. Wetsel was born in Dallas, Texas in 1935. He received a B.S. degree in electrical engineering from Southern Methodist University and M.S. and Ph.D. degrees in physics from Rice University. After a year on the faculty of the Department of Electrical Engineering at the University of Texas, Austin, Texas he joined the Department of Physics at S.M.U. in 1964, where he now holds the rank of Professor of Physics. Dr. Wetsel is presently on research leave from S.M.U. at Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland.

He is a member of the American Physical Society, the American Association of Physics Teachers, Eta Kappa Nu, Sigma Tau, and Sigma Xi. He was a member of the Technical Program Committees for the Topical Meeting on Photoacoustic Spectroscopy in Ames, Iowa, 1979, and for the Second International Topical Meeting on Photoacoustic Spectroscopy in Berkeley, California, 1981. He served as a member of the local committee for the March Meeting of the American Physical Society in Dallas, Texas, 1982.

Dr. Wetsel's research interests have included ultrasonic paramagnetic resonance, ultrasonic attenuation in solids and nematic liquid crystals, nonlinear wave propagation, and photoacoustics. He is presently active in photothermal generation of elastic waves and photothermal imaging of subsurface structure. As a consultant to industry, he has designed ultrasonic modulators for ink-jet printers, studied capillary waves on liquid jets, and designed ultrasonic devices.

Symposium Committee

Publicity



ROBERT J. KANSY

Dr. Kansy was born in Springfield, Illinois in 1947. He received the B.S., M.S., and Ph. D. in Electrical Engineering from the University of Illinois at Urbana-Champaign in 1970, 1971, and 1975, respectively. His thesis research involved the study of acoustics generation and propagation in ferroelectric ceramics.

He joined the Magnavox Government and Industrial Electronics Division, Ft. Wayne, Indiana in 1974, where he was involved with the design and application of surface acoustic wave devices. In 1976 he joined Texas Instruments, Dallas, Texas, where he designed analog MOS integrated circuits for signal processing applications in infrared imaging and radar systems. He joined RF Monolithics, Inc. in 1980 where he has been responsible for the analysis of new SAW device structures and the development of SAW CAD software.

Dr. Kansy is the Director of SAW Product Development at RFM. His responsibilities include the definition, design, and evaluation of new SAW components. He is a member of the IEEE.

Proceedings Editor



BRUCE R. McAVOY

Bruce McAvoy has been the Editor and formerly the Co-editor with John de Klerk of the Ultrasonics Symposium Proceedings since 1976. He is currently and Advisory Scientist in Microwave Acoustics at the Westinghouse R&D Center in Pittsburgh, PA, having been active in the area of SAW and bulk mode devices since 1972. He has published over 35 papers in the microwave field concerning effects in bulk and junction semiconductors in addition to microwave acoustics. Currently his work includes new designs and processing techniques for microwave bulk mode delay lines, high overtone bulk mode resonators and a study of the effects of magnetostrictive films on SAW propagation for device applications. He holds 7 patents in these areas.

Bruce has served as the Meetings Chairman of the Group from 1975 to 1981 and was General Chairman of the 1982 Ultrasonics Symposium in San Diego. In 1981 he joined the Meetings Committee of the Technical Activities Board of the IEEE as Division IV representative. He is currently on the TAB Finance Committee.



IEEE 1984 ULTRASONICS SYMPOSIUM

NOVEMBER 14-16, 1984
HILTON HOTEL DALLAS, TX



1984 Ultrasonics Symposium Technical Program

The technical program at the 1984 Ultrasonics Symposium promises to be excellent. There were upwards of 300 abstracts received, including 19 which were invited, and a review of these abstracts shows that all areas of activity were well represented and that the technical quality was very high.

Per the guidelines established at the March meeting of the Sonics and Ultrasonics Group Advisory Committee, the Symposium is limited to three days and a maximum of four parallel sessions. Further, we have allowed an hour and a half for lunch and half hour breaks at mid-morning and mid-afternoon. The morning sessions on Thursday and Friday will begin promptly at 8:30 A.M. and the afternoon sessions will begin at 1:30 P.M. The Symposium will open with a plenary session which starts at 8:00 A.M. on Wednesday, followed by 39 oral sessions and an open-forum session for a total of 24 papers.

Two sessions are devoted to acousto-otic devices and signal processing and the talks include discussions on fiber-optic modulators, acousto-otic devices and materials, EW receivers, multiplexers, correlators, and spectrum analyzer techniques. Acousto-electric devices will be discussed in a session, plus a number of papers in the open-forum sessions, and these include talks on correlators, programmable filters, and GaAs charge transport devices.

Acoustic-microscopy is covered in three sessions all placed on the same day. The topics discussed include material studies, the use of surface waves with digital image processing, transducer developments, surface profiling, new results for NDE, superfluid helium acoustic microscopy, and others.

Two sessions are devoted to Photoacoustic/Photothermal imaging including discussions of the resolution and definition of thermal imaging, non-contact thermal wave imaging, the use of a laser probe in thermal imaging, thin film characterization, imaging of microcracks, and the detection of defects in semiconductors.

There are four sessions plus a number of open-forum papers dealing with fundamental and applied topics in medical and biological ultrasound. The session on Tissue Characterization includes an invited review paper, the use of acoustic arrays in tomography, and the physical characterization of blood, bone, and liver. The session on hyperthermia includes work on techniques to reduce ultrasonic heating, and a variety of biophysical topics. Medical ultrasonics is covered in two sessions and includes work on imaging techniques, focussing, scanning, inversion methods, and calibration techniques.

Physical acoustics is discussed in two sessions which include work on non-linear effects, transient acoustic phenomena, thermal strain effects, and techniques for materials characterization.

Porous media studies will be discussed in a session which includes work on non-linear propagation in rock, and attenuation studies. A session on sensors includes work on ranging devices and techniques, acoustic waves in air, and vapor sensing. Inverse scattering is covered in a session where fundamental and applied topics are reviewed and new results are discussed. Arrays and beam steering is covered in a session which includes talks on multi-dimensional systems, tomographic techniques, nonresonant transducer design, and high resolution and dispersive techniques.

The area of industrial ultrasonics is again heavily represented including five sessions, a number of open-forum papers, and three invited talks. The Nondestructive Evaluation sessions cover advances in composite-material design and evaluation, acoustic-emission measurement studies, microstructure evaluation, defect detection, three dimensional imaging, corrosion monitoring, pyroelectric testing of transducers, beam theory, acousto-electric techniques, structural studies, transducer design, and attenuation studies. A session on process monitoring and control will include a discussion of containerless processing, ultrasonic spectroscopy, and a study of the charge properties of colloidal suspensions.

Piezoelectric resonators are discussed in a session which covers the use of surface transverse waves in devices, reflecting structures, and temperature effects due to metal films.

Two sessions are devoted to piezoelectrics in which flexible composites, PZT/polymer transducers, resonant modes in PZT composites, and the properties of composite resonators are discussed.

Bulk waves and devices are covered in two sessions where new developments in piezoelectric resonators, resonator microphonics, UHF and high overtone resonators, and temperature compensation are discussed. Also, a session is devoted to temperature compensation which includes talks on the use of berlinite, thallium vanadium sulfate, and fersnoite for device applications.

