IEEE ULTRASONICS, FERROELECTRICS, AND FREQUENCY CONTROL SOCIETY NEWSLETTER

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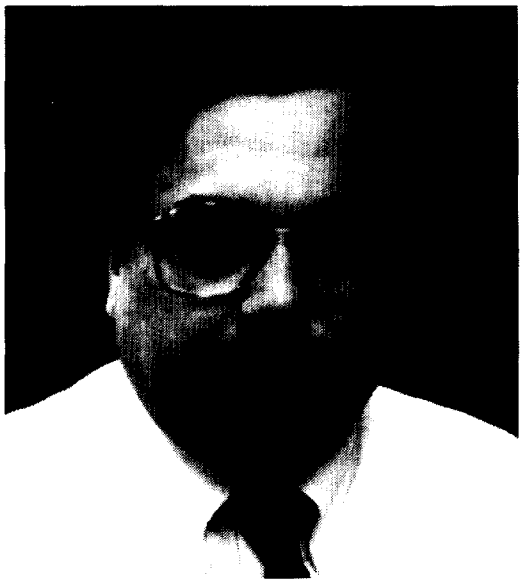
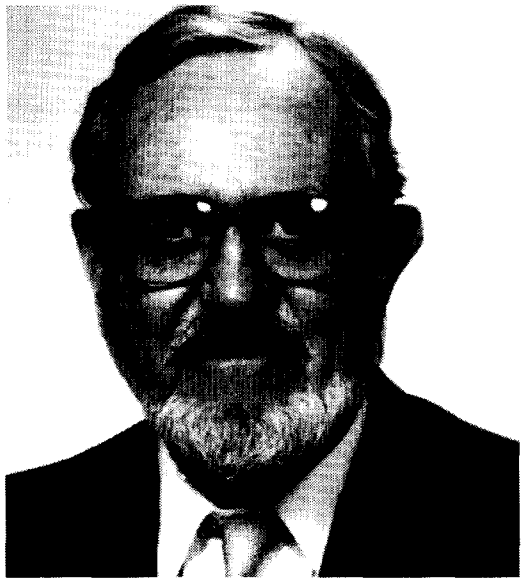


Harry L. Salvo, Jr. – UFFC-S President



L. Eric Cross – Distinguished Lecturer

48th Annual Symposium on Frequency Control

June 1-3, 1994
Boston, Massachusetts

International Symposium on Applications of Ferroelectrics

August 7-10, 1994
University Park, Pennsylvania

UFFC-S Distinguished Lecturer

L. Eric Cross

L. Eric Cross is an Evan Pugh Professor of Electrical Engineering at the Materials Research Laboratory of The Pennsylvania State University. Professor Cross took his BSc (Honors Physics) at Leeds University in 1948, and completed his PhD in Physics in 1953. He was a University Scholar, and Assistant Professor and an ICE fellow in the Department at Leeds. After a short period at the Electrical Research Association in Leatherhead Surrey, he moved to the USA to take up a position in the developing Materials Research Laboratory (MRL) at Penn State. He was the Laboratory Director from 1985 to 1989.

Dr. Cross is a member of the National Academy of Engineering, Fellow of the American Institute of Physics, of the American Ceramic Society, the IEEE, and the American Optical Society and a member of the Japanese Physical Society. He is chairman of the IEEE committee on ferroelectrics, US representative for ferroelectrics on IUPAP, and a member of the Defense Sciences Research Council of ARPA. His interests are in dielectric and ferroelectric crystals, piezoelectric and electrostrictive ceramics and composites for sensor, actuator and transducer applications, and as components in "smart" materials and structures. He has co-authored more than 420 technical papers and sections of six books.

Ferroelectric Materials for Electromechanical Transducer Applications

L. Eric Cross
Evan Pugh Professor of Electrical Engineering
Materials Research Laboratory
The Pennsylvania State University
University Park, PA 16802-4800

The talk will explore the special characteristics of ferroelectric materials which make them highly suitable for application as both sensors and actuators in electromechanical (smart) systems. The domain structure which gives the possibility to impart a polar axis in a randomly axed polycrystal ceramic is essential for piezoelectricity but all electromechanical behavior may be traced ultimately to the electrostrictive coupling between polarization and strain fields. Topics to be discussed will include:

- The special advantages of materials in the lead zirconate:lead titanate solid solution system for both sensing and actuation.
- Domain and phase switching contributions to electrical, mechanical and coupled responses.
- Scaling effects in ferroics and the origins of the relaxor ferroelectric behavior of electrostrictive ceramics.
- Composite polymer:ceramic systems and the maneuverability engendered by phase connectivity control.

In the applications arena, the talk will focus upon recent advances in electromedical transducers and in the more specialized transduction requirements for space based systems such as in the Hubble Space Telescope Corrector and in the actuators for very large passive mirror systems. The possibility to use combinations of sensors and actuators under active control to transfer the "smarts" of electronics into "dumb" mechanical systems will be briefly reviewed.

Schedule the UFFC-S Distinguished Lecturer Now!

The Administrative Committee of the Ultrasonics, Ferroelectrics and Frequency Control Society has announced Professor L. Eric Cross as the UFFC-S Distinguished Lecturer for 1994-1995. Professor Cross 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:

Ferroelectric Materials for Electromechanical Transducer Applications

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 on the previous page.

Professor Cross may be reached by mail at:

Materials Research Laboratory
The Pennsylvania State University
University Park, PA 16802-4800

or by the following means:

Telephone: 814 865 1181
Fax: 814 863 7846

Please make arrangements with Professor Cross early so he will be able to plan his schedule well in advance and conserve on transportation costs and time.

PRESIDENT'S MESSAGE

I was told, when I agreed to assume the Presidency of the Ultrasonics, Ferroelectrics, and Frequency Control Society, that I should expect "a ton of paperwork" from the folks at IEEE central. However, I thought this was an exaggeration and, therefore, was not prepared for what was delivered to my home on January 2, 1994. The stack of correspondence from IEEE that arrived would not fit into our mailbox. While most of the correspondence was of the "for your information" type, I did have to send in the names of the UFFC-S representatives to the various Committees, Boards, and Councils on which our Society is suppose to have representation.

For the most part, since it was my second day on the job, I just re-appointed last year's representatives for another year. In order to prepare for January 2, 1995, I plan to contact you individually, during the coming year, to find out if you wish to continue for 1995. However, You can help me sort out this year. If you believe you are a representative to a committee, but are not sure, please contact me. If you are not a representative, but are receiving correspondence and meeting notices from a committee, please let me know. If you wish to become involved in some of the committee work, and there are vacancies, please contact me. The easiest way to reach me is by E-mail at "h.salvo@ieee.org". If you do not have E-mail access my telephone number is (410) 765-4290.

This year is going to be an interesting year for the Ultrasonics, Ferroelectrics, Frequency Control Society. All three of the Society's sponsored conferences will be held in 1994. The 1994 IEEE Frequency Control Symposium will be held in Boston the first week of June, the 1994 IEEE International Symposium on the Applications of Ferroelectrics will be held at Penn State University the second week of August, and the 1994 Ultrasonics Symposium will be held in Cannes, France the first week of November. Obviously, we are extremely excited about the Ultrasonics Symposium being held in Europe for the first time.

I wish to acknowledge the work of our past President, Jim Greenleaf. Jim left the Society in such good shape, that I do not have anything else to report at this time. Please contact me if you have any issues or concerns about the Society. I look forward to another good year.

Harry L. Salvo, Jr.

Newly Elected Administrative Committee Members

GARY R. JOHNSON

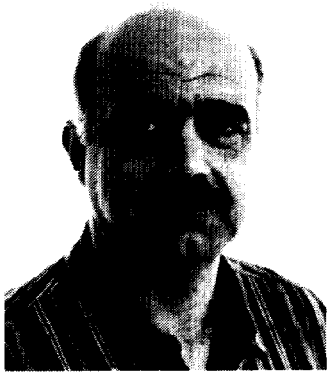
Gary R. Johnson was born in Gary, IN in 1949. He received the BSEE degree from Purdue University in 1971, specializing in materials. He interrupted his professional career in 1974, earning an MS degree in 1975 also from Purdue University.

Mr. Johnson began his career with CTS Corporation in Elkhart, IN, a manufacturer of electronic, including quartz, components. In 1975 he became product manager for crystal filters, leading a team responsible for engineering and manufacturing. In 1979 he joined Cleveland, OH based Sawyer Research Products, Inc., the largest producer of cultured quartz, as Sales Manager. His first efforts were in international marketing. This required more than fifty visits to Asia and twenty to Europe, especially Japan, Korea, Republic of China, People's Republic of China, Germany, France and Russia. This effort was the beginning of a continuing interest in international relations.

He was named Director of Marketing and Technology in 1981 and in 1983 worked to organize the purchase of Sawyer Research from Brush Wellman, Inc. He was elected Vice President in 1983, becoming President and Chief Operating Officer in 1990 and Chief Executive Officer in 1993.

Mr. Johnson's research contributions are in the areas of solid phase inclusions and dislocations in cultured quarts. Current technical research interests to improve the capability of quartz material include the application of statistically designed experiment and advanced computer control techniques to quartz growth.

He and his wife Brenda Ashley live in Cleveland Heights. They enjoy travel, cooking and music. Johnson plays golf and squash as time permits. Though less frequently now, he enjoys mountaineering, having made several winter climbs in Rocky Mountain National Park and warmer weather climbs around the Midwest.



BUTRUS T KHURI-YAKUB

Butrus T. Khuri-Yakub received the B.S. degree in 1970 from the American University of Beirut, the M.S. degree in 1972 from Dartmouth College, and the Ph.D. degree in 1975 from Stanford University, all in electrical engineering.

He joined the research staff at the E. L. Ginzton Laboratory of Stanford University in 1976 as a research associate and was promoted to a Professor of Electrical Engineering (Research) in 1982. He has served on many university committees and is presently Associate Chairman for graduate admissions in the EE department at Stanford.

Prof. Khuri-Yakub has been teaching both at the graduate and undergraduate levels, and his current research interests include acoustic ejection of fluids, silicon micromachining and its applications to ultrasonic materials, sensors for in-situ process monitoring and control, nondestructive evaluation, and acoustic imaging and microscopy.

Professor Khuri-Yakub is a senior member of the IEEE and the Acoustical Society of America, and a member of Tau Beta Pi. He is associate editor of *Research in Nondestructive Evaluation*, a Journal of the American Society for Nondestructive Testing.

Professor Khuri-Yakub has authored more than 250 publications and has been principal inventor or co-inventor on over 30 patents, and has received the Stanford University School of Engineering Distinguished Advisor Award, June 1987, and the Medal of the City of Bordeaux for contributions to NDE, 1983.

Professor Khuri-Yakub personal interests include coaching his children in little league sports such as basketball, baseball, and soccer. His hobbies are traveling, swimming, reading and studying old Semitic languages.

ROBERT E. NEWNHAM

Robert E. Newnham is Alcoa Professor of Solid State Science at the Materials Research Laboratory of the Pennsylvania State University. He served as Chairman of the program for 18 years. Dr. Newnham is also affiliated with the Ceramic Science Section of the Materials Science and Engineering Department where he teaches courses in crystal chemistry, crystal physics, and electroceramics.

Prior to joining the Penn State faculty, Dr. Newnham taught at M.I.T. where he was a staff member of the Laboratory for Insulation Research. A native of upstate New York, he is a graduate of Hartwick College (B.S., mathematics), Colorado State University (M.S., physics), Penn State (Ph.D., physics and mineralogy), and Cambridge University (Ph.D., crystallography).

His research interests are in structure-property relations, electroceramics, and composite materials for electronic applications. Recently elected to the National Academy of Engineering, Professor Newnham is the author of four books, more than 300 research papers, and is now serving as co-editor of the Journal of the American Ceramic Society. He is past president of the American Crystallographic Association, and Distinguished Lecturer for the Ultrasonics, Ferroelectrics, and Frequency Control Section of IEEE. Professor Newnham has served as Program Chairman for the International Symposium on Applications of Ferroelectrics (ISAF) and as Secretary of the International Meeting on Ferroelectrics (IMF-5). He has been an invited speaker at many meetings, especially those concerned with composite transducers and smart materials.

In 1990 he was elected Ceramic Educator of the Year by the Ceramic Education Council, and in I 991 received the John Jeppson Medal for "Distinguished, creative and inspiring contributions to ceramic science, technology and education in the area of electronic ceramic materials." In 1992, he received the First International Ceramics Prize from the Academy of Ceramics "for distinguished, creative and exceptional interdisciplinary contributions to the advancement of ceramic science and culture, especially in composite electroceramics, including intelligent ceramics".

