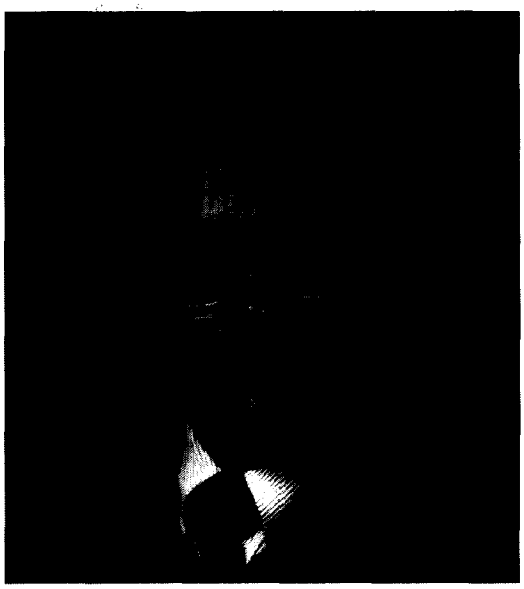
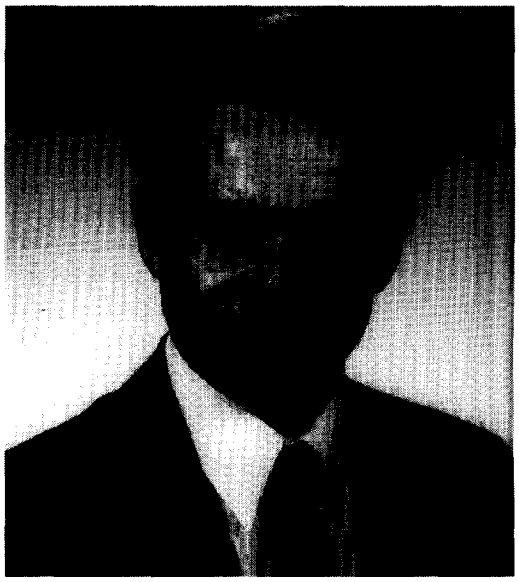
IEEE ULTRASONICS, FERROELECTRICS, AND FREQUENCY CONTROL SOCIETY NEWSLETTER

Number 13: April 1992

Editor: Fred S. Hickernell



James Greenleaf – UFFC-S President



John Vig – Distinguished Lecturer

46th Annual Symposium on Frequency Control

May 27-29, 1992

Hershey, Pennsylvania

International Symposium on Application of Ferroelectrics

August 31-September 2, 1992

Greenville, South Carolina

UFFC-S
Distinguished Lecturer

John R. Vig

John R. Vig was born in Hungary in 1942. He immigrated to the United States in 1957, received the B.S. degree in physics from the City College of New York in 1964, and the M.S. and Ph.D. degrees from Rutgers - The State University, New Brunswick, New Jersey, in 1966 and 1969, respectively.

From 1969 to 1972 he served as an officer in the US Army, stationed at the R&D laboratories of the Army Electronics Command, Fort Monmouth, New Jersey, where he developed a superconductive tunable filter. Since 1972 he has been employed as a civilian research scientist at Fort Monmouth, working primarily on the experimental aspects of quartz crystal devices. Specific areas of interest have included the properties of quartz, resonator fabrication technology (cleaning, etching, polishing, X-ray orienting, packaging, etc.), the effects of design and processing parameters on stability, and the development of SC-cut resonators and oscillators for high-stability applications. As Chief of the Frequency Control and Timing Branch in the US Army Electronics Technology and Devices Laboratory, he currently leads a multidisciplinary research program aimed at the development of high-stability frequency control devices and clocks for future DoD communication, navigation, identification, and radar systems.

Dr. Vig served as the General Chairman of the Annual Frequency Control Symposium from 1982 to 1988, and has been a member of the Technical Program Committee since 1972. He served on the IEEE UFFC-Society Administrative Committee for the 1986-1989 term. He has been serving on the Technical Program Committee of the IEEE Ultrasonics Symposium since 1986, on the IEEE Standards Coordinating Committee 27 (and its predecessor, TC-3) since 1979, and as the IEEE Representative on the Hoover Medal Board of Award since 1985. From 1982 to 1986 he served as a member of the Technical Program Committee of the Quartz Devices Conference, and since 1982, on the Executive Committee of the Precise Time and Time Interval Applications and Planning Meeting. He has been the Principal United States Member of the NATO Working Group on Frequency Control Devices since 1981. He received the highest R&D award bestowed by the US Army, the Army Research and Development Achievement Award, in 1979, 1983, and 1987. The results of his research have been presented at professional meetings and have been published in more than 80 professional papers. He has received 39 patents.

In 1988, he was elected a Fellow of the IEEE "For contributions to the technology of quartz crystals for precision frequency control and timing." He received the 1990 IEEE Cady Award "for outstanding contributions to the development of improved quartz crystals and processing techniques, significantly advancing the field of precision frequency control and timing." In 1992, he was selected to be the Distinguished Lecturer of the IEEE UFFC-Society for 1992-1993.

John Vig
UFFC-S Distinguished Lecturer

The Administrative Committee of the Ultrasonics, Ferroelectrics and Frequency Control Society has announced the UFFC-S Lecturer for 1992-1993 Dr. John R. Vig. As the Distinguished Lecturer, Dr. Vig will be available to speak before UFFC-S chapters, graduate and undergraduate student university seminars, IEEE groups, and other appropriate scientific and engineering associations. His topic is:

High-accuracy Oscillators and Clocks

Dr. Vig is Chief of the Frequency Control and Timing Branch in the U.S. Army Electronics Technology and Devices Laboratory, Fort Monmouth. He currently leads a multidisciplinary research program aimed at the development of high-stability frequency control devices and clocks for future DoD communication, navigation, identification, and radar systems.

The establishing of the Distinguished Lecturer program and providing a stipend to cover travel expense by the UFFC-S is indication of the interest of the AdCom in supporting the activities of groups interested in Ultrasonics, Ferroelectrics, and Frequency Control. In addition to present UFFC-S Chapters, groups which are considering chapter formation, university groups, and other IEEE groups which have an interest are encouraged to schedule the distinguished lecturer at as early a date as practical so that he can organize his talks and schedules to best fits the groups' needs. Please feel free to copy or extract from the abstract and biographical information given in this newsletter.

High-Accuracy Oscillators and Clocks

John R. Vig
U.S. Army Electronics Technology and Devices Laboratory
Fort Monmouth, NJ 07703-5601

Prior to the 15th century, clocks did not play a significant role in people's lives; the major use of clocks was for reminding the population that it was time to assemble for prayer. Clocks began to be used for regulating people's lives (primarily the work hours) in the 15th century. Since the 17th century, when the best available clock's accuracy was about a minute per day, clock-accuracy has improved by about 10 orders of magnitude. Today, clocks seem to be everywhere. More than 10^9 crystal oscillators are produced annually, mostly for clock applications. The average family (in developed countries) owns more than ten crystal oscillators — not only in quartz watches, but also in automobiles, TV sets, home and office computers, radios and hi-fi equipment, video cameras, VCRs, telephones, two-way radios, kitchen appliances, electronic toys and games, etc.

This lecture will review the subject of high accuracy oscillators used for frequency control and timing applications. The discussion will include the historical evolution of clock technologies, descriptions of the various types of oscillators (TCXO, MCXO, OCXO and atomic oscillators), some interesting civilian and military applications of frequency standards and high-accuracy clocks, the instabilities of oscillators and their significance, the causes of instabilities, methods of minimizing the various instabilities, the importance of environmental effects, and comparisons among state-of-the-art quartz and atomic frequency standards.

Of the numerous applications, navigation, space tracking, communication, radar and identification-friend-or-foe systems are among the most demanding. The instabilities to be discussed are: frequency aging, noise, frequency vs. temperature characteristics (including warmup, hysteresis, trim effect, and activity dips), oscillator-circuit-caused instabilities, drive level effects, the effects of various types of acceleration, the effects of various types of radiation, electric and magnetic field effects, the effects of ambient pressure/altitude, humidity, gas permeation, power supply and load impedance effects, and interactions among the various effects.

Clocks and time transfer methods will also be discussed. Emerging technologies that promise large improvements in frequency and time accuracy will be described, including the Global Positioning System and its uses in nanosecond level timekeeping and time transfer.

President's Message

It is an honor to be elected the president of the Ultrasonics, Ferroelectrics, and Frequency Control Society, and I look forward to working with everyone over the next year. The past president, Dr. Jan Brown, did a fantastic job of organizing the society so that it serves all three groups of individuals in ultrasonics, ferroelectrics, and frequency control. Harry Salvo, the past secretary and current vice president did a great job of keeping track of the minutes of the meetings and answering questions from most of us as to how the system worked. Don Malocha, who is now the new secretary, has done a very good job in the past as membership secretary. Bill O'Brien continues his excellent job running the Transactions. We all look forward to working together in the new year. We predict 1992 to be as good as the past years. This society is especially healthy fiscally and can be considered one of the top societies in the IEEE because of the high citation level of our Transactions and Proceedings. I expect over the next year to develop some new services and products for the members. For instance, we are trying to develop methods for obtaining videotapes of the workshops and courses provided at our meetings. These would be useful in courses at universities and companies. We also would like to provide CD-ROM bibliographies or selected topics that can be analyzed by your favorite data base management system. Bill O'Brien, the editor of our Transactions had a great idea to publish some special publications through the IEEE Press consisting of groups of specific papers on subjects of interests to our members. We are open to any new idea as to new goods or services that could be provided by our members.

I look forward to working for UFFC-Society over the next year and hope to hear from some of you about new ideas for the society.

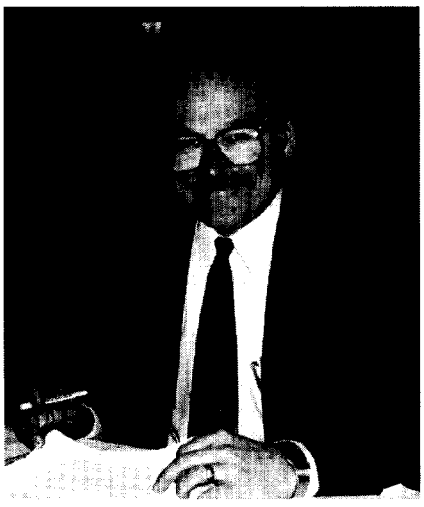
James F. Greenleaf

New Society Officers

JAMES F. GREENLEAF

James F. Greenleaf (M'73) was born in Salt Lake City, UT, on February 10, 1942. He received the B.S. degree in Electrical Engineering from the University of Utah, Salt Lake City, in 1964, the M.S. degree in Engineering Science from Purdue University, Lafayette, IN, in 1968, and the Ph.D. degree in Engineering Science from the Mayo Graduate School of Medicine, Rochester, MN, and Purdue University in 1970.

He is currently Professor of Biophysics and Medicine, Mayo Medical School, and Consultant, Biodynamics Research Unit, Department of Physiology, Biophysics, and Cardiovascular Disease and Medicine, Mayo Foundation. He has served on the IEEE Technical Committee for the Ultrasonics Symposium for five years. He served on the IEEE-UFFC-S Subcommittee on Ultrasonics in Medicine/IEEE Measurement Guide Editors, and on the IEEE Medical Ultrasound Committee. Dr. Greenleaf was Vice President of the UFFC Society in 1991. Dr. Greenleaf has four patents and is recipient of the 1986 J. Holmes Pioneer award from the American Institute of Ultrasound in Medicine and is a Fellow of IEEE and AIUM. Dr. Greenleaf was the Distinguished Lecturer for IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society (1990/1991). His special field of interest is in ultrasonic biomedical imaging science and he has published more than 165 articles and edited five books in the field.



"I've got a lot in store for you"
– Jim Greenleaf, UFFC-S President

New Society Officers

HARRY L. SALVO, JR.

Harry L. Salvo, Jr. was born in Racine, Wisconsin. He received his B.S. degree in Applied Mathematics and Physics from the University of Wisconsin in 1969. He attended graduate school at the University of Wisconsin - Milwaukee where he received his M.S. and Ph.D. degrees in Physics in 1974 and 1979 respectively.

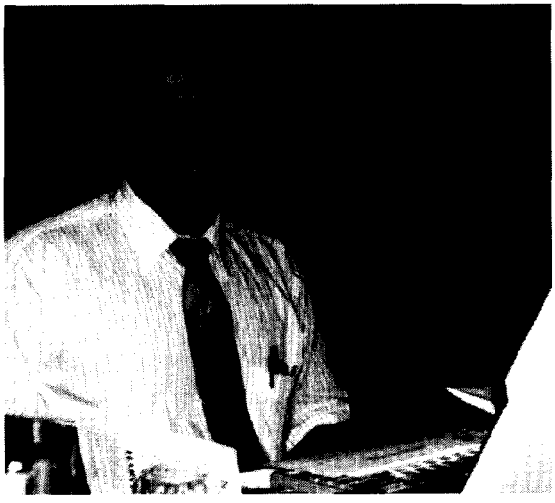
Since 1979 he has been with the Westinghouse Electronic Systems Group and is a member of the Advanced Technology Division located near Baltimore, Maryland. He is currently Acting Manager of the Microwave Acoustics and Magnetics Department. He is primarily involved in thin film bulk acoustic devices for use in signal processing and frequency control applications.

Harry was the Secretary - Treasurer of the UFFC-S Administrative Committee from 1987 to 1991. He has been a member of the Ultrasonics Symposium Technical Program Committee since 1985 and a past President of the Baltimore, Washington, and Northern Virginia Chapter of the UFFC-S. He was involved with the local arrangements for the 1974 Ultrasonics Symposium held in Milwaukee and was Finance Chair for the 1984 Ultrasonics Symposium in Atlanta. In addition to his position as Technical Chair of the 1990 Ultrasonics Symposium in Honolulu, he is the General Chair of the 1993 Ultrasonics Symposium to be held in Baltimore, MD. Harry is a member of the American Physical Society as well as the IEEE.

