



**IEEE
ULTRASONICS,
FERROELECTRICS,
AND
FREQUENCY CONTROL
SOCIETY
NEWSLETTER**

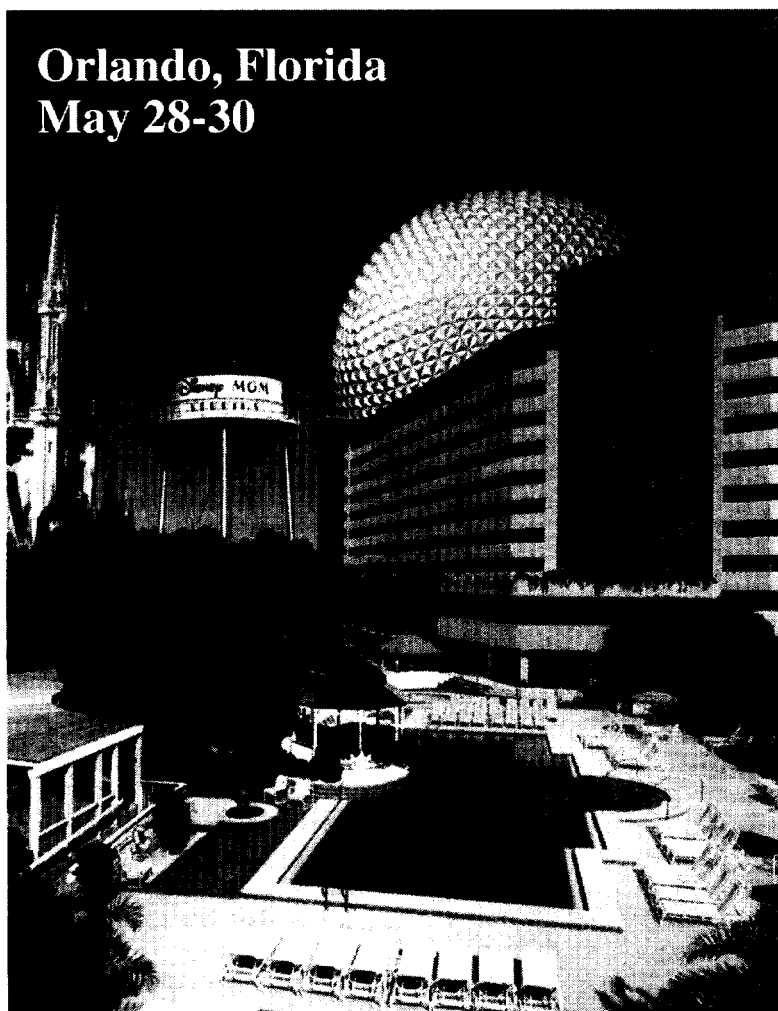


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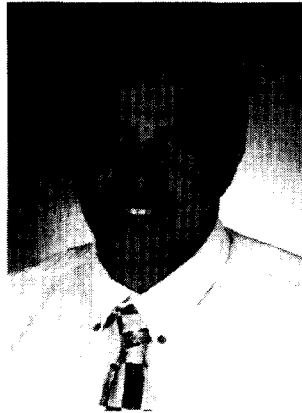


**1997 IEEE
Frequency Control Symposium**

Reflections on Our Society

by D.C. Malocha, UFFC President

Once in awhile it is useful to reflect on our society and to take a look into a mirror, so to speak. Several questions came to mind and I would like to share some facts and some of my own observations. In order to present some of the results, I used the most recent data I could find from either 1995 or 1996, whichever was most complete. Please forgive me if there are any errors in my interpretation of our society data. **First, it is worth noting that our society is managed completely by volunteers. We have no paid UFFC staff!!** The only paid personnel services are IEEE HQ, support staff for the editors, and the symposia management services.



arena of publications or conferences there is competition from other sources, whether they are commercial publications for profit or other not-for-profit organizations. The UFFC society will continue to provide the greatest opportunity to disseminate technical and scientific information through a peer review process in the shortest possible time from submission, and at a reasonable cost to all those interested in purchasing our transactions or attending our conferences. In addition, authors pay no fees for normal length papers published in the transactions and publication priority is not based on any publication charges. The society's primary focus and motivation is to serve its members and remain an advocate for its technology interests. We encourage all those who have similar interests in ultrasonics, ferroelectrics or frequency control to join our society, attend our conferences and publish in our transactions.

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Promotion of our Society and Technical Interests

A question is whether and in what manner should we promote our society and technical areas of interest. I think as a community of engineers and scientists we have made the commitment to promote and disseminate our technical information by our joining of professional organizations and societies. I believe we promote our interests by sharing and transferring technical information, recruiting others into our field to sustain the technology, recognizing technical excellence and achievement, and providing an organizational infrastructure. We hope, of course, all of these goals are for the broader good of our global society.

I believe the UFFC society strives to achieve these lofty goals. Our primary sources for transfer of technical information are our publications and conferences for which we expend the bulk of our financial and volunteer resources. We provide our newsletter and transactions to our UFFC members for a fee of \$15.00 per year in addition to the IEEE membership fee of \$86.00. Our transactions will produce approximately 1000 pages in 1997. This is a cost to our members of \$.015 per page based on UFFC membership and \$.10 per page if you include the entire IEEE membership fee. I think this is a remarkable value for delivery of this quality of information. Because the society believes our publications are a primary focus, the rates are maintained at a level such that any individual with modest income can afford them. Compare these rates to any commercial publication, which also has advertising, and you can appreciate the value. Our society has and will only in a positive manner promote our publications and conferences. In each

Allocation of Resources - How Do We Spend Our Money?

Trying to read IEEE financial statements requires great skill and we are fortunate that the society has Herman van deVaart to decipher it for us mere mortals. We publish all the summary details each year so I'll present the condensed version. The budget is projected to break down like this for 1997:

Numbers are to multiplied by \$1,000

Category	Income	Income (%)	Expense	Expense (%)	Net
Investments	38	4.4%	4.5	.5%	33.5
UFFC Transaction	267.4	31.2%	214.7	25.6%	52.7
UFFC Newsletter	0	-	11.1	1.3%	-11.1
Symposia	540.3	63.1%	463.1	55.2%	77.2
HQ Administration	10.9	1.3%	33.6	4%	-22.7
UFFC ADCOM	0	-	112	13.3%	-112
Totals:	856.6		839		17.6

The first observation is that the projected surplus for 1997 is just 2% of the operating budget. I think this is pretty good management by most standards, assuming we meet all the goals. Note that if we had no investment income we would actually be in the red.

The transactions are a significant income which is principally from the library subscription rates. Members only pay \$15.00 per year for subscriptions, I think that's a real value. Bill O'Brien, transaction editor, has refined our management

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of papers and we are now starting a new publisher/printer which may significantly reduce our costs of formatting and printing, reduce the time from submission to publication, and increase the quality. The Newsletter is pure expense but is well worth it and is a first class publication with Fred Hickernell as editor.

Symposia are a significant source of surplus. Is this necessary? The surplus is projected to be approximately 15% of income which provides a margin for unexpected expenses. The society is promoting a significant increase in non-North America venues for symposia which are more costly and higher risk. In the past several years several of the symposia have actually lost money. The losses were due to increased costs for proceedings, symposium costs, grants for travel for speakers, etc. Does any surplus money come back to the symposia? The answer is yes and I will present that in the UFFC AdCom expenses.

HQ Administration is to pay for services which our society uses at IEEE HQ. These can include a host of things: labels, computer usage, membership lists, TAB support, etc. This is a little over a 1% cost and seems to me to be very reasonable for the support services which are often essential.

The UFFC AdCom budget is pretty large. The president's office is budgeted for \$6K and is principally for travel to all the AdCom meetings, symposia, TAB meetings and any other meetings requiring the UFFC AdCom be represented. The president also hosts a reception at each symposium to thank the organizing and technical program committee for its efforts and pays for meals at the AdCom meetings. This represents about 5% of the AdCom expenses. Several years ago AdCom initiated a budget of not to exceed \$750 per voting member to attend the AdCom meetings. This is to help defer expenses to those who find it a hardship for travel. In the past we spent only a fraction of the \$17K budget since most institutions provided support. Given the changing business and academic climate, the fraction for support is increasing each year but is probably an essential element to get and keep high caliber volunteers. This expense represents about 15% of the AdCom expenses. The AdCom would like to promote student and non-North American participation at our symposia and to encourage the symposia chairs to support these activities within their budgets, the AdCom allocates matching moneys of up to \$10K for students and \$10K for speaker travel per

symposium. For 1997 there are only two symposia and a total of \$40K is budgeted. This is a direct return of moneys to each symposium and represents 35.7% of the AdCom expenses. The society fully supports the UFFC Distinguished Lecturer to travel throughout the world lecturing; topics are usually rotated between ultrasonics, ferroelectrics, and frequency control. The budget is \$15K which represents about 13.5% of the AdCom expenses. Finally, the society supports each UFFC chapter for up to \$250 per year, supports a membership Outreach Program for our colleagues who have financial or currency hardships, and the society awards and recognition. This is budgeted for \$25.5K which represents about 23% of the AdCom expenses. By my calculations, approximately 72.2% of the AdCom expenses are returned to either the symposia or members at large for support of our members. In addition, the AdCom supports special projects such as CD ROM for the 1996 Ultrasonics Symposium and electronic publishing.