REINHARD LERCH

Reinhard Lerch (M'86) was born in Lauterbach, Germany, on December 29, 1953. He received his masters degree in 1977 and his Ph.D. degree in 1980 in electrical engineering from the Technical University of Darmstadt, Germany.

From 1977 to 1981, he was engaged in the development of a new type of audio transducer based on piezoelectric polymer foils at the Institute of Electroacoustics at The University of Darmstadt. From 1981 to 1991, he was employed at the Research Center of Siemens AG in Erlangen, Germany, where he implemented new computer tools supporting the design and development of piezoelectric transducers. Within this work, finite-element simulations of phased array antennas for medical imaging and surface acoustic wave filters applied in communication engineering were performed.

Dr. Lerch is author of more than 50 papers in the field of acoustics and signal processing. In 1982, he received the Award of the German 'Nachrichtentechnische Gesellschaft' for his work on piezopolymer microphones. In 1990, be was honored with the Outstanding Paper Award of the IEEE UFFC Society for his publication "Simulation of Piezoelectric Devices by Two- and Three-Dimensional Finite Elements" (*IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, Vol. 37, May 1990). In 1991, he received the German 'Philipp-Reis-Award', a combined donation of the VDE (Society of German Electrical Engineers), the German Telecom, and the town of Friedrichsdorf, where Philipp Reis was born, for his innovative work in the field of computer modeling of novel transducers.

Since December 1991, he has a full professorship for Mechatronics at the University of Linz, Austria. His current research is directed towards establishing a computer-aided design environment for electromechanical sensors and actuators, especially piezoelectric ultrasound transducers.

Dr. Lerch is serving on the Technical Program Committee of the IEEE Ultrasonics Symposium. He also is a member of the German Society of Electrical Engineers (VDE), the German Acoustical Society (DEGA), as well as the Acoustical Society of America.

48th ANNUAL IEEE INTERNATIONAL FREQUENCY CONTROL SYMPOSIUM

The 48th IEEE International Frequency Control Symposium is 1 to 3 June in Boston, MA. This is the largest and most important technical meeting of the frequency control community, including precision timekeeping. We expect about 350 engineers and scientists from over 20 countries to hear of the current work in such areas as: theory, design and fabrication of piezoelectric (bulk and surface wave) devices, millimeter and microwave frequency control systems, and atomic and molecular frequency and time standards.

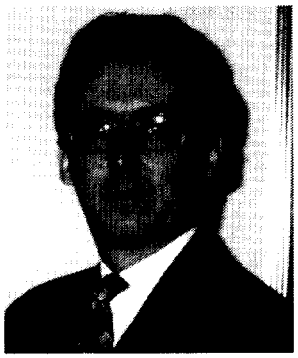
The 1994 conference includes special sessions and invited papers reporting on the latest developments in new piezoelectric materials (especially, dilithium tetraborate, langasite, and gallium phosphate), cryogenic and whispering gallery dielectric resonators, cryogenic hydrogen masers and rf and laser excited trapped ion standards, and 1/f noise processes in oscillators.

On 31 May the conference offers an expanded series of tutorials presented by the leading scientists in a variety of fields. To address needs ranging from the interested to the involved, the tutorials range from introductory to advanced. For example, introductory tutorials covering quartz, atomic, and molecular frequency standards are presented along with other sessions covering robust statistics and data filtering and time-domain instability measures in time and frequency and telecommunications systems. A special session on the ISO 9000 series of specifications in relation to the frequency control industry is included.

To receive an advance program and registration information, please contact Synergistic Management (3100 Route 38/Wall Township, NJ 07719/Voice: 908-280-2024/FAX: 908-681-9314).

Frequency Control Symposium Committee

GENERAL CHAIRMAN – GARY R. JOHNSON



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TECHNICAL PROGRAM CHAIRMAN – LUTE MALEKI

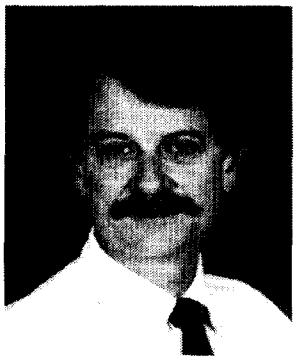
Lute Maleki is the supervisor of the Time and Frequency Systems Research Group, Communications Systems Research Section, at JPL. Dr. Maleki has been involved in directing and conducting research in a number of areas related to the generation, distribution, and measurement of ultra-stable reference frequencies. The areas of research in Dr. Maleki's group include the development of atomic frequency standards; cryogenic cavity stabilized masers, and other cryogenic oscillators; photonics frequency generation and distribution systems; and investigations of the noise and stability properties of rf and optical frequency sources.

Dr. Maleki's current research include ion confinement and the development of trapped ion frequency sources; development of laser cooled atom traps; the study of various aspects of the physics of frequency standards; laser spectroscopy of free atoms and ions, and ions confined in rf traps; the study of noise properties and stabilization of semiconductor lasers and laser arrays; tests of special relativity using clocks and optical fiber distribution systems.

Dr. Maleki received his B.S. in physics from the University of Alabama in 1969, and his Ph.D. in experimental atomic physics in 1975 from the University of New Orleans (Louisiana State Universities). He is an Adjunct faculty at the Center for Laser Studies, University of Southern California. He is also the Associate Editor in the area of Frequency Control-Atomic and Molecular, of the IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control.

In his spare time, Lute Maleki studies French and Saxophone, and teaches a course entitled "Physics and Art" at Pasadena Art Center College of Design.

LOCAL ARRANGEMENTS CHAIRMAN – R. MICHAEL GARVEY



R. Michael Garvey (M'81) was born in Winston-Salem NC in 1947. He received the B.S. degree in physics from Davidson College in 1969, and the Ph.D. degree in physics from Duke university in 1975.

In 1976, Dr. Garvey was awarded a US National Research council Fellowship in the Time and Frequency Division at the National Bureau of standards (NBS, now NIST), Boulder CO. At NBS, Dr. Garvey's worked on improved atomic frequency standards and frequency metrology.

In 1979 Dr. Garvey joined Frequency and Time systems Inc. (FTS) in Beverly, MA. His initial responsibilities included evaluation of performance of cesium frequency standards for use in the Global positioning system satellites. Dr. Garvey also lead a design team in the development of the first cesium frequency standard with an entirely digital (microprocessor) servo.

Dr. Garvey was appointed Director of Engineering at FTS in 1983. As Director he has lead the development of products including precision quartz oscillators and high performance cesium frequency and time standards. Other developments include redundantly configured timing systems for use in US and international telecommunication synchronization systems.

Dr. Garvey serves on the program Committee of the Annual symposium on Frequency Control. He is a member of the IEEE and sigma Xi. His publications include fifteen papers relating to frequency control and spectroscopy. He holds two patents relating to cesium frequency standard technology.

ISAF-94

The ninth IEEE International Symposium on the Applications of Ferroelectrics will be held the 7th through the 10th of August 1994, at the Penn State Scanticon Conference Center Hotel, The Pennsylvania State University, University Park, Pennsylvania. Sponsored by the UFFC Society of the IEEE, the IX-ISAF meeting commemorates several important milestones in the history of ferroelectricity:

- Centennial of "Observation of the First Dielectric Anomaly with Temperature in Rochelle Salt (1894)."
- 75th Anniversary of the "Discovery of Ferroelectricity (1920-22)."
- The Golden Anniversary of the "Discovery of First Most Widely Used Ferroelectric BaTiO3."

The ISAF Symposium will cover a wide range of ferroelectric, piezoelectric and dielectric materials along with several special sessions devoted to the development of electronic and optical devices. Both invited and contributed papers will be presented on topics including but not limited to:

1. Papers related to the history of ferroelectrics.
2. Piezoelectrics, pyroelectrics and ferroelectric materials: innovative processing, ceramic technology, single crystals, fibers, polymers and composites.
3. Dielectrics, capacitors and multilayer devices.
4. Sensor and actuator materials for smart systems, electrostrictive and photostrictive devices, high and low temperature application, PTC and NTC, thermistors and varistors and chemical sensors.
5. Microwave dielectrics and their applications.
6. Ferroelectric films: processing, applications and devices; Integration of ferroelectrics with semiconductors and superconductors.
7. Uncooled IR detectors/bolometers, pyroelectrics, novel IR-detectors and imaging systems.
8. Nonlinear optical materials and devices, photorefractive materials, optical storage in ferroelectrics.
9. Liquid crystals, ferrofluids, electrorheological fluids and their applications.
10. Substrate materials for high Tc superconductors.

For more information contact Amar Bhalla, General Chairman ISAF-94, Materials Research Laboratory, The Pennsylvania State University, University Park, PA 16802 USA, Fax: (814) 865-2326.

Awards Presented at the 1993 Ultrasonics Symposium

1993 ACHIEVEMENT AWARD

Harry F. Tiersten is the fourteenth recipient of the IEEE UFFC Achievement Award given in recognition of outstanding technical contributions to UFFC. Harry's citation reads:

"For developing several rational theories for analyzing the electroelastic behavior in anisotropic crystals, including piezoelectric, nonlinear and energy-trapping effects for bulk and surface acoustic waves."

Robert C. Smythe (left), of PiezoTechnology Inc., introduced Harry F. Tiersten recipient of the 1993 Achievement Award with opening remarks on Harry's many contributions. Harry is a Professor at Rensselaer Polytechnic Institute. Award was presented by James F. Greenleaf, President (right).

Harry is currently Professor of Mechanics at Rensselaer Polytechnic Institute in New York. He has made major contributions to the theory of linear piezoelectric plate vibrations, which broadened our understanding of electroelastic behavior of anisotropic crystals. He has also contributed to the theoretical studies on the properties of semiconductors. In all his work, Harry is known for the rigor of his analysis and the precision with which it is presented.

Robert C. Smythe, of PiezoTechnology Inc., presented the opening remarks for Harry's award, noting the many and varied contributions of Prof. Tiersten. Robert has first-hand knowledge of these contributions through many years of collaboration with Harry in applying piezoelectric device theory. Robert expressed joyful amazement at how accurately Harry's theories predict actual device performance. He also extended to Harry the appreciation of the whole Society for the theoretical foundations he has established and which are now used worldwide.

Harry received a metal plaque, a certificate and a cash award.

OUTSTANDING PAPER AWARDS

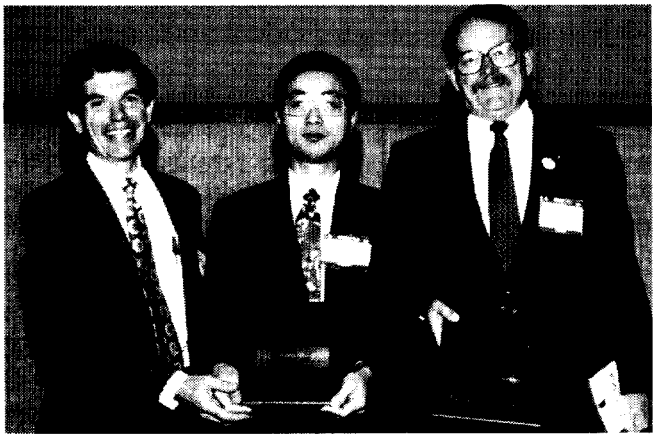
This year, two Outstanding Paper Awards were presented for papers published in the 1992 *Transactions*. The Awards Committee recommends these two series of papers as excellent reviews on topics of interest to the membership.

Mathias A. Fink, François Wu, Jean-Louis Thomas, and Didier Cassereau won the Outstanding Paper Award for their combined papers "Time Reversal of Ultrasonic Fields" which appeared in three parts: "Part I: Basic Principles," "Part II: Experimental Results," and "Part III: Theory of the Closed Time-Reversal Cavity," all published in the September 1992 issue. The authors work at the Laboratoire Ondes et Acoustique, Université Paris in France.

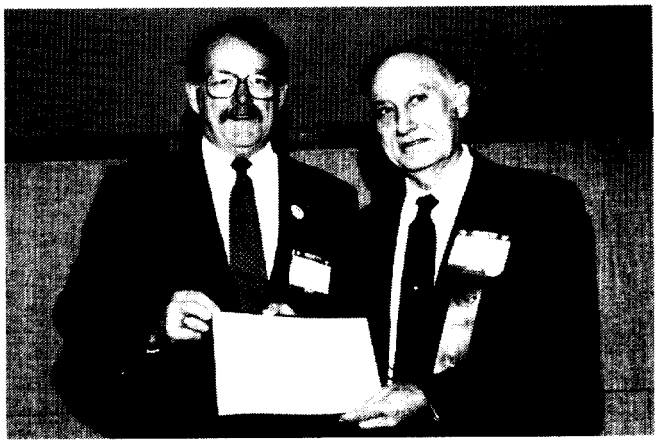
Jian-yu Lu and James F. Greenleaf won the Outstanding Paper Award for their combined papers "Nondiffracting X Waves—Exact Solutions to Free-Space Scalar Wave Equation and Their Finite Aperture Realizations" and "Experimental Verification of Nondiffracting X Waves," published in the January and May 1992 issues, respectively. The authors work at the Mayo Clinic in Rochester, MN.