"It goes this way"
– Harry Salvo, UFFC-S Vice President

DONALD C. MALOCHA

Don Malocha earned his B.S. degree in Electrical Engineering/Computer Science and his M.S. and Ph.D. degrees in Electrical Engineering from the University of Illinois, Urbana in 1972, 1974, and 1977, respectively. Presently, Don is a Professor in the Electrical Engineering department and group leader of the Solid State Devices and Systems Laboratory at the University of Central Florida, Orlando. His research group is currently working on single-phase surface acoustic wave (SAW) transducers, diffraction analysis, CAD techniques, SAW based systems, quartz resonator measurement techniques and ACT devices.

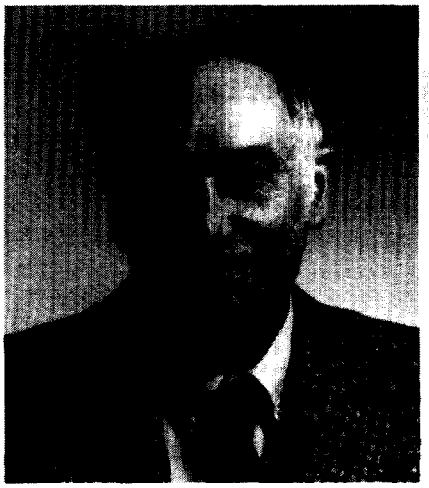


"Yep, I can run this ol' laptop with my eyes closed"
– Don Malocha, UFFC-Secretary- Treasurer

From 1977 to 1978, Don was a research associate in the Coordinated Sciences Laboratory at the University of Illinois working on SAW technology. From 1978 to 1980 he was a member of the Corporate Research Laboratories at Texas Instruments, Dallas, working on SAW based modulator and convolver systems. From 1980 to 1982 he was the Manager of Advanced Product Development for Sawtek, Orlando, developing low loss transducer technology, data acquisition techniques and bidirectional filters. In 1989-1990, he was a visiting member of the Technical Staff at Motorola's Advanced Components Technology Group, Phoenix, working on SAW and acoustic charge transport (ACT) technology.

Don is an Associate Editor of the *IEEE UFFC Transactions,* is the former UFFC-Society Membership chair and an elected member of the UFFC Society Administrative Committee. Don is past chair of the IEEE Orlando Section and the Orlando UFFC chapter. He has received the IEEE Orlando Sections' Engineer of the Year, Educator of the Year, and Outstanding Service Award in 1984, 1988, and 1989, respectively. He was awarded the UCF College of Engineering Excellence in Research Award in 1986 and 1991 and received the Florida Governor's Award for Outstanding Contributions to Science and Technology in 1989. Don is a Senior Member of the IEEE, a member of the American Vacuum Society, Eta Kappa Nu and Tau Beta Pi. He is a professional engineer, State of Florida, and holds three patents, several copyrights on computer software and has over 40 publications.

Newly Elected Administrative Committee Members



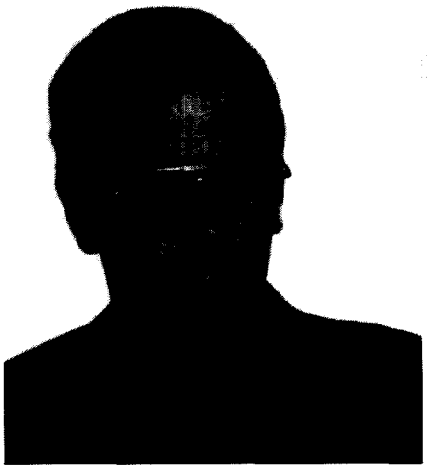
ERIC L. ADLER

Eric L. Adler (M'59-SM' 83-F'89) was born in Alexandria, Egypt, on December 10, 1930. After finishing high-school in Alexandria he went to England and received the B.Sc. (Electrical Engineering) degree in 1955 from the University of London, London, England. He worked for STC (IT&T) in England as a research engineer before moving to Canada where he received the M.A.Sc. degree from the University of Toronto, ON, Canada, and the Ph.D. degree from McGill University, Montreal, PQ, Canada, all in electrical engineering, in 1959, and 1966, respectively.

Eric has been with McGill University since 1959 and is currently a Professor of Electrical Engineering. His primary research interests are acoustic propagation, thin-film transducers, acoustooptics, and surface-wave devices. In 1979/1980 his sabbatical leave was spent at the Lincoln Laboratory of MIT, and in 1986/1987 a sabbatical was spent at the University of California at San Diego. While in San Diego, Eric was a consultant with the Naval Ocean Systems Centre.

Eric is a Fellow of the IEEE, has been a member of the Symposium Technical Program Committee for a number of years, and is a regular reviewer for the UFFC transactions. He is a member of Sigma Xi and a member of the Order of Engineers of Quebec.

Eric's wife Lee is an Associate Professor of Mathematics and Statistics at Concordia University in Montreal. They enjoy dancing, tennis, cycling, and traveling together. They have two Siamese cats.



HELGE E. ENGAN

Helge E. Engan was born in Bergen, Norway, in 1939. He received a master's degree in physics in 1962 and a doctorate degree in physical electronics in 1967, both from the Norwegian Institute of Technology, Trondheim, Norway.

Since 1967 he has worked mainly at the Department of Electrical Engineering and Computer Science at the Norwegian Institute of Technology, from 1984 as professor of physical electronics. He spent one year, 1973, at Raytheon Research Division, Waltham, Massachusetts, two months in 1979 at Sperry Research Center, Sudbury, Massachusetts, and one year, 1985, at Edward L. Ginzton Laboratory, Stanford University, California. During the last ten years he has also consulted for various research groups and companies. He is co-founder of a company engaged in acoustics- and electronic-based products.

He started his professional work by studying oscillations of electron-phonon interaction in piezoelectric semiconductors. Later he worked with many aspects of surface acoustic wave transduction, propagation, diffraction and detection. He has also worked with acoustic waves in areas such as optical fibers, medical ultrasound, hearing aids, gas flow measurements and underwater acoustics. Acousto-optic interactions have been studied in connection with laser probing of surface acoustic waves and with frequency shifting of light in optical fibers.

He is a member of the IEEE, the Optical Society of America, The Norwegian Physical Society, and The Norwegian Academy of Technical Sciences.

Helge and his wife Ingvild are the parents of two boys. They spend much of their spare time at their mountain cabin enjoying outdoor activities such as mountain hiking and cross-country skiing. Helge enjoys jogging and swimming when possible, and he finds music listening and reading to be relaxing and revitalizing at the same time.

JIM MILLER

Jim Miller is currently Professor of Physics at Washington University in St. Louis where his research focuses on the physics of inherently inhomogeneous media. Active areas of research include ultrasonics tissue and materials characterization, the physics underlying the propagation of ultrasound in inhomogeneous media, and ultrasonic transducers. He holds three patents and has co-authored approximately 120 manuscripts on ultrasonics. He was the recipient of two Industrial Research IR100 awards, in 1974 for an ultrasonics microemboli monitor used in open-heart surgery and in 1978 for a phase insensitive ultrasonic transducer based on the acoustoelectric effect.

In addition to his appointment as Professor of Physics, Jim Miller serves as Director of the Physics Department's Laboratory for Ultrasonics. He holds a joint appointment as Research Professor of Medicine in the Washington University School of Medicine.

Miller is a Fellow of the Acoustical Society of America and a Fellow of the American Institute of Ultrasound in Medicine. Miller is a Senior Member of the IEEE and had previously served two elected terms as a member of the UFFC ADCOM. He has been a member of the Technical Program Committee for the IEEE Ultrasonics Symposium for a number of years and served as Technical Chairman for the 1986 Ultrasonics Symposium in Williamsburg, Virginia. Miller also serves as a member of the Technical Program Committee for the annual International Symposium on Ultrasonic Imaging and Tissue Characterization. Miller was a Sigma Xi National Lecturer for 1981-1982.

Jim's wife, Judy, is a Ph.D. molecular biologist who studies viral diseases in an ophthalmologic laboratory. Their son, Doug, will be a freshman at Harvard University next fall.

SUSAN C. SCHNEIDER

Dr. Schneider received her B.S. in physics and mathematics from the University of Wisconsin-Stevens Point in 1972, followed with a Ph.D. in physics from the University of Wisconsin-Milwaukee in 1981. In 1981, she joined the Department of Electrical and Computer Engineering at Marquette University, and was promoted to Associate Professor in 1988. She has served as the Associate Chair of the department since 1988. Her teaching interests have been in electromagnetic fields and advanced analog and digital circuit design. Her research interests include theoretical studies of the SAW attenuation and velocity changes produced by electron-phonon, magneto-elastic and acousto-electric interaction in conducting, and superconducting thin films; experimental studies to characterize charge transport mechanisms across the interface formed by the union of dissimilar materials; and developing semiconductive glaze compositions for use as high power, high stress resistors. In addition, she has been involved in developing and implementing signal processing algorithms for "near real time" time differentiation. Dr. Schneider is an active member of the Ultrasonics, Ferroelectrics, and Frequency Control Society of IEEE, and she has just recently been elected to a three year term on the UFFCs Administrative Committee. In addition, she has served on the technical program committee for the 1988-1992 IEEE Ultrasonics Symposia, was publicity chairperson for the 1990 Ultrasonics Symposium, and is currently serving as the finance chairperson for the 1992 Ultrasonics Symposium.

On a personal note - six years ago, when her son Jacob was born, Dr. Schneider began to explore with her son the wonderful world of "boy toys". Starting with Matchbox Toys, the two kids moved into construction toys, and now they're confirmed Lego Maniacs. It's been reported that Lego stock has risen significantly since they started collecting sets. The two of them are now saving their (tooth fairy) money to buy the metroliner. Next stop will be LEGO/TC LOGO equipment, and then Mom will have to share her computer. Any free time remaining after work & Lego is devoted to devouring science fiction. (Dr. Schneider has a very messy house.)

46TH ANNUAL SYMPOSIUM ON FREQUENCY CONTROL

The 46th Annual Symposium on Frequency Control is sponsored by the IEEE UFFC Society, with the participation of the personnel of the U.S. Army Electronics Technology & Devices Laboratory, Fort Monmouth, NJ. The symposium will be held on May 27, 28, and 29, 1992 at the Hershey Lodge and Convention Center, Hershey, Pennsylvania. The symposium committee consists of:

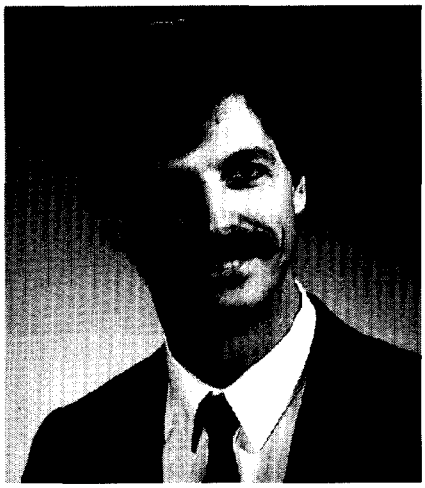
General Chairman:	Dr. Raymond L. Filler U.S. Army LABCOM
Technical Program Chairman:	Mr. Jack Kusters Hewlett-Packard Company
Finance Chairman:	Dr. Thomas E. Parker Raytheon Research Division

The Annual Symposium on Frequency Control has served as the leading technical conference addressing all aspects of frequency control and precision timekeeping. Recent progress in research, development, and applications will be represented by the following topics:

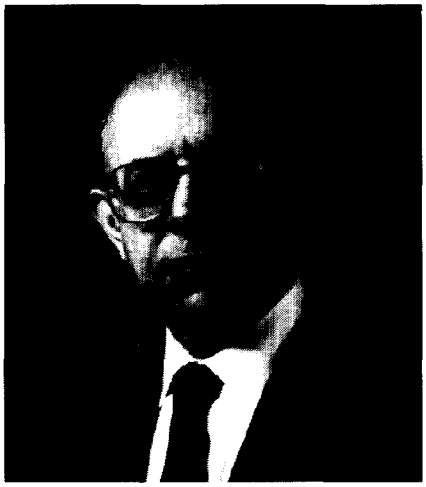
- Fundamental Properties of Piezoelectric Crystals
- Theory and Design of Piezoelectric Resonators
- Resonator Processing Techniques
- Filters
- Surface Acoustic Wave Devices
- Quartz Crystal Oscillators
- Microwave and Millimeter Wave Oscillators
- Synthesizers and Other Frequency Control Circuitry
- Atomic and Molecular Frequency Standards
- Noise Phenomena and Aging
- Frequency and Time Coordination and Distribution
- Sensors and Transducers
- Applications of Frequency Control
- Measurement and Specifications

For any additional information on the 46th Annual Symposium on Frequency Control contact Mr. Michael Mirarchi or Ms. Barbara McGivney, Synergistic Management Inc., 3100 Route 138, Wall Township, NJ 07719, (908) 280-2024.

Frequency Control Symposium Committee



Raymond L. Filler



John A. Kusters

Thomas E. Parker

RAYMOND L. FILLER

Ray Filler was born in Brooklyn, NY in 1948. He received the B.S. degree in physics from Rensselaer Polytechnic Institute, Troy, NY in 1969 and the Ph.D. degree from Rutgers, New Brunswick, NJ in 1975.

He is currently the leader of the Crystal Oscillator and Resonator Team of the Frequency Control and Timing Branch of the U.S. Army Electronics Technology and Devices Laboratory (LABCOM), Fort Monmouth, NJ. His research interests include techniques to improve the long and short term stability, and shock and acceleration sensitivity of quartz crystal oscillators. His professional credits include five patents and over 30 publications.