Surface acoustic wave technology is covered in seven sessions in which SAW filters, SAW

oscillators, signal processing including spectrum analyzers modulators, SAW materials and propagation, and new SAW technology are discussed. Related to these SAW sessions is one on modelling of metallic structures where the properties of metallic lines and dots on the propagation of surface waves is covered.

A session is also devoted to magneto-static surface wave devices which covers signal processing, MSSW oscillators, various mode effects, guided waves, and scattering.

It is our hope that everyone with an interest in any of the above topics will be able to attend the 1984 Ultrasonics Symposium in Dallas.

W.J. Tanski, Chairman
Technical Program Committee

* * * * *

Invited Speakers

M. Barmatz
Jet Propulsion Labs
"A new method for acoustic containerless processing of materials"

R. J. Besson
Besancon, France
"Recent evolution and new developments of piezoelectric resonators"

J. Cafarella
MIT Lincoln Laboratories
"Application of SAW convolvers to spread spectrum communications"

H. Ermert
University of Erlangen, Germany
"Non-contact thermal wave imaging using infra-red radiation"

J. Greenleaf
Mayo Clinic
"An inverse view of scattering"

K. Goebbels
Fraunhofer Institute, Saarbucklen, Germany
"The use of ultrasound in the determination of microstructure - A Review"

M. Hikita
Hitachi Ltd., Tokyo, Japan
"High performance SAW filters with several new technologies for cellular radio"

W.S. Ishak
Hewlett Packard, Palo Alto, CA
"Microwave signal processing using magnetostatic wave devices"

F.A. McDonald
Southern Methodist Univ., Dallas TX
"Resolution and definition in thermal imaging"

R.E. Newnham
Pennsylvania State University
"Flexible piezoelectric composites"

B. Pipes
University of Delaware
"Recent advances in composite nondestructive evaluation"

W. P. Risk
Stanford University
"Acoustic Fiber-optic modulators"

J. M. Reid
Drexel University, Philadelphia, PA
"Tissue characterization: A continuing effort"

A. A. Schoenberg
University of Utah
"Dynamic distance and tactile force measurement using ultrasonic PVF2 Transducers"

A. Timur
Chevron Research, La Habra, CA
"Applications of acoustic wave propagation methods to evaluation and production of hydrocarbon reservoirs"

G. Tobolka
Siemens AG, Munich, Germany
"High volume tv-if filter design, fabrication, and applications"

J. B. Tsui
Wright Patterson AFB, OH
"EW receiver using acousto-optic and ultrasonic components"

H. W. Whittington
University of Edinburgh, UK
"Sonic integrity assessment of civil engineering sub and super structures"

P. V. Wright
RF Monolithics Inc., Dallas, TX
"The properties of SAW metallic gratings: Theoretical modelling, empirical results and applications."

Centennial Reflections

Since this is the 100 year anniversary of the IEEE, it seems fitting to take a look at the technologies represented by the Group on Sonics and Ultrasonics: where we have been, where we are, and perhaps make a try at predicting where we are going.

Although G-SU got started in the early fifties, the root of much of what we are doing today go back even further than the birth of the IEEE to the discovery of piezoelectricity by the brothers Curie in 1880. It was about that same time that Lord Rayleigh demonstrated the existence of surface waves, something that would become very important nearly 80 years later.

Instrumental in the development of modern frequency control was the introduction in the early 1920s by Cady of the quartz crystal controlled oscillators. Since Cady's oscillator, each decade in time had seen approximately one order of magnitude frequency and time stability improvement.

For example, frequency stability of laboratory precision oscillators progressed from 10^{-8} in 1940 to 10^{-12} in 1980; frequency accuracy of commercial oscillators over environmental ranges ranged between 10^{-3} and 10^{-4} in 1940, improving to the 10^{-5} to 10^{-6} range in 1980; long term aging rates improved from 10^{-6} to 10^{-7} per day to the 10^{-10} per day range. By the use higher purity materials and improved fabricating and mounting procedures, one may guardedly estimate that the precision of laboratory oscillators may reach the 10^{-14} stability range around the year 2000, and that commercial versions will reach 10^{-12} at that time.

Ultrasound has been an important tool for nondestructive inspection for decades because of the deep penetration achievable in most structural materials, the low power levels required for generation and detection, and the quality of the data received. Until recently, the techniques were dependent on human operators. However, rapid progress of the technology in recent years has produced systems for automating or computerizing the inspection process. Manufacturing floors of large aerospace companies now typically have large computer-aided inspection stations in which the manufactured part is inspected rapidly with a real-time color display and permanent record. Recent research and development on ultrasonic transducers, coupling materials, transmitter and receiver electronics, and mechanical/robotic scanning devices have led to systems which can inspect materials ranging from Ti-alloy to composite laminates to honeycomb parts. More sophisticated signal processing promises even better detection and characterization of the flaws, and consequently, failure prevention.

The outlook for the next decades points to an even greater role for non-destructive evaluation (NDE). Of special concern is increased productivity to maintain our national position in a competitive world. Productivity here is not quantity alone, but rather quantity with quality. This requires in-process inspection to reduce rework, repair and rejects. The emergence of inexpensive computational capacity allows one to combine computer-aided design with computer aided manufacturing cost. Computer-aided process modeling combined with sensing, feedback and control systems will allow quality to be built into a product. Joining these elements with computer-aided control of overhead functions, such as inventory or scheduling, permits additional major cost savings. The promise of quantitative NDE suggests that models of the inspection process can eventually be used to enable optimization of inspectability with performance in initial design. The ability to model these functions, search for optimum conditions, and use this capability to guide experimental Verification provides the engineer with new paradigms. NDE science and the ability to model the inspection process will be significant factors in computer-aided engineering of the future.

Ultrasonic technology has also made its mark in the medical field. Pulse-echo ultrasonic imaging has been one of the most rapidly accepted medical devices in the 1960s and early 1970s, especially for obstetric examinations. The early bi-stable images yielded organ and other prominent tissue structure outlines. About a decade ago, gray scale imaging developed from the utilization of analog and then digital scan converters. During this time period research efforts were progressing with transducers, including arrays, which led the way to real-time ultrasonic imaging. To some extent the continued improvement of this clinical device paralleled computer technology development. These sophisticated systems are now an essential part of providing quality medical care.

The development of acoustic microscopy is quite recent. The scanning laser acoustic microscope (SLAM) has been commercially available for about a decade and the scanning acoustic microscope (SAM) is currently becoming available. Their early applications have been limited to the displaying of side-by-side acoustic and optical images. In some sense, this has retarded their acceptance in biology and medicine since little, if any, new microscopic detail was revealed, even though this new technology was providing an image of the mechanical details of the biological studies. The present work, although limited to a few research laboratories worldwide, is aimed at quantifying ultrasonic propagation properties at the microscopic level; that is, microscopic tissue characterization aimed at an understanding

of scattering properties of tissue. The imaging capability is in its preliminary stages in terms of identifying unique biological situations for which this technology would be the technique choice, or even complementary, for solving a particular biological problem. The future holds for itself the greatly improved quantitative capability and the greatly increased resolution of this technology. Resolutions to a few hundred angstroms would allow the "imaging" of subcellular components.