All authors received a metal plaque and a certificate to commemorate their accomplishments.

Mathias A. Fink, from the University of Paris, received the Outstanding Paper Award for papers on "Time Reversal of Ultrasonic Fields" from Roger H. Tancrell, Awards Chair. Mathias also accepted Awards for his co-authors in France, Fançois Wu, Jean-Louis Thomas and Didier Cassereau who were unable to attend.



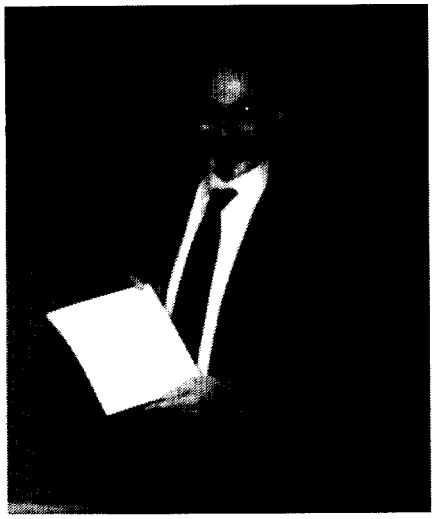
Jian-yu Lu and James F. Greenleaf, of Mayo Clinic, received the Outstanding Paper Award for their papers on "Nondiffracting X Waves" from Roger H. Tancrell, Awards Chair.



Eric L. Adler, of McGill University, Canada, received the 1993-94 Distinguished Lecturer Award from James F. Greenleaf, President, commemorating Eric's presentations on "Surface-Acoustic-Wave Devices".

DISTINGUISHED LECTURER AWARD

Eric L. Adler received the 1993-94 Distinguished Lecturer Award for his lecture entitled "Surface-Acoustic-Wave Devices: Fundamentals, Current Status, and Future Trends". At the time of this award, Eric had already presented his lecture at numerous meetings throughout the world, with many more scheduled in the coming months. Eric is a Professor in the Electrical Engineering Department at McGill University, Montréal, Canada. Eric received a certificate to commemorate the honor (and adventure) of serving as Distinguished Lecturer.



Andrea Prosperetti, of John Hopkins University, received a certificate of appreciation for his talk on "Bubbles and Sound" as President's Speaker at the Plenary Session.

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. Lawrence N. Dworsky
9638 E. Cochise Drive, Scottsdale, AZ 85258
For contributions to piezoelectric and transmission line resonators and band pass filters for telecommunications applications.

Dr. Thomas W. Grudkowski
107 Sherwood Drive, Glastonbury, CT 06033
For development of integrated microwave acoustics and semiconductor technologies for high-speed signal processing.

Dr. Gerald R. Harris
132 So. Van Buren Street, Rockville, MD 20850
For contributions to the measurement and understanding of ultrasound in medical applications.

Prof. Arye Nehorai
Yale University, Dept. of EE
P. O. Box 2157, Yale Station, New Haven, CT 06510
For contributions to statistical signal processing and system identification.

Dr. Thomas E. Parker
13 Cider Mill Road, Framingham, MA 01701
For contributions to the development of high-stability surface acoustic wave oscillators.

Prof. Peter H. Russer
Inst. fur Hochfrequenztechnik
Techn. Universitat Munchen
Arciss. 21, D80333 Munich 2, Germany
For fundamental contributions to noise analysis and low-noise optimization of linear electronic circuits with general topology.

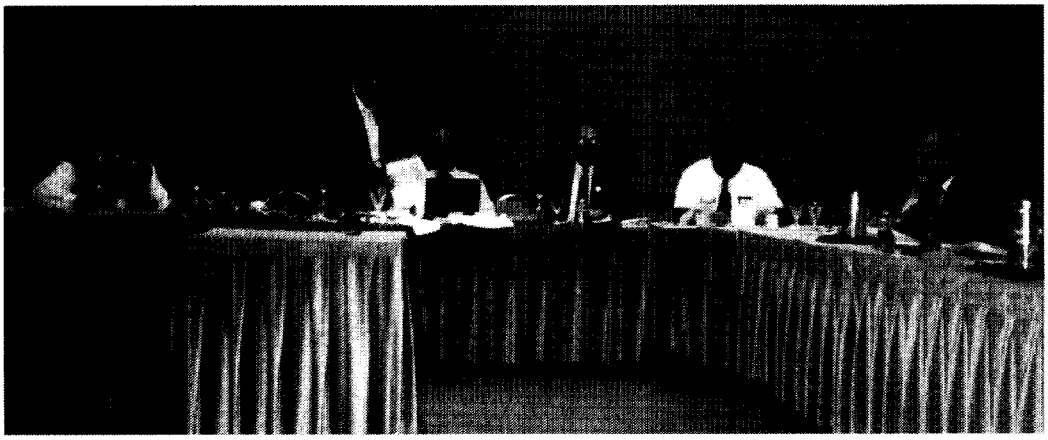
Prof. Yasutaka Shimizu
Cradle Tokyo Inst. of Technology
2-12-1 O-Okayama Meguru-ku, Tokyo 152, Japan
For contributions to research and development in the field of educational technology, electromagnetic compatibility, and surface acoustic waves.

Prof. Werner Wiesbeck
University Karlsruhe
Kaiserstr. 12, D-76131 Karlsruhe, Germany
For contributions to wide-band polarimetric radar metrology.

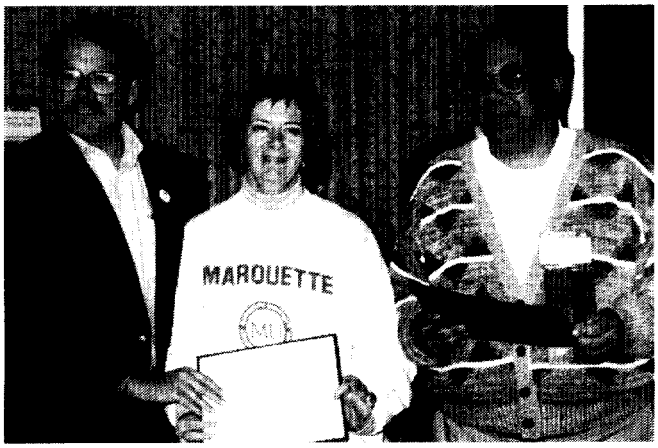
Scenes from the 1993 Ultrasonics Symposium

Jan Brown present plaque to Jim Greenleaf, retiring UFFC-S President.

Jim Greenleaf presents plaque to retiring Symposium Proceedings Editor Bruce McAvoy



AdCom Committee Meeting

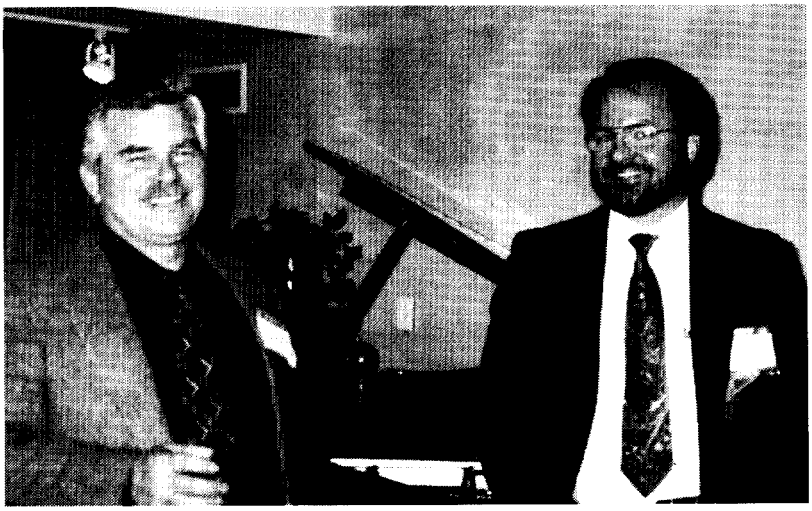


Susan Schneider, Technical Program Chair, and Harry Salvo, General Chair receive certificates of appreciation from Jim Greenleaf.

Elizabeth Salvo humbly accepts her certificate of appreciation for the guest program activities.

Mary Lou Blessing proudly accepts her certificate of appreciation for the guest program activities.

Art Ballato in conversation with the Raytheon Troika.



Ed Staples and John Kosinski share a few laughs.

You are all smiles when your term in office is over.

Dinner at the B.O. Railroad Museum in the Round House

IEEE
Ultrasonics, Ferroelectrics, and Frequency Control Society Administrative Committee

IEEE HEADQUARTERS

Director, Division IX	J. G. Ackenhusen	
Secretary, TAB	R. T. Wangemann	

SOCIETY OFFICERS

President	H. L. Salvo, Jr.	*Westinghouse Electric Corporation, Electronic Systems Group*
Vice-President	D. C. Malocha	*University of Central Florida, Orlando*
Secretary-Treasurer	G. K. Montress	*Raytheon Company, Research Division*

ELECTED COMMITTEE MEMBERS

1992-1994	E. L. Adler	*McGill University, Montreal*
1992-1994	H. E. Engan	*Norwegian Institute of Technology, Trondheim*
1992-1994	J. G. Miller	*Washington University, St. Louis*
1992-1994	S. C. Schneider	*Marquette University, Milwaukee*
1993-1995	G. V. Blessing	*National Institute of Standards Technology*
1993-1995	F. S. Foster	*University of Toronto*
1993-1995	T. W. Grudkowski	*United Technologies Research Center*
1993-1995	T. Shiosaki	*Kyoto University*
1994-1996	B. T. Khuri-Yakub	*Stanford University*
1994-1996	G. R. Johnson	*Sawyer Research Products Inc.*
1994-1996	R. E. Newnham	*The Pennsylvania State University*
1994-1996	R. Lerch	*University of Linz, Linz, Austria*

EX-OFFICIO COMMITTEE MEMBERS

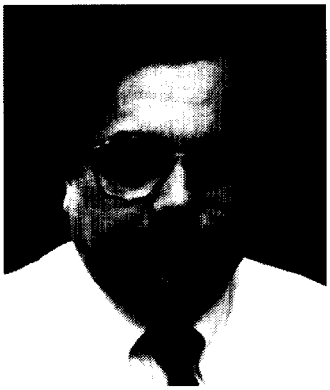
Awards	R. H. Tancrell	*Raytheon Company, Research Division*
Chapters-Membership	K. W. Ferrara	*Riverside Research Institute*
Fellows	R. M. White	*University of California, Berkeley*
Ferroelectrics	L. E. Cross	*The Pennsylvania State University*
Finance	H. van de Vaart	*Allied-Signal, Inc.*
Frequency Control	T. E. Parker	*Raytheon Company, Research Division*
Newsletter	F. S. Hickernell	*Motorola, Inc., GSTG*
Nominations	B. R. Tittmann	*The Pennsylvania State University*
Standards	A. Ballato	*U.S. Army Research Laboratory, Ft. Monmouth*
Transactions	W. D. O'Brien, Jr.	*University of Illinois, Urbana*
Ultrasonics	G. W. Farnell	*McGill University, Montreal*
Past President		
(1992-1994)	J. Brown	*Consultant*
(1994-1996)	J. F. Greenleaf	*Mayo Clinic*

New Society Officers

Harry L. Salvo, Jr. – President

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



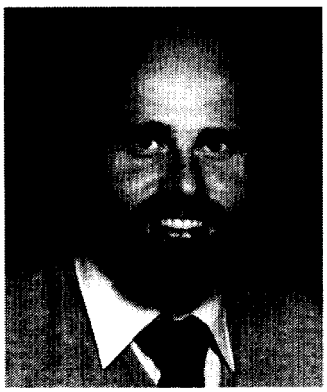
involved in thin film bulk acoustic devices for use in signal processing and frequency control applications.

Harry was the Secretary - Treasurer of the UFFC-S Administrative Committee from 1987 to 1991 and vice-president from 1991 to 1993. 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, Finance Chair for the 1984 Symposium, Technical Program Chair for the 1990 Symposium, and General Chair for the 1993 Symposium. Harry is a member of the American Physical Society as well as the IEEE.

Donald Malocha – Vice-President

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 the Martin/St. Laurent 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.

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.