Dr. Filler served as Publicity Chairman of the Annual Symposium on Frequency Control from 1986-1990 and as General Chairman in 1991. He is a Senior member of the IEEE and a member of APS.

He is married and spends virtually all of his non-working hours caring for, training, and competing with his and his wife's five horses. The rest of the family consists of 3 dogs, 9 cats, 1 rabbit, and Gus T. Goat.

JOHN A. KUSTERS

John A. Kusters (S'61-M'64-SM'87) was born in Racine, WI in 1937. He received the B.S.E.E. degree from Loyola University, Los Angeles, in 1964. From 1964 to 1968 he attended Stanford University working on microwave acoustic delay lines, receiving the M.S.E.E. degree in 1965. From 1965 to 1986 he was employed by Hewlett-Packard developing cesium frequency standards, acoustooptic devices, and quartz resonators. From 1986 to 1989 he was employed by the Efratom Division of Ball Corporation developing quartz resonators and oscillators. In 1989, he returned to the Santa Clara Division of the Hewlett-Packard Company where he is currently the R&D Manager for Precision Time & Frequency products.

Mr. Kusters is a member of Tau Beta Pi, Sigma Xi, and Alpha Sigma Nu. Mr. Kusters is also the current Chairperson of the Technical Program Committee of the IEEE Frequency Control Symposium and has been active in various IEEE and EIA Standards Committees.

Mr. Kusters is married, has four sons, and spends much of his spare time playing with computers, woodworking, and assisting his wife in the travel agency that they own.

THOMAS E. PARKER

Thomas E. Parker was born in Natrona Heights, PA on September 17, 1945. He received the B.S. degree in Physics from Allegheny College in 1967. He received the M.S. degree in 1969 and the Ph.D. degree in 1973, both in Physics, from Purdue University. His doctoral thesis was a Brillouin scattering study of acoustoelectric domains in GaAs.

In 1973 he joined the staff of the Raytheon Research Division, working with the Generalized Filters and Microwave Acoustics (now Stable Sources) group. His initial areas of interest involved temperature stable surface acoustic wave (SAW) materials and laser probing techniques. Since 1976, he has concentrated on stable frequency sources, in particular, SAW stabilized oscillators. He has made fundamental contributions to the understanding, and reduction of flicker noise in stable oscillators, and has conducted an extensive investigation of the long-term frequency stability of SAW oscillators. He played a major role in the development of the "all quartz package" for SAW devices and has worked on the reduction of the vibration sensitivity of SAW devices and oscillators. In 1989, Dr. Parker was promoted to Consulting Scientist, the highest technical level in Raytheon.

Dr. Parker is a member of Sigma Pi, Sigma Xi, and a Senior Member of IEEE. He has been an officer of the Boston Chapter of UFFC, served on the Technical Program Committees of both the Ultrasonics and Frequency Control Symposia, and also served as Technical Program Chairman for Frequency Control. Dr. Parker was an elected member of the UFFC AdCom and is the chairman of the Frequency Control Standing Committee.

ISAF '92

IEEE International Symposium on the Application of Ferroelectrics

August 31 - September 2, 1992
Hyatt Regency, Greenville, South Carolina

TECHNICAL PROGRAM

The International Symposium on the Application of Ferroelectrics, ISAF '92, will be held August 31 - September 2, 1992, in Greenville, South Carolina. The meeting is sponsored by the Ultrasonics, Ferroelectrics, and Frequency Control Society of the IEEE in cooperation with the Electronics Division of the American Ceramic Society. This biannual meeting emphasizes the application of ferroelectric materials in the form of single crystals, bulk ceramics, and thick and thin films. Papers will be presented describing original work in the following categories which reflect those properties of the materials determining their application.

Ferroelectric

Materials and applications in which the primary property utilized is polarization reversal (ferroelectric switching). Topics include thin film processing, integrated memories, integration, performance, fatigue, ageing, modelling, and new applications.

Dielectric

Materials and applications in which the primary property utilized is the high permitivity of the ferroelectric materials. Topics include multilayer capacitors; thin film integrated static capacitors; packaging; dielectric breakdown and reliability; high frequency dielectrics; PTC materials; boundary layer capacitors; and processing. A new topic will be electrorheological fluids.

Piezoelectric and Electrostrictive

Materials and applications in which the primary property utilized is piezoelectricity (and the related electrostriction). Applications to include actuators; transducers; micromotors and microactuators; resonators; and sensors. Topics to include processing and modelling, and material categories to include ceramics, ceramic/polymer composites, and polymers.

Electrooptic, Pyroelectric, etc.

Materials and applications in which the primary properties utilized are the electrooptic effect, pyroelectricity, photorefraction, and related optical properties. This category will include ferroelectric liquid crystals. Applications to include phase modulators, second harmonic generators, displays, optical NDRO devices, optical comparators, digital and analogue image storage, thermal sensors and imagers, detectors, etc.

LOCATION

Greenville, South Carolina is located approximately 150 miles northeast of Atlanta, Georgia along Interstate I-85 connecting Atlanta and Charlotte, North Carolina. International flights are available into Atlanta, GA and Charlotte and Raleigh, NC. Domestic flights are also available into the Greenville-Spartanburg airport located 10 miles from downtown Greenville.

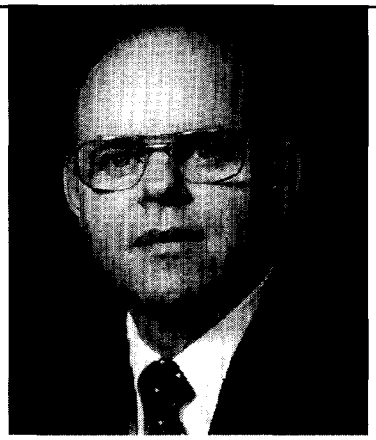
During the symposium, the group will be traveling to Clemson, SC, about 30 miles west of Greenville, for a brief visit to the campus of Clemson University and an evening outdoor social function at Lake Hartwell on the University grounds.

ACCOMMODATIONS

Accommodations will be available at the Hyatt Regency in downtown Greenville, South Carolina or at several other hotels and motels in the local area. The Hyatt will serve as the conference headquarters.

INFORMATION

For further information on ISAF '92 contact Professor Gene Haertling, 206 Olin Hall, Clemson University, Clemson, SC 29634-0907, telephone (803) 656-0180, Fax (803) 656-2698.

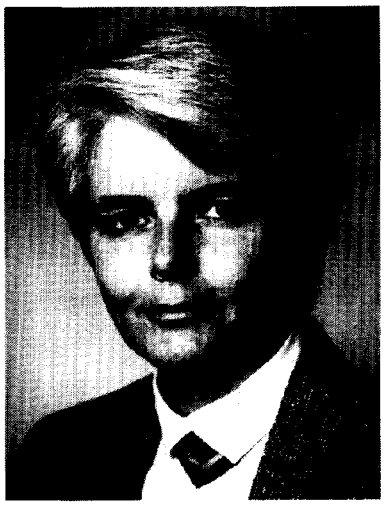


Gene H. Haertling

Dr. Gene Haertling received his B.S. degree in ceramic engineering from the University of Missouri at Rolla in 1954. His M.S. and Ph.D. degrees, also in ceramic engineering, were earned from the University of Illinois in 1960 and 1961, respectively. Previously, he served briefly on the faculty of the University of Missouri-Rolla. During the years from 1974-1987, he was Vice-President of the technical staff and manager of the ceramic research group at Motorola, Inc, in Albuquerque, NM. Prior to joining Motorola, he was president of Optoceram, Inc., a small entrepreneurial company he founded, which was engaged in the development and manufacture of PLZT electrooptic ceramics. From 1961 to 1973, he held staff and managerial positions at Sandia National Laboratories. During this time he developed the first transparent ferroelectric ceramics, the PLZT (lead lanthanum zirconate titanate) materials, which are now used in both military and commercial applications. In 1989, Dr. Haertling joined the faculty of Clemson University as Bishop Professor of ceramic Engineering.

Gene is a member of the American Ceramic Society, IEEE, Materials Research Society, National Institute of Ceramic Engineers, Sigma Xi, and the Society for Information Display. He is a Fellow of both the IEEE and the American Ceramic Society and is a co-holder of nine patents in the area of ferroelectric and electrooptic ceramic materials and devices. He has published 37 papers and two book chapters on electronic ceramics.

Jan Brown Elected to IEEE Board of Directors



Jan Brown

The UFFC society congratulates our former president, Jan Brown, director of sensor development at Fisher Controls International, Inc., Austin, Texas, who has been elected to a two-year term to the Board of Directors of The Institute of Electrical and Electronics Engineers, Inc. (IEEE). She will serve as division director-Division IX (Signals and Applications), which includes more than 32,000 members.

Jan received the A.B., A.M. and Ph.D. degrees from Washington University in 1972, 1974 and 1978 and the M.B.A. from the University of Texas at Austin in 1990. From 1978-84, she was a member of the professional staff at Schlumberger-Doll Research in Ridgefield, Connecticut, where she was primarily involved in investigations of materials, devices, and techniques for pressure and temperature measurements in extreme conditions. Since she joined Fisher Controls in 1984, she has held positions of increasing responsibility in technical management.

Jan was president of the Ultrasonics, Ferroelectrics, and Frequency Control Society from 1990-91, vice president from 1988-89, and associate editor, Transactions, from 1987-91. She was chairman of the Ultrasonics Symposium in 1987 and 1988. She was a member of the IEEE Technical Activities Board (TAB) from 1990-91, and served as chairman of the TAB Public Relations Task Force in 1991. Jan continues to support our society as past president and as a member of society committees.

Awards Presented at the 1991 Ultrasonics Symposium

The 1991 Achievement Award was presented to Professor Gerald W. Farnell, Fellow IEEE, of the Department of Electrical Engineering at McGill University in Montreal, Quebec Canada. The citation read as follows:

For his dedication to engineering education, his comprehensive research on acoustic propagation and waveguiding in anisotropic materials, and his long-term commitment to the Society and IEEE.

The award was presented by UFFC-S President, Jan Brown. Professor Eric L. Adler, a long-time colleague at McGill University reviewed for the audience, Professor Farnell's many contributions to the field of ultrasonics. The Achievement Award consists of a cash award, a certificate, and a plaque.

Eric and Lee Adler (left), Norma and Jerry Farnell (1991 Achievement Award Recipient) (right)

1990 Outstanding Paper Award to Dr. Reinhard Lerch (left) of Siemens AG, Germany

The 1990 Outstanding Paper Award was presented to Dr. Reinhard Lerch of Siemens AG, Germany for his paper "Simulation of Piezoelectric Devices by Two- and Three-Dimensional Finite Elements" which appeared in the May 1990 issue of the Transactions. The award consists of certificate and plaque. The key features of the paper were that it was 1) very clearly written, 2) was a self-contained discussion, useful to expert and non-specialist alike, 3) had detailed comparison with experiment (from his and others' work), 4) addressed current (and difficult) issues in transducer design and 5) yielded information not attainable by analytic approaches.

The 1991 UFFC-S Distinguished Lecturer Award was presented to Professor Moises Levy of the Department of Physics, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin. His lecture is entitled "Ultrasonics of High T_c and Other Unconventional Superconductors". The distinguished lecturer received a certificate from president Brown.

ADCOM BRIEFS

The Administrative Committee (AdCom) Meeting of the Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFC-S) was called to order at 9:05 A.M., December 8, 1991 by J. Brown.

President Brown introduced the new members of the ADCOM for 1992: Eric L. Adler, Helge E. Engan, James G. Miller, and Susan C. Schneider.

L.E. Cross gave the report on the 1990 ISAF. He reported that the printing of the Conference Proceedings is now underway at IEEE.

G. Haertling presented the report on the 1992 ISAF. The Symposium will be held on August 31 to September 2, 1992 at the Hyatt Regency Hotel in Greenville, South Carolina. He reported that they expect an attendance of 360 to 370.

L.E. Cross reported that there probably will not be an ISAF in 1993 due to the IMF that year.

J. Brown reported that the organization and structure of the Ferroelectrics Committee is under review. Also under consideration is the issue of a yearly ISAF Meeting.

ADCOM approved a motion that UFFC-S will work "in cooperation" with the other sponsors of the IMF 1993.

T.E. Parker gave the Frequency Control Report. He stated that the Memorandum of Understanding with the U.S. Army on the Frequency Control Symposium has been rewritten and approved. The MOU no longer requires two administrators to run the Symposium. He reported on the new make-up of the Frequency Control Committee.

T. Parker reported that an agreement between Sawyer Research Products and the UFFC on the Sawyer award has been worked out. The agreement specifies that the award recipient will be selected by the Frequency Control Nominations Committee and the monetary award and plaque will come from Sawyer Research Products.

T. Parker presented the final report on the 1991 Frequency Control Symposium. The attendance was 362 which is up from last year.

The ADCOM approved Boston, MA as the site of the 1994 Frequency Control Symposium.

ADCOM also approved Don Sullivan as the 1995 and 1996 Frequency Control Symposium General Chair and Gary Johnson as the 1997 and 1998 Frequency Control Symposium General Chair.

ADCOM passed a resolution that ADCOM encourages the three symposia to support student and other travel.

J. Brown reported that TAB has hired a marketing director, Jonathan Doll. He has done a marketing survey, using the nonmember individual subscribers, and found that our Transactions rates in the top ten of the most popular.

J. Brown reported that TAB has not instituted a G&A fee.

The TAB entitlement, which comes from IEEE dues, is going to be returned for 1992 and 1993. This money is going to come from the "All Transactions Package". The effect on our Society is about $2-3K.

TAB has a colloquium in one region each year. For 1992 this will happen in Region 8, Europe, Middle East, and Africa. TAB is trying to match up each section in Region 8 with a Society. J. Brown would like to know if anyone is going to travel into Region 8.