Physical acoustics remains an area of active research. Ultrasonic measurements are being used to probe the collective mode properties of superfluid He^3 . It is predicted that there should be 18 such modes which are associated with spin and density degrees of freedom of the superfluid. A third of these modes have already been identified. Acoustic levitation techniques are being developed for containerless processing of materials in space, for coating of glass microballoons which are terrestrially suspended in the acoustic levitation field, and for performing studies of fluid dynamics of free liquids both in the earth gravity field and in the microgravity found in space. It has been discovered that piezoelectric coupling of a surface acoustic wave to the sheet resistivity of a film is quenched in the superconducting state. This effect provides a powerful tool for investigating the percolation properties of granular superconductors and the two dimensional properties of thin superconducting films. Preliminary work on piezoelectric composition modulated structures appears to be very promising. It may be possible that such structures could provide efficient transducers for the production of coherent ultra high frequency phonons. Ultrasonic attenuation measurements in ferromagnetic superconductors have helped to corroborate the existence of a new mechanism, superconducting screening of the spin phonon interaction, in these systems.

One of the greatest success stories of our technology has undoubtedly been the development of Surface Acoustic Wave (SAW) devices. Although the existence of surface waves was first demonstrated theoretically in 1885 by Lord Rayleigh to explain the wave propagation in the earth's crust due to an earthquake, SAW propagation on solid materials remained unexploited until 1965 when White and Voltmer demonstrated an efficient means of generating and detecting such waves by means of the interdigital transducer. Their possibilities as signal processing devices were quickly recognized because of the operating frequency range, available bandwidths, and obtainable time delays. An intensive development effort was started in many laboratories, continuing at a somewhat lower level at this date. The first devices to be exploited were pulse compression or chirp filters, the heart of many modern radar systems. The use of reflecting arrays allowed the separation of various frequency components as a function of position, thereby providing accurate phase control. The acceptance of SAW bandpass filters took a little more effort, mainly because competing technologies with lower insertion loss were available. Nevertheless, they are now produced at a rate of many millions per year. The use of reflecting strips or grooves also led to the development of SAW resonators, which are finding more and more applications as the frequency controlling element in oscillators. The nonlinear interaction of two counterpropagating surface waves gave rise to the convolver, a highly flexible programmable matched filter.

It is beyond the scope of this brief review to discuss the status and potential of all the various SAW devices, even less to discuss all their applications. They are too numerous. Further development will undoubtedly continue, particularly in the areas of SAW sensors, exploitation of SAW waveguides, more compact spectrum analyzers using acousto-optics, and the integration of SAW and semiconductor devices on a single piezoelectric/semiconducting substrate such as GaAs. In addition, the application of advanced SAW devices in increasingly complex signal processing systems will surely continue.

In retrospect, past development in Sonics and Ultrasonics technology has been impressive. We know that the present status of research and its actual application is exciting. It remains for us to ensure that our field of endeavor continues to be full of promise.

Authored by: H. Van De Vaart, with contributions from A.D. Ballato, M. Levy, W.D. O'Brien Jr. and B. Tittman.

New AdCom Members



DAVID L. HECHT

David L. Hecht received the B.E.E. degree from the Cooper Union School of Engineering in 1966. He pursued graduate studies at Stanford University as a National Science Foundation Graduate Fellow, receiving the M.S. and Ph.D. degrees in Electrical Engineering in 1967 and 1971.

He was a summer employee at USAERDL (1963), Bell Telephone Laboratories (1965), Sperry Gyroscope (1966), and IBM Watson Research Center (1967), conducting projects in electromagnetic noise, digital logic integrated circuits, semiconductor lasers and computer-aided instruction of physics. From 1968 to 1971 he was a Research Assistant at the Microwave Laboratory, Stanford University, pursuing research on dye lasers and nonlinear optics. From 1972 to 1980 he was employed at the Applied Technology Division of Itek where he was responsible for research and development of acoustooptic devices and techniques for wideband signal processing. In 1980 Dr. Hecht joined the Xerox Palo Alto Research Center where is responsible for research on modulator technologies and applications to information processing and electronic printing.

Professional activities include membership in the IEEE Sonics and Ultrasonics Group and the IEEE Quantum Electronics and Applications Society. Dr. Hecht serves on the program committee for the Ultrasonics Symposium and has organized several sessions on acoustooptics. He is Chairman of the IEEE Standards Subcommittee on Acoustooptics Devices and serves as a representative of the Sonics and Ultrasonics Group on the steering committee of the new IEEE/OSA Journal of Lightwave Technology. Dr Hecht was program chairman of the Santa Clara Valley Chapter of the Sonics and Ultrasonics Group during its first year of operation and later served as Chairman.



JOSEPH S. HEYMAN

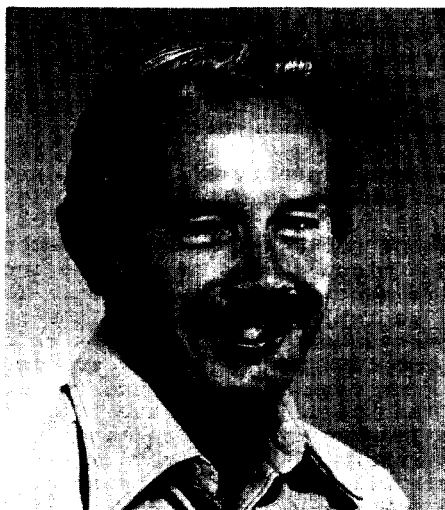
Joseph S. Heyman was born in New England in New Bedford, Massachusetts, November 4, 1943. He received the A.B. (Physics-Honors) in 1968 from Northwestern University, the A.M. in 1971 and the Ph.D. (Physics) in 1975 both from Washington University where he studied under J. G. Miller.

He began his career with NASA-Langley in 1966-1969 in the area of radiation damage in solids which resulted in the solar wind experiment on Apollo 16. From 1970-1975, his research concentrated on phono-electron interactions and he developed improved power detector transducers for Nondestructive Evaluation. In 1975, he was appointed head of NASA's Laboratory for Ultrasonics and in 1981 advanced to Head, Materials Characterization Instrumentation Section. In 1983 he was named Langley Manager of the NDE research program.

Dr. Heyman has been active in planning many conferences and workshops for AIAA, ASTM, IEEE, ASNT and was cofounder of the public lecture series "Our Future in the Cosmos." He belongs to the IEEE, The American Physical Society, The Society for Experimental Stress Analysis, Sigma Xi, and the American Association for the Advancement of Science. He is an Associate Editor of NDE Communications and has worked for the IEEE Sonics and Ultrasonics Group's technical committee for the past several years. He is married to a university Librarian and has one daughter.

Other interests for David include photography, music and audio equipment, theater, gardening, and economics. For he and his wife Judy, the expected birth of their first child in early September has provided a major new focus in life and the prospect of a very empirical project for a theoretically oriented engineer.

Centennial Medalists



RICHARD M. WHITE

Richard M. White was born in Denver, Colorado on April 25, 1930. At Harvard University he majored in Engineering Sciences and Applied Physics, receiving the A.B., A.M., and Ph.D. degrees in 1951, 1952, and 1956 respectively. His doctoral research concerned scattering of ultrasonic waves at cylindrical discontinuities in solids.