Gary Montress – Secretary-Treasurer

Gary Montress (S'66-M'76-SM'87) was born in East Orange, New Jersey, on April 10, 1947. He received the B.S.E.E., M.S.E.E., Electrical Engineer, and Ph.D. degrees from MIT, Cambridge, MA, in 1969, 1971, 1971, and 1976, respectively. From 1969 to 1972, while at MIT, he was a Teaching Assistant in the E.E. Department, teaching courses in solid-state electronics and circuit design, while pursuing research in the area of p-n junction breakdown phenomena. From 1972 to 1975, he was an Instructor in the E.E. Department, teaching and supervising courses in solid-state physics and microelectronics. From 1975 to 1976, while a Research Assistant in the Research Laboratory for Electronics at MIT, he completed his Ph.D. thesis research and dissertation in the area of solid-state microwave devices (BARRITT diodes). From 1976 to 1984, Dr. Montress was a member of the Professional Staff at the United Technologies Research Center, East Hartford, CT, involved in research and development activities related to SAW frequency control and signal processing components. Since October 1984, Dr. Montress has been a member of the Professional Staff at the Raytheon Research Division, Lexington, MA. His current activities are concentrated on stable VHF, UHF, and microwave frequency sources, including both SAW and dielectric resonator based oscillators and synthesizers. His interests also encompass the development of custom electronic circuitry for application to low noise frequency sources. Dr. Montress is a member of Eta Kappa Nu, Sigma Xi, and Tau Beta Pi. IEEE activities include having served as an officer of the Boston Chapter of UFFC-S (1986-89) and as a member, since 1981, of the Technical Program Committee for the annual Ultrasonics Symposium. Dr. Montress served as Technical Program Chairman (TPC) for the 1989 Ultrasonics Symposium in Montreal and the 1991 Symposium in Orlando, and the 1992 Symposium in Tucson.

Dr. Montress received the 1988 Outstanding Transactions Paper Award from the Ultrasonics, Ferroelectrics, and Frequency Control Society as a co-author of the papers "Precision Surface-Acoustic-Wave (SAW) Oscillators" and "Extremely Low Phase Noise SAW Resonators and Oscillators: Design and Performance".

In the little bit of spare time available, Gary, Sara, and twelve year old daughter Rebecca enjoy vacationing on Cape Cod. Gary also enjoys reading (almost anything), golf, and softball.

UFFC-S ADCOM BRIEFS

The Administrative Committee (Adcom) of the Ultrasonics, Ferroelectrics and Frequency Control Society (UFFC-S) was called to order at 8:45 AM at the Hyatt Regency, Baltimore, Maryland. Introduction of attending members was conducted.

Don Malocha moved that the minutes of the February 12, 1993, Adcom meeting be approved. The motion was seconded by Jan Brown. The minutes were approved with a few minor changes.

Jim Greenleaf presented the President's report. A non-member transaction and periodical status report was given. Greenleaf stated that approximately 60% of publication revenues come from non-member periodical fees. Jan Brown indicated that despite the fact that IEEE publications rates were raised approximately 10%, library sales increased slightly.

Jim Greenleaf stated that the Ferroelectricity Newsletter was sent to many members of the UFFC-S. The UFFC-S is looking at the newsletter for possible joint sponsorship and Wally Smith and Jim Greenleaf are pursuing this activity. Fred Hickernell reported that the current UFFC newsletter costs approximately $10K per year. Jan Brown suggested that all UFFC members receive the proposed newsletter. A motion by Art Ballato was passed to pursue the joint sponsorship of the Ferroelectrics Newsletter. Jim Greenleaf also noted that the IEEE would like our newsletter to be published quarterly.

Jim Greenleaf noted that the Vehicular Society is setting up an Intelligent Highway System Committee and asked for a liaison from anyone in the Adcom committee.

It was pointed out by Jim Greenleaf that there was a strong letter from Al Mietzler encouraging the UFFC-S to follow our own IEEE standards in our publications. Al Mietzler was in attendance and addressed the Adcom and discussed his letter. He indicated that he briefly reviews papers in his area and sees if the standards are being referred to in the authors presentation and if the proper concepts are being followed. He feels that the reviewers and associate editor should be very conscientious in this area. Jan Brown stated that John Vig has previously complained that the IEEE standards are too costly for general purchase and, therefore, are not as well referenced as probably should be. John Vig has addressed the board and is currently working to address and change the current system of disseminating the IEEE standards.

The IEEE USA defense policy committee is requesting interested persons to become involved. Anyone interested should contact Jim Greenleaf. Jan Brown indicated that the best way to influence the committee is to get in-

volved within the committee. Any letters of comment on defense policy actions should be sent to the IEEE president.

Under Old Business, Jim Greenleaf started discussion on the Women of the UFFC. Susan Schneider reported that there will be a meeting at the 1993 Ultrasonics conference and the meeting was announced in the Advanced Program book. Jim Greenleaf made a motion at the TAB on the subject of women in engineering. That motion was approved at the IEEE board August 1993 meeting and TAB will address this issue. A request was sent out to all members for their responses and an action plan is being formulated.

The previous motion made at the February Adcom meeting on Smart Structures was pursed by Art Ballato and Tom Grudkowski. Art Ballato reported that smart structures is pursued by both electrical and mechanical engineers. The group appears to already have cast their lot with other publishers, such as the Institute of Physics, however, Tom Grudkowski believes that this issue can be further pursued. Art Ballato believes we should have a grander strategy by attempting to lure the most talented people into our society and we should use our own society experts and nurture this area. It was pointed out that Bob Newnham has just won an award in the area of smart structures. It was suggested that the UFFC-S could possibly have a special issue in the area of smart structures. Jim Miller suggested invited talks and sessions on the areas of smart structures at the Ultrasonics Symposium. Gerry Farnell questioned whether the UFFC-S join as a joint sponsor of the current IEEE MEMS journal which is currently being sponsored by the Electron Device Societies. This will be pursued by Art Ballato and Tom Grudkowski.

Tom Parker reported that the Conference manual needs to be picked up by someone else in order to finish the manual due to other commitments by himself, such as his new Associate Editor position. The current status: Frequency Control is completed, the Ultrasonics is partially done, and nothing is done on Ferroelectrics. Gary Montress volunteered to help in finishing the manual.

During his tenure as secretary Don (center) has always captured the salient facts of discussions held in the Administrative Committee meetings.

Bill O'Brien reported on publications. He noted that manuscripts are now going directly to the editor. Because of this fact, the editor's report can now show the accountability of the manuscripts. The editor presented his written report and the editor's statistics on publications were presented. There is currently no backlog in the transactions, however, there is approximately a 5 month delay from the time UFFC submits manuscripts to IEEE before they can be published. There has really not been any decrease in publication time due to the electronic media. Eric Adler stated that although the publication time is good compared to other journals, it should be made shorter and he asked where the bottleneck in the 6 month review process was occurring. Bill O'Brien stated that this will be discussed at the Associate Editor's meeting later that week. Helmut Hellwig suggested that the review process should be less than the publication lead time process. The UFFC Transaction Applications issue was a huge success; there were 22 papers in that issue. The January issue will have 12 papers from the Drexell University meeting.

The UFFC editorial office moved this summer when Bill O'Brien moved his office, however, there is no interruption in the publications office. There will be a UFFC Transactions associate editor's luncheon on November 2, 1993, where a new manual and new forms will be distributed by O'Brien to the Associate editors .

Fred Hickernell provided a written report concerning the Newsletter and made the verbal report. There were Newsletter issues at this year's Ultrasonics symposium registration desk. It was noted that the UFFC-S is currently 40 years old. As always, articles and suggestions for the Newsletter are welcomed and encouraged.

Herman van de Vaart presented a verbal and written report on the Finance

Committee and budget. Jan Brown made a motion that the Adcom travel reimbursement be continued for the next two years, 1994-1995. Eligibility is all voting and standing Adcom members, with a maximum of $750.00 per year. The total amount of expense to Adcom will be a maximum of $15,000 per year. The motion passed. Herman Van de Vaart moved a motion to approve $12,000 per year for continuing the Ambassador Program in Membership Services for 1994 and 1995. The motion passed. Jan Brown moved a motion for $10,000 matching funds per symposium for student travel support for 1994 budget year. The motion passed. Jan Brown moved to approve $6,000 matching funds per symposium for support of travel of participants outside of Regions 1-7 for budget year 1994. The motion passed. Jan Brown moved to accept the budget as submitted by the Finance Committee for 1994. The motion passed.

Jan Brown reported that every symposium of the IEEE will be audited in the near future. The IEEE is currently unable to track the symposium incomes and every conference greater than $100,000 will need to be audited by a professional service. For our conferences, we should be paying approximately $1,200 auditing fees. This will probably take effect sometime next year and all symposium chairs should be aware of this action.

Eric Cross provided a written and oral report of the Ferroelectrics Standing Committee. A verbal report was given by Eric Cross on the International Meeting on Ferroelectrics, IMF 8. In summary, this is the most prestigious meeting in this area and it was very successful.

The 1991 International Symposium on Applications of Ferroelectrics (ISAF) held at Clemson University was given its last report by Eric Cross. The symposium was successful but had a surplus of only $750 due to a much reduced attendance from that anticipated. Eric Cross reported that the 1994 ISAF will be held at the new Penn State University conference center. The budget was presented and a motion to approve the budget passed.

Tom Parker reported for the Frequency Control Standing Committee. A book on direct digital synthesis by Dr. Kroupa has been endorsed by the committee for a possible IEEE publication. Tom Parker reported on the possible joint meeting of the European Time and Frequency Forum. There was good support of TPC members and from symposium attendees for holding joint meetings in the future. There are future planning meetings with further discussions to determine means for achieving the joint meetings.

The Frequency Control Symposium will begin using credit cards soon. The society may wish to buy the equipment for phoning and checking the credit cards but no decision was reached on this issue.

Gary Johnson gave the verbal report and the written interim financial report for the 1993 FCS held in Salt Lake City. There was a slight reduction in the expected surplus due to some losses from foreign travel arrangements. In the future, it is suggested that very specific rules and guidelines should be setup and followed to minimize problems. The symposium supported, either partially or fully, 21 people. There was a heavy emphasis on tutorials this past year at FCS. Dave Allen is currently the tutorial chair and the symposium will be paying Allen's travel expenses while he acts as the symposium tutorial chair.

The 1994 FCS oral report was given by Gary Johnson. Gary noted that there is a reduction in the foreign travel budget, and the surplus is budgeted at less than $12,000. The 1994 FCS budget was approved as submitted. There was a discussion of the fact that the surplus was budgeted for less than the 15%. The budget did not reflect the Adcom matching moneys for travel assistance, therefore, the budget will come close to the required 15% and there was no further discussion. The TPC meeting for the 1994 Ultrasonics Symposium, and the Frequency Control Symposium will be held on Thursday following the 1993 Ultrasonics Symposium.

John Vig reported that the 1995 FCS to be held in San Francisco is being finalized and Lute Maleki will be the technical program chair. John Vig reported that the 1996 FCS will be held in Hawaii, probably in Honolulu. Plans to choose the hotel are near closure and the symposium will be held in the week of Memorial Day.

Gerry Farnell reported for the Ultrasonics Standing Committee. He introduced each of the symposia chairs and allowed the chairs to report.

Fred Hickernell provided a final verbal report of the 1992 Ultrasonics Symposium held in Tucson. The estimated surplus is nearly $33,000.

Harry Salvo reported on the 1993 Ultrasonics Symposium being held in Baltimore directly after the Adcom meeting. He reported that the short courses are doing very well. The symposium budget, as recorded in October,

Ferroelectrics Goings on ...

The IEEE Ferroelectrics Committee of UFFC played a major role in the recent highly successful International Meeting on Ferroelectrics-IMF8 in Gaithersburg at NIST. These IUPAP sponsored meetings are on a four year cycle, and it was due to an initiative from the IEEE committee at IMF7 in Saarbruken that IMF8 came to USA. Dr. Smith, a valued member of our committee, was Chairman for the meeting and several other committee members played prominent roles. Over 550 participants attended with some 60 oral presentations and more than 800 posters. Proceedings for the meeting are not in final preparation.

The committee is now heavily involved in preparation for ISAF9 this August at the new Penn State Scanticon Conference Center. Already more than 370 papers have been submitted and the program is in final preparation. The meeting coincides with the 50th Anniversary of the discovery of barium titanate, the most widely used perovskite ferroelectric and a special history session and exhibition of early ferroelectric components are planned for the meeting.

may change from expected since the surplus projected will fall short due to an error in expected revenue from the book broker program. IEEE provided very unclear information which led to an error in projected revenue.