H. van de Vaart presented the operating financial report. So far in 1991, as of 10/31/91 our surplus is $97.1K and our reserves are $451.2K.

H. van de Vaart stated that both the voluntary and overlength page charges are way down from the budget. The budget was based on 1000 pages with an average voluntary page charge income of 42% and overlength charges based on 30% of the total pages. If the current numbers are extended to the end of the year, we find voluntary page charges at 17% and overlength pages at 19%.

He is expecting the Transactions to end the year with a surplus of $34K instead of the $60K budgeted.

He reported that for next year the IEEE has raised the Transactions nonmember list price by $50.00 to $220.00. This means and additional income of $20K. However the income from the page charges will probably be down.

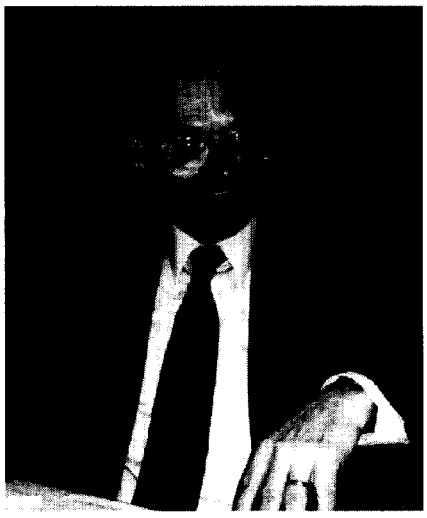
He also stated that the "All Transactions" income will be reduced from $90K to $75K. We will loose $15K in 1992 and also $15K in 1991.

W. O'Brien gave the Transactions Editor's report. With the January 1992 issue, the Transactions has gone to electronic publishing. The November 1991 issue contained the two Ferroelectric Special issues and the Ferroelectrics Standard.

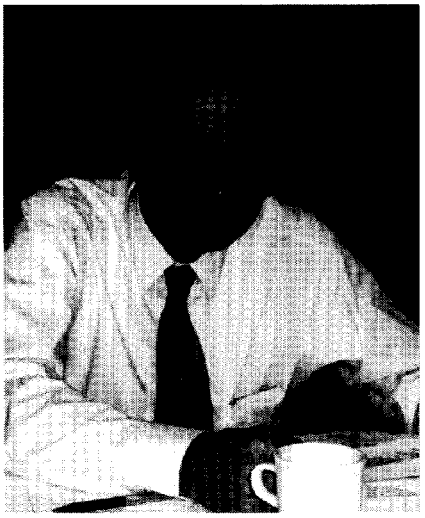
The new overlength page charge schedule has not yet been published. He will include the new schedule in the "Instruction to Authors".

He reported on the new Associate Editors:

Some of Your Friendly AdCom Members



Art Ballato



Eric Adler

Susan Schneider	Physical Acoustics
Cecil Land	Ferroelectrics – Applied
Gerald Blessing	Nondestructive Evaluation
David Hutchins	Measurement & Control Applications

He is soliciting names of candidates for Associate Editors in the following areas:

Optical Interactions
Book Reviews
Elastic Wave Phenomena
Biomedical and Medical
Frequency Control Acoustic Materials

W. O'Brien introduced a proposal for Editor-Directed Manuscripts. This proposal would allow the Editor-in-Chief to accurately track manuscripts.

ADCOM instructed the Transactions Editor-in-Chief to implement Editor-in-Chief-Directed Manuscripts for the 1993 Transactions year.

F. Hickernell gave the report on the Newsletter. He reported that the total cost of publishing the two 1991 Newsletters was approximately $9,000. The deadline for the Spring Newsletter will be March 1, 1992.

D.C. Malocha gave a report on the 1991 Ultrasonics Symposium to be held in Orlando, FL. Pre-registration was the highest in history but this may be because they are accepting credit cards. As of December 6, 1991, registration is 206 IEEE, 86 Non-IEEE, 64 Student, And 82 Guests for a total registration of 444. As of the present time, registration is 520.

He reported that do to a lack of pre-registration, some of the guest functions had to be canceled. The short courses are doing well.

F. Hickernell gave the report on the 1992 Ultrasonics Symposium in Tucson. The Symposium Hotel is the Holiday Inn. He has made arrangements with the Park Inn and the Ramada Inn to handle the overflow.

H. Salvo reported on the 1993 Ultrasonics Symposium. The Symposium will be held at the Hyatt Regency Hotel in Baltimore on November 8 to 10, 1993.

Q. Gerard reported that the 1994 Ultrasonics Symposium in France will be held on November 1 to 4, 1994. He reported that he has signed a contract with the Hotel Martinez. At the current rate of exchange the hotel rooms would cost $116.00 including breakfast.

ADCOM approved G.V. Blessing as the General Chair of the 1995 Ultrasonics Symposium".

ADCOM also approved Seattle, WA as the site of the 1995 Ultrasonics Symposium.

R. Tancrell gave the report from the Awards committee.

R. Tancrell reported that the 1991 Achievement Award will be presented to Dr. Gerald W. Farnell. The Outstanding Paper award is going to Dr. Reinhard Lerch for his paper "Simulation of Piezoelectric Devices by Two-and Three-Dimensional Finite Elements."

The Distinguished Lecture for 1991-1992 is Dr. Moises Levy. His topic is "Ultrasonics of High Tc and Other Unconventional Superconductors."

ADCOM approved Dr. John R. Vig as the 1992-1993 Distinguished Lecturer and his talk be tentatively titled "High-Accuracy Oscillators and Clocks".

D.C. Malocha reported on membership. He stated that membership is down by about 50. He reported on the response rate of our Outreach program.

A. Ballato presented the report on Standards activities. He reported that Standard 790-1989 has been submitted to IEC/TC87 for adoption as an IEC Report.

B.R. Tittmann gave the report of the Nominations committee. These annual election to ADCOM was held in June, the new members are: E.L. Adler; J.G. Miller; S.C. Schneider; and H.E. Engan

He discussed the guidelines the Nominations Committee uses in selecting nominees for ADCOM. He also presented the members of the nominations committee.

D. Hecht submitted a written report on the Journal of Lightwave Technology. The Journal has a surplus for 1991 of about $31K which is to be distributed to the seven sponsoring Societies. The UFFC share is $1,130.00.

M. Schafer submitted a written report on the Transactions on Medical Imaging. He reports that they are looking for a new editor.

ADCOM elected J.F. Greenleaf as President, and H.L. Salvo, Jr. as Vice-President for 1992.

The first ADCOM meeting of 1992 will be Thursday, February 20, 1992 in Dallas, Texas.

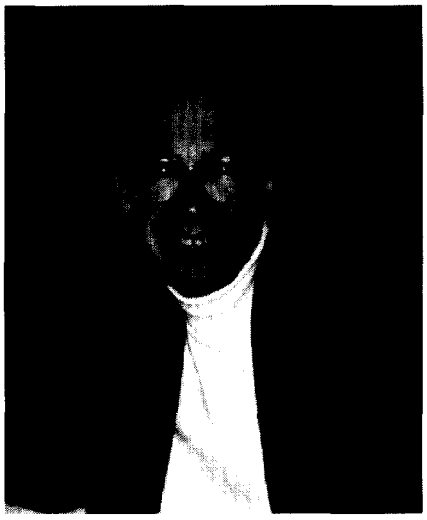
The second ADCOM meeting of 1992 will be tentatively set for Sunday, August 30, 1992 in Greenville, NC.

J. Brown presented Certificates of Appreciation to the outgoing ADCOM Members: J.F. Greenleaf, H. Ermert, D.C. Malocha, and C. Yeack-Scranton.

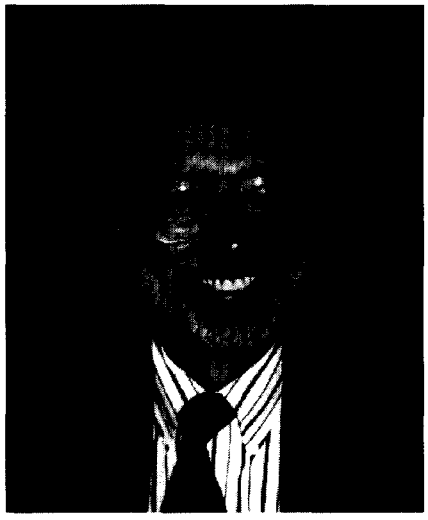
ADCOM gave an unanimous vote of thanks to Jan Brown for her services as ADCOM President.

The UFFC-S ADCOM adjourned at 5:52 PM.

Harry Salvo
Secretary/Treasurer



Helmut Hellwig



Errol EerNisse

Bolef Symposium

Organizers: Yaotian Fu and Jan Brown (left) and Ron Sundfors (far right) with Dan Bolef

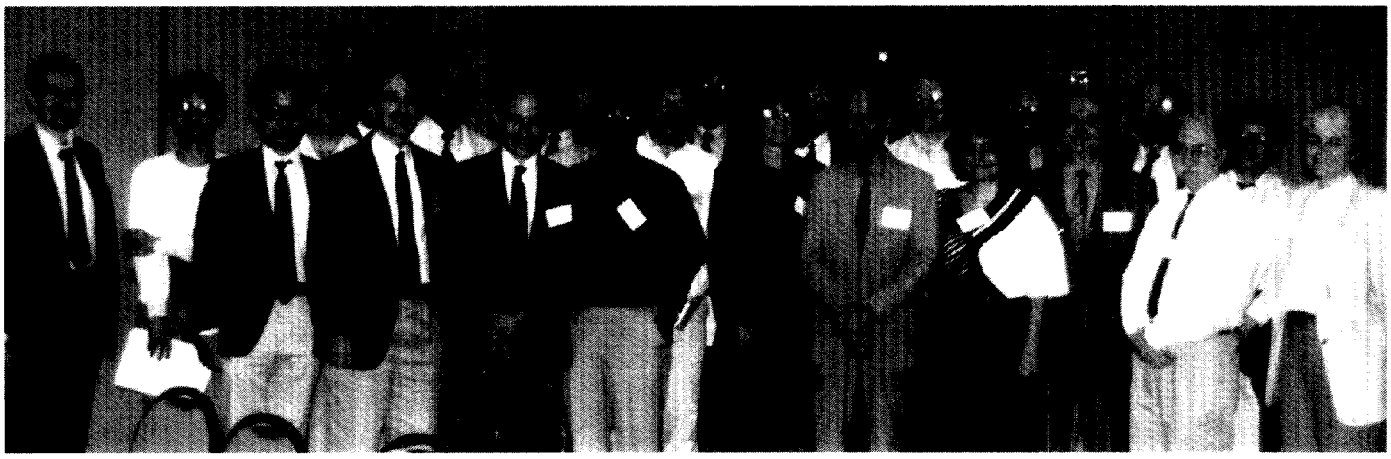
The Bolef Symposium was held the day before the 1991 IEEE Ultrasonics Symposium in honor of the seventieth birthday of Professor Dan I. Bolef. Dr. Bolef has contributed to the fundamental understanding of molecular beams, solid state masers, elastic properties of solids, acoustic paramagnetic resonance as well as nuclear acoustic resonance. His students have gone on to contribute in a wide range of fields both inside and outside of physics.

The symposium featured invited lectures by Dan, some of his former students, and colleagues in the field who have used Dan's work including the acclaimed Russian academician, Alexander Kessel. The topics presented in the symposium ranged from the history of nuclear acoustic resonance in Russia to ultrasonic investigations of high Tc superconductors to tuning up a quasi-crystal.

Dan Bolef (left)

Jan Brown with Academician Alexander Kessel, invited Russian speaker on nuclear acoustic resonance (right)

Attendees at Bolef Symposium (below)



The three technical sessions were followed by a lively dinner roast and tribute to Dan, the teacher, colleague, activist, and friend. While Dan has inspired his students and colleagues to think independently and to voice their opinion, I'm not sure he was prepared for their forthrightness in telling stories on him and each other. It was clear that a bit of history was rewritten to the delight of all.

On behalf of the organizers, friends, and colleagues of Dan, and Dan himself, I would like to thank the UFFC for their help in scheduling, advertising, making local arrangements, and generally making this event possible. A special thanks to the Ultrasonics Symposium organizing committee without whom we would not have been able to stage such a successful birthday celebration.

Jan Brown for the organizers...

Keith Pickens, Dan Bolef, and Dennis Dietz

Marj Yuhas, Reginna Birchem, and Dennis Dietz (right)

"Now Dan, are you ready for what's in bag #3?" (below)

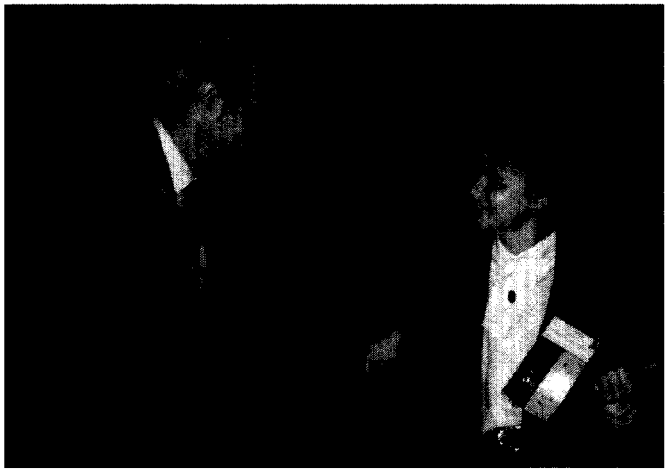
Dan Bolef and Brage Golding (bottom right)

EXPRESSIONS/IMPRESSIONS - JAN BROWN

Our beloved Jan Brown has guided the UFFC Society over the past two years with a firm administrative hand, a listening ear, and an impish grin. She has supported new programs for society outreach while remaining concerned about the future of UFFC and meeting it's own members needs. Jan brought a spirit of excitement and fun to all who worked with her. The captions on the following photos are what one of her fellow AdCom members perceived were her thoughts at the time the pictures were taken at the 1991 Ultrasonics Symposium.