His professional experience includes part-time or regular work on instrumentation in a government laboratory, and research and development on microwave tubes at Raytheon, Bell Telephone Laboratories and the General Electric Microwave Laboratory in Palo Alto, where he was employed from 1956 through 1963. He joined the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley, in 1962 where he teaches and conducts research. He has studied thermoelastic wave generation in solids, surface acoustic wave (SAW) phenomena and devices, non-destructive materials evaluation, stroboscopic scanning-electron microscopy, microwave solid-state devices, concentrator solar cells and, currently, integrated sensors. He is also presently Chair of the campus' Graduate Group in Science and Mathematics Education and Director of the Instructional Technology Center. He is author or co-author of more than seventy publications including a recent book on solar cells, and is inventor or co-inventor on ten patents.

Dick enjoys running, particularly competing in the medium distance (10K) races (He retired from marathon running after completion of the first one). He enjoys outdoor activities such as backpacking and skiing (downhill and cross-country). He is a gardner and reports that the corn crop is excellent this year. He also enjoys listening to Blue-Grass music. (Note: the editor was unable to determine if he plays Blue-Grass in the garden which could account for the excellence of the corn crop).

As a part of its 100th anniversary celebration, the ISS has awarded 1984 IEEE Centennial Medals to persons who have been selected by IEEE societies, Sections, Major Boards and other Institutes entities for outstanding contributions in their respective areas of activity. The following awardees are members of our Group on Sonics and Ultrasonics. We congratulate them on their achievements.

Robert Adler, Glenview, IL
R. Bartnikas, Varennes, Quebec, Canada
Vitold Belevitch, Bruxelles, Belgium
S.D. Chatterjee, Calcutta, India
Richard D. Claus, Blacksburg, VA
L.S. Corey, Rochester, NY
C.C. Cutler, Stanford, CA
Richard W. Damon, Waltham, MA
R.S. Duggan Jr., Atlanta, GA
Peter D. Edmonds, Menlo Park, CA
Stanley L. Ehrlich, Middletown, RI
R.M. Emberson, Eugene, OR
G.W. Farnell, Montreal, Quebec, Canada
Eric Herz, New York, NY
Charles F. Horne, Jr., Pomona, CA
Gordon S. King, Stanford, CA
C.E. Land, Albuquerque, NM
Robert I. Magnusson, Goteborg, Sweden
Bruce McAvoy, Pittsburgh, PA
T.R. Meeker, Allentown, PA
Tatsuji Nomura, Tokyo, Japan
William D. O'Brien Jr., Urbana, IL
A.A. Oliner, Brooklyn, NY
Song B. Park, Seoul, Korea
Veljko Radeka, Upton, NY
Harold A. Sabbagh, Bloomington, IN
O.H. Schmitt, Minneapolis, MN
Gustave Shapiro, Silver Spring, MN
D.B. Sinclair, Boston, MA
Ricardo Valle-Sanchez, Barcelona, Spain
Herman Van De Vaart, Orlando, FL
G. Wade, Santa Barbara, CA
W. Welkowitz, New Brunswick, NJ
Lawrence, R. Whicker, Arnold, MD
Bernard Widrow, Palo Alto, CA
Richard C. Williamson, Lexington, MA
G.L. Wilson, State College, PA

Ad Com Briefs

The G-SU AdCom met on March 13, 1984 at the Dallas Hilton Hotel in Dallas, Texas, presided over by H. van de Vaart, President. Twenty-seven people attended, including several future symposia chairmen.

The agenda for the meeting was quite extensive with several controversial issues. The question whether Publication in Proceeding was considered prepublication for the transaction was settled. Guidelines for future Ultrasonics Symposiums were established. The issue of future exhibits at Ultrasonics Symposiums was clarified. How Gordon and Breach inadvertently owned the copyrights for 1983 International Symposium on Applications of Ferroelectronics was explained. These and many other topics will be covered in this AdCom Briefs.

H. van de Vaart presented highlights from the Winter TAB meeting which was held in Washington, D.C. on February 21, 1984. The first item that might be of interest to G-SU members was a proposal presented by the Regional Activities Board. This was an increase for the conference registration fee for non IEEE members. The proposal was to increase the registration fee 100% or the amount of the IEEE dues. The Technical Activity Board felt the proposal would reduce conference attendance, so they sent it to the Meeting Committee. The second item of interest was the proposal presented by Microwave Theory and Techniques Society that Fiber Optics become a Council. This was opposed by the Quantum Electronics and Applications Society. After some discussion, the measure was voted down. Thus Fiber Optics will remain a steering committee and only be responsible for the Lightwave Technology Journal. Conferences will be run by the Quantum Electronics and Applications Society. The third topic was IEEE new guidelines for pricing Transaction for non members. Since we are an engineering society the guideline is expressed in a mathematical formula, which is: the price equals the number of issues plus 3.4 times the square root of the number of pages published annually. The societies and groups may increase the subscription up to 15% of the formula provided that the 1985 price does not exceed the 1984 price by more than 20%. Societies and groups may decrease non member price up to 15% of the formula or down to 1984 rate. Applying this formula to the G-SU transaction assuming 400 published pages, the price should be \$74.00. The present G-SU transaction rate is \$72.00 which is in close agreement. The final topic of interest was G-SU new division. G-SU is in division IX which is entitled "Signals and Applications Division." The division consists of Acoustics, Speech, Signal Processing Society, Aerospace and Electronic Systems Society, Geoscience and Remote Sensing Society, Ocean Engineering, and Group on Sonics Ultrasonics. The new director of Division IX is S.H. Durrani, former president of Aerospace and Electronic Systems Society. Three members of

G-SU are representative to either the technical activities board or IEEE committee for the division. They are: R.C. Williamson who is on the publication board, W.J. Tanski who is on the membership development Committee and B.R. McAvoy who is on the Finance Committee.

R.S. Kagiwada reported that the G-SU income and expenses for the period 1/1/83 to 12/31/83 were 124.1K and 115.4K, respectively for an operating surplus of 8.7K. The net-worth as of 1/1/83 was 112.3K up from 103.6K at the same time last year.

S. Wanuga presents his report on Transactions on Sonics and Ultrasonics. In 1983 Transactions published 456 pages which make it a significant publication. The November 1983 issue had a mixup at the printer so incorrect copies were sent to the West Coast. This issue can be replaced by calling the publisher whose phone number is published in this newsletter. For 1984 Transactions, six issues are planned, four regular issues and two special issues. The special issues are "Digital Ultrasonics Imaging" (July 1984) and "Ultrasonic Hyperthermia" (September 1984). For 1985, there will be again two special issues, "Acoustic Microscopy" (May 1985) and "SAW Convolvers and Correlators" (July 1985).

G.S. Kino then raised the question in regards to publishing papers in the Ultrasonics Symposium Proceeding and the Transaction on Sonics and Ultrasonics. Several people felt that it was alright to publish in both places since the proceedings are not archival while transactions are archival. To clarify matters, E.P. Papadakis moved that "Papers which are submitted to the proceedings of the symposium be considered permissible to be submitted to the Transaction for review and later publication with or without charges except as the Transaction review requires." This motion was unanimously accepted.

At the Atlanta 1983 Fall meeting, AdCom passed a resolution to limit future Ultrasonics Symposium to three days with a maximum of four parallel sessions. In the 1984 Spring AdCom, guidelines were established for the symposium committee. The first guideline was "poster sessions for future Ultrasonics Symposium not be held in parallel with other sessions." The second guideline was "the Annual Ultrasonic Symposium technical meeting should be a maximum of 18 hours." Also, AdCom adopted a policy that exhibits will be part of the Ultrasonics Symposium.