Gerard Quentin provided an oral report for the 1994 Ultrasonics Symposium to be held in France. The two closest airports to Cannes are Nice and Paris. The room contract at the Martinez will be approximately $122 per day. The conference will be in November which will be in the low price season. Round-trip airline tickets from N.Y. to Cannes are estimated at $450. All of the TPC schedules have been moved forward to ensure early publication of the advanced program book for mailings overseas. There was a suggestion of an exhibitor's poster session and the symposium will take the suggestion under consideration. The symposium budget submitted was approved. There was a discussion following the budget motion of the fact that the budgeted surplus is less than 15% and Bill O'Brien questioned the cost of the UFFC reception. After some discussion the budget was accepted without changes.

Gerald Blessing gave a verbal report for the 1995 Ultrasonics Symposium to be held in Seattle Washington. The location is the Westin Hotel, the conference will be the first week in November, and the room rate will be $115/single. George Allers will be the technical program chair and a volunteer for finance chair is still needed.

Roger Tancrell reported the symposium survey he conducted on potential problems with foreign symposium travel was completed. He pointed out there are problems in universities, government and industry but prior planning and lead time can overcome most problems; lead time is important for budgeting purposes. Cooperation with European companies and agencies would add justification when requesting travel in companies and government agencies.

Roger Tancrell gave an oral report and a written report for the Awards Committee. Eric Adler, the UFFC Distinguished Lecturer, reported that he gave two talks thus far, one in Bulgaria and the other in Istanbul. He will also give approximately 5 lectures in Japan. Roger Tancrell would like some additional members on the Major IEEE Awards subcommittee; volunteers are invited to contact Roger. The Distinguished Lecturer oral report was given by Roger Tancrell. The Distinguished Lecturer for 1995 has not yet been chosen. There was a discussion on a procedure for choosing the Distinguished Lecturer earlier but the consensus was to make no changes at this time.

Kathy Ferrara gave an oral report on Membership and also provided membership statistics. Membership is up about 2% from last year. New membership brochures have been printed and the brochure will be revised for 1994. The new brochure will be multicolor and any suggestions are encouraged. The membership brochure is currently used for the Outreach program. Kathy Ferrara made a motion that Chapters be made an ex-officio Standing Committee, as a non-voting member, via a by-law and constitutional change as soon as possible. There was a discussion of whether this motion is a good idea or not at this time. There was a discussion of the charter and goals of the potential Chapters. Gerry Farnell moved to table the motion by Ferrara until the next Adcom meeting. The motion to table passed. Jan Brown moved to have travel support of up to $750/yr for the Chapters representative, per the same constraints as on the voting and standing Adcom committee travel. The motion passed.

Art Ballato provided an oral and written report from the Standards Committee. The UFFC is currently responsible for 6 standards. John Vig reported that he brought the problem of access of IEEE standards to the IEEE Board. There was some progress made and the issues are being studied.

There was no Fellows Committee report. It was noted that Richard White has not been at an Adcom meeting for several meetings. Jim Greenleaf will contact Richard White to obtain further details.

A verbal report from the Nominations Committee was given by Bernie-Tittmann. New Adcom members for 1994 are Gary Johnson, Butrus Khuri-Yakub, Reinhard Lerch, and Robert Newnham.

Elections were conducted by Jim Greenleaf for President and Vice-President of the UFFC society. Nominations were open for President. Harry Salvo was nominated for President. There were no other nominations and nominations were closed. Harry Salvo was elected by acclamation of the Adcom. Nominations were opened for Vice-President. Don Malocha and John Vig were nominated. Gerry Farnell moved to close nominations and the motion passed. Both candidates left the meeting during Adcom discussions. Don Malocha was elected Vice-President.

Jim Greenleaf circulated the current UFFC Bylaws and possible Bylaws changes. Members are requested to review and to email comments on the possible changes .

John Vig reported that the co-chairs for an acoustoelectronics conference, Prof. Kulakov and Mansfeld, have requested monetary support. The conference is to be held next June, on a ship, while the ship is traveling from St. Petersburg to another Russian port. Fred Hickernell moved that the UFFC co-sponsor the acoustoelectric conference in June 1994, in St. Petersburg, Russia and that we provide $3,000 of monetary support. We require that the UFFC have members on the technical program committee and/or organizing committee. The motion passed. John Vig will be responsible as the liaison to the symposium representing Adcom.

A motion was made that the next Adcom meeting be held in conjunction with the Frequency Control Symposium, on Friday, June 3, and make a strong recommendation that the Ultrasonics TPC meeting be held on Saturday, June 4, in Boston. The motion passed.

The Adcom applauded and thanked Jim Greenleaf for his hard work as UFFC-S President for the past two years. The UFFC-S Adcom meeting adjourned at 5:05PM.

Donald C. Malocha
1993 UFFC-S Secretary/Treasurer

Standards Activities Report

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

Piezoelectric Crystals — T. R. Meeker (176-1987) (177-1978)

Standard 177-1966, "Standard Definitions and Methods of Measurement for Piezoelectric Vibrators", was published in the January 1993 issue of Trans. UFFC. After publication, comments received will be used in its revision, which is presently scheduled for June 1994. Standard 176 will then be published in the Transactions, followed by revision based on comments received.

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

No progress since last report.

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

The IEEE Guide for Measurements of Environmental Sensitivities of Standard Frequency Generators was balloted and will be submitted to the IEEE Standards Committee. A special session on "Guidelines for the Measurement of Environmental Sensitivities of Precision Oscillators" was organized and held at the Frequency Control Symposium in Salt Lake city in June.

Sensors — J. Schoenwald (P1182)

The draft version of "Guide to Terms and Definitions of Ferroelectric, Frequency Control and Ultrasonic Sensors" is being circulated prior to publication in Trans. UFFC for reader comments.

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

Work on P1211 — "Standard Definitions, Symbols and Characterization of Ferroelectric Thin Films, Memory Cells and Device Structures", continued at ISIF, Colorado Springs, in April 93.

Regarding Standard 180-1986, the Ferroelectrics Committee has been granted an extension until March 1995.

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

IEEE Standard Terms and Definitions for Surface Acoustic Wave (SAW) Devices has been published as Std 1037-1992.

Piezomagnetic Technology — S. L. Ehrlich (319-1971)

A measurement standard committee is being assembled.

Acousto-Optics — D. L. Hecht (P1022)

Presently inactive.

Industrial Ultrasonics — E. P. Papadakis

Presently inactive.

Delay Lines — A. A. Comparini

Arthur Ballato
Chairman, Standards Activities, UFFC-S

UFFC Financial Report

As shown on the UFFC Operating Financial Statement 12/31/93, we had a small surplus in 1993. Our interest income was down, reflecting lower interest rates. The Transactions show a healthy surplus; the lower than expected income from the individual non-member (INM) subscriptions (INM subscribers dropped from 373 to 339) was more than offset by the higher than expected income from the voluntary and overlength page charges. The page charge income is very hard to budget; it seems to jump up and down from year to year. The printing/distribution costs for the Transactions was also lower than expected. The Symposia continue to do well. The 1992 Frequency Control Symposium had a $11.8K surplus and the 1992 Ultrasonics Symposium is expected to show a surplus of $33K, although the final report did not make it in time to be included in the 1993 statement. Only ISAF 1992 had some difficulties and managed just to break even. The AdCom expenses were lower than budgeted. Expenses budgeted for travel expenses for selected East-European colleages do not seem to have materialized. The bottom line is that our net worth remains approximately $500K. $100K is now invested in an IEEE long term fund; the rest is in a short term fund. This year, an additional $100K will be shifted from the short term fund to the long term fund, as approved by AdCom.

H. van de Vaart
Chair Finance and
Operations Committee

CONGRATULATIONS

The IEEE Standards Board presented an IEEE Standards Working Group Award to Elio Mariani of the U. S. Army Research Laboratory, Fort Monmouth, New Jersey. The award is presented to key IEEE standards working group members in recognition of their leadership and contributions toward getting IEEE standards published. Elio received the award for standard 1037, "Surface Acoustic Wave Devices". Our congratulations to Elio and our appreciation for the time spent by him and those working with him to bring this standard into existence.

UFFC OPERATING FINANCIAL STATEMENT 12/31/93

UFFC	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
INTEREST	21.8	13.0	0.0	0.0	21.8	13.0
PERIODICALS	231.2	243.6	195.7	182.9	35.5	60.7
NEWSLETTER	0.0	0.2	10.0	11.0	-10.0	-10.8
NON-PERIODICALS	1.3	1.6	1.1	1.5	0.2	0.1
SYMPOSIA	415.6	185.7	367.1	173.4	48.5	12.3
ADMINISTRATION	0.0	0.0	12.5	19.4	-12.5	-19.4
ADCOM/OTHER	-4.7	0.6	91.5	43.0	-96.2	-42.4
TOTAL	**665.2**	**444.7**	677.9	**431.2**	-12.7	**13.5**

TRANSACTIONS	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
MEMBERSHIP FEES	26.6	24.8	0.0	0.0	26.6	24.8
INDIVIDUAL NM SUBS.	89.0	78.4	0.0	0.0	89.0	78.4
ALL TRANS. PACKAGE	86.5	86.5	0.0	0.0	86.5	86.5
VOLUNTARY PAGE CHARGES	13.8	31.7	2.9	7.0	10.9	24.7
OVERLENGTH PAGE CHARGES	7.8	19.5	1.5	0.7	6.3	18.8
PRINTING/DISTRIBUTION	1.8	3.0	115.1	104.3	-113.3	-101.3
EDITING	0.0	0.0	31.4	31.0	-31.4	-31.0
PUB. ADMINISTRATION	0.0	0.0	4.6	4.4	-4.6	-4.4
UFFC EDITOR	0.0	0.0	26.0	20.7	-26.0	-20.7
SUBSCRIBER HANDLING	0.0	0.0	11.6	11.4	-11.6	-11.4
OTHER TRANSACTIONS	5.7	-0.3	2.6	3.4	3.1	-3.7
TOTAL	**231.2**	243.6	**195.7**	**182.9**	35.5	**60.7**

SYMPOSIA	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
1992 ULTRASONICS	207.6	0.0	181.2	0.0	26.4	0.0
1992 FREQ. CONTROL	0.0	113.8	0.0	102.0	0.0	11.8
1993 FREQ. CONTROL	100.0	0.0	90.0	0.0	10.0	0.0
1992 ISAF	107.9	71.9	94.5	71.2	13.4	0.7
CONF. ADMINISTRATION	0.1	0.0	1.4	0.2	-1.3	-0.2
TOTAL	**415.6**	**185.7**	367.1	**173.4**	**48.5**	**12.3**

ADCOM EXPENSE	BUDGET	ACTUAL
PRESIDENT'S OFFICE	4.5	6.2
ADCOM EXPENSES	51.3	20.7
CHAPTERS/DIST. LECTURER	14.0	5.3
TECHNICAL	1.9	0.1
MEMBERSHIP	17.3	5.9
AWARDS	1.4	2.4
OTHER	1.1	2.4
TOTAL	**91.5**	**43.0**

OUTSTANDING LOANS	
1993 ULTRASONICS	40.0
1993 FREQ. CONTROL	8.0
1994 ULTRASONICS	35.0
TOTAL	**83.0**
RESERVES 1/1/93	493.1
SURPLUS	13.5
RESERVES 12/31/93	**506.6**

CHAPTER ACTIVITIES

Tokyo Chapter

Technical Meeting

The Tokyo Chapter held 6 technical meetings during the second half of 1993, in conjunction with the Technical Group on Ultrasonics of the Institute of Electronics, Information and Communications Engineers of Japan:

Date	Papers	Place
1) July 22-23, 1993	15	Kanazawa
2) August 20	8	Yokosuka
3) September 21-22	17	Sendai
4) October 19	6	Tokyo
5) November 26	7	Chofu
6) December 10	6	Tokyo

Cady Award winner Dr. H. Kawashima (center) being honored at a congratulatory party.

Dr. Hirofumi Kawashima, Winner of Cady Award

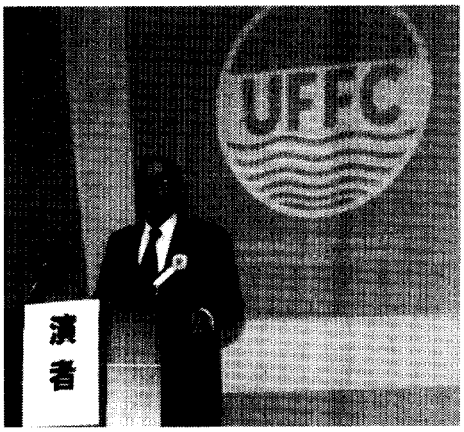
Dr. H. Kawashima, a member of the UFFC-S Tokyo Chapter, was presented the Cady Award of the IEEE UFFC-Society at the 1993 Frequency Control Symposium for his outstanding contributions to "photolithographic miniature quartz crystal units with excellent stability". To commemorate this the Tokyo Chapter offered a special lecture by Dr. Kawashima on September 21, 1993, in Sendai in cosponsorship with the Technical Group on Ultrasonics of IEICE Japan. The recipient was then toasted at a congratulatory party.

14th Symposium on Ultrasonic Electronics

The Tokyo Chapter sponsored the 14th Symposium on Ultrasonic Electronics (USE'93) on December 7-9, 1993, at the Turumi-Kaikan in Yokohama, attended by more than 390 participants. Five invited talks and 129 contributed papers were presented. The papers will be published in the May 1994 issue of the Japanese Journal of Applied Physics.

UFFC-S 1993-1994 Distinguished Lecturer Program

Professor Eric Adler of McGill University in Canada, the UFFC-S 1993-1994 Distinguished Lecturer, was invited to Japan and he and Mrs. Adler were here from Dec. 5 to Dec. 14. He favored us with impressive and instructive talks on the topic, "Surface Acoustic Wave Devices: Fundamentals, Current Status and Future Trends," at the USE'93 in Yokohama and at technical meetings held in Yokohama, Kawasaki, Tokyo, and Sendai. We wish to thank Prof. Adler for his patience with the busy schedule we imposed on him. During his lecture in Kawasaki there was an unexpected event. Since officers of the Tokyo Chapter have been sworn to secrecy, you will have to get the details from him.



Prof. Eric Adler delivered an invited talk at the USE'93.

Prof. Adler holding the shippo-yaki (cloisonne) plate presented him by the Tokyo Chapter at the welcoming party. The Japanese word on the piece of paper held by Mrs. Adler was written by Prof. Y. Shimizu, the chairman of the Tokyo Chapter. The word means 'delightful gong' and has the same pronunciation as their name 'Adler'.

1994 Officers

The new officers of the Tokyo Chapter for 1994 are:

Chairman: Professor Yasutaka Shimizu, CRADLE, Tokyo Institute of Technology, Oh-okayama, Meguro-ku, Tokyo 152.

Vice Chairman; Professor Kiyoshi Nakamura, Faculty of Engineering, Tohoku University, Aoba, Aramaki, Aoba-ku, Sendai 980.

Secretary: Professor Toshihiro Kojima, Faculty of Engineering, Tamagawa University, Tamagawagakuen 6-1-1, Machida, Tokyo 194.

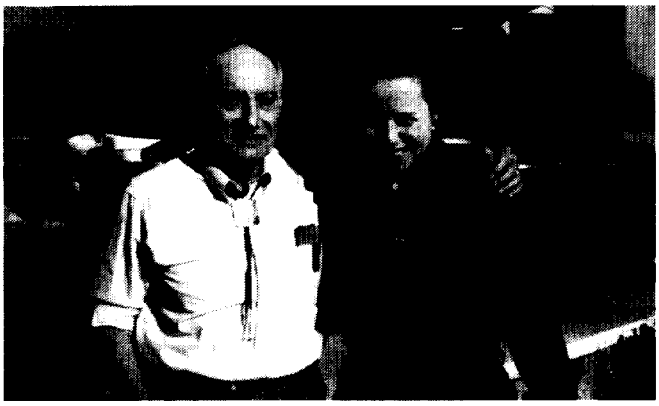
Treasurer: Professor Yasuhiko Nakagawa, Faculty of Engineering, Yamanashi University, Takeda 4-3-1 I, Kofu 400.

Kiyoshi Nakamura
Vice Chairman, Tokyo Chapter

Prof. and Mrs. Adler with some members of the Tokyo Chapter after the welcoming party.

Phoenix Chapter

The UFFC Society has had a good representation of speakers and members at the IEEE Waves and Devices Section of Phoenix. On September 15th, Dr. Larry Dworsky of Motorola inaugurated the IEEE speakers series with a talk entitled "A Comparison of Bandpass Filter Technologies for communication Systems Applications."



Eric and Lee Adler enjoy the warm Arizona sunshine.

In February Professor Eric Adler, the UFFC-S Distinguished Lecturer, left the frozen north and came to sunny Phoenix for his talk entitled "Surface Acoustic Wave Devices, Fundamentals, Current Status, and Future Trends." His wife, Lee, joined him, and they spent a few days in the Phoenix area after the talk, enjoying the weather, scenery, and some western dancing. (See photograph)

On March 29th, Dr. Fred Hickernell gave a talk entitled "Surface Acoustic Wave Characterization of Thin-Films for Acoustoelectronic Applications." It was a good follow-up to the Adler presentation.

The audience for these talks at Arizona State University have included students and faculty from ASU and engineers and scientists from several of the valley industries. It has been a good opportunity to promote IEEE and the UFFC-S.

Fred Hickernell, UFFC-S Representative

Boston Chapter

The Boston Chapter of the UFFC-S assembled a full program of monthly meetings for the 1993-1994 season. A variety of speakers and topics were planned representing many of the various areas of interest to UFFC-S members. Meeting dates and the topic/speaker were/are as follows:

20 October 1993 — "Space Experiments with High Frequency Stability Atomic Clocks" — Robert C. Vessot, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA

15 December 1993 — "Low-Loss IF and RF Surface Acoustic Wave (SAW) Filters for Mobile Communications" — C. S. Lam, AT&T, Bell Laboratories, North Andover, MA

26 January 1994 — "An Acoustic Sidewall Sensor for Noninvasive Measurement of Discrete Liquid Levels in Large Storage Tanks" — Y. Liu and L. C. Lynnworth, Panametrics Inc., Waltham, MA

9 February 1994 — "Fabrication and Properties of Fine-Scale Piezoelectric Composite Transducers" — Leslie J. Bowen, Materials Systems Inc., Littleton, MA

9 March 1994 — "Intravascular Ultrasound Imaging" — John Scampini, Hewlett-Packard Company, Imaging Systems Division, Andover, MA

13 April 1994 — "Applications of Ultrasonic Imaging in High Resolution Flaw Detection and the Characterization of Industrial Materials" — Philip P. Mooney, Panametrics Inc., Waltham, MA

11 May 1994 — "Ultrasonic Devices and Methods for Biomedical Studies" — Armen Sarvazyan, Rutgers University, Department of Chemistry, Piscataway, NJ

6 June 1994 — "Surface-Acoustic-Wave Devices: Fundamentals, Current Status, and Future Trends" — Eric L. Adler, McGill University, Montreal, Quebec, Canada, and *Ultrasonics, Ferroelectrics, and Frequency Control Society* Distinguished Lecturer, 1993-1994

(continued on next page)

Attendance at meetings held thus far has ranged from eighteen to thirty-nine.

Chapter officers for 1993-1994 are:

Chairman: Gary K Montress, Raytheon Company, Research Division, Lexington, MA 02173

Vice-Chairman: Jan G. Smits, Boston University, Department of Electrical & Computer Engineering, Boston, MA 02215

Secretary-Treasurer: William J. Ossmann, Hewlett-Packard Company, Andover Division, Andover, MA 01810-1099

Elections for 1994-1995 officers will be held at the 6 June 1994 meeting. Officer nominations for the upcoming year are:

Chairman: Jan G. Smits, Boston University, Department of Electrical & Computer Engineering, Boston, MA 02215

Vice-Chairman: William J. Ossmann, Hewlett-Packard Company, Andover Division, Andover, MA 01810-1099

Secretary-Treasurer: Gerald F. Jennings, Analogic Corporation, Peabody, MA 01460

While details of next year's speakers and their topics are incomplete at this time, the first meeting is planned for October 1994. A November 1994 meeting is not planned since this conflicts with the 1994 IEEE International Ultrasonics Symposium scheduled for 1-4 November 1994, in Cannes, France.

Gary K. Montress
Boston Chapter Chairman, 1993-1994

Acoustoelectronics '93

The Sixth "Acoustoelectronics '93" Conference with international participation was held from September 19-25, 1993, at the House of Bulgarian Academy of Sciences in the beautiful Black Sea resort of Varna, Bulgaria. The conference was organized by the Institute of Solid State Physics of the Bulgarian Academy of Sciences and sponsored by the Advanced SAW Products SA, Switzerland; St. Cyril and St. Methodius International Foundation; the Union of Scientists in Bulgaria and the Society of the Bulgarian Physicists. Prof Josef Pelzl from Ruhr University, Bochum, Germany, also supported the Bulgarian organizers.

The "Acoustoelectronics '93" Conference began with three tutorial lectures by the guest speakers F. S. Hickernell, J. R Vig, from USA and E. A. Adler from Canada, all of them members of the Ultrasonics, Ferroelectrics, and Frequency Control Society. Twelve invited talks and 32 contributed papers were presented in six oral and one poster sessions. More than 70 scientists from Australia, Canada, Czech Republic, Germany, France, Japan, Poland, Republic of Belarus, Russia, Switzerland, Ukraine, USA and Bulgaria took part in the Conference. All presented papers were published in the Proceedings of the Sixth Conference "Acoustoelectronics '93".

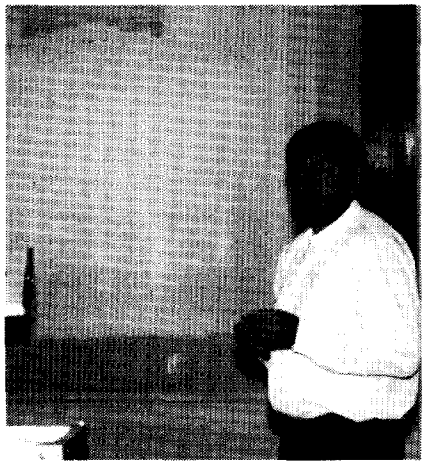
Besides the scientific program the attendees had ample time for exchanging experiences and discussing problems within the Conference topics in personal conversations. They also enjoyed an interesting social program, including a welcome party, an official dinner, sightseeing trips to the wonderful rocky cap of Kaliakra, the Palace and the Botanical garden of Baltchik, and Euxinograd — the former summer residence of Bulgarian monarchs. No one missed the opportunity to relax, to delight in the sunny weather and the warm Black Sea, and to taste the delicious Bulgarian cuisine at local restaurants and patio cafes overlooking the Sea.

The photographs give you a glimpse into the conference activities. The next "Acoustoelectronics '95" Conference will be held in 1995. The Bulgarian organizers are looking forward to your participation.

Lozan Spassov
General Chairman

Dr. John R. Vig (U.S.A.), UFFC-S Distinguished Lecturer 1992-1993

Dr. Eric L. Adler (Canada), UFFC-S Distinguished Lecturer 1993-1994



Dr. Ivan D. Avramov (Bulgaria)

Attendees at one of the oral sessions with the Technical Program Chairman, Dr. Ivan Avramov (left) and Dr. Lozan Spassov, General Chairman (center).

Dr. Miloslav Kosek (Czech Republic) and Prof. Sergei Kulakov (Russia)

Attendees at one the oral sessions.

Dr. D.P. Chen (Switzerland), Dr. David Morgan (United Kingdom), Dr. Michael Reichling (Germany), Prof. Nikolay Kirov (Bulgaria)

Dr. John Kosinski (U.S.A.), Dr. David Thompson (U.S.A.), Dr. Charles Faleo (U.S.A.), Mr. Michael Reichling (Germany)

In the botanical garden of Baltchik.