"He doesn't look like much, but he is your new leader"

"Get your hand off me and beat it buster"



"I just recruited two new UFFC-S members — Eyore and Igor"

"Dad, what do you think of my new boyfriend?"

"Is that all I get Roger, just a handshake and this heavy plaque?"

Membership Report

A welcome to all new UFFC members listed on pages 22 & 23. Our membership has remained relatively constant over the past three years at slightly under 2200 members. This is my last article as Membership Chair, with Kathy Ferrera assuming this responsibility. We will attempt to smoothly transition responsibilities. Sam Richie will continue as Membership Development Chair, and I would like to thank Celia Yeack-Scranton for all her efforts on Chapters over the past three years.

Our Ambassador Program, which provides financial support for IEEE and UFFC membership to the engineers and scientists in countries without "hard" currency, is approximately two years old. The program gives timely access of IEEE publications and information to areas of the world which might, otherwise, be isolated. In addition, the program has provided technical exchange through conferences, visiting lecturers, the UFFC Distinguished Lecturer, and individual member correspondence. Please contact Kathy if you are traveling to countries and visiting colleagues who may benefit from this international program.

Donald C. Malocha
1991 Membership Chair

Membership Chair
Katharine Ferrera
California State University – Sacramento
Department of Electrical Engineering
Sacramento, CA 95819-6019
Office: (916) 278-7308
FAX: (916) 278-5949

Membership Development Chair
Samuel M. Richie
University of Central Florida
Electrical Engineering Department
Orlando, FL 32816-0450
Office: (407) 823-5765
FAX: (407) 823-5835

IEEE UFFC-S Members Elected to Fellow Grade

Congratulations to the following members of the Ultrasonics, Ferroelectrics, and Frequency Control Society who were recently elected to the grade of IEEE Fellow.

Dr. Leif Bjorno Stendiget 19 DK 2630 Taastrup Denmark	For contributions to ultrasound technology.
Dr. John Cafarella, President MICRILOR Inc. 17 Lakeside Office Park 607 North Avenue Wakefield, MA 01880	For contributions to the development of surface-wave and other advanced signal-processing components.
Professor Hua Lee Department of ECE University of California Santa Barbara, CA 93106	For contributions to high-resolution imaging techniques and tomographic acoustic microscopy.
Dr. Robert Moore 1243 Balfour Drive Arnold, MD 21012	For the development of monolithic microwave acoustic filters.
Dr. Paul S. Peercy Sandia National Labs, Dept. 1140 1515 Eubank, SE Albuquerque, NM 87185	For contributions to ferroelectric and strained-layer compound semiconductor materials and their device applications.
Dr. William J. Tanski United Technologies Research Ctr. Silver Lane - M/S 31 East Hartford, CT 06108	For developments in surface acoustic-wave resonator devices.
Professor R. Bruce Thompson Ames Laboratory/108 Ofc. & Lab. Iowa State University Ames, IA 50011	For contributions to ultrasonics nondestructive evaluation as a quantitative measurement science.
Mr. Stephan Wanuga General Electric Company Electronics Laboratory, Rm. 142 Electronics Park Syracuse, NY 13221	For contributions to the development of zinc oxide thin-film piezoelectric transducers.

IEEE 1991 Ultrasonics Symposium Review

Don Malocha, General Chairman, 1991 IEEE Ultrasonics Symposium

The 1991 Ultrasonics Symposium, held in December, in Orlando, Florida, was a great success. Attendance was excellent, and was only surpassed by the near-ideal Florida weather. The symposium had a near-record number of attendees; 689 people attending, of which 592 were regular attendees and 97 were student attendees. Of these numbers, 290 were IEEE members, 146 were non-IEEE members, and the remaining were students and guests. The symposium, again this year, offered six short courses, spanning the various interest groups within the ultrasonics community. The short courses were very well attended, having a total enrollment of 159.

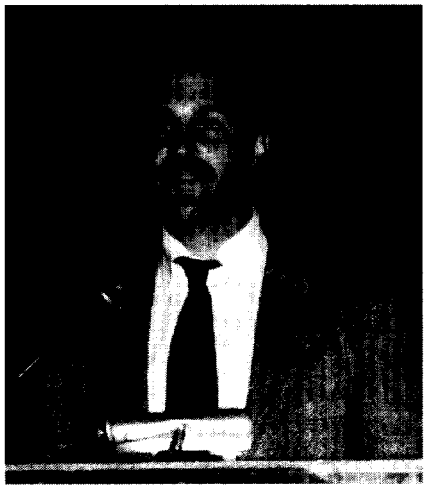
The Technical Program Committee reviewed approximately 410 abstracts from 26 states of the United States and 26 other countries. Of the 315 papers finally accepted, 54% were from outside the United States, including 39 from Japan, 15 from Canada, 26 from France, 20 from the United Kingdom, and 20 from Germany. The Technical Program was extremely well-attended.

In addition to the technical part of the program, the social program was very successful and was very well attended. A banquet was held the first night of the Symposium at the Hilton Hotel around the pool. The weather was nearly perfect, and the additional guests of Mickey, Minnie, and Goofy provided a touch of magic to the evening. A Calypso band provided background music while attendees and guests were able to socialize and partake of the fine food of the Hilton, which included a gourmet treat of gator tail.

The second evening was highlighted by a short trip to Sea World, where guests were given a behind-the-scenes tour of several attractions prior to hors d'oeuvres and a banquet dinner. Approximately 329 guests attended the evening event, which was capped by a special evening show by Shamu the Whale. We were further delighted to have Otto Fad, our President's invited speaker, as our host and trainer for Sea World. Everyone was able to see the two sides of Otto Fad: the first at the podium in a shirt and tie and the other poolside in a wetsuit.

On Thursday, following the symposium, an all-day tour of Kennedy Space Center was also available. Over 90 people registered for the trip, which was an enjoyable day seeing the accomplishments of the United States' space program.

The Symposium was pleased to have a number of eminent special guests, which included Dr. Werner Buff, Dr. Igor Yakovkin, Dr. Alexander Izmalov, Dr. Kessel, Dr. Geilieb, and Ms. Ludmila Bogomolova. It was a pleasure having these special guests able to attend the Ultrasonics Symposium, and, for many of them, this was the first time they were able to attend.



President's speaker, Otto Fad, telling the group a whale of a story

WOMEN IN UFFC-S MEETING

Some preliminary planning has begun for an informal "get acquainted" social gathering of the **Women in UFFC-S** and women student members of the IEEE in the Tucson area. The meeting will be the evening of Tuesday, October 20, 1992, just immediately preceding the 1992 IEEE Ultrasonics Symposium. It will be held at the symposium main hotel. The evening's activities will include "introductions", a slide presentation on "Women in Business in the Far East", followed by open discussion. Anyone interested in having a similar get together at the 1992 IEEE Frequency Control Symposium or the International Symposium on Applied Ferroelectrics (ISAF) or has any other ideas or suggestions, please contact Susan C. Schneider @ Marquette University, Milwaukee WI, (414) 288-7178; or Jan Brown @ Fisher Controls, Austin, TX, (512) 834-7230; or Celia Yeack-Scranton @ IBM Research Division, San Jose, CA, (408) 927-2330; or write to any of the above (addresses available in the IEEE membership directory).

Keep your eyes on this newsletter for further details about this gathering as they develop.

SCENES FROM THE SOCIALS — 1992 ULTRASONICS SYMPOSIUM

Jim and Mary Jane Heighway and friend

Mickey and friends

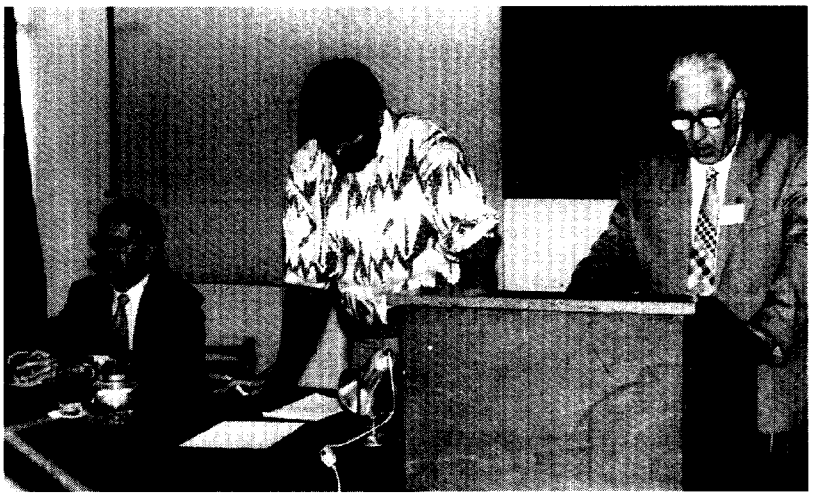
Karen Malocha and friend

Ron Hayes and Madjid Belkerdid

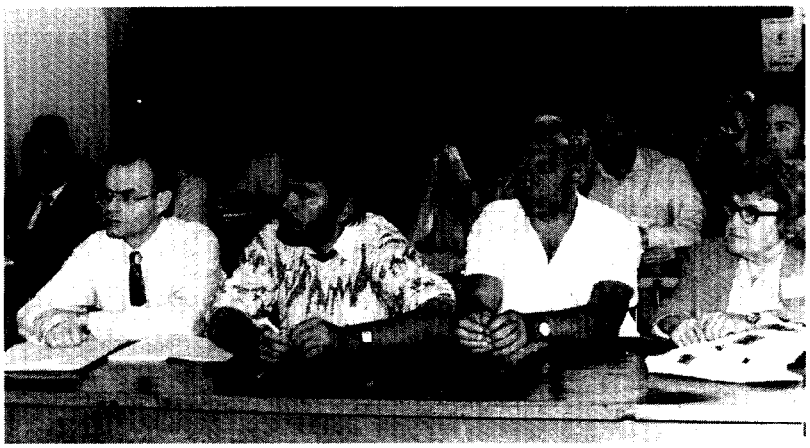
Minnie and Mickey and friend

Ludmila Bogomolova and friend

Acoustoelectronics '91, Varna, Bulgaria



M. Borissov - Chairman (right), I. Avramov - Secretary (middle), and L. Spassov - Vice Chairman (left), at the Opening Session



Attendees at one of the oral sessions

L. Paradovski (Poland), W. Hofman (Poland), N. Yanchev (Bulgaria), and D. Yankov (Bulgaria), discussing problems of crystal growth at a poster session

The 5th Conference with International Participation Acoustoelectronics '91 was held from September 10-13, 1991, at the House of Bulgarian Academy of Sciences in the beautiful Black Sea resort of Varna, Bulgaria. It was organized by the Institute of Solid State Physics in Sofia in a time of severe economic crisis and major system changes in Bulgaria. Nonetheless, the organization committee, with Chairman M. Borissov, Vice Chairman L. Spassov, and Scientific Secretaries I. Avramov, V. Kutepova and D. Yankov, decided not to break the good tradition and to proceed with the conference despite the enormous financial difficulties.

Initially, more than 60 people from Bulgaria and abroad submitted their abstracts, which were published in an abstract booklet after a careful evaluation. Eventually, only 32 participants were able to attend. Among them were scientists from the United States, France, Germany, Poland, and the former USSR. The participants enjoyed the first "Chamber Conference" in the history of "Acoustoelectronics". Eleven oral talks were presented at the three plenary sessions while the poster session included 14 papers, all presented and written in English. There was considerable interest in the invited talks of J.R. Vig, USA, (on instabilities of quartz crystal resonators and oscillators), J. Pelzl Germany, (on photoacoustic effect from fine particles

Group photograph of participants (left)

Y. Pelzl (Germany), N. Tankovski, Zh. Bunzarov, and L. Spassov discussing changes in the technical program during the coffee break (below)

and inhomogeneous solids), E. Bigler, France (on design and test of surface transverse wave resonators on quartz), and in the talk of I.D. Avramov, Bulgaria (on a surface transverse wave based 1 GHz FM transceiver for local area radio networks). All papers presented at the conference will be published by World Scientific Publishing Co. Pte. Ltd., Singapore, in the Proceedings of the Fifth Conference "ACOUSTOELECTRONICS '91".

Since the scientific program was very relaxed, the participants had the wonderful opportunity of exchanging experiences and discussing problems within their field of expertise with each other. They also enjoyed an interesting social program, including a cocktail party, an official dinner, a trip to Evksinograd, former residence of Bulgarian kings, and trips to the Botanical Gardens in Balchik and the beautiful Black Sea resort of Albena. No one missed the opportunity to relax, to enjoy the lovely weather and the warm sea, and to taste the delicious Bulgarian food at various local restaurants.

The photographs will give you an impression of the conference activities. The next conference "Acoustoelectronics '93" will be held in 1993. We look forward to your participation.

I.D. Avramov
Scientific Secretary

John Vig (USA) and L. Spassov (Bulgaria) discussing the future of the conference

UFFC-S New Members

27 February 1991 - 31 January 1992

Aceto, Cecilia C.
Albasri, Hussain H.
Alfan, Ersan
Allsopp, Gerald E.
Alvarez, Alejandro J.
Amery, Suliman
Anzaldo, Damian R.
Arndt, Horst
Assiri, Hassan M.
Azcondo, Francisco J.

Banno, Hisao
Bates, Kenneth N.
Batha, Dean
Behar, Marcelo S.
Bei, Zen-Wei
Blom, Eric D.
Bofelli, Daniel J.
Bolderdrosh, Mirsato S.
Bottauscio, Oriano
Burnside, Michael E.
Bush, Norman
Butner, Wayne M.