The 1983 IEEE Ultrasonics Symposium Chairman's Report was given by M. Levy at Atlanta. There were 557 attendees, of these 134 were non-U.S. The symposium had a total of 255 regular contributed papers and 19 invited speakers. For the first time there were organized exhibitors. Twenty-one industrial exhibitors contributed greatly to the success of the conference. The financial report was given by H.L. Salvo. The income for the conference was \$55,642.47 and the expenses were \$54,730.45. This left a net surplus of \$912.02. Out of the 557 attendees, 475 were paid registrants and 82 other were exhibitors, students and guests. California had again the highest U.S. attendance with 82 and

England had the largest non-U.S. group with 30. The international character was again attained with participants from Australia, Austria, Belgium, Canada, China, Denmark, Egypt, England, Finland, France, Germany, Israel, Italy, Japan, Korea, Netherlands, Norway, Poland, Sweden, Switzerland, and Venezuela. The Symposium proceedings had a net surplus of about \$8,263.00 close to previous years.

The budget for the 1984 Ultrasonics Symposium was approved at last Fall's AdCom, however L.T. Claiborne had few minor changes. This was due to the fact the budget's original plan for the four day symposium was changed to three days. The 1984 Symposium will provide extensive social functions, cocktail reception, spouse's program and the Big D Gathering.

Regarding the 1985 Ultrasonics Symposium in San Francisco, California, W.R. Shreve, the general chairman, reminded everyone that Cathedral Hill Hotel (formerly Jack Tar) will be the site of the conference on October 16 - 18, 1985. That J.D. Larson is technical program chairman and Professor R.M. White is in charge of Local Arrangements.

Beyond 1985, the Conference Center at Williamsburg, Virginia will be the site for the 1986 Ultrasonics Symposium, November 17-19, 1986. General Chairman is R.A. Moore, Technical Program Chairman is J.G. Miller, and Local Arrangements will be handled by J.S. Heyman. The 1987 Ultrasonics Symposium will be at Sheraton Technology Center, Denver, Colorado, in October 14, - 16, 1987. The General Chairman is R.S. Wagers. The 1988 Ultrasonics Symposium will be in Chicago, Illinois, and the General Chairman is W.D. O'Brien. For 1989, the Ultrasonics Symposium again returns to the south and goes to Orlando, Florida. The budget for the 38th Annual Frequency Control Symposium, which is co-sponsored by G-SU was submitted by T.E. Parker and approved. The 1983 International Symposium on Applications of Ferroelectrics (ISAF) Report was presented by C.E. Land. The ISAF conference is sponsored by G-SU. C.E. Land pointed out that 1983 ISAF was a financial success with a surplus of about \$1,800.00. Unfortunately, in the author kits of ISAF on Gordon and Breach a copyright form was inserted instead of IEEE copyright form. This was a direct violation of IEEE policy and procedure. There was several long dialogues related to this matter. In conclusion, C.E. Land assured that this would not happen at future ISAF conferences.

As part of the IEEE Centennial Year, each group or society has been asked to select an outstanding young engineer. These young engineers will be given a "Key to the Future" by the IEEE at a special banquet in December 1, 1984 in Santa Clara, California. H. van de Vaart has assigned R. Adler to find an appropriate person.

Two new awards have been established for the Annual Frequency Control Symposium. A.D. Ballato presented the criteria for the Cady and Rabi Awards. The Cady Award is to recognize outstanding contributions related to

piezoelectric frequency control devices. The Rabi Award is to recognize outstanding contributions related to fields such as atomic and molecular frequency standards, time transfer, and frequency and time metrology.

R.A. Moore gave an updated status of Chapter Activities in G-SU. There are seven U.S. and one Japanese Chapter. The new Japanese Chapter is extremely active and co-sponsoring several activities in Japan. R.A. Moore pointed out the New Jersey coast and Chicago area appear to be ideal places to start new chapters. The Fellows Report was given by G.S. Kino. He pointed out all five candidates reviewed by G-SU became Fellows. They are Eric Cross, Shigeru Hayakawa, Robert Wagers, Ronald Schmidt, and John Reid. In addition eleven other G-SU members became fellows. W.J. Tanski, chairman of the membership committee, stressed the best way to enroll new members was by personal contact. He urged the G-SU members to recruit people that are active in the field. J.D. Larson, chairman of the nomination committee, presented the slate of 1985-1987 term on AdCom. They were Professor N. Mikoshiba, Dr. D. Hecht, J.S. Heyman, Professor M. Levy, Professor E. Dieulesaint and Professor R.M. White. The Technical Activities Committee is chaired by A.D. Ballato. This committee is responsible for seven items: four standards and three "projects." The subcommittees are: Surface Acoustic Wave Devices, E.A. Mariani, Piezoelectric Crystal, T.R. Meeker; Ultrasonics in Medicine, F.W. Kremkau; Delay Lines, A.A. Comparini; Acousto-Optics, D.L. Hecht; and Industrial Ultrasonics, R.S. Woollett.

The next AdCom Meeting will be held the day before 1984 Ultrasonics Symposium, Tuesday, November 13, 1984 starting at 1:00 p.m. at the Dallas Hilton, Hotel, Dallas, Texas.

Reynold S. Kagiwada
Secretary-Treasurer

FELLOWS COMMITTEE

This year we only had two applications to the Ultrasonics Group for approval of Fellow applications to the IEEE. Last year there were eleven. Members of the Ultrasonics Group are urged to submit names of suitably qualified colleagues as candidates for this honor. Candidates should have been a senior member of the IEEE for at least three years, and should have made major contributions to the field of electrical engineering. In order to receive a recommendation from the ultrasonics group, they must have made contributions to the field of ultrasonics.

G.S. Kino
Chairman
Edward L. Ginzton Laboratory
Stanford University
Stanford, CA 94305
(415) 497-0205

Chapters Report

LONG ISLAND

The SU Long Island Section held three technical meetings this season:

1. Tuesday, October 18, 1983, 4:00 p.m. at PINY, Farmingdale. Professor Henry L. Bertoni of PINY speaking on "Imaging with the Reflection Acoustic Microscope". The talk was based on his work at University College, London, while there on sabbatical. The combination of early hour, location, and Henry's good sense in publicizing the meeting among his colleagues produced a goodsized audience of interested people.
2. Thursday, March 8, 1984. Dinner meeting and talk at Tudor Times Restaurant in Jericho. SU National Lecturer George A. Alers of Magnasonics spoke on "Quantitative Non-Destructive Evaluation - A Timely Confluence of Science, Engineering, and Economics". This was a joint meeting with the Long Island Section of the American Society for Non-Destructive Testing held on their regular meeting night and at their usual meeting place. Their Chairman, Mike Berman took care of the arrangements and financial details.
3. Thursday, April 12, 1984, 8:00 p.m. at PINY, Farmingdale. Klaus D. Breuer (AIL) speaking on "Compressive Receivers for EW Systems". This was a joint meeting with the Aerospace Electronic Systems group; but of the 35 people who attended, only 6 were from SU and 4 from AES. The remainder were attracted by the topic. This meeting was arranged by SU Program Chairman Dr. Frederick Freyre, who also arranged the first meeting. The importance of the topic was obvious from the interest and questioning at the end of the talk.