IEEE UFFC-Soc 1992-93 Distinguished Lectures on "High-Accuracy Oscillators and Clocks"

The UFFC-Soc Distinguished Lecturer for 1992-93, John R. Vig of the U.S. Army Research Laboratory, made 29 stops on his lecture circuit, including several outside the USA, as follows:

China:		
1) Shanghai	Jiao Tong Univ.	3 Sept. 93
2) Beijing	14th Int'l Congress on Acoustics	7 Sept.
3) Beijing	Beijing Inst. of Radio Metrology and Measurements	8 Sept.
4) Beijing	Factory No. 707	9 Sept.
5) Hong Kong	Univ. of Hong Kong, Dept. of EE	21 Sept.
6) Penn. State	Materials Res. Lab.	21 Oct
Japan:		
7) Toyohashi	Technical Group on Ultrasonics of the IEICE	27 Nov
8) Sendai	13th Symp. on Ultrasonic Electronics (USE 92)	2 Dec
9) Fukushima	Toyo Comm. Ltd.	3 Dec.
10) Oyama	Seiko, Ltd.	4 Dec.
11) Orlando, FL	Orlando Chapter	20 Jan 93
12) Colts Neck, NJ	Jersey Shore Chapter,	25 Jan
13) Lynchburg, VA	Lynchburg Sigma Xi Club	28 Jan
14) Milwaukee	Milwaukee Chapter, Marquette U.	30 Mar
15) Milwaukee	U. of Wisconsin	31 Mar
16) Baltimore	Baltimore/Wash/N. VA Chapter	8 Apr
17) Tempe, AZ	Phoenix Chapter	15 Apr
18) Boston	Boston Section	19 May
Bulgaria, Russia, Hungary:		
19) Varna, Bulgaria	Acoustoelectronics 93	20 Sep
20) Moscow	Inst of Crystallography	24-28 Sep
21) Moscow	Sci. Inst. Phonon	24-28 Sep
22) Moscow	Moscow Power Engineering. Inst., MPEI	24-28 Sep
23) St. Petersburg	St. Petersburg State Academy of Aerospace Instrum.	29-2 Oct
24) Budapest	Technical U. of Budapest	2-5 Oct
25) Bethlehem, PA	Lehigh U.	21 Oct
26) Berkeley, CA	U. of CA	15 Nov
27) Carnegie-Mellon	Cleveland	6 Dec
28) Stamford, CT	Connecticut IEEE Sect., PACE - at Norden	8 Mar 94
29) Philadelphia	Drexel U.	10 Mar

John Vig

1994 IEEE INTERNATIONAL ULTRASONICS SYMPOSIUM

The 1994 IEEE International Symposium will be held November 1-4, 1994 on the French Riviera in Cannes, France. Six Short Courses will be presented on Tuesday, November 1; the Symposium Technical Program will be held from Wednesday, November 2 through Friday, November 4. All symposium activities will be concentrated in the Martinez Hotel which is located on the beach and only separated from it by the world known Boulevard de la Croisette. The closest airport is Nice with direct flights from the U.S. It is also possible to fly to various major European cities and then fly to Nice on one of many direct flights, or experience the Très Grande Vitesse (TGV) train connecting Paris and Nice. A shuttle bus will connect the Nice Airport with the Martinez hotel during the Symposium. Rental cars are available at the Nice Airport.

Travel and Tour Management Services

The Symposium Organizing Committee has appointed International Conference Management (ICM) as the official Travel Agent for North American participants. ICM will negotiate, promote and sell air fares, post-Symposium tour options and other travel related services. ICM has already negotiated some excellent fares with KLM Royal Dutch Airlines starting at $518 from New York to Nice with a stop-over in Amsterdam. As always, early reservations are strongly recommended. Inquiries should be directed to:

International Conference Management
7152 SW 47th Street
Miami, FL 33155
USA
Telephone: (800) 327-8338 / (305) 661-5115
Fax: (305) 666-7134

Ask for "Ultrasonics Symposium" fares.

Hotel

Hotel reservations should be made **directly with the hotel**, not through ICM. The room rates are as follows:

Single, mountain view:	600 FF
Double, mountain view:	700 FF
Single, sea view:	700 FF
Double, sea view:	800 FF

These rates include Continental Breakfast. As of February 25, 1994, the exchange rate was $1 US=5.81 FF. The hotel can be reached as follows:

Hotel Martinez
73, La Croisette
06406 Cannes Cedex - B.P. 142
France
Telephone: (33) 92 98 73 00
Fax: (33) 93 39 67 82

Symposium and Short Courses Registration

Symposium registration fees are as follows:

	Advance	On-site
IEEE Members	$285.00	$315.00
Non-IEEE Members	$360.00	$395.00
Students and Retirees*	$ 25.00	$ 40.00
One-day Registration*		$150.00
Short Courses registration*:		
IEEE Members	$110.00	$120.00
Non-IEEE Members	$140.00	$150.00
Students and Retirees	$ 40.00	$ 50.00

*does not include Proceedings

Advance Registration must be made in US dollars. On-site registration can be made in US dollars or in French francs at the exchange rate in effect on that day. Both advance and on-site registration can also be made using VISA or Mastercard.

Companion Social Program

A variety of tours during the three days of the Symposium will be arranged for the enjoyment of companions and attendees. Since Continental Breakfast is included in the hotel rate, no separate registration fee will be charged to companions. However, we strongly suggest companions register for the Symposium so badges can be issued. A room will be made available for companions to meet in the morning before the tours start.

Complete information on the Symposium, short courses, travel arrangements and Companion programs, along with reservation and registration forms, will be included in the Advance Program Booklet which is scheduled to be mailed July 29, 1994.

1994 IEEE Ultrasonics Symposium INVITED SPEAKERS

"Material Characterization and Resonant Scattering by Cylinders" — M.T. Talmant, *University of Paris VII, France*

"Power Ceramic Materials for Piezocomposite Hydrophone" — L. Eyraud, *INSA Laboratoire de Genie Electrique et Ferroelectricite, Villeurbanne, France*

"New Technologies in High-Power Ultrasonic Industrial Applications" — J.A. Gallego-Juarez, *Instituto de Acustica, Spain*

"Microbubble Based Echo Enhancing Agents Basic Characteristics, Clinical Diagnostic Value and Potential Impact on Technology" — R. Schlief, *Clinical Development Ultrasound and Magnetic Resonance Contrast Media, Shering AG, Berlin, Germany*

"Recent Advances In Non-Contact and Air-Coupled Transducers" — D.A. Hutchins, *University of Warwick, Department of Engineering, Coventry, England*

"Ultrasonic Propoagation in Quasicrystals and Quasiperiodic Structures" — A. Zarembowitch, *Universite Pierre & Marie Curie, Paris, France*

"Chaotic Behavior in Acoutstic Cavitation" — W. Lauterborn, *Technical University of Darmstadt, Darmstadt, Germany*

"An Acoustic Mode Method for the Description of Scattering and Mode Conversion Processes" — R. Briers and O. Leroy, *Interdisciplinary Research Center, University Loewen, Belgium*

"Ultrasonic Sensors In Air" — V. Magori, *Siemens Ag, Munich, Germany*

"Review of SAW Oscillator Performance" — G. Montress, *Raytheon, Research Division, Lexington, MA*

"Acoustic-Wave Based Monolithic Microsensors" — M.J. Vellekoop, *Delft University of Technology, Electronic Instrumentation Lab, Delfi, The Netherlands*

"Net Shape Piezoelectric Materials" — L. Bowen, *Materials Systems Inc., Littleton, MA*

"Quantitative Imaging of Transient Acoustic Fields by Optical Interferometry" — D. Royer, *Laboratoire ondes et Acoustique, University of Paris VII, Paris, France*

"Phase Aherration Correction With Time Reversal Mirrors" M. Fink, *Laboratoire Ondes et Acoustique, Paris, France*

"GHz Range SAW Devices" — K. Yamanouchi, *Tohoku University, Research Institute of Electrical Communication, Sendai, Japan*

"NDT Ultrasonic Techniques in Nuclear Industries" — P. Benoist, *Service Des Techniques Avancees, Centre d'Etude de Saclay Yvette, France*

"Review of Models for Low-Loss Filter Design and Applications" — C. Ruppel, *Siemens AG, Corporate Re-*

search and Development, Munich, Germany

"Phononic Localization in Complex Structures" — A. Alippi, *Istituto di Acustica-CNR, Rome, Italy*

"Ultrasonic Characterization of Brittle Damage in Rocks", C.M. Sayers, *Schlumberger Cambridge Research, Cambridge, England*

"Scanning Tunneling Microscopy on Surface Acoustic Wave Fields" — H.-J. Frohlich, *Paul-Drude-Institut fur Festkorperelektronik, Berlin, Germany*

"Very High Frequeney EMAT for Resonant Measurements" — K. Kawashimna, *Tokyo Engineering University, Tokyo, Japan*

"Quantitative Ultrasonic Tissue Characterization of Vascular Pathology" — S. Wickline, *Jewish Hospital Cardiology, St. Louis, MO*

"Spectral Theory for IDTs" — E. Danicki, *Polish Academy of Sciences, Warsaw, Poland*

"Applications of 3D Transesophageal Imaging" — B. Lees, *Middlesex Hospital Department of Radiology, London, England*

"Finite Amplitude Ultrasound Beams" — J. Naze-Tjotta, *University of Bergen, Department of Physics, Bergen, Norway*

"Nonlinear Rayleigh Waves" — Z. Zabolotskaya, *University of Texas at Austin, Department of Mechanical Engineering, Austin, TX*

"Collinear Acousto-Optic Devices and Applications", V.I. Pustovoit, *Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russia*

"Frequency Trimming of SAW Devices" — T. Uno, *Kanagawa Institute of Technology, Department of Electronics & Electrical Engineering, Kanagawa, Japan*

"Specifications for SAW System Challenges for Personal Communications" — K. Linden, *Nokia, Helsinki, Finland*

Eric Adler's 1993-1994 UFFC Distinguished Lecture Itinerary

Host	Location	Date
Bulgarian Academy	Varna, Bulgaria "Acoustoelectronics '93"	September 20, 1993
Technical University Istanbul	Istanbul, Turkey	September 27, 1993
IEEE UFFC-S, Tokyo	Hitachi, Yokohama	December 7, 1993
	NEC, Kaeasaki	December 8, 1993
	USE, Symposium, Yokohama	December 9, 1993
	Shibaura Institute of Technology, Tokyo	December 10, 1993
	Tohoku University, Sendai	December 13, 1993
IEEE Section, Singapore	Singapore Polytechnic	December 16, 1993
IEEE UFFC-S, Orlando, FL	Orlando, FL	February 3, 1994
RF Monolithics, TX	Dallas, TX	February 21, 1994
IEEE-UFFC-S/UC Irvine	ECE.UC Irvine	February 23, 1994
IEEE-Waves/Devices	Phoenix, AZ	February 24, 1994
Univ. Wisconsin, Milwaukee (Physics)	UWM, Physics Colloquium	March 21, 1994
Marquette U. (ECE)	ECE Colloquium	March 22, 1994
Penn. State Materials Research Lab.	MRL, Seminar	March 23, 1994
Scheduled for April	Fort Month Labs	April 19
	Washington IEEE Chapter	April 21

1995 IEEE Ultrasonics Symposium

The 1995 Ultrasonics International Symposium will be held in Seattle, Washington, 7-10 November 1995. The Symposium organizing committee is composed of:

GENERAL CHAIR:
Gerald V. Blessing, National Institute of Standards & Technology
TECHNICAL CHAIR:
George A. Alers, National Institute of Standards & Technology
FINANCE: Doron Kishoni,
The College of William & Mary
LOCAL ARRANGEMENTS:
Helen F. Routh,
Advanced Technology I,abs.
PUBLICITY: Peng Jiang,
Siemens Ultrasound
EXHIBITS: Gary H. Brandenburger,
Mallinckrodt Medical, Inc.
SHORT COURSES: Janpu Hou,
Allied Signal, Inc.

Janpu Hou is already giving some thought to the content of the short courses. A format of six courses total is again being planned, with a tract of three of these to be focused on medical ultrasound, which is a strong activity in the Seattle area. These three courses would try to include material ranging from fundamentals and theory to applications and instrumentation. The other three courses include material on nondestrvctive evaluation; sensors; materials characterization; physical acoustics; bulk waves; and the SAW area. (Please contact Janpu, 201-455-3439, if you have any specific recommendations for course content and/or instructors.) Thanks!