Cadavieco, Daniel I.
Cantor, Stephen R.
Capineri, Lorenzo
Castellanos-Guzman, A.G.
Chan, Don
Chang, Pi H.
Chapman, Robert G.
Chiang, Alice M.
Chiavetta, Robert J.
Cho, Siu C.
Chomanics, Frank D.
Cinbis, Can
Cini, Enrico
Cirit, Fatih I.
Cissell, Thomas J.
Claycomb, Rodney W.
Coffen, Kenneth W.
Cohen, Edward N.

Coon, Allan
Crovets, David E.
Cruse II, Energy
Cutsinger, Terrial C.

Davis, Charles L.
de Marchi, Andrea
Dee, Antonio M. Abines
Diaz, Hector Gomez
Diedrickson, Neil D.
Dirim, Bayezit
Doescher, W.L.
Dong, Yanwu
Duffy, Patrick C.

Eidens, Richard S.
Elbel, Charles R.
English, Michael O.
Epp, Shaun G.
Erikmats, Osten
Erman, Marko S.
Evensen, Sverre

Finsterwald, P. Michael
Fiscal, Fernando
Flaiani, Roberto
Flieder, Robert A.
Fundak, Terry J.

Garcia, Juan C.
Garrity, Michael E.
Gatzen, David P.
Gerard, John G.
Gesualdo, Edson
Ghafarianzadeh, F.
Gidwani, Sanjay
Giordano, James R.
Goldberg, Victor
Gomero, German
Grajales, Liliana
Griffin, Jeff B.
Guennoun, Zouhair
Guo, Liang

Hadjicostis, Andreas N.
Hall, Tracy L.
Haller, Robert W.
Hansen, Peter E.
Happley, Marilou T.
Hatalis, Miltiadis K.
Hathaway, Gary F.
Hayashi, Kozo
Hedstrom, Kale P.
Heggie, Robert
Herring, F. George
Hicks, Graham P.
Hobrock, Lance M.
Hodgins, Robert G.
Hofmann, Eugene L.
Holley, Gregory L.
Hood, Julie A.
Hsueh, Cheng Chen
Hughes, Michael S.
Hulett, David H.
Humbert, Donald L.
Hunt, John W.

Inocenti, Gabriel A.
Inoue, Hiroshi
Ioannou, John T.

Jackson, Charles S.
Jackson Jr., Irvin R.
Jeon, Yoo C.
Jeong, Su-Hyun
Jeong, Young S.
Jo, Heung Jo
Johnson III, Freemon
Jordal, Lars

Kalayci, Tulga
Kandyba, Petr E.
Karst, Douglas L.
Kartal, Mesut
Katinsky, Albert J.
Kee, Chua Tiong
Kelleher, John S.
Kim, Chan S.
Kim, Cheol-Gi
Kim, Eun S.
Kim, Jinyoung
Kim, Jun H.
Klipov, Vladimir A.
Klobedans, Edwin J.
Korah, Joseph
Kozaki, Shogo
Kress, Donald W.
Kudo, Katsutoshi
Kwon, Byong-Hong

Lager, Gunnar
Lal, Amit
Lam, Lam T.
Lee, Larry M.
Li, Pai-Chi
Lim, Byung H.
Lopez, Steven

Madter, Richard C.
Magalas, Leszek B.
Magner, Joseph L.
Malak, Michael S.
Maltby, Philip
Mang, Luke C.B.
Massion, Engene I.
Matthey, Hubert
McCall, Edward L.
McCollister, Michael J.
McCutcheon, Shawn
McGehee, Duncan
McGrail, Anthony J.
Mehdrich, Robert N.
Mehrl, David J.
Michel Fardeau
Mikio, Ishimaru
Moehring, Mark A.
Montero, Francisco R.
Moormann, Hans W.
Morrison, Kenneth A.
Mosino, Francisco
Motterle, Mariano
Mozurkewich, George
Mueller, Guenter

Nair, Vijayan K.
Nayebi, Mohammad R.
Nguyen, Thang D.
Nguyen, Van H.
Nikkhah, Saied
Niknami, Hamid R.
Nikolaj, Shmakov N.
Noutko, Robert J.

Ogino, Kazuo
Oh, Jong-Taik
Olivito, Renato S.

Pahuja, Sangeeta
Pallack, Michael D.
Patel, Bharat
Perkins Jr., Frank H.
Persun, Marijan
Pyne, C.C.

Rachedine, Mohammed
Ramm, Hans E.
Reeves, Richard W.
Reiter, Jr., Frederick B.
Reno, Richard W.
Rifaat, Rasheek M.
Rives, Mark F.
Roberts, Darcy J.
Robinson, Robin A.
Rossetti, Richard M.
Rost, Timothy A.
Rotter, Rochelle L.
Ruano, Maria
Ruppel, Clemens C.

Sang-Ho, Gohng
Santarelli, Giorgio
Sarvazyan, Armen
Sasaki, Kazuhiko
Satyapal, Shanti
Schaerf, Mirella
Schmidt, Hans J.
Schoenduve, James H.
Seay, Thomas S.
Shen, Peitao

Shen, Yao Chun
Shikata, Shinichi
Shin, Dal-Woo
Simoneau, Michael J.
Skudelny, Hans Ch.
Sleva, Michael
Smallwood, Robert E.
Smith, Brett A.
Smith, David A.
Smith, Gorden R.
Soetanto, Kawan
Stamatiou, K.
Steck, Juergen
Stein, Samuel R.
Stokes, Everett D.
Strid, Per Erik
Strifors, Hans C.
Sviben, Igor
Szeto, Johnny K.

Takacs, F.
Talkington, Kenneth M.
Taylor, Deborah J.
Teza, Jeffery R.
Thiagarajan, Sekar
Thibault, Gordon A.
Thomas, Judith G.
Tiponut, Virgil
Tipsunwanporn, Vittaya
Tran, Dam-Uyen D.
Trommmer, Raphael
Truesdell, David J.
Tsubouchi, Kazuo
Turner, Stephen P.

Ucer, Murvet K.

Van Rhijn, A.J.
Van Zeijl, P.T.M.
Vandervalk, Leon C.
Varela, Daniel H.
Villa, Alberto
Villanger, Orjan
Vorokhovsky, Yakov L.
Vu, Anthony T.
Wai, Wing K.
Wang, Fei-Long
Wang, Sung-Yuen
Waters, David D.
Weltert, Alfredo F.
Wheeler, Richard G.
Wiggenhorn, John R.
Williams, Martin A.
Wojtowicz, Michael
Woolsey, Kevin G.
Worley, Daniel S.

Yaghi, Mazen A.
Yancey, Gary L.
Yao, Linxin

Zakharia, Manell E.
Zhu, Qing

Standards Activities Report

Our society is currently responsible for eleven items, six standards and five projects.

Piezoelectric Crystals T.R. Meeker (176-1987) (176-1978)

The revision of Standard 177-1966 is proceeding. A new working group has been formed to prepare a guide on non-linear piezoelectric properties. A PAR will be submitted for the revision of Standard 176-1987, in the near future.

Ultrasonics in Medicine P.D. Edmonds (790-1989)

Two possible topics for standards are being considered: performance and safety of ultrasonics lithotripty and use of ultrasound for hyperthermia. Standard 790-1989 has been submitted to IEC/TC87 for adoption as an IEC report; it will be considered at the May meeting in Tokyo.

Time and Frequency J.R. Vig (1139-1988 and P1193)

A half-day session on "Guidelines for Measurement of Environmental Sensitivities of Precision Oscillators" will be presented at the 46th Annual Frequency Control Symposium. Comments received will be incorporated into P1193 prior to submission to the IEEE Standards Committee.

Sensors J. Schoenwald (P1182)

A draft entitled, "Guide to terms and definitions of ferroelectric, frequency control and ultrasonic sensors" has been prepared and is being circulated for comments.

Ferroelectrics A.H. Meitzler (180-1986) G.H. Haertling (P1211)

The present version of Standard 180-1986 was republished in the November 1991 Special Issue on Ferroelectrics, with a call for reader input as a prelude to revision.

Work on P1211 - "Standard Definitions, Symbols and Characterization of Ferroelectric Thin Films, Memory Cells and Device Structures", will continue with a meeting in March 1992 at the ISIF Conference in Monterey, CA.

Surface Acoustic Wave Devices E.A. Mariani (P1037)

The draft standard has been approved by the balloting committee, and is being coordinated with the symbols and dictionary committees.

Piezomagnetic Technology S.L Ehrlich (319-1971)

A measurement standard is being considered as a future project.

Acoustic-Optics D.L. Hecht (P1022)

Presently inactive; anticipate reactivation by mid-92.

Industrial Ultrasonics E.P. Papadakis

Presently inactive.

Delay Lines A.A. Comparini

Presently inactive.

Arthur Ballato
Chairman, Standards Activities

UFFC Financial Report

UFFC Operating Financial Statement Summary 12/31/91

	Income		Expense		Net	
	Budget	Actual	Budget	Actual	Budget	Actual
Membership Fees	31.8	30.1	0.0	0.0	31.8	30.1
Interest	18.8	20.3	0.0	0.0	18.8	20.3
Transactions	256.5	173.9	212.3	151.8	44.2	22.1
Newsletter	0.0	0.0	6.5	10.4	−6.5	−10.4
Non-Periodicals	2.6	4.9	5.4	5.3	−2.8	0.4
Symposia	263.5	330.6	226.2	280.9	37.3	49.7
TAD Administration	0.0	0.0	10.6	10.8	−10.6	−10.8
Other	−3.0	−2.9	30.4	44.2	−33.4	−47.1
TOTAL	570.2	556.9	491.4	503.4	78.8	53.5

As shown on the UFFC Operating Statement Summary 12/31/91 (which is preliminary), our operating surplus for 1991 was $53.5K, $25.3 below budget. The reason for the budget shortfall can be traced to both the "Transactions" and "Other" expenses. The Transactions income was substantially below budget due to greatly reduced voluntary page charge (VPC) and overlength page charge (OPC) income as well as reduced income from the All Transactions Package (ATP), which is now determined by the actual number of pages published instead of the budgeted number of pages (if actual is less than budget). This reduced income was offset by reduced expenses as a result of publishing fewer pages than budgeted. Taken together, the actual surplus for the Transactions was $22.1K, exactly half the budgeted surplus. "Other" expenses were $44.2K versus $30.4K budget, and Chapter/Distinguished Lecturer expenses, $16.8K versus $9.5K budget. On the positive side, the surplus from the Symposia was higher than budgeted, $49.7K actual versus $37.3K budget, primarily due to the tremendous success of the 1990 Ultrasonics Symposium in Hawaii. With the $53.5K surplus, the UFFC reserves now are $407.6K, or approximately 60% of projected expenses for 1992. Financially, UFFC is in a relatively healthy position, although the decrease in Transactions income and the increased "Other" expenses have to be watched carefully.

H. van de Vaart
Chairman Finance and
Operations Committee

Future Ultrasonics Symposia

1993 IEEE Ultrasonics Symposium, Baltimore, MD — 7-10 November 1993. For information contact:

Harry L. Salvo, Jr., *General Chair*
Westinghouse Electric Corporation
Electronic Systems Group
333 Gordon Avenue
Severna Park, MD 21146
(301) 765-4290

Susan C. Schneider, *Technical Program Chair*
Marquette University
Department of Electrical & Computer Engineering
1515 West Wisconsin Avenue
Milwaukee, WI 53233-2286
(414) 288-7178

1994 IEEE Ultrasonics Symposium, Cannes, FRANCE — 1-4 November 1994. For information contact:

Gerard J. Quentin, *General Co-Chair*
G.P.S. Tour 23
Universite Paris 7
2 Place Jussieu
75251 Paris CEDEX 05
FRANCE
(33) 1-43-29-51-22

or

Herman van de Vaart, *General Co-Chair*
Allied-Signal, Inc.
Research & Technology
P.O. Box 1021
Morristown, NJ 07962
(201) 455-2482

Bernhard R. Tittmann, *Technical Program Chair*
The Pennsylvania State University
Department of Engineering Science & Mechanics
227 Hammond Building
University Park, PA 16802-1484
(814) 865-7827

1995 IEEE Ultrasonics Symposium, Seattle, WA —October 1995 (Tentative). For information contact:

Gerald V. Blessing, *General Chair*
National Institute of Standards & Technology
Building 233, Room A-147
Gaithersburg, MD 20899
(301) 975-6627

OTHER UFFC-S SPONSORED SYMPOSIA

1992 IEEE Frequency Control Symposium (formerly the 46th Annual Symposium on Frequency Control), Hershey, PA —26-29 May 1992. For information contact:

Raymond L. Filler, *General Chair*
U.S. Army LABCOM
Electronics Technology & Devices Laboratory
SLCET-EQ
Fort Monmouth, NJ 07703-5000
(908) 544-2467

Jack A. Kusters, *Technical Program Chair*
Hewlett-Packard Company
5301 Stevens Creek Boulevard
Santa Clara, CA 95052
(408) 553-2041

1993 IEEE Frequency Control Symposium, Salt Lake City, UT —2-4 June 1993. For information contact:

Gary Johnson, *General Chair*
Sawyer Research Products
35400 Lakeland Boulevard
Eastlake, OH 44095
(216) 951-8770

Jack A. Kusters, *Technical Program Chair*
Hewlett-Packard Company
5301 Stevens Creek Boulevard
Santa Clara, CA 95052
(408) 553-2041

1994 IEEE Frequency Control Symposium, Boston, MA —1-3 June 1994. For information contact:

Gary Johnson, *General Chair*
Sawyer Research Products
35400 Lakeland Boulevard
Eastlake, OH 44095
(216) 951-8770

Lute Maleki, *Technical Program Chair*
Jet Propulsion Laboratory/CIT
Time & Frequency Systems Research Group
4800 Oak Grove Drive
MS-298-100
Pasadena, CA 91109
(818) 354-3688

1995 IEEE Frequency Control Symposium, San Francisco, CA —31 May - 2 June 1995 (Tentative)

1992 IEEE International Symposium on Applications of Ferroelectrics, Clemson University, Clemson, SC —31 August - 2 September 1992

Gene H. Haertling, *General Chair*
Clemson University
Department of Ceramic Engineering
Olin Hall
Clemson, SC 29634
(803) 656-0180

Angus I. Kingon, *Technical Program Chair*
North Carolina State University
Department of Materials Science & Engineering
Materials Research Laboratory
P.O. Box 7907
Raleigh, NC 27695-7907
(919) 737-2867

Meeting Announcement

13th International Symposium on Nonlinear Acoustics - Bergen, 1993

The 13th International Symposium on Nonlinear Acoustics will be held in Bergen, Norway, 26 June - 2 July 1993. This is the first ISNA to be held in Europe since 1981 when ISNA was held in Great Britain. After two more meetings in Asia and one in North America, Norway will host the next symposium. The main topics will be:

Generation and Propagation of Finite Amplitude Sound Waves

Interaction of Finite Amplitude Sound Waves with Particles and Boundaries

Acoustic Streaming

Industrial and Medical Applications of Nonlinear Acoustic Cavitation

Additional information can be obtained from Professor Halvor Hobaek, Department of Physics, University of Bergen, Allegt. 55, N-5007 Bergen. He can also be reached via telephone + 0475 21 27 87 and FAX 0475 31 83 34.