George Alers was pleased with the size of the audience. He was not so pleased with the snowstorm which changed to a blizzard by next morning. At 4:00 a.m., after 4 hours sleep, he got on his plane at J.F.K. only to have the airport close down about five minutes before take-off. He was stuck at J.F.K. until 11:00 a.m. and missed his appointment with an important visitor back in Albuquerque.

Warren White, inventor of the compressive receiver, was there. It was the kind of large, spirited meeting that is fun for somebody with a technical interest in the subject.

We had intentions of holding a meeting on ultrasonic transducer design and application for people making flow meters, cleaners, liquid level meters, etc. However, we were not able to compile a list of contacts and possible audience in this technical area. I tried calling some of the many small companies who make ultrasonic products. Some were cordial and indicated interest. Some were cautious about people stealing their "secrets". We might pursue this further in the future,

if we can make contact with enough interested people to make it economically worthwhile for a transducer supplier to send us a speaker. Anybody interested please get in touch with me at Hazeltine Corporation, Greenlawn, NY 11740. If we don't find enough interested parties, we'll probably continue the emphasis on ultrasonic imaging, signal processing, and non-destructive evaluation. We'll follow the formula of joint meetings in convenient places in order to insure a large-enough audience.

We have intentions of exploring the possibility of combining with the New York Metropolitan Chapter but have not followed up yet.

BALTIMORE-WASHINGTON-VIRGINIA

The elected officers of the Washington-Baltimore-Virginia section of Sonics and Ultrasonics for 1984-85 are:

Chairman: Dr. Narendra K. Batra
202-767-3505
Vice-chairman: Dr. Joel Rosenbaum
301-459-8240
Secretary: Dr. Manas K. Roy
301-583-4553

Dr. Harry L. Salvo, Jr. (301) 765-4290) will serve as meeting arrangements officer.

The following is our planned schedule for the coming year:

DATE	TOPIC/SPEAKER
October 2, 1984	Magnetoelasticity (Tentative) Speaker: To be announced
December 4, 1984	From Ultrasonic transducer to Robotic C-scan. Speaker: Dr. Boro Djordjevic Martin Marietta
February 5, 1985	Electro-acoustics & the Ear: Hearing Aids & Personal Sound Exposure Meters. Speaker: Dr. V. Nedzeinitzky National Bureau of Standards
April 2, 1985	Frequency & Time Sources -Past, Present & Future. Speaker: Dr. Arthur Ballato IEEE Nat'l Speaker
June 4, 1985	Acousto-Optic Devices for Microwave Applications. Speaker: Dr. Joseph F. Weller Naval Research Lab

For further information, please feel free to contact any of the officers of the section.

Narendra K. Batra
Chairman

Chapters Report (continued)

SANTA CLARA VALLEY

The following is the tentative speaker schedule for the Santa Clara Valley Chapter of G-SU. All talks are at 8:00 p.m. in Hewlett Packard Building 20.

DATE	TOPIC/SPEAKER
September 19, 1984	Surface Acoustic Waves Speaker: Bob Potter Crystal Tech.
October 17, 1984	Tissue Characterization Speaker: Meno Nassi Diasonics
November 7, 1984	Acoustic Microscopy Speaker: Hadi Mioglu Babur Stanford Univ.
December 19, 1984	Acousto-Optics Speaker: TBA Crystal Tech.
January 16, 1985	Acoustic Imaging Speaker: Pierre Khuri- Yakub Stanford Univ.
February 20, 1985	Non-Destructive Testing Speaker: Bob Addison Rockwell
March 20, 1985	Transducer Technology Speaker: Amin Hanafy Acuson Inc.
April 17, 1985	Frequency and Time Sources Speaker: Arthur Ballato U.S. Army
May 15, 1984	Surface Acoustic Waves Speaker: Waguhi Ishak Hewlett Packard

For additional information contact Dr. Alan Selfridge, Ultrasonic Devices, 2592 Middlefield Rd., Palo Alto, CA. (415) 327-1140

Alan Selfridge
Chairman

BOSTON CHAPTER

The following schedule of technical meetings has been established for 1984-85.

DATE	TOPIC/SPEAKER
October 25, 1984	Professor Pankaj Das of Rensselaer Polytech Institute will speak on "Nondestructive Testing of Semiconductors using Surface Acoustic Waves"
January 23, 1985	Dr. S.W. Merritt of United Technologies will speak on GaAs SAW tapped delay lines.
February 13, 1985	Dr. Tom Parker of Raytheon will discuss "Measurement of Frequency Stability". This is a joint meeting with the Instrumentation and Measurement Society.

April 3, 1985

Dr. Arthur Ballato of ERADCOM, the G-SU National Lecturer, will speak on "Frequency and Time Sources, Past, Present, and Future"

For information on the time and location of these meetings contact the Chairman Richard Webster, (617) 861-3683.

The following officers will be guiding the Boston Chapter.

Richard Webster - Chairman
Joe Callera - Vice Chairman
Tom Szabo - Secy - Treasurer

Richard Webster
Chairman

CHAPTER COORDINATORS REPORT

By now the chapters have scheduled some very interesting speakers with exciting topics for their 1984/85 program schedules. All should have scheduled Dr. Arthur Ballato, our National Lecturer. His topic is "Frequency and Time Sources - Past, Present and Future". Art is with the U.S. Army Electronics Technology and Devices Laboratory, Fort Monmouth, NJ 07703. He may be reached at (201) 544-2773 or 2751.

Joint meetings with other IEEE chapters and appropriate technical organizations has proven to be an effective approach to broadening the areas available for programs. Various chapters have reported excellent joint meetings with MTT, AP, ED and various active device, NDE and medical groups. If your section has an organization meeting in which all chapters are brought together this is a good time to organize joint meetings.

One of the recurring subjects of this column is its appeal for interested persons to establish new chapters. It can be very rewarding both personally and professionally resulting in an increased awareness of professional work in your area. The chart below is repeated from the last newsletter issue because it pinpoints key areas where there is a high potential for establishing a successful chapter.

State	Total State Membership	Membership In Possible Chapter Area
Connecticut	45	
New Jersey	71	50 in New Jersey coast area
New York	116	37 in NY City to Conn. border
Pennsylvania	77	31 in Philadelphia-Trenton area
Illinois	68	52 in Chicago area
Texas	81	40 in Dallas-Ft. Worth area
Arizona	18	15 in Phoenix area
California	291	
Washington	53	44 in Seattle area.

The idea of stimulating additional interest and membership in IEEE-GSU as a result of chapter

Congratulations

development is presently being pursued by one of our members. He is located in an area other than those cited above where there is no concentration of G-SU members but there is a significant concentration of acoustical work. He feels that a chapter will soon be developed through personal contacts with others in the area. This will result in a significant technical and professional benefit to the area and IEEE-GSU memberships will be forthcoming.

If your pioneering instincts have been aroused contact Bob Moore at (301) 765-4027 or by mail at Westinghouse Defense and Electronic Center, P.O. Box 746, MS 335, Baltimore, MD 21203. I will be more than happy to assist you in any possible way.

For any who are in the areas served by our chapters a list of contacts is given below.