I think the society does a very competent job of responsibly managing and allocating the society's revenues. This is to the credit of all the past officers who established a very credible system which is refined slightly each year. What do you think?

Volunteers - Get Involved!

The fundamental reason the UFFC society operates so well is because of the high caliber of volunteers among our peers. The cost of publications and conferences would be multiplied many times if not for the commitment and dedication of all the volunteers. I read in a survey that the highest productivity in organizations are those which were staffed by volunteers. I would agree based on my observations of our society. The opportunity for leadership and achievement are provided in a very collegial atmosphere within all the various groups.

So how to get involved? There is no single approach except to look for an opportunity in which you have an interest and get involved. This can start at the local IEEE section level, as a reviewer for the UFFC Transaction, as a volunteer for a conference, etc. I invite you to visit our WEB site (<http://bul.eecs.umich.edu/uffc/>) to see the diversity of activities of the society, obtain symposium information; as well as to obtain technical information which is constantly being added and refined. Please contact any UFFC society officer and/or myself if you have any questions or comments (dcm@ece.engr.ucf.edu).

Congratulations Len

The March 19, 1997 Wall Street Journal carried an article on the front page about Len Cutler of Hewlett-Packard. The article was entitled, "Time of His Life: World Keeps an Eye on Physicist's Clocks." It described Mr. Cutler's work on atomic clocks which help satellites and computers stay on split-second schedules with ac-

curacies to within one second every 1.6 million years. Mr. Cutler has been very active in the Frequency Control community of the UFFC Society and received the Rabi Award in 1989. "for consistent technical and managerial contributions to the development of atomic cesium, rubidium, and mercury ion frequency standards."

Modern Diagnostic Ultrasound Imaging — Assessing the Risks

Some 35 years after the brothers Paul-Jaques and Pierre Curie discovered piezoelectricity, ultrasonic imaging was developed by Paul Langevin. He used the “echo method” in which underwater ultrasonic echoes were bounced off submerged objects. During this work, ultrasonic energy was observed to have a detrimental biological effect. “. . . fish placed in the beam in the neighborhood of the source . . . were killed immediately, and certain observers experienced a pain . . . on plunging the hand in this region.” These observations were confirmed a decade later by R. W. Wood and A. L. Loomis. Although ultrasound biological effect studies continued, the importance of characterizing the exposure conditions was not recognized. Intensity levels undoubtedly were much higher than those currently used in clinical medicine. It was not until the early 1950’s that ultrasonic exposure conditions were controlled and specified so that studies could focus on the mechanisms by which ultrasound influenced biological materials. Two classes of mechanisms were identified, namely, (1) those associated with conversion of ultrasonic energy into heat, and (2) cavitation and other nonthermal mechanisms.

In the late 1940’s and the early 1950’s, pioneering work was initiated to image the human body by ultrasonic tech-

niques. These engineers and physicians were well aware of the deleterious effects of ultrasound at sufficiently high levels, so it must be presumed that they endeavored to keep the exposure levels reasonably low. Yet, it was not until the early 1970’s that major efforts were made to assess the risk of ultrasonic energy.

Over the past three decades, diagnostic ultrasound has become a sophisticated technology. However, our understanding of the potential risks has not changed appreciably from that of the 1950’s. However, it is very encouraging that human injury has never been attributed to clinical practice of diagnostic ultrasound.

After a historical introduction, the lecture focuses on the risk of using ultrasound in medical practice. Assessing the risk includes determining which biological systems are most sensitive to ultrasound, and the exposure levels that impose a significant risk on these systems. This approach requires a greater understanding of energy absorption locally and regionally (dosimetry), understanding of types of ultrasound-induced biological material alterations (bioeffects), and understanding of ultrasound-biological material interaction phenomena (biophysics). These topics are covered in the lecture.

William D. O’Brien

William D. O’Brien, Jr. (S’64, M’70, SM’79, F’89) received the B.S., M.S., and Ph.D. degrees in 1966, 1968, and 1970, from the University of Illinois, Urbana-Champaign.

From 1971 to 1975 he worked with the Bureau of Radiological Health (currently the Center for Devices and Radiological Health) of the U.S. Food and Drug Administration. Since 1975, he has been at the University of Illinois, where he is a Professor of Electrical and Computer Engineering and of Bioengineering, College of Engineering, and Professor of Bioengineering, College of Medicine, is the Director of the Bioacoustics Research Laboratory and is the Program Director of the NIH Radiation Biophysics and Bioengineering in Oncology Training Program. His research interests involve the many areas of ultrasound-tissue interaction, including spectroscopy, risk assessment, biological effects, dosimetry, tissue characterization, acoustic microscopy and imaging for which he has published more than 180 papers.

Dr. O’Brien is Editor-in-Chief of the *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*. He



is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the Acoustical Society of America (ASA), and the American Institute of Ultrasound in Medicine (AIUM) and a Founding Fellow of the American Institute of Medical and Biological Engineering. He was recipient of the IEEE Centennial Medal (1984), the AIUM Presidential Recognition Awards (1985 and 1992), the AIUM/WFUMB Pioneer Award (1988), the IEEE Outstanding Student Branch Counselor Award (1989), and the AIUM Joseph H. Holmes Basic Science Pioneer Award (1993).

He has been President (1982-1983) of the IEEE Sonics and Ultrasonics Group (currently the IEEE UFFC Society), Co-Chairman of the 1981 IEEE Ultrasonic Symposium, and General Chairman of the 1988 IEEE Ultrasonics Symposium. He has also been President of the AIUM (1988-1991) and Treasurer of the World Federation for Ultrasound in Medicine and Biology (1991-1994).

Dr. O’Brien can be reached at the Department of Electrical and Computer Engineering, University of Illinois, 405 N. Mathews, Urbana, IL 61801, 217/333-2407 (phone), 217/244-0105 (fax), wdo@uiuc.edu.

Schedule the UFFC-S Distinguished Lecturer Now!

The Administrative Committee of the Ultrasonics Ferroelectrics and Frequency Control Society has announced Dr. William D. O'Brien Jr. as the UFFC-S Distinguished Lecturer for 1997-1998. Dr. O'Brien 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:

Modern Diagnostic Ultrasound Imaging — Assessing the Risks

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 chap-

ter 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 accommodate the groups' needs. Please feel free to copy or extract from the abstract and biographical information given.

Dr. O'Brien may be reached at:

Department of Electrical and Computer Engineering,
University of Illinois, 405 N. Mathews, Urbana, IL 61801

or by the following means:

Telephone: 217 333-2407, Fax: 217 244-0105

Email: wdo@uiuc.edu

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

1997 IEEE INTERNATIONAL FREQUENCY CONTROL SYMPOSIUM AND TUTORIALS

The 1997 IEEE International Frequency Control Symposium will be held from May 28 to May 30, 1997 at the Hilton Hotel in Disney World Village, Orlando Florida. Again we had over 200 abstracts submitted for evaluation and approximately 165 papers will be presented. Gary Johnson, the Technical Program Chairman, the Group Vice Chairs, and the entire Technical Program Committee have done an excellent job of putting together a fine program. For the first time the symposium will run for three full days in order to accommodate the large number of papers. There will be nineteen oral and two poster sessions along with one panel discussion. One plenary presentation and six invited papers are scheduled as listed below.

Plenary Paper

Spontaneous Synchronization in Nature: From Fireflies to Josephson Junctions

S.H. Strogatz, Cornell University

Invited Papers

Comparison Between BAW and SAW Sensor Principles

E. Benes and F. Seifert, Vienna University of Technology

Paving the Way to the 10-16 Range Accuracy with Cold Cs Atoms

G. Santarelli, E. Simon, Ph. Laurent, S. Ghezali, K. Szymaniec and A. Clairon, Bureau Nationale de Metrologie-Laboratoire Primaire du Temps et des Frequences, P. Lemonde, Laboratoire Kastler Brossel

Does Allan Variance Determine the Spectrum?