IEEE Frequency Control Symposia

as of 18 April 1994

Year & No.	Dates	City & Hotel	General Chairman	Technical Program Chairman	Tutorial Chairman	Local Arrangements	Comments
1994 48th	June 1-3	Boston Westin Hotel	Gary Johnson	Lute Maleki	Dave Allan	Mike Garvey	
1995 49th	May 31 to June 2	San Francisco Fairmont Hotel	John Vig	Lute Maleki	TBD	Jack Kusters	
1996 50th	June 5-7	Hilton Hawaiian Village Hotel, Honolulu, Hawaii	Prof. Kazuhiko Yamanouchi & John Vig	Fred Walls	TBD	Dean Okayama, NIST WWVH	50th Anniversary Bash
1997 51st	TBD	TBD	Tom Parker	Fred Walls	TBD	TBD	
1998 52nd	TBD	TBD	Tom Parker	TBD	TBD	TBD	
1999 53rd	TBD	TBD	Don Sullivan	TBD	TBD	TBD	
2000 54th	TBD	TBD	Don Sullivan	TBD	TBD	TBD	

FUTURE ULTRASONICS SYMPOSIA

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
101 Columbia Road
Morristown, New Jersey 07962-1021
(201) 455-2482 (Phone); (201) 455-3008 (FAX)

Bernhard R. Tittmann, *Technical Program Chair*
The Pennsylvania State University
Department of Engineering Science & Mechanics
228B Hammond Building
University Park, Pennsylvania 16802-1484
(814) 865-7827 (Phone); (814) 863-7967 (FAX)

1995 IEEE Ultrasonics Symposium
Seattle, WA — 7-10 November 1995
For information contact:

Gerald V. Blessing, *General Chair*
National Institute of Standards and Technology
Building 233, Room A-147
Gaithersburg, Maryland 20899
(301) 975-6627 (Phone); (301) 417-0514 (FAX)

George A. Alers, *Technical Program Chair*
National Institute of Standards & Technology
Materials, Room A-167
Gaithersburg, Maryland 20899
(301) 975-6140 (Phone); (301) 926-7975 (FAX)

1996 IEEE Ultrasonics Symposium
San Antonio, TX — November 1996
For information contact:

Jeffrey S. Schoenwald, *General Chair*
Rockwell International Science Center
Mail Code A9
1049 Camino dos Rios
Thousand Oaks, California 91358
(805) 373-4236 (Phone); (805) 373-4810 (FAX)

OTHER UFFC-S SPONSORED SYMPOSIA

1994 IEEE Frequency Control Symposium
Boston, MA — 31 May - 3 June 1994
For information contact:

Gary Johnson, *General Chair*
Sawyer Research Products Inc.
35400 Lakeland Boulevard
Eastlake, OH 44095
(216) 951-8770 (Phone); (216) 951-1480 (FAX)

Lute Maleki, *Technical Program Chair*
Jet Propulsion Laboratory/CIT
Time & Frequency Systems Research Group
4800 Oak Grove Drive
MS-298-100
Pasadena, California 91109
(818) 354-3688 (Phone); (818) 393-6773 (FAX)

1995 IEEE Frequency Control Symposium
San Francisco, CA — 30 May - 2 June 1995
For information contact:

John Vig, *General Chair*
U.S. Army Research Laboratory
AMSRL-EP-ME
Fort Monmouth, New Jersey 07703-5601
(908) 544-4275 (Phone); (908) 544-4223 (FAX)

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 (Phone); (818) 393-6773 (FAX)

1996 IEEE Frequency Control Symposium
Honolulu, Hawaii
For information contact:

John Vig, *General Co-Chair*
U.S. Army Research Laboratory
AMSRL-EP-ME
Fort Monmouth, New Jersey 07703-5601
(908) 544-4275 (Phone); (908) 544-4223 (FAX)

or

Kazuhiko Yamanouchi, *General Co-Chair*
Research Institute of Electrical Communication
Tohoku University
Katahira, Aoba-ku
Sendai 980
JAPAN
(81) 22-266-5528 (Phone); (81) 22-266-5528 (FAX)

Frederick L. Walls, *Technical Program Chair*
National Institute of Standards & Technology
Time & Frequency Division
325 Broadway
Boulder, Colorado 80303
(303) 497-3207 (Phone); (303) 497-6461 (FAX)

1994 IEEE International Symposium on Applications of Ferroelectrics
University Park, PA — 7-10 August 1994
For information contact:

Amar S. Bhalla, *General Chair*
Pennsylvania State University
Materials Research Laboratory
Room 253
University Park, Pennsylvania 16802
(814) 865-9232 (Phone); (814) 865-2326 (FAX)

CALL FOR PAPERS

Special Issue on Thin-Films for Acoustoelectronics

(Submission Deadline May 31, 1994)

The IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control invites the submission of papers on thin-films used for acoustoelectronic applications. The papers should specifically describe results where thin-films are the major contributor to the acoustoelectronic application area of interest. Basic papers on the properties of thin-films and particularly new films which have acoustoelectronic application potential are also welcomed. The following are some suggested thin-film related topics for this special issue.

- SAW Devices
- BAW Devices
- Acousto-optic Devices
- Acoustoelectronic Sensors
- Acoustic Imaging
- Mechanical and Elastic Properties
- Piezoelectric and TransducerProperties
- Material Q and Propagation Loss

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, identify that the contribution is being submitted for publication consideration in the Special Issue on Thin-Films for Acoustoelectronics. Consult the "Information for Contributors" which appears in the Transactions for manuscript preparation requirements. All papers will be subject to the normal peer-review process. Submission deadline is May 31, 1994 and the expected publication date is late 1994 or early 1995. The guest editors for this special issue are Fred Hickernell, Motorola, Noriyoshi Chubachi, Tohoku University and Adrian Venema, University of Delft.

In Memoriam
Celia E. Yeack-Scranton

It is with great sadness that we note the passing of Dr. Celia E. Yeack-Scranton who died of ovarian cancer on Monday, March 14, 1994 at the age of 42. Celia was a valued member of our society and we will all miss her. She had been a research staff member in the IBM Research Division since 1979. Due to her contributions in advanced magnetic recordings, she was recognized as an IBM Fellow two days before her death. The fellowship was voted for her and four others, and corporate executives decided to bestow the honor on her at an earlier date when they became aware of her illness. Celia was especially an inspiration to young women engineers and scientists, and made efforts to help and encourage them. The cancer did not stop her tenacity or her brilliance, accepting a promotion and new responsibilities at IBM in 1992, long after the cancer diagnosis, and she kept working until the last month of her life.

Celia's work included magnetic recording sensors and related technologies, piezoelectric and non-destructive testing, and other ultrasonic phenomenon. Her most significant contribution was the application of miniature piezoelectric sensor technology to the problem of head-disk interactions in rigid disk data storage.

Celia was a very active member of the Ultrasonics, Ferroelectrics, and Frequency Control Society. She served as an UFFC AdCom member and the society's Chapters Representative from 1989-1991. Celia was also the current Vice President of the Magnetics Society, previously served as Secretary-Treasurer, was a member of the Magnetics Society AdCom, and held numerous other positions in the society, the MMM Conferences, and the Intermag Conferences.

Celia received her BS from Washington University in 1974 and her PhD from Stanford in 1980, with a thesis on ultrasonic microscopy. She joined IBM in 1979, and worked on a variety of sensors, instruments, and especially on data storage devices. She had received numerous IBM awards: Corporate Award (1990), Outstanding Technical Achievement Award (1983, 1988), Research Division Award (1988, 1990) and the Invention Achievement Award (1984, 1987). She has 18 publications, 2 issued patents and several patents pending. She was elected IEEE Fellow and IBM Fellow.

She is survived by her husband Robert, son Peter, daughter Karen, father Bob, brothers Bill and Craig, and sisters Christy Linnenkohl and Connie Johnson. The UFFC community offers our deepest condolences to her family and friends. Celia was among the most brilliant and versatile colleagues that we shall encounter. Some of her projects on advanced recording heads will continue to bear fruit for years to come, and we will not forget her.

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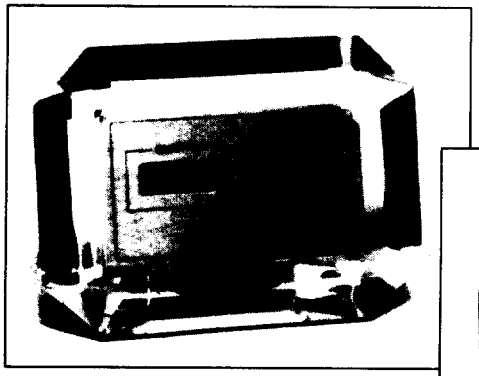

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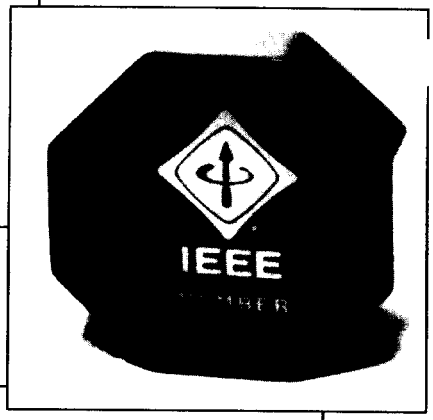

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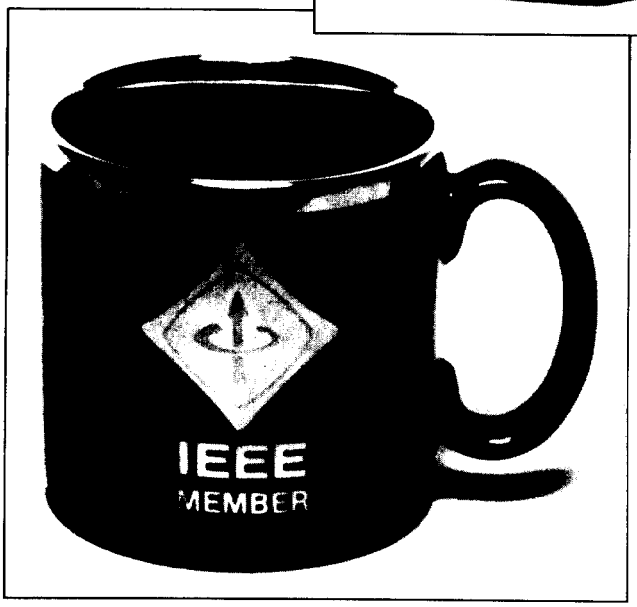

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EDITOR'S NOTE

I am again very grateful to the many people who supplied articles and photos for this spring issue of the newsletter. Harry Salvo and Eric Adler supplied the Ultrasonic Symposium photographs and Lozan Spassov the Acoustoelectronic '93 photos.

We were saddened by the death of one of our faithful members, Celia Yeack-Scranton. Don Malocha gathered information from various members who knew her and wrote the memorial tribute. Our sympathy is extended to her family.

The Society has a new set of officers and four new Administrative Committee members. They all welcome your inputs as does the rest of your administrative committee.

There are three great symposia occurring this year, Frequency Control, Ferroelectric, and Ultrasonic. Treat yourself to the latest in technical achievements, see some new places, and meet some new friends.

Congratulations to Eric Cross our new Distinguished Lecturer. He will be bringing some good technical information sprinkled liberally with his enthusiasm and charm. Keep him busy by inviting him to your area. Note the busy schedule our two recent Distinguished Lecturers have kept. We also congratulate our newly elected Fellows.

Don Malocha has clued us in on the happenings at last falls AdCom meeting and Herman van de Vaart reports that the society is financially sound. Check out John Vigs letter on smart choices for journal selection. In line with this, a recent survey of scientific and engineering journal and magazine publishing costs showed that the IEEE publishing services was a low cost leader while maintaining high quality publications.

We are adding new members weekly to our society. Just between the 13th and 26th of this March, 25 new members were added to the society. An interesting fact was that eleven of them were from countries outside the United States. They were from Argentina, Bahrain, Canada, China, France, Italy, Japan, Korea, Mexico, Romania, Spain and Thailand. Quite a world-wide representation. It got me to thinking that it would be good to consider publication of a membership roster with names, addresses and specialties. It would give us an opportunity to be in contact with other members we may not know, whether they live just down the street from us or across the ocean. Maybe as a world-wide community with common interests we could be drawn even closer together for mutual benefit and service to others. If you consider this a good idea let your AdCom members know.

On a personal note your newsletter editor plans to travel to Russia in May for the International Symposium on Surface Waves in Solid and Layered Structures. The conference will be held on a ship traveling from Moscow to St. Petersburg. I will be joined by my wife and other UFFC-S members for a look at Russia in the springtime. Our society is a sponsor of this conference and both Russian and U. S. IEEE members are chairs and committee members for the conference. Time and funds permitting I will be at our three society symposia plus the American Scientific Affiliation Conference in Minnesota in August. I am serving the American Scientific Affiliation as its president this year.

I await your articles and photos for the next newsletter to be published this fall. If you could send them to me by 15 July it would be appreciated. You can communicate with me by several methods. My address is Motorola GSTG, 8201 E. McDowell, Scottsdale, Arizona 85252, phone: (602) 441 2923, Fax: (602) 441 7714 and Email: p04564@email.mot.com.

Fred S. Hickernell
UFFC-S Newsletter Editor

On Journal Costs and Where to Publish

Recently, I was asked to serve on an ad-hoc committee that was to determine the least damaging way to cut about $40,000 from our library's budget. Unfortunately, this cut was made necessary by a severe budget shortfall in my organization.

While examining the library's list of journal subscription costs, we noticed a wide range of subscription prices, e.g., one journal cost over $6,000/year, and several cost well over $2,000/year. We also noticed that many of the most expensive journals are published by other than professional/technical societies. (In addition, I also noticed that, relative to the expensive journals, the $9,995 price of the "IEEE 1994 All Society Periodicals Package - 89 titles," is a real bargain.)

We decided to start by cutting the most expensive journals first. This meant eliminating a few that are of great interest to some of us, however, we decided that, although less convenient, searching these journals electronically and ordering the articles of interest will be less expensive than subscribing. I suspect that the very expensive journals will find it increasingly difficult to survive as library budgets become tighter.

In deciding where to publish, when there is a choice, I hope that my colleagues will choose an IEEE publication rather than one which may or may not be around in a few years.

John R. Vig,
Fellow, IEEE

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