BOSTON
Richard Webster, RADC/EEA
Hanscom AFB, MA 01731.

SOUTHERN CALIFORNIA
C.S. Tsai
University of California
School of Engineering
Irvine, CA 92717

LONG ISLAND
Dr. Richard La Rosa
Hazeltine Corporation
Greenlawn, NY 11740

SANTA CLARA VALLEY
Allan Selfridge
2592 Middlefield Rd.
Palo Alto, CA 94301

WASHINGTON
Navenda K. Batra
Naval Research Laboratory
Washington, D.C. 20375

PITTSBURG
Mark A. Jerabek
West Virginia University
Dept. of Elec. Engineering
Engineering Sciences Bldg.
Morgantown, WV 26506

TOKYO, JAPAN
Nobuo Mikoshiba
Res. Inst. Elec. Commun.
Tohoku University
Katahira Sendai Japan

OREGON
Robert D. Chew
12875 S. Barlow Rd.
Beaverton, OR 97005

TOKYO CHAPTER

The Tokyo Chapter-SU is now making an effort to invite Dr. Arthur Ballato, the National Lecturer for 1984-85, to Japan. Meeting activities of the Tokyo Chapter-SU will be reported in the next newsletter issue by Prof. Y. Shimizu or by Prof. K. Takagi.

Nobuo Mikoshiba
Chairman

To R.F. Wagner, S.W. Smith, J.M. Sandrik and H. Lopez, winners of the 1983 Best Paper Award for their two papers:

"Statistics of Speckle in Ultrasound B-Scans"

and

"Low Contrast Detectability and Contrast/Detail Analysis in Medical Ultrasound"

which appeared in the May issue of the Transactions on Sonics and Ultrasonics.

To Dr. Gordon Kino of the E.L. Ginzton Laboratory, Stanford University, who will be presented the 1984 Achievement Award at the Ultrasonics Symposium in Dallas Texas.

* * * * *

GUIDE FOR WRITING BETTER PAPERS

Craig Harkins of IBM in San Jose, California, and Don Plung of Exxon Nuclear in Idaho, both members of the IEEE Professional Communication Society, have coauthored a book entitled "A Guide for Writing Better Technical Papers". The book, published by the IEEE Press, contains 48 reprinted articles selected from a variety of sources and grouped in five categories as follows:

- Getting Started
- The Rhetoric of Papers and Articles
- Tricks of the Trade
- Some Research Results
- Following Through

In using this book, potential authors can either focus their attention on one aspect of writing a paper or article, or they can follow all the recommended steps from planning to polishing. It provides even the most experienced professionals with ideas to help simplify and improve the process of writing technical papers.

Copies of "A Guide for Writing Better Technical Papers" may be obtained by contacting the IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. The paperbound edition is \$12.45 (for IEEE members only), while the clothbound edition is \$18.70 (for IEEE members) and \$24.95 (for nonmembers). The order number is PP01537 for the paperbound edition and PC01529 for the clothbound edition.

Transactions Report

1984 is shaping up as a good year for the Transactions. The July 1984 Special Issue on "Digital Acoustical Imaging" will be an excellent issue for present and archival useage. The issue contains 25 papers of interesting and valuable content. Look for a new format in this issue with all the papers beginnning on separate pages.

The September Special Issue on "Hypo-thermia" is also complete and contains nine excellent papers on the subject.

In 1985, we have two Special Issues upcoming, March "Acoustical Microscopy" and May "SAW Convolvers and Correlators".

All members, authors and prospective authors for the Ultrasonic Symposium Proceedings should be made aware of the new invitation to write up their submitted manuscripts for the Proceedings in a format that could be used for regular publishing in the Transactions. The manuscript would appear in the Proceedings as written. However, the manuscript would undergo the standard review process for considerations of publishing as a regular manuscript in the Transactions. The advantages of also appearing in the Transactions are a) much wider audience b) complete review of the technical content by at least two referees c) archival interest d) wider reference acknowledgement. The Group on Sonics and Ultrasonics and its Publication Board strongly encourage authors at the Symposium to write their papers for also publishing in the Technical Periodical Transactions on Sonics and Ultrasonics.

The November 1984 issue will be our Centennial issue. We plan on having a brief historical review of the origin of the Group.

Have you noticed that the authors photo and biography are now at the conclusion of their respective articles in the Transactions?

The Transactions Editor and Publication Board encourages you all to support the Transactions by submitting and publishing papers in your technical endeavors. We are planning to expand our total number of pages published.

Stephen Wanuga
Editor, IEEE Transactions
on Sonics and Ultrasonics
General Electric Co.
Electronics Park
Syracuse, NY 13221
(315) 456-3152

Membership

The Sonics and Ultrasonics Groups membership is currently 2017 which is roughly the same as it has been for the last two years at this time. Membership retention and recruitment is vitally important to our group and I wish to ask your help in this effort. If you know of potential new members, or if you know members who are dissatisfied and who may drop out, please let me know giving me their name, address, and telephone number and I will contact them personally.

As in the past several years, we shall again offer S & U group membership free of charge to persons who join at our forthcoming Symposium in Dallas. Application forms and other information will be available at the membership booth. All members can assist us by encouraging non-member acquaintances who are attending the meeting to consider the merits of group membership.

William J. Tanski
GSU Membership Chairman
Schlumberger-Doll Research
Center
Ridgefield, CT 06877
(203) 431-5472

REPORT OF THE SUBCOMMITTEE ON ULTRASONICS IN MEDICINE

Thirty-six people have agreed to contribute to the medical ultrasound field parameter measurement guide. Approximately two-thirds of the contributions have been received. The following persons have agreed to coordinate and edit the contributions from the respective areas:

Hydrophone, G.R. Harris, Center for
Devices and Radiological Health

Radiation Force, P.D. Edmonds, SRI
International

Thermoelectricity, L.A. Frizzell,
University of Illinois

Calorimeter, H.F. Stewart, Center for
Devices and Radiological Health

Optics, W.A. Riley, Wake Forest
University

Cavitation, W.T. Coakley, University
College, Cardiff

Comments on the submitted drafts will be received from all contributors, area editors, subcommittee members, and other interested persons.

F.W. Kremkau
Chairman
Department of Diagnostic
Radiology
Yale University School of
Medicine
New Haven, CT 06510
(203) 785-2428

MORE SYMPOSIUM INFORMATION

A meeting room will be provided to give the spouses a chance to meet and visit during any spare time. Dallas is an interesting place for sightseeing, shopping, and entertainment. By Friday you will know your way around better than most of the newly arrived residents and will be able to plan your own activities.