C.A. Greenhall, Jet Propulsion Laboratory

A Brief Review of Progress in Quartz Tuning Fork Resonators

E. Momosaki, SEIKO EPSON Corp.

Optimization of the Design of the Resonators using the New Materials: Applications to Gallium Phosphate and Langasite

J. Detaint, France Telecom CNET/PAB, A. Zarka, B. Capelle, Universite Paris VI
E. Philippot, Universite de Montpellier

A New Hyperstable Quartz Oscillator

M.M. Mourey, R.J. Besson and S. Galliou, Ecole Nationale Supérieure de Mécanique et des Microtechniques

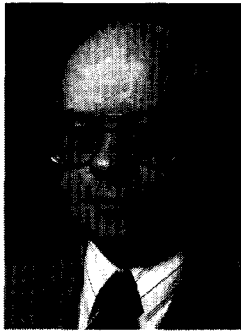
The program highlights sensors this year with four oral sessions, a panel discussion and fourteen poster papers on sensors. Other sessions include atomic frequency standards, BAW and microwave oscillators, thin films, time and frequency measurements, GPS and MILSTAR, BAW resonator design and packaging, SAW, noise properties, and materials. Approximately 12 exhibitors will also be present. The Advance Program for the symposium will be available in early April, but information can also be obtained from Mr. Michael Mirarchi at (908) 280-2024. Approximately 20 speakers will receive some financial support from the symposium in order to attend the conference.

Social functions include a reception Wednesday night and a trip to Sea World Thursday night. Guest registration will include entrance to the reception and three continental breakfasts.

The Frequency Control Tutorials will be held on May 31, 1997.

Tom Parker
General Chair

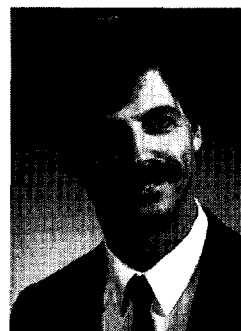
1997 International Frequency Control Symposium Committee



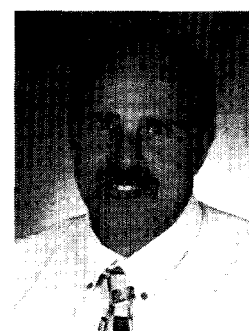
Thomas E. Parker



Gary R. Johnson



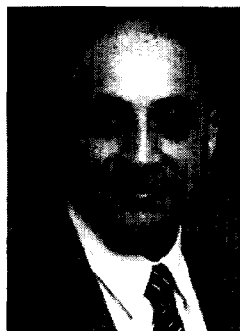
Raymond L. Filler



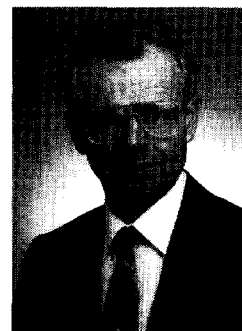
Donald C. Malocha



Roger W. Ward



Lute Malecki



John R. Vig

Thomas E. Parker –General Chair

Thomas E. Parker (M'79, SM'86, F'94) was born in Natrona Heights, Pennsylvania, USA, on September 17, 1945. He received his B.S. in Physics from Allegheny College in 1967. He received his M.S. in 1969 and his Ph.D. in 1973, both in Physics, from Purdue University.

In August 1973, Dr. Parker joined the Professional Staff of the Raytheon Research Division, Lexington Massachusetts, USA. Initially, his work was primarily related to the development of improved temperature stable surface acoustic wave materials. From 1977, Dr. Parker was responsible for the development of high performance surface acoustic wave (SAW) oscillator technology at the Research Division, including the "All Quartz Package" for SAW devices. His primary interest was frequency stability, with an emphasis on 1/f noise, vibration sensitivity, and long-term frequency stability. In June of 1994, Dr. Parker joined the Time and Frequency Division of the National Institute of Standards and Technology in Boulder, Colorado, USA. He is the group leader for the Time Scale and Coordination Group and his interests include improved time scales and time transfer technology.

Dr. Parker is a Fellow of the IEEE, and a member of Sigma Xi and Sigma Pi Sigma. He has served as an elected member of the Administrative Committee of the IEEE Ultrasonics,

Ferroelectrics, and Frequency Control Society (1988-1990), and is currently Chair of the Frequency Control Standing Committee of the UFFC-S. He has served on the Technical Program Committees of both the Ultrasonics and the Frequency Control Symposia, and was the Technical Program Chair for the Frequency Control Symposium in 1990 and 1991. Dr. Parker is currently the Associate Editor for Frequency Control-Acoustics of the UFFC-S Transactions.

Dr. Parker received the 1988 Outstanding Transactions Paper Award from the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society as a co-author of two papers which appeared in the May 1988 and November 1988 issues of the Transactions. Dr. Parker was the recipient of a Thomas L. Phillips "Excellence in Technology Award" from Raytheon in 1992. In 1994, he received the W. G. Cady Award presented by the IEEE International Frequency Control Symposium.

Gary R. Johnson –Technical Program Chair

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.

Raymond L. Filler –Finance Chair

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

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

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

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

Donald C. Malocha —Local Arrangements Chair

Don Malocha earned his B.S. degree in Electrical Engineering/Computer Science and his M.S. and Ph.D. degrees in Electrical Engineering from the University of Illinois, Urbana in 1972, 1974 and 1977, respectively. Presently, Don is a Professor in the Electrical and Computer Engineering Depart-

ment and Director of the Center for Applied Acoustoelectronic Technology at the University of Central Florida, Orlando. His research group is currently working on SAW and BAW technology, CAD techniques and acoustoelectronic based systems.

In the past, Don was a member of the Corporate Research Laboratories at Texas Instruments, Dallas, Manager of Advanced Product Development for Sawtek, Orlando, a visiting scholar at the Swiss Federal Institute of Technology, Zurich, and a visiting member of the Technical Staff at Motorola's Advanced Components Technology Group, Phoenix. He has served on the UFFC AdCom as an elected member and on several committees. He is past chair of the IEEE Orlando Section and the Orlando UFFC chapter.

Don is currently president of the Ultrasonics, Ferroelectrics, and Frequency Control (UFFC) society and an Associate Editor of the IEEE UFFC Transactions. When not working for IEEE or UCF, he enjoys the warm Florida outdoors by playing basketball, drowning golf balls, tipping canoes, fishing and biking. He enjoys traveling with family and friends and the opportunity to meet new colleagues (who often become good friends).

Roger W. Ward –Awards Chair

Roger W. Ward graduated from McMurry College in Abilene, TX, cum laude in 1967 with a B. A. degree in physics under Dr. Virgil E. Bottom. He earned his M.S. degree in physics from Purdue University in 1969.

From 1969 until 1975 he worked in the quartz crystal R&D group at Hewlett Packard in Palo Alto, CA, where his projects included miniature ovenized precision resonators, laboratory pressure transducers utilizing a quartz sensor, and quartz tuning fork resonators, in addition to designing production x-ray orientation equipment. From 1975 to 1979 he worked on tuning fork crystals for wrist watches at Litronix, Cupertino, CA, where he was Product Manager, and at Statek, Orange, CA. From 1979 to 1981 Mr. Ward was vice-president of Colorado Crystal Corp. in Loveland, CO where he designed general purpose quartz crystals and precision crystals, including introducing the SC-cut to CCC's product line.

Mr. Ward was Engineering Manager at Motorola, Ft. Lauderdale, FL, from 1981 to 1983 for the monolithic crystal filter program for Motorola's next generation pocket pagers.

He joined the group of quartz companies, Quartex-Quartztronics-Quartzdyne, in 1983 to help develop quartz sensors for commercial application, including tuning fork sensors for measuring force, temperature, and pressure, and thickness-shear mode quartz sensors for measuring pressure, especially for down-hole oil and gas wells. He is currently President of Quartzdyne, Inc. Quartzdyne manufactures a line of high performance pressure transducers with customers around the world.

Mr. Ward has 27 publications and 15 U. S. patents, all related to quartz devices. In 1994 he received the C. B. Sawyer Award at the IEEE Frequency Control Symposium and in 1996 he received the "Man of the Year Award" at the EIA Piezoelectric Devices Conference, both for his contributions

to the industry. For the past three years he has been the Awards Chair for the IEEE Frequency Control Symposium.

Lute Maleki –Tutorial Chair

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.

John R. Vig –Editorial Chair

John R. Vig was born in Hungary in 1942. He immigrated to the United States in 1957, received the B.S. degree

in physics from the City College of New York in 1964, and the M.S. and Ph.D. degrees from Rutgers - The State University, New Brunswick, NJ in 1966 and 1969, respectively. Since 1969 he has been employed as a research scientist, working primarily on the experimental aspects of quartz crystal devices. As leader of the frequency control activity in the US Army Research Laboratory, Fort Monmouth, NJ, he currently leads a research program aimed at the development of high-stability frequency control devices, clocks, and sensors for future military systems. He has published more than 100 papers and book chapters, and he has been awarded 45 patents.

In 1988, John was elected a Fellow of the IEEE "for contributions to the technology of quartz crystals for precision frequency control and timing." He received the 1990 IEEE Cady Award "for outstanding contributions to the development of improved quartz crystals and processing techniques . . ." He was UFFC-Society's Distinguished Lecturer for 1992-93, served as the General Chairman of what is now the IEEE Frequency Control Symposium from 1982 to 1988, and again in 1995-96, has been a member of that meeting's Technical Program Committee since 1972, and has been on the Technical Program Committee of the IEEE Ultrasonics Symposium since 1986. He was elected to the IEEE UFFC-Society Administrative Committee for the 1986-89, and 1995-98 terms, and is currently the President-elect. He is chairman of the IEEE Standards Coordinating Committee 27 on Time and Frequency, and is an IEEE representative on the Hoover Medal Board of Award.

John has been an environmentalist most of his life. He has served on his town's Environmental Commission for the past 25 years, is a life member of the Nature Conservancy, and is a member of several other environmental organizations. His wife is an artist specializing in printmaking. John's favorite pastimes are ballroom dancing, classical music, and relaxing in his backyard, where he and his wife have gradually been replacing the grass (which John hates to tend) with numerous varieties of hollies, daylilies and other ornamental plants.

Sensors at the 1997 International Frequency Control Symposium

The IFCS '97 conference will be the largest piezoelectric sensor meeting so far. The idea of creating a forum where sensors have a special place was crystallizing rapidly last fall. Several initiatives took place then, including, the creation of an informal working group* on "what to do with sensors within the UFFC Society", several meetings on that subject during the 1997 IEEE Ultrasonics Symposium in San Antonio, an e-mail based idea sharing forum and several friendly conversations. As a result it was decided that the IFCS, starting with the IFCS '97, would emphasize and expand sensors. Ryszard Lec and John Vig started to solicit papers

with this new IFCS agenda in the late fall. The time for the submission of papers was very short, but the response of the sensor community was very enthusiastic. More than 50 papers were submitted with 39 being accepted for presentations. Last February, at the Technical Program Committee (TPC) of the IFCS in New Orleans John Vig proposed to create a separate subject group entitled Sensors at the IFCS. The proposal was strongly accepted and at the IFCS'97 sensors will be in their new capacity.

The IFCS offers a unique forum which probably no other conference can offer for piezoelectric sensors. The IFCS

brings together the well established piezoelectric frequency control community with piezoelectric sensor designers and users coming from very broad backgrounds. Sensors are a typical interdisciplinary area, and their development requires collaboration of specialists with different backgrounds. The IFCS'97 forum will bring chemists, physicists, biologists, microbiologists, surface chemists and physicists, as well as sensor engineers and researchers from the piezoelectric community. At the IFCS'97 there will be five sensor sessions; Sensor Fundamentals, Physical Sensors, Chemical Sensors, Bio-Chemical Sensors, and a Poster Session. In particular, the proposed presentations will address such issues as the interfacial phenomena between biochemical liquid environment and the piezoelectric sensing element, different technologies for deposition/assembly of sensing thin films, the very important problem of sensor packaging, design aspects of electronic circuitry supporting bulk and SAW resonators operating in high loss/low Q conditions, and various appli-

cations of sensors in the automotive, chemical, environmental, manufacturing, and medical industries. Also a panel discussion titled "Sensor Issues: Design, Performance, Instrumentation and Commercialization" is planned. However, the most important task will be the creation of a stimulating environment for the exchange of information and for promoting the development of new cross-disciplinary research teams. Currently, piezoelectric sensor technology is emerging as one of the most promising sensor technologies offering several advantages over its competitors, including: fiber optic, silicon, or thin and thick film. One may say that both the further progress in piezoelectric sensors and their market success will depend on how synergetic the IFCS forum will be.

Ryszard M. Lec,
Chairman of Sensor Group at the IFCS'97

* A. Ballato, J. Brown, R. Lec, D. Malocha, S. Martin, J. Vetelino, J. Vig and R. White..

UFFC SENSORS and ACTUATORS Web Site

<http://www.eece.maine.edu/Research/Sensors/Sens+Act/>

A new UFFC Sensor and Actuators Web site has been initiated. This site provides a forum for the exchange of information among people interested in solid state sensors and actuators based on piezoelectric, ferroelectric, acoustic, ultrasonic, and silicon technologies. This site is still under development and suggestions and contributions of information from people interested in sensors and actuators will be appreciated. In particular, we are looking for web pages addresses of sensor and actuator research groups; names of incoming conferences, workshops and meetings in sensors and actuators; university or company based educational programs in the area of sensors and actuators; review papers, tutorials, sensors and actuators market analyses, etc. More details regarding these topics of interest are given at our Web site. Everyone is welcome to visit our site and make his/her suggestions and contributions.

Areas of Interests

1. **Theoretical Foundations:** sensing mechanisms, interfacial phenomena, modeling, etc.
2. **Physical Sensors:** mechanical, electric, magnetic, optical, thermal, and radiation measurands.
3. **Chemical Sensors:** gas, vapor, liquid, humidity, ion, etc.

4. **Biosensors:** immunological, DNA, enzymatic, etc.
5. **Materials and Technology:** advanced materials, micromachining, packaging, etc.
6. **Device Design and Performance:** sensitivity, noise, electronic circuitry, signal processing, calibration, neural networks, etc.
7. **Actuators:** piezoelectric, electrosensitive, magnetostrictive, microvalves, micropumps, etc.
8. **Smart sensors and actuators:** material and electronic intelligence, smart structures, etc.
9. **Applications:** industrial, environmental, medical, etc.

Content

Background
Conferences, Workshops, Meetings
Research Groups
Educational Opportunities
Journals
Reference Information and Data
What's new?

Comments, Questions, Updates regarding Web site should be sent to Ryszard M. Lec at e-mail address: R.Lec@eece.maine.edu.

ISAF '96 Reflections

The Tenth International Symposium on the Application of Ferroelectrics (ISAF'96) was held August 18-21, 1996, at the Brunswick Hilton and Towers, East Brunswick, NJ. The Symposium, hosted by Rutgers University, was sponsored by the IEEE Ultrasonic, Ferroelectric, Frequency Control Society and the Office of Naval Research, the Defense Advanced Research Projects Agency, and the Howatt Foundation. Supporting organizations included the New Jersey Commission on Science and Technology, the College of Engineering and Center for Ceramic Research at Rutgers University.

The ISAF series of symposia began in 1968 when sponsored by the IEEE Committee on Ferroelectrics, and has grown through the years along with the interest in ferroelectric research. ISAF '96 had over 400 attendees, with more than 130 coming from outside the United States. Over 100 graduate students from all over the world attended this meeting. Some 380 plenary, invited, oral and poster papers were presented on topics including: ultrasonic imaging, memory, electrooptic devices, processing, energy storage, infrared imaging, microelectromechanical systems, wireless, electromechanical controls, novel applications, characterization, transducers and composites. Sixteen exhibitors contributed booths at the symposium to display products ranging from raw materials to discrete ferroelectric devices.

In order to provide a more dynamic nature to the Symposium, the attendees' attention was switched several times to various social functions which offered potential for socializing and good food. Monday evening most of the attendees and many guests attended a banquet where they enjoyed not only a fine meal but also a most interesting and entertaining presentation, "Gems: Synthesis, Beauty and Deception," by Dr.

Kurt Nassau. Tuesday evening the attendees were treated to a picnic at the Rutgers University Log Cabin. Without question, the highlights of the picnic were the impromptu choral performances by several of the international groups in attendance. A guest program also complimented the technical program by providing for sight-seeing in New York City and Princeton, New Jersey, as well as a Broadway show.

As with any meeting such as the ISAF, the work of many volunteers was key to the success of the Symposium. A special thanks goes to the Secretary of the symposium, Dr. V. Janas, Local Arrangement chair Professor S. Danforth, both of the Department of ceramic Engineering at Rutgers, and to Technical Program co-chairs Dr. T. R. Gururaja, Hewlett Packard, and Professor T. ShROUT, Pennsylvania State University, Technical Committee members A. Ballato U. S. Army Research Lab., A Kingon of North Carolina State University, S. T. McKinstry of Penn State University, H. O'Bryan of Lucent Technology and R. Riman of Rutgers University. Publications co-chairs, Dr. Bernard Kulwicki and Dr. Ahmed Amin, Texas Instruments, are owed many thanks for seeing to it that over 300 of the reviewed papers presented at the Symposium will be published in the Proceedings shortly.

And now with the success of ISAF'96 still in our minds, we look forward to the eleventh ISAF to be held in Congress Center at Montreux, Switzerland, on August 24, 1998. The General Chair for ISAF'98 is Professor Nava Setter of the Swiss Federal Institute of Technology in Lausanne. We hope to see many of you there.

*Ahmad Safari, General Chair
Bill Wilber, Chair, Publicity and Exhibition*

Scenes from ISAF '96



Welcome overhead



Opening remarks, Prof. A. Safari
(General Chair)



Registration

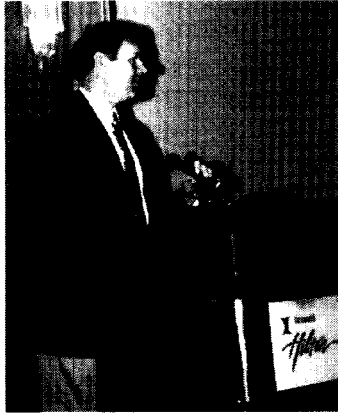


Banquet dinner, Prof. and Mrs. Danforth
(Local Chair) and Prof. and Mrs. Safari
(General Chair)

Scenes from ISAF '96



Dr. T. R. Gururaja of Hewlett-Packard and Prof. ShROUT (PSU) Co-Chair of Technical Program



Prof. Stephen Smith of Duke University presenting Plenary Talk



Banquet dinner



Prof. Okazaki, singing at the picnic



Dr. John Vig presenting Certificate of Appreciation to General Chair of ISAF



Banquet dinner, Prof. Eric Cross, Penn State, Prof. Nava Settor of Epfl Switzerland, Prof. Tadashi Takenaka of Science University of Tokyo, and Prof. Tom ShROUT of Penn State.



Choral performance of the Russian delegation at the picnic



Choral performance of the Chinese delegation at the picnic

1996 IEEE Ultrasonics Symposium Summary

Dear Society Members,

It is with great pleasure and personal gratification that I report to you that the 1996 IEEE International Ultrasonics Symposium was a resounding success by any quantitative measure. With over 730 conference attendees and guests, more than 600 full paying registrants, over 300 short course attendees and 336 banquet celebrants, participation exceeded the expected attendance by more than 50%.

The size of the registration caught us by surprise, quite frankly, which posed a challenge for us and the hotel management to reorganize for larger meeting space as the conference progressed and adjust for refreshment demands during the coffee breaks.

There are several factors that contributed to the "exuberant" participation in this annual gathering of our professional group, and many comments that I heard at the Symposium support the feeling that there is an acceleration in the technological developments taking place in ultrasonics these days. Of course, the choice of San Antonio as a centrally located and quite attractive venue didn't hurt, either. For that I must give

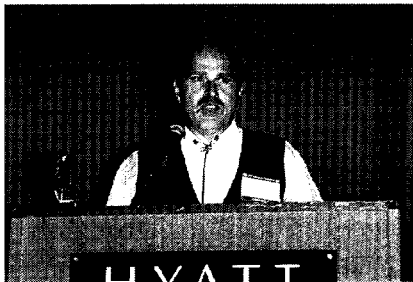
due credit to Gerry Farnell and Fred Hickernell for urging its selection upon me.

Pierre Khuri-Yakub is to be congratulated on the outstanding technical program he and his committee put together. It was my responsibility to attend to the "creature comforts," and I hope that everyone shares my perception (biased though it is) that the hotel, the Riverwalk location, the weather, and the social events conspired to make for a delightful backdrop to an important professional event.

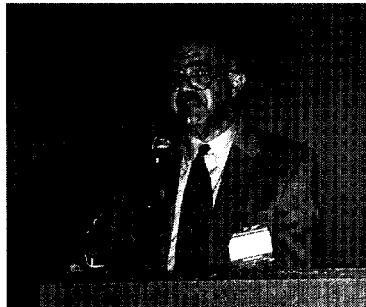
As of this writing I can report that I am now somewhat settled in as a staff member of the newly formed Boeing North American Division of Boeing Aircraft Company. Rockwell sold its aerospace and defense divisions to Boeing last December 6, and at that time I transferred to Rocketdyne, and thus to Boeing. My new land and email addresses are listed below, but I can still be reached at j.schoenwald@ieee.org.

I now look forward to an exciting gathering in Toronto this October!

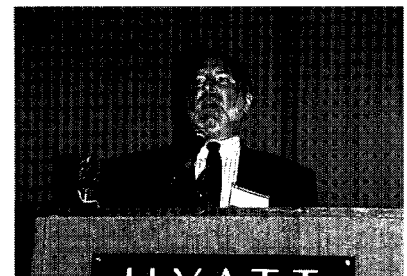
Jeff Schoenwald
jeffrey.s.schoenwald@boeing.com



UFFC-S President Don Malocha
welcomes symposium attendees



Pierre Khuri-Yakub,
Program Chair

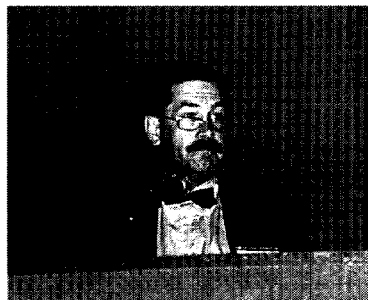


Jeff Schoenwald, General Chair

The Plenary Session



Eric Cross receives the UFFC-S
Achievement Award



Ernst-August Seyfarth,
Plenary Speaker



Roger Tancrell, Awards Chair,
signals UFFC-S is number one



A question from the audience

Achievement Award - Professor Eric Cross

Professor L. Eric Cross received the 1996 Achievement Award during Awards Ceremonies at the Ultrasonics Symposium, when he accepted a plaque, certificate and cash award. Prof. Cross teaches and directs research at The Pennsylvania State University, University Park, PA.

Well-known for his work in materials science, Eric was cited "for his many contributions to the theoretical understanding and engineering applications of ferroelectric and antiferroelectric materials, and for his worldwide leadership of the ferroelectrics community."

Eric was introduced to the audience by Wallace A. Smith of the Office of Naval Research, an organization which has been able to achieve advances in Naval sonar systems based in part on new materials from Eric's work. Wally emphasized the fact that Eric is recognized world wide for his research and insights into the origins of ferroelectricity. Eric's more than 500 technical publications contain original contributions to essentially every aspect of the processing and properties of ferroelectric materials. But Eric's biggest legacy to the field, Wally affirmed, are the scores of students trained by Eric who now dominate the international ferroelectrics community through their own leadership in industry and research.

Eric began his professional career at Leeds University in England, where he received both his B.Sc. and Ph.D. degrees, and where he continued to work for a decade. Emigrating to the United States in 1961, on what he expected would be a couple years' sabbatical, Eric began a new career at The

Pennsylvania State University which continues to this day. Eric expanded his initial work on single crystals of Barium Titanate and Sodium Niobate, into a host of other materials studying their dielectric, piezoelectric, ferroelectric, ferroelastic, pyroelectric, and electrostrictive properties. This work included not only experimental studies of the materials' properties, but the theoretical thermodynamics of their behavior and the chemistry of materials processing as well. The list of materials shall be omitted here for brevity; suffice it to say that the list is extensive. In addition to his research, Eric held the position of Director, Materials Research Laboratory (1985-1989) at Penn State University. He currently is the Evan Pugh Professor of Electrical Engineering at Penn State.

Many honors have been conferred on Prof. Cross through the decades. He was elected to the grade of Fellow of IEEE (1984). In addition, he is a Fellow of the American Institute of Physics, of the American Ceramic Society, and of the American Optical Society. He was awarded the Best Paper Award in the IEEE Transactions on UFFC (1985). Again, this is only a partial list.

Eric has served IEEE in many capacities. He traveled to several countries as Distinguished Lecturer for the UFFC Society in 1994-95. He served as Chair of past IEEE International Symposia on Applications of Ferroelectrics, most recently as Program Chair of the Ninth ISAF (1994). He continues to serve as Chair of the Ferroelectrics Committee on UFFC-S Administrative Committee.

Behind the Scenes



Our symposium management
Larry and Margaret Whicker



The Money-Man, Bob Potter, Symposium
Finance

The Reception



Ernst-August Seyfarth and Jeff Shoenwald



Sheri Schoenwald and Sara Kishoni



Margaret and Art Ballato

The Reception



Moises and Nina Levy

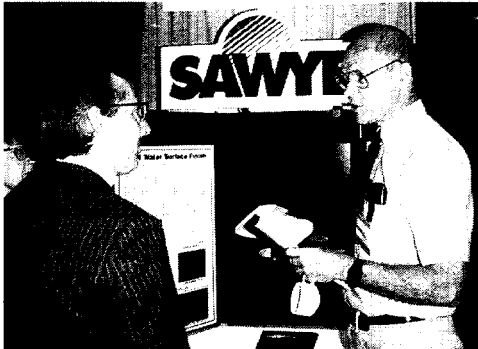


Lee Adler and Thresa Hickernell



Bill Hunt, Fred Hickernell, Clement Ruppel, and Jeff Schoenwald

Overheard at the Vendors and Posters Sessions



You're selling wafers for under a dollar?



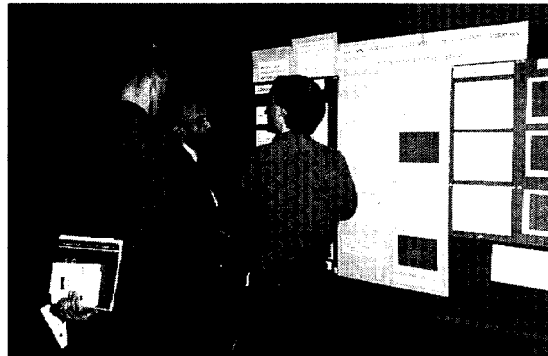
Let's make a deal



Where is PA-6?



They're making transducers this small?



Now that the crowds have gone . . .



The food, food, food . . .



The ballad



The fellowship



The Ribbons

The Fiesta



The whirling skirts



**A Scottish jig to a Mexican Hat Dance -
Colin Campbell**

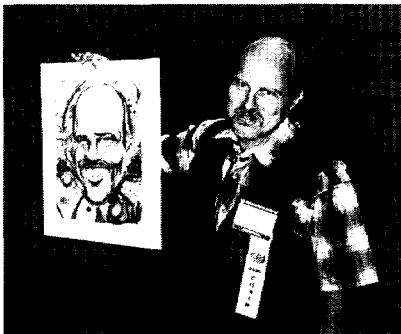


The Mariachi music

Extra Activities



The Birthday Boy - Art Ballato



Look-a-likes - Don Malocha

Recollections of the Guest Program at the San Antonio Ultrasonics Symposium

As guests and conferees from all over the world arrived in San Antonio, the President of the United States of America, Bill Clinton, was leaving. This was Saturday noon, November 2, 1996. There was an incredible traffic congestion in downtown San Antonio because of the president's visit. Nevertheless, the attendees finally reached the Hyatt Regency and settled into comfortable rooms with excellent views.

The next day while spouses and significant others were attending the conference activities, the guests strolled along the River Walk. What beautiful T-shirt weather we had! We felt the warmth of the sun shining on us. To those from countries where the forecast was for snow and temperatures hovering around zero, it was a real joy to be walking in the sun along the Antonio River. There were shops of every kind, a large shopping mall and many restaurants. We would sit for awhile, relax and enjoy the warm atmosphere with all the exotic plants. After a long walk we could hop a boat which would bring us back to our hotel.

On Monday the official part of the IEEE 1996 Ultrasonics Symposium started with its sessions and so did the guest program. We were all happy to meet our friends again from all over the world. Everybody was glad to see Norma Farnell in good health. Possibly, our best wishes sent to her from

Seattle last year helped her to recuperate and join our group again. It is always a pleasure to be together with all those gentle people, who are like a big family that meets once a year. We had so much to talk about.

It is our tradition to join in the common continental breakfast each morning and to talk a little bit about everything before the excursion of the day starts. We get suggestions of where to go and what to see for our time outside of conference times.

This year the guest program included visits of the historical and cultural San Antonio with plenty of time for shopping. Our coach brought us to the famous Alamo, the best known historic place of San Antonio, and to the mission of San Jose, where in former times missionaries tried to civilize the Indians. We went to Villita, the original site of San Antonio, where gift shops are located today. The next day we had a chance to visit the McNay Art Institute. (I proudly presented my photos showing the wonderful patio of this house to my husband as an idea for our next house. He signaled rather clearly that this will always remain just an idea.) We also visited the San Antonio Museum.

We had lunch at an excellent restaurant, Los Patios, which is surrounded by a variety of shops in a beautiful large park. My choice: Cajun shrimps!! Another day we had lunch at the Guenther House. I recommend the delicious enchiladas with chicken. Also in this area we found a gift shop with nice things to buy.

After these long days, we really enjoyed the pool and spa on the roof of the Hyatt. From this vantage point there was an impressive view overlooking San Antonio. At these moments, it's always a pleasure to think about the weather in Germany in November. On my way to the roof, I discovered Mary-Lou Blessing walking in the exercise room at the 11th floor. That's amusing ... especially as a spectator.

At night, at the social gathering there never have been so many German speaking guys. It's nice to meet them at the conference, because that's the only possibility during the year to see them if at all. On the other side, speaking to so many Germans does not improve my English. I'm glad to know so many ladies rather well, so I have many opportunities to speak English, too.

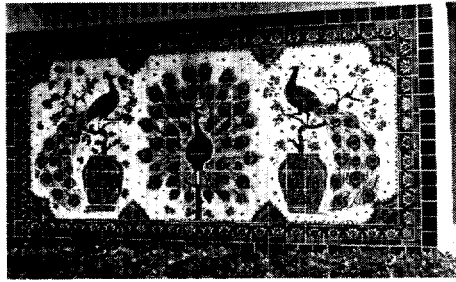
On Wednesday, Astrid and I didn't join the guided tour, but decided to have our own shopping tour. We found some smaller shops near the hotel. Then we visited the Mexican market with all its bright colors, large variety of everything, and the outdoor restaurants where we tasted various tacos at lunch.

The days after the conference we spent some special time with our husbands in Frederiksborg, San Marco, and Houston before we had to return to the European winter. Our stay in Texas was too short, like always, when visiting the United States. I saw some very unhappy eyes when we had to say bye-bye. But next year ...

Hope to see you in the fall of 1997 in Toronto.

Elke Lerch,
Germany and Austria

Scenes from the Guest Program



Liz continues to improve her camera skills

1996 International Symposium "Acoustoelectronics, Frequency Control and Signal Generation"

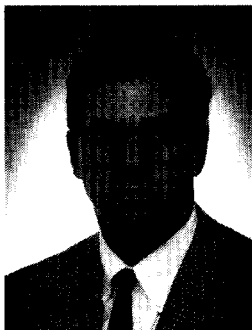
The First International Symposium "Acoustoelectronics, Frequency Control and Signal Generation" (AFC&SG) was held September 17-19, 1996 in Moscow. The Symposium was organized by the IEEE Moscow UFFC-S Chapter, Institute of Radioengineering and Electronics Russian Academy of Science (IRE RAS), Moscow Power Engineering Institute (Technical University) (MPEI-TU) of Basic Research (RFBR), Committee of Russian Federation for Standardization, Metrology and Certification, Russian A.S. Popov Society, Promradtechbank and Special Research Bureau of MPEI. General Chair of the Symposium was Academician Yu. V. Gulyaev (IRE RAS), Program Committee Chair was Prof. G. D. Mansfeld (IRE RAS), Organizing Committee Chair was Prof. V. N. Kuleshov (MPEI-TU) and Local arrangement Chair was Dr. T. I. Boldyreva (MPEI-TU). The Symposium was quite successful. Ninety-one papers were submitted for presentation at the Symposium. There were 112 participants from Russia, Ukraine, Belarus, USA, France, and Vietnam at the Symposium. Five papers were presented at the plenary session on September 17. Among plenary speakers were Academician Yu. V. Gulyaev (Russia), Prof. E. V. Charnaya (Russia), UFFC-S Distinguished Lecturer Dr. T. E. Parker (USA), Prof. R. Y. Besson (France), Dr. Yu. P. Ilyasov (Russia), Dr. A. V. Medved (Russia). Other papers were presented in two parallel oral sessions: Sensors A1-A5, (Physical Acoustics, Acoustic wave propagation,

Acoustoelectronics problems), Sessions B1-B5 (Oscillators, Standards and Measurements, Frequency synthesizers and Signal Generation, Acoustic wave devices), and one poster session. The discussions were very interesting and fruitful at all sessions. They often continued after sessions and a lot of useful informal contacts were established among the participants of the Symposium.

Guest program was organized in accordance with the interests of the guests. The guests in Moscow visited the Moscow Kremlin, the Armory in the Moscow Kremlin, the Tretjakov Gallery, and some other places of interest. At the closing ceremony on September 19 many participants said that it would be very useful and important to organize such Symposia regularly. It was recommended that the Second Symposium AFC&SG should be held in Moscow, Russia, in September, 1998. By the end of January, 1997, the Proceedings of 1996 International Symposium "Acoustoelectronics, Frequency Control and Signal Generation" was published. It contains 71 papers (in English) placed at 382 pages. Copies of the Proceedings are available. Contact Valentin N. Kuleshov if you are interested in purchasing a copy of the Proceedings. The cost is 50 U.S. dollars.

Vice Chairman of the Organizing Committee
Valentin N. Kuleshov e-mail: rpdu@mpei-rt.msk.su
Chairman of the Program Committee
George D. Mansfeld e-mail: mans@mail.cplire.ru

NEW ADMINISTRATIVE COMMITTEE MEMBERS



William D. Hunt

William D. Hunt was born in Jackson, MS, on December 21, 1954. He received the B.S. in 1976 from the University of Alabama, the S.M. from the Massachusetts Institute of Technology in 1980 and the Ph.D. from the University of Illinois at Champaign-Urbana in

1987, all in electrical engineering.

He worked for Harris Corporation from 1976 to 1978, and for Bolt Beranek and Newman from 1980 to 1984. He joined the faculty of Georgia Tech in 1987, where he has been promoted to the rank of Professor. He was a Rhodes Scholar Finalist in 1975, received a DuPont Young Faculty Award in 1988 and was named an NSF Presidential Young Investigator in 1989. In addition, he has been selected for Who's Who in the South and Southwest and Who's Who in American Education and was named as one of the 1994 Distinguished Engineering Fellows by the University of Alabama College of Engineering.

Professor Hunt's current research includes the development of new architectures for ACT devices and new substrate materials for ACT devices. This includes experimental and theoretical work on the details of SAW propagation in multi-layered media as they pertain to the performance of proposed ACT devices. Of particular interest is the impact of acoustic considerations on the design of new device structures. Also of interest are SAW devices for telecommunication applications. Among these are waveguide-coupled resonator filters and longitudinally coupled filters. Other research interests include SAW chemical sensors and high frequency bulk acoustic wave resonators.

Professor Hunt is a member of the IEEE, a member of the Technical Program Committee for the IEEE Ultrasonics Symposium, and a member of ADCOM for the UFFC.

Bill and his wife, Mary, are the proud parents of two boys (Owen and Roger) who are 3.5 and 1.5 years old respectively. At home he appears to be a subject in an experiment on accelerated aging induced by parenthood. Among other activities, his hobbies include music composition and he has recently produced a CD of his piano compositions entitled, "Primal Heart."



Dennis R. Pape

Dennis R. Pape is President of Photonic Systems Incorporated (PSI), a small high technology firm he founded in Melbourne, Florida, which performs research and development in the fields of acousto-optics and optical information processing. He received a BA degree in physics in 1974 from Cornell University and a Ph.D. in physics in 1980 from Duke University. His experimental Ph.D. thesis involved the use of ultrasound to probe the superfluid phases of liquid ^3He very close to absolute zero. After first working at Texas Instruments and then Harris Corporation, he founded PSI to apply optical technology solutions to information processing problems.

Dennis has been an active participant in the fields of ultrasonics and optical information processing over the last 20 years. He is the coeditor of the recent book *Design and Fabrication of Acousto-Optic Devices*, which provides, for the first time in a detailed and systematic manner, discussions on all aspects of these devices. He is the author or coauthor of five book chapters and some 50 papers in the fields of acousto-optics and optical information processing.

Dennis has been active in the affairs of the scientific societies associated with his technical interests. He is a member of the technical program committee of the IEEE Ultrasonics Symposium. Since 1994 he has chaired a subcommittee responsible for securing funds for members of the former Soviet Union to attend the Ultrasonics Symposium. He is past president of the Florida chapter of the Optical Society of America and is also a member of SPIE and the American Physical Society. He has helped organize and has chaired or cochaired a number of conferences both in the US and abroad in acousto-optics and optical information processing with sponsorship from the IEEE, OSA, and SPIE.

Dennis has three children and lives on the Banana River in Indian Harbour Beach, Florida. He also spends time in Arizona. He is an avid runner and enjoys reading and traveling.



Bob Potter

Bob R. Potter (M'72) was born in Salina, Oklahoma. He received his B. S. degree in EE from California State University at Long Beach in 1967, and the M. S. Degree in EE from Brigham Young University in 1970.

He serves as a Senior SAW Design engineer for Vectron Technologies in Hudson, New Hampshire. He entered the SAW field in 1973 at Texas Instruments Central Research Laboratories and has spent the last 23 years in the SAW device field — 12 of those years as a director of engineering. He is the author of 20 technical articles and 2 patents.

Bob served as the Finance Chair for the 1980 IEEE Ultrasonics Symposium held in San Diego, CA. In 1984-85 he served as the Technical Program Chair for the Bay Area UFFC Chapter and Chairman of the Chapter in 1986-1987. In 1988 he formed the first UFFC Chapter in the Dallas, Texas area and remained Chairman of the chapter for several years. He has served on the Technical Program Committee for the International Ultrasonics Symposium since 1987 and served as the Finance Chair for the 1996 Ultrasonics Symposium held in San Antonio, Texas.

Bob's hobbies include high school basketball referee for varsity and boys basketball in the state of New Hampshire, skiing and trout fishing. He also gives his time to working as a priesthood leader in the LDS church.



Kazuhiko Yamanouchi

Kazuhiko Yamanouchi received the B.S. and Ph.D. degrees in communication engineering from Tohoku University, Sendai, Japan, in 1959 and 1965. In 1965, he joined the Research Institute of Electrical Communication, Tohoku University, where he was an Associate Professor from 1968 to 1979. Since 1979 he has been a Professor at

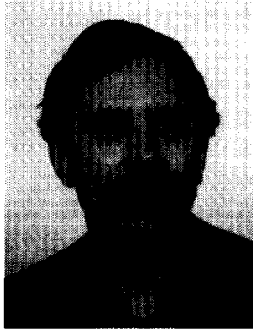
Tohoku University. From 1979 to 1980 he was a Visiting Professor at Cornell University, Ithaca, New York.

Since 1965, Dr. Yamanouchi has worked on surface acoustic wave (SAW) transducer (interdigital transducer, IDT, named *Sudarejou Denkyoku* in Japanese), propagation characteristic of SAW, and various kinds of SAW devices. He also studied the propagation characteristics of leaky surface waves (41° Y-X, 64° Y-X LiNbO_3) and a new cut of LiNbO_3 (128° Y-X LiNbO_3). He invented a group-type unidirectional transducer (UDT) and floating electrode type single phase UDT. In 1986, he determined nonlinear elastic, piezoelectric, dielectric and electrostrictive constants of LiNbO_3 . He has also worked on submicron fabrication techniques using electron beam exposure and electro-chemical effects and obtained 20 GHz-range SAW fibers. He developed a TE-TM mode converter by interaction between an elastic surface wave and a laser beam on an optical surface wave guide.

He received the Invention Award from Invention Association of Japan in 1979 and Ichimora Contribution Award from Ichimora Association in 1984. He received the Achievement Award from Institute of Electronics, Information, and Communication Engineering of Japan in 1995.

He was the Chairman of the Tokyo Chapter of IEEE Society on UFFC (1991-1993). He was the Co-Chairman of International Symposium on SAW Devices for Mobile Communication held in Sendai in 1992 and of FCS in Hawaii in 1996. He is the Chairman of the 150th Committee of Elastic Wave Devices on JSPS, from 1991 and an Associate Editor of IEEE Transactions of the IEEE.

His hobbies are playing Shogi (Japanese Chess), Go, and Contract bridge.



Peter Wright

Peter is currently Director of Strategic Planning with Thomson Microsonics in Sophia-Antipolis in the south of France. He joined them in September of 1996 after moving from Dallas, Texas. Quite a culture shock! Thomson Microsonics designs and manufactures optical signal processing devices, medical acoustic imaging probes and surface-acoustic-wave devices. The company has a history of innovation, especially in the field of low-loss SAW filters, which is what attracted him to the job. Peter, himself, has over a dozen patents in the field; it was a natural fit. Before joining Thomson Microsonics, he was Director of Engineering for RF Monolithics. There, he worked on the development of low-loss SAW filters, and numerous varieties of resonators and coupled resonator filters. He began his long association with RF Monolithics around 1980 when finishing up his thesis at the Massachusetts Institute of Technology. There, he applied Coupling Of Modes (COM) analysis to SAW devices with distributed internal reflections and succeeded in deriving closed-form expressions for a "U-path" acoustic reflection such as occurs in a Reflective Array Com-

pressor (RAC). He then applied the COM formalism to the analysis of SAW transducers with internal reflections and published the first such analysis of a Single-Phase Unidirectional Transducer (SPUDT) in 1982. However, he got the greatest enjoyment from the development of the Natural Single-Phase Unidirectional Transducer (NSPUDT) in 1983. When he first proposed that a single-level uniform two-electrodes per wavelength transducer need not radiate equally in both directions many people thought he was crazy. After all, it was a basic belief in all the SAW text books of the period, that a symmetric transducer would radiate acoustic energy symmetrically. However, his hypothesis proved correct and in 1984 he succeeded in demonstrating directivities in excess of 10 dB from uniform transducers on quartz and LiNbO₃. After the NSPUDT, he then went on to develop several other low-loss SPUDT configurations. The two-level "Hopscotch" SPUDT, developed around 1984 for a regenerative-receiver delay-line application probably being the first SPUDT produced in large volume. More recently, he developed a "dithered" single-level SPUDT technology suitable for high-frequency applications and demonstrated the technology with the realization of a 916 MHz IF filter.

Peter is married with three small children who are now happily adapting to their new home in France.

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. Jeannine H. Henaff
Centre National d'Etudes des Telecommunications
France Telecom
*For contributions tot the analysis, design, and realization
of telecommunication systems.*

Prof. Karl J. Langenberg
Department of Electrical Engineering
University of Kassel
For contributions to acoustoelastic and microwave imaging.

Prof. Johannes G. Smits
Dept. of Electrical, Computer, and Systems Engineering
Boston University
*For research and development of piezoelectric materials
and integrated piezoelectric microelectromechanical sensors and actuators.*

Mr. Robert C. Smythe
Piezo Technology Inc.
*For contributions to the theory and technology of crystal filters
resonators, and monolithic filters*

ADCOM BRIEFS

The Administrative Committee (AdCom) meeting of the Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFC-S) was called to order at 9:03 A.M., November 3rd, 1996, by D. C. Malocha, UFFC-S AdCom President, at the Hyatt Hotel - Riverwalk, San Antonio, Texas. Introductions of attending members were conducted.

D. C. Malocha, UFFC-S AdCom President, introduced the four newly elected UFFC-S AdCom members, whose terms begin on January 1st, 1997: W. D. Hunt, D. R. Pape, B. R. Potter, and K. Yamanouchi. D. R. Pape, B. R. Potter, and K. Yamanouchi, were able to attend today's UFFC-S AdCom meeting prior to the start of their elected terms.

G. K. Montress, UFFC-S Secretary/Treasurer, moved to approve the minutes of the June 4th, 1996 UFFC-S AdCom meeting, with two changes/corrections noted. The motion was seconded by H. van de Vaart. The motion passed.

G. K. Montress, UFFC-S Secretary/Treasurer, reported that three motions were handled by e-mail balloting since the last UFFC-S AdCom meeting (covers the period from June 5th, 1996 through November 2nd, 1996).

D. C. Malocha, UFFC-S AdCom President, moved to nominate P. V. Wright to serve the unexpired balance of T. Shoup's elected UFFC-S AdCom term in office (November 3rd, 1997 through December 31st, 1998). The motion was seconded by G. K. Montress. The motion passed with 7 Yes votes recorded (only elected UFFC-S AdCom members voting).

D. C. Malocha, UFFC-S AdCom President, reported on the most recent IEEE TAB meeting which he attended. The UFFC-S's C. B. Sawyer Award is now an official IEEE award after approval by TAB. All IEEE Transactions publishing "loopholes" concerning either over- or under-publishing a society's page budget have been closed. Over- and under-publishing are penalized now equally.

F. S. Hickernell reported that he is still working on arrangements for the UFFC-S Membership Directory, which was approved at the November 7th, 1995 UFFC-S AdCom meeting. The status of the membership directory will be updated at the next UFFC-S AdCom meeting.

F. S. Hickernell, UFFC-S Newsletter Editor-in-Chief, presented an oral report. The deadline for submission of material for the April 1997 (Spring) issue of the UFFC-S Newsletter is March 15th, 1997.

J. Vetelino reported that an AdHoc committee on Sensors has been formed under the Long Range Planning Committee. J. Vetelino is serving as Sub-Committee Chair for the group which will develop ideas on how to stimulate more activity related to Sensors within the UFFC-S's Conferences, Transactions, etc.

A committee was appointed to study whether an Administrative Assistant position would be beneficial to the UFFC-S. The committee will report on its findings at the next UFFC-S AdCom meeting.

A. Ballato reported that the Director of the IEEE's History Center had recently resigned. UFFC-S action on a possible financial contribution to the Center will be placed on hold, pending receipt of additional information in the coming months as regards the IEEE's History center.

H. van de Vaart, UFFC-S Finance & Operations Committee Chair, presented oral and written reports. The UFFC-S has a surplus of approximately \$615k at this time.

L. E. Cross, UFFC-S Ferroelectrics Standing Committee Chair, indicated that the 1994 International Symposium on Applications of Ferroelectrics (ISAF) is complete, now that the Final Financial Report has been submitted and the financial audit performed. The surplus was approximately \$20k. The 1996 ISAF conference was very successful. The venue for the 1998 ISAF will be Montreaux, Switzerland, with N. Setter serving as General Chair for the conference. The UFFC-S AdCom approved these arrangements for the 1998 ISAF.

J. R. Vig reported that the 1995 IEEE International Frequency Control Symposium's technical program and activities were very successful; however, due to a decrease in anticipated outside support for foreign participant travel, a loss of approximately \$3k was incurred. The final financial report and the financial audit have been completed and submitted, thereby closing-out this symposium.

J. R. Vig reported that the 1996 IEEE International Frequency Control Symposium in Honolulu, Hawaii, was very successful and well attended.

The budget for the 1997 IEEE International Frequency Control Symposium was approved as submitted.

H. van de Vaart provided an oral report on the 1994 IEEE International Ultrasonics Symposium, held in Cannes, France. The meeting was extremely successful; however, due to some unanticipated additional expenses, there was a loss of approximately \$3k. The final financial report and the financial audit have been completed and submitted, thereby closing-out this symposium.

F. S. Foster reported that arrangements for the 1997 IEEE International Ultrasonics Symposium (Toronto, Ontario, Canada) are still proceeding nicely. The Hotel will be the Marriott. K. W. Ferrara has agreed to serve as Technical Program Chair. The dates for the conference are 5-8 October 1997.

The budget for the 1997 IEEE International Ultrasonics Symposium was approved as submitted.

The following Symposium venues and General Chairs were approved by the UFFC-S's AdCom: 1998 IEEE International Ultrasonics Symposium in Sendai, Japan, with B. R. Tittmann and N. Chubachi serving as General CoChairs; 1999 IEEE International Ultrasonics Symposium in the San Francisco Bay Area, with B. T. Khuri-Yakub serving as General Chair; 2000 IEEE International Ultrasonics Symposium in San Juan, Puerto Rico, with M. A. Belkerdid serving as General Chair (approved by prior e-mail ballot); 2002 IEEE

International Ultrasonics Symposium in Munich, Germany, with R. Lerch serving as General Chair. The UFFC-S's Ultrasonics Standing Committee will determine whether a General Co-Chair will be needed for the 2002 symposium.

R. H. Tancrell, UFFC-S Awards Committee Chair, submitted a written report. W. D. O'Brien, Jr., was approved as the UFFC-S's 1997-1998 Distinguished Lecturer.

E. S. Furgason, UFFC-S Chapter/Membership Services Committee Chair, presented oral and written reports. There has been a decrease in active UFFC-S local chapters in recent years. Efforts to strengthen the UFFC-S's local chapters will be considered.

R. M. White, UFFC-S Fellows Committee Chair, reported that nomination paperwork was submitted for nine UFFC-S candidates to be considered for 1997 IEEE Fellow consideration. Those selected will be announced in early 1997.

B. R. Tittmann, UFFC-S Nominations Committee Chair, presented oral and written reports. The 1998 election for new UFFC-S AdCom members will be held next summer (1997). The slate of candidates will be presented for UFFC-S AdCom approval at the next UFFC