Southern California Chapter

Professor Igor Yakovkin, Deputy Director of the Semiconductor Physics Institute of the USSR Academy of Sciences and invited speaker of the 1991 Ultrasonics Symposium, visited the University of California, Irvine for the period of December 19-22, 1991. Professor Yakovkin discussed various SAW and Acoustooptic-related research projects being pursued in his group at a very well-attended seminar. He also visited the research laboratories of Prof. Chen Tsai and others, and held technical exchanges with a number of faculty members and graduate students.

The UFFC Southern California Chapter, and the Los Angeles Chapter of IEEE MTT Society, jointly sponsored an IEEE Distinguished Lecture on "Some Relations Between Microwaves and Optics," by Professor John Whinnery, of UC Berkeley, on February 18, 1992.

Chen S. Tsai

Boston Chapter

As usual the Boston UFFC Chapter has concentrated on providing technical presentations dealing with a variety of topics at their Wednesday evening monthly meetings. The meetings are traditionally followed by dinner at a local restaurant.

The topic of the design and applications of acoustic charge transport (ACT) is being addressed at two meetings by speakers from United Technologies, Inc. and Electronic Decisions, Inc. At our November meeting, the distinguished lecturer for the UFFC Society, Moises Levy from the Univ. of Wisconsin-Milwaukee, provided a very interest presentation on the ultrasonics of bulk superconductors. Other topics being addressed include the use of ultrasound for osteoporosis risk assessment, SAW resonators, acoustic spurious effects in optical modulators, acoustic data communications, and microminiature piezoelectric motors. The schedule for the 1991-1992 program year is shown below.

As in past years, Raytheon Research Center in Lexington, MA was again very kind to provide the facility for all of our Chapter meetings. The use of their modern and convenient facility is very much appreciated by our Chapter and adds greatly to the success of our meetings.

The UFFC Chapter's nominees for the 1992-1993 slate of officers is:

Chairman; Dr. James Greer, Raytheon Research Center

Vice Chairman; Dr. Gary Brandenburger, Research & Development Management

Secretary/Treasurer; Dr. Gary Montress, Raytheon Research Center

Boston Chapter Meeting Dates 1991-1992 Program Year

Date	Day	Subject	Speaker
September 25	Wednesday	Acoustic Charge Transport (ACT and HACT) Device Development And Applications	Dr. William Tanski United Technologies
October 23	Wednesday	Osteoporosis Risk Assessment With Ultrasound: Has it Arrived?	Dr. Gary H. Brandenburger Research & Devel. Management
November 20	Wednesday	Ultrasonics of High Tc and Other Unconventional Superconductors	Prof. Moises Levy Univ. of Wisconsin-Milwaukee
January 22	Wednesday	Suppression of Acoustic Effects In Lithium Niobate Integrated Optical Modulators	Dr. Gary E. Betts MIT Lincoln Laboratory
February 26	Wednesday	Low Vibration Sensitivity Surface Acoustic Wave (SAW) Resonators	Dr. Thomas E. Parker Raytheon Research Center
March 25	Wednesday	Silicon Ants and Piezoelectric Motors	Prof. Jan G. Smits Boston University
April 22	Wednesday	Underwater Data Communications Using Hydroacoustic Spread Sprectrum	Dr. Stanley A. Reible MICRILOR, Inc.
May 27	Wednesday	Acoustic Charge Transport Devices (ACT) and Applications	Mr. Dan Fleisch Electronic Decisions

The meetings will begin at 6:00 pm at Raytheon Research Center, Lexington, MA. Coffee and donuts will be served at 5:30. An optional dinner with the speaker at a local restaurant will follow the scheduled meeting. For further information call Stan Reible at (617) 246-0103. A summary of the talk and vitae on the speaker are due two months before the scheduled presentation.

Dr. Iwen Yao, MICRILOR, Inc.

Tokyo Chapter

The 12th Symposium on Ultrasonic Electronics

The Tokyo Chapter sponsored the 12th Symposium on Ultrasonic Electronics

(USE 91) held in Tokyo on 2-4 December, 1991. More than 100 papers including two invited lectures were given to some 370 participants.

UFFC-S 1991-1992 Distinguished Lecturer Program

Professor Moises Levy of the University of Wisconsin-Milwaukee, UFFC-S 1991-1992 Distinguished Lecturer, gave four impressive talks at the meetings in Tokyo, Sendai, and Nagoya. After the very busy week with the lectures, both Professor and Mrs. Levy enjoyed typical Japanese food.

Professor Levy at Sendai Meeting

Technical Meeting

The following six technical meetings on ultrasonics were held during the past half year.

1) 22 August, 1991 – 6 papers – Tsukuba
2) 20 September, 1991 – 6 papers – Tokyo
3) 17-18 October, 1991 – 14 papers – Sendai
4) 22 November, 1991 – 6 papers – Yokohama
5) 19 December, 1991 – 8 papers – Nagoya
6) 27-28 January, 1992 – 20 papers – Kyoto

1992 Officers

The officers of the Tokyo Chapter for 1992 are:

Chairman: Professor Kazuhiko Yamanouchi, Research Institute of Electrical Communication, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai-shi 980, Japan, Tel. 022-266-5528

Vice Chairman: Professor Masatsune Yamaguchi, Faculty of Engineering, Chiba University, 1-33 Yayoi-cho, Inage-ku, Chiba-shi 260, Japan, Tel. 043-251-1111 ext. 2837

Secretary/Treasurer: Professor Kiyoshi Nakamura, Faculty of Engineering, Tohoku University, Aoba, Aramaki, Aoba-ku, Sendai-shi 980, Japan, Tel. 022-222-1800

Masatsune Yamaguchi
Vice Chairman

1992 IEEE Ultrasonics Symposium

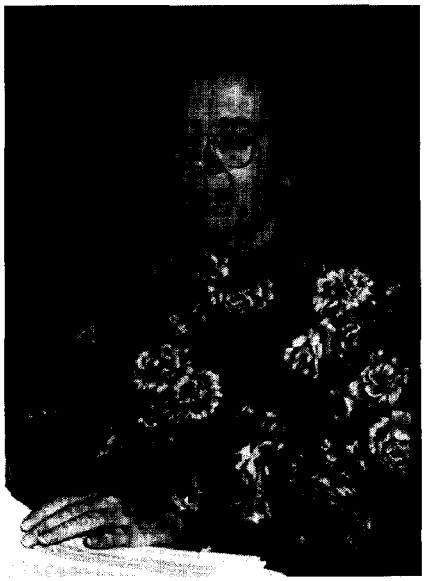
20 - 23 October 1992
Tucson, Arizona

General Information

The 1992 IEEE Ultrasonics Symposium will be held at the Holiday Inn Hotel in Tucson, Arizona. Six short courses covering the areas of transducers, medical ultrasound, bulk and surface acoustic wave devices and acoustic sensors are scheduled for Tuesday, October 20th. Three full days of technical sessions including oral and poster papers will follow Wednesday through Friday, October 21st to the 23rd. There will be a guest's social program for those accompanying registered attendees. A welcoming party will be held Wednesday evening and an evening dinner outing to Old Tucson will take place on Thursday evening. A visit to the Desert Sonora Museum and the Biosphere is planned for Saturday after the symposium.

Tucson is a fast-growing Sunbelt city of more than six hundred thousand people that blends modern, metropolitan life with scenic beauty and rich cultural diversity. Indian, Spanish, Mexican, and Pioneer influences have created a study in contrasts between old and new, traditional and modern, rural and metropolitan. Historic adobe buildings have been preserved among downtown high rises. Breathtaking scenic beauty can be seen from any point in Tucson. Five mountain ranges rise above the desert valley floor, itself covered by cacti, scrub brush and trees unique to the Sonora desert environs.

The symposium hotel, The Holiday Inn, is in the heart of downtown Tucson near the historic district and convenient to restaurants, cultural centers, and recreational activities. Two other hotels within a short walking distance will be used for the expected overflow. The Park Inn-Santa Rita is a seven minute walk from the symposium and the Ramada Inn is a fifteen minute walk. Both give you some good exercise be-



"We've ordered boots and six-shooters for the Organizing Committee in case we have any problems"
Susan Schneider – Finance, 1992 Ultrasonics Symposium

fore settling in your seat for the technical sessions. The symposium rates at each hotel are all very reasonable.

Tucson is served by twelve airlines, Amtrak, and major bus lines. Los Angeles and San Francisco have good connecting flights to Tucson if you are coming from far East. From Europe, Dallas, Texas is a good port of entry. Interstate 10, the major highway between Los Angeles and El Paso, goes through downtown Tucson. In fact you may wish to spend the week in Arizona, in which case Phoenix is a good central location for car trips to the Grand Canyon and Indian Country in Northern Arizona. Tucson is a scenic two-hour drive from Phoenix.

Tucson enjoys more sunshine than any other city in the United States, about 350 days each year. October is normally dry with daytime temperatures in the 70's, while night time temperatures drop into the 40's. Remember to bring a sweater or jacket for evening wear because the dry desert air cools rapidly after the sun goes down. The lifestyle in Tucson is carefree and so is the dress. Casual clothing is acceptable almost everywhere.

Social Program

The traditional welcoming party is planned for Wednesday evening at the Holiday Inn in the Starlight Ballroom and adjacent patio area. Every paid registrant is invited to join the party, visit with friends, munch on hors d'oerves and have a drink on the house. Be sure to make some new friends. Your symposium organizing committee and Arizona residents will be available to answer any questions you have about the symposium or about Tucson and the surrounding state area.

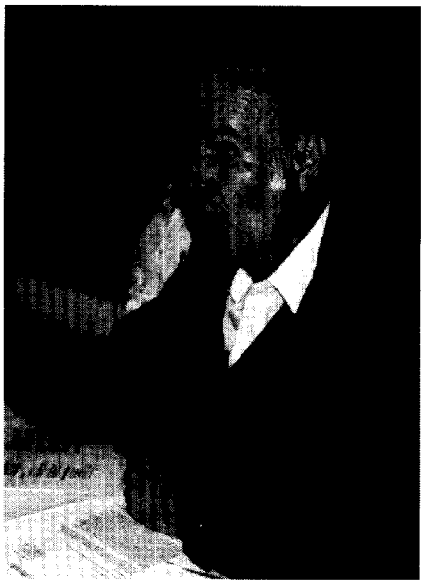
On Thursday evening for those desiring a western experience, tickets may be purchased to visit Old Tucson located in the Sonora Desert just west of Tucson. This recreation of a western town has been used in countless movies and television specials. We will prowl the streets and shops before having dinner under the moonlit sky. Chicken and ribs are the dinner fare and some lively entertainment will be provided.

Guest Program

A special program has been arranged for those accompanying registered conference attendees. Every companion registered for the guest program will be invited each morning of the symposium to a continental breakfast to see old friends and hear about activities of the day. Advantage is being taken of the local area's, cultural, historical, and scenic attractions. Wednesday will be a morning walking tour of downtown Tucson preceded by a talk about the area. The afternoon is for relaxing before the evening social program. On Thursday, a bus tour to Nogales, Mexico, is planned with a stop at the historic San Xavier Mission. You will be back in time for the all-symposium outing to famous Old Tucson. On Friday, you will go north of Tucson to the foothills of the Santa Catalina Mountains for a tram ride through Sabino Canyon, a visit to the DeGrazia studios, lunch and a tour of Tohono Chul Park. On Saturday, you won't want to miss the post-symposium tour of the World Famous Desert Sonora Museum and the Biosphere, with a picnic lunch at a desert park in-between.

Exhibits

The IEEE Ultrasonics Symposium will again have an exhibit area with booths this year. We will have many of our former exhibitor, and new exhibitors as well. We will be advertising locally to support the symposium, and expect to have many engineers and scientists from the surrounding area in attendance. This will provide exhibitors with an excellent opportunity to introduce their products to the southwest technical community, in addition to regular symposium attendees. If your company is interested in receiving further information or assistance in exhibiting, please contact Margaret Whicker, LRW Associates, at (301) 647-1591.



"Well, if you sit on a cactus in Tuscon, you'll look like this,"
Fred Hickernell – General Chair, 1992 Ultrasonics Symposium

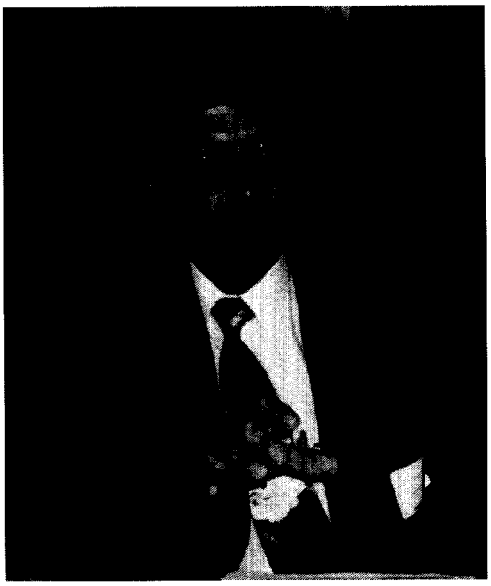
Invitation

Finally, on behalf of the entire Symposium Organizing and Technical Program Committees, we look forward to seeing you in Arizona this October, and promise an exciting and productive series of technical sessions as well as a golden opportunity to partake in the unique attractions of the historic southwest. Further details and additional information including the symposium and hotel registration forms will be provided in the Advance Program Booklet which will be available by mid-August. If you should have any questions about the 1992 IEEE Ultrasonics Symposium, please contact the General Program Chairman for the conference, Dr. Fred S. Hickernell, Motorola Inc., 8201 E. McDowell Road, Scottsdale, AZ 85252, (602) 441-2923. Should you need additional information related to the technical program, or abstract preparation and submission, please contact the Technical Program Chairman for the conference, Dr. Gary K. Montress, Technical Program Chairman, Raytheon Research Division, 131 Spring Street, Lexington, MA 02173, (617) 860-3053.

FEBRUARY TECHNICAL PROGRAM COMMITTEE MEETING

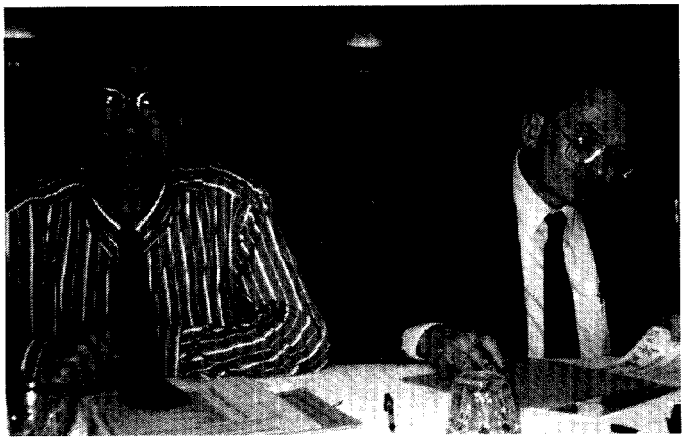
"No, no, it goes like this" - Bikash Sinha

The following photographs were taken by Chief Photographer Brown at the February Technical Program Committee Meeting for the 1992 IEEE Ultrasonics Symposium. She noted a lot of hand waving and a tie exhibitionist. The Technical Program Chairman, Gary Montress, kept his cool and continued his work, oblivious to all the animated actions of the Technical Program Committee.

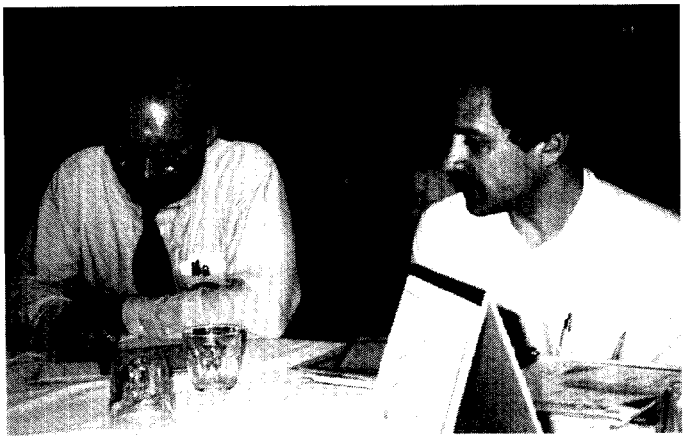


"Hold it, it really goes like this" - Dennis Pape

"It's only fair that I get two votes" - Doron Kishoni



"Art, you aren't noticing my tie" - Jan Smits



"Gary, you shouldn't be working crossword puzzles during the meeting" - Peter Wright

"No, you may not all be excused at once, you have to take turns" - Gerry Blessing

Call for Papers

Special Issue on Applications
(Submission Deadline: October 1, 1992)

The *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* invites the submission of **Applications Papers** on any of the following topics:

- Biological and Medical
- Devices
- Elastic Wave Phenomena
- Ferroelectrics-Applied
- Ferroelectrics-Fundamental
- Frequency Control-Acoustics
- Frequency Control-Atomic & Molecular
- Imaging
- Materials
- Measurement and Control Applications
- Nondestructive Evaluation
- Nonresonant SAW Devices
- Optical Interaction
- Physical Acoustics
- Sensors
- Systems Applications
- Underwater Sound

The contributed papers must have a significant applications component in order to fall within the scope of this Special Issue. Consult the inside cover of the *UFFC Transactions* for a more detailed breakdown of each of these topics. Contributed papers should be sent to the Editor-in-Chief

William D. O'Brien, Jr.
Department of Electrical and Computer Engineering
University of Illinois
1406 West Green Street
Urbana, IL 61801

In the transmittal letter, from the above list, identify the specific topic of the contribution. All papers will be subjected to the normal peer-review process of the *UFFC Transactions.* Submission deadline is October 1, 1992 and the expected publication date is mid-1993.

1992 IEEE ULTRASONICS SYMPOSIUM

October 20-23, 1992 **Tucson, Arizona**

Sponsored by The Ultrasonics, Ferroelectrics, & Frequency Control Society

FINAL CALL FOR PAPERS
Deadline for Abstract Submission: Friday, May 29, 1992

Papers are solicited describing original work in the field of Ultrasonics. Papers concerned with mechanical wave phenomena, including but not limited to the Subject Classification listed below, will be considered.

ABS	Arrays & Beam Steering	**NSP**	NDE Signal Processing
ACE	Acoustic-Electric Effects & Devices	**PA**	Physical Acoustics
AE	Acoustic Emission	**PAS**	Photo-Acoustics
AM	Acoustic Microscopy	**PF**	Piezoelectric & Ferroelectric Materials
AO	Acousto-Optic Effects & Devices	**PMC**	Process Monitoring & Control
AOS	Acousto-Optic Signal Processing	**SEN**	Sensors
BB	Bio-Effects & Bio-Physics	**SEP**	Sonically Enhanced Processing
BW	Bulk Wave Effects & Devices	**SFT**	SAW Filters & Transducers
DMC	Defect & Material Characterization	**SMP**	SAW Materials & Propagation
ED	Exposimetry/Dosimetry	**SP**	Speckle
FM	Flow Measurement	**SRO**	SAW Resonators & Oscillators
GA	Geophysical Acoustics	**SSA**	SAW System Applications
HT	Hyperthermia	**SSP**	SAW Signal Processing
HTS	High Temperature Superconductors	**TC**	Tissue Characterization
IS	Inverse Scattering	**TFP**	Thin Films (Bulk & Optical Devices)
IU	Industrial Ultrasonics	**TFS**	Thin Films (SAW Devices)
MI	Medical Imaging	**TH**	Therapeutics
MSP	Medical Ultrasound Signal Processing	**TM**	Tomography
MSW	Magnetostatic Waves & Devices	**UAM**	Ultrasonic Actuators & Motors
NDE	Nondestructive Evaluation	**US**	Underwater Sound

Authors of Contributed and Invited Papers are required to submit an abstract. Carefully follow the ABSTRACT PREPARATION INSTRUCTIONS on the following page and send to:

Dr. Gary K. Montress
c/o LRW Associates
1218 Balfour Drive
Arnold, MD 21012-2150
U.S.A.

The abstract **original** (unfolded) and **two (2) copies** should be provided.
The deadline for receipt of abstracts is Friday, May 29, 1992.

Each abstract will receive careful review and evaluation. A good abstract **must clearly explain** the intent and content of the paper. Evaluation criteria will include, but not necessarily be limited to: **CONTRIBUTION TO THE STATE-OF-THE-ART, ORIGINALITY OF THE WORK, CLARITY OF THE ABSTRACT IN CONVEYING SALIENT TECHNICAL DETAILS AND PURPOSE/APPLICATION FOR THE WORK, AND POTENTIAL OVERALL INTEREST TO THE ULTRASONICS COMMUNITY.** Prospective authors should be as specific as possible, and include qualtitative information or data whenever possible. Authors should also refrain from presenting vague generalities and conclusions within their abstracts.

POSTER SESSIONS will provide an alternative format for paper presentation which allows for greater flexibility and expanded audience interaction.

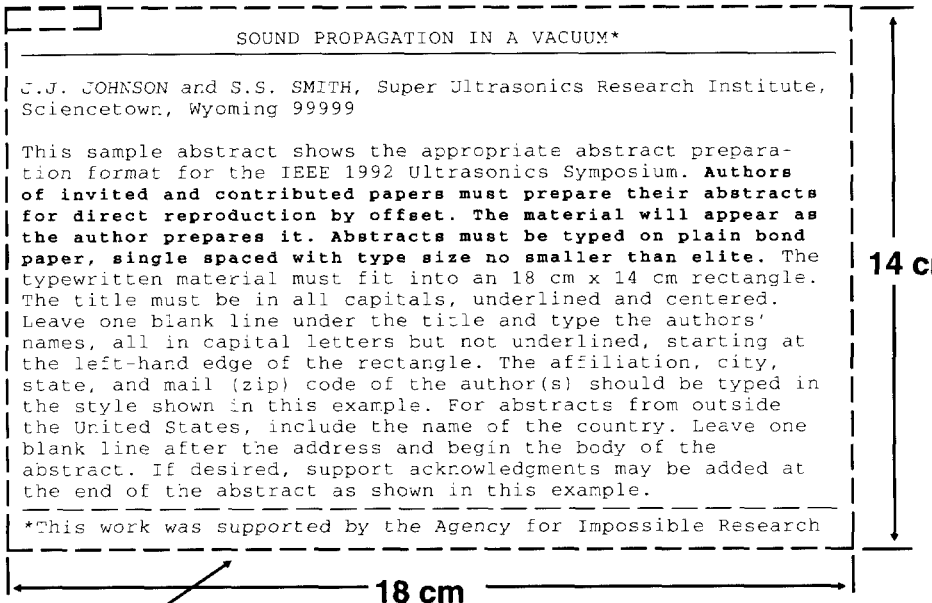
STUDENT TRAVEL SUPPORT—Limited funds are available to support student attendance at the 1992 IEEE Ultrasonics Symposium. Awards will be made on a competitive basis. Further information and application forms can be obtained from Prof. Gerald W. Farnell, Department of Electrical Engineering, McGill University, McConnell Engineering Building, 3480 University Street, Montreal, Quebec H3A 2A7, Canada. **The deadline for applications is June 30, 1992.**

ABSTRACT PREPARATION INFORMATION

Subject Classification: PA

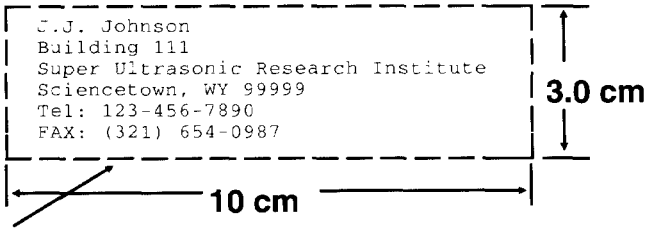
Insert the one most appropriate Subject Classification (see previous page)

Leave this corner area blank for eventual insertion of an abstract number



NOTE: This diagram has been reduced from its original size. Please refer to the dimensions given for the actual size of the abstract area.

On the submitted original and copies, these outlines should appear as light blue lines, or not at all.



This 3.0-cm x 10-cm space should contain the name, complete mailing address, and office/FAX telephone number of the author to whom all further correspondence should be sent.

Please help us evaluate your abstract and plan for the symposium by providing this information

- I prefer to present my paper in the poster session.
- I prefer to present my paper in an oral session.
- I do not have a preference one way or the other.

} ← You must type one of these three sentences at the bottom of the abstract sheet to indicate your preference.

I will require a VHS VCR/Monitor	yes ☐	no ☐
I am an IEEE Member, #_____	yes ☐	no ☐
I am a UFFC Member	yes ☐	no ☐
I plan to bring my spouse or a guest	yes ☐	no ☐

} ← You must type your answer to each of these four questions at the bottom of the abstract sheet.

Newsletter Editor Notes

A big thank you to all the contributors who supplied articles, disks, and photographs. I was overwhelmed with photographs which led to a high rejection rate, sixty percent. I do thank our roving photographers for their candid camera shots. Also a big thank you to the ever faithful Kathy Nolan who assembled disk information, typed inputs, and compiled the newsletter on a single disk. Ann Scrupski and her associates at IEEE Publishing Services have worked their editorial and artistic magic to produce what you now hold in your hand.

We have a new group of officers in charge of the UFFC Society. Keep them informed of your concerns regarding our society. John Vig is our new distinguished lecturer. Be sure and have your section schedule him for a timely talk. Two good symposiums (46th Annual Frequency Control and ISAF'92) will have taken place before the next newsletter hits the streets. Plan on attending one or both. Be sure and save enough money for the Tucson trip in October. The photos of the social activities should indicate the fun we had in Orlando. Don and his crew did a great job. We also have fun in committee meetings but the more serious business always takes precedence. Our society has had strong leadership over the years. I have been very impressed with the concerns the AdCom members have expressed regarding the future of our society. We are small but technically a very powerful society. We need to continue to reach out to students (our future) and new members both national and international. We are fiscally healthy, but we must use our resources wisely for our membership and the technical community we serve.

Because of the earlier date of the Ultrasonics Symposium I will need your next newsletter inputs by July 15th. Have a good summer.

Fred S. Hickernell
Newsletter Editor

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