EXHIBITION

Again this year a professionally managed exhibition has been organized to accompany the technical program. Thus far the following companies have signed up as exhibitors:

Allied Corporation
Anderson Labs
Crystal Technology, Inc.
Hewlett Packard
Hitachi Metals
MATEC
Murata Erie North American, Inc.
Panametrics, Inc.
Phonon, Corp.
RF Monolithics
SAWTEK
Sonoscan, Incorporated
Texas Instruments Incorporated
Ultrasonics Magazine
Valpey Fisher
Westinghouse

FUTURE ULTRASONIC SYMPOSIA

October 16-18, 1985
Cathedral Hill Hotel (formerly Jack Tar)
San Francisco, CA
General Chairman: W.R. Shreve

November 17-19, 1986
Williamsburg Conference Center
Williamsburg, VA
General Chairman: R.A. Moore

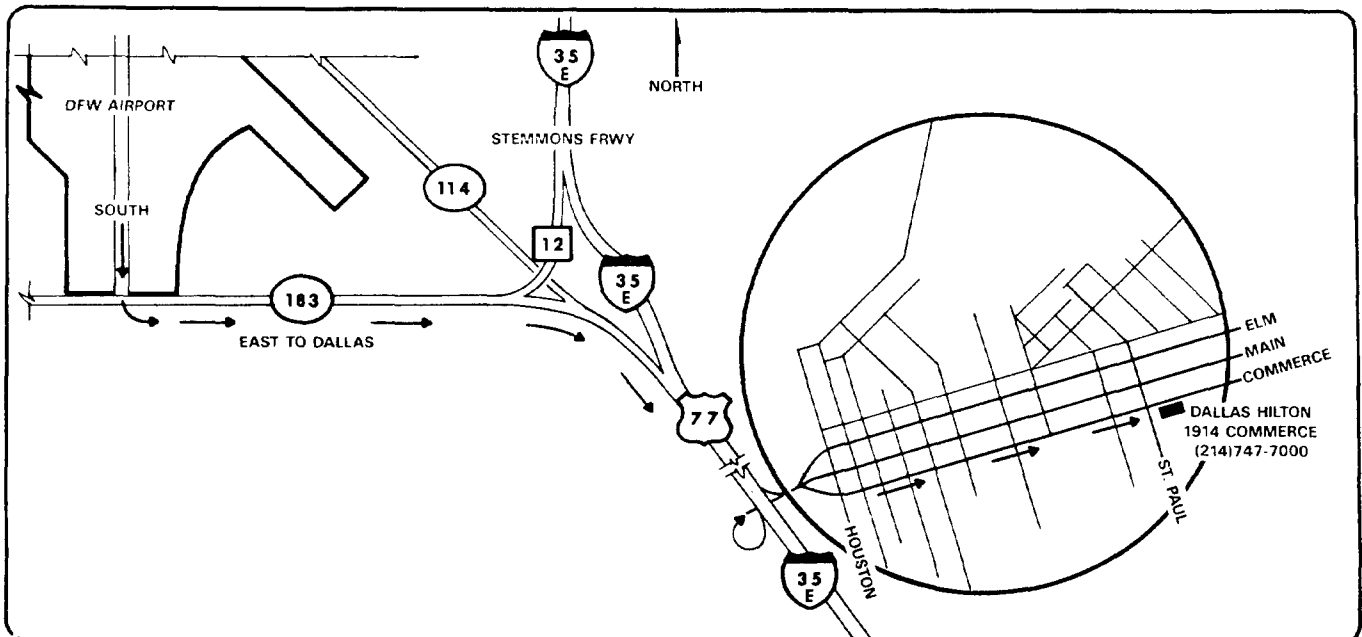
October 14-16, 1987
Sheraton Technology Center
Denver, CO
General Chairman: R.S. Wagers

1988-Chicago, Illinois
General Chairman: W.D. O'Brien Jr.

1989-Orlando, Florida

NOMINATIONS

Your Nominating Committee chaired by John Larson will be meeting during the Ultrasonic Symposium in Dallas. The Committee welcomes suggestions from G-SU members for candidates to serve on the Administrative Committee. Contact any of the following committee members: Bernie Tittman, M.A. Breazeale, Fred Hickernell, William Shreve, Jim Miller, Eric Ash or the chairman John Larson, Hewlett Packard Laboratories, Building 28C, 1651 Page Mill Road, Palo Alto, CA 94340, (415) 857-2930.



From the Division Director's Desk

YOU BE THE JUDGE

S.H. Durrani, Director, Division IX

I would like to share with you a question that will be faced by the Board of Directors in its fall meeting, and ask for your verdict: What would you decide if you were the judge?

The offices of President Elect and Executive Vice President are of critical importance to the Institute and are the only two offices elected by the entire membership. Obviously the nominees must be of the highest caliber as leaders and managers within the Institute and must have a proven record of service in the organization. They must also be willing to listen to all viewpoints and resolve conflicts on emotionally charged issues.

The Institute is fortunate in having several highly dedicated people on its Boards. However, the demands of office increase exponentially along the way, and only a very few individuals possess the time, energy, and talent needed for the two top jobs. Board members, who observe them from close quarters, are in an excellent position to know who these individuals are.

According to the bylaws, the Board of Directors must submit to voting members a list of nominees for these offices. The list must include any other names placed on the ballot by petition.

Traditionally, the Board used to submit a single nominee for each office. This was so because suitably qualified candidates are very few; moreover, some of them decline to run against another highly qualified and respected colleague when it is guaranteed that one of them is going to lose.

A couple of years ago the Board departed from tradition and started naming two candidates for each top office, ostensibly to offer members a choice. However, since both candidates are selected by the same Board, they usually have very similar views of how to run the Institute. (They do not represent different "parties" with distinct programs; the choice is one of personality rather than of philosophy or approach.) Actually, a different mechanism for offering a choice already exists and is guaranteed by the IEEE constitution: if someone is unhappy with the Board's choice, he can offer another name through the petition route; it takes only about 1800 signatures to put a name on the ballot.

There are several drawbacks of the Board naming two candidates for an office: it gives members no real guidance as to their relative merits; it ensures that a highly qualified nominee will be "defeated" and his services may possibly be lost to the IEEE for a year or two; and it injects "politics" into the process without any identifiable benefit.

A more serious drawback is the following. In case of three nominees--say all endorsed by the Board, or two endorsed by the Board and one nominated by petition--it is possible for

the two "best" candidates to split the vote, thus allowing the lesser qualified candidate to win. To prevent such an outcome, it would be necessary to have a run-off when there are three or more nominees for the same office. This would add even more politics, delays, and costs to the election process, all of which is unnecessary and unsuited to a volunteer technical and professional organization. After all IEEE has no "political" authority and its officials cannot influence our lives as elected government officials can, so that the safeguards needed in one situation are completely irrelevant in the other.

For the reasons discussed, I am fairly convinced that the endorsement of two or more nominees by the Board for these top offices is a mixed blessing, and the disadvantages far outweigh the advantages. Thus I am in favor of reverting to the traditional approach of presenting a single nominee for President-Elect and similarly a single nominee for Executive Vice President, of course with provision for petition candidates in each case.

Before casting my vote, I would like to hear from you about your preference. Your reasons will also be welcome; however, if you are pressed for time, a simple answer will do:

Single nominee or multiple nominees--what would you prefer?

Please call me at my office (301) 344-6339 or drop me a line at my home address: 17513 Lafayette Drive, Olney, Maryland 20832. Your inputs will be greatly appreciated.

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2. Clarity-To be clear is to say what you mean. The good writer makes the meaning as clear as possible and leaves no room for doubt about what is being read.

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7. Poetry-Good writing entertains, informs, advises, illuminates. It cannot simply be. It must do. In much that you write there is the opportunity to do more than tell the reader what will happen or when or how or even why. Is there a figure of speech that will enhance your meaning as well as etch across the reader's mind a vision that will endure beyond the last page? Can you choose words with such care and arrange them in such a way that they reveal not just your point but also a point about life? That is poetry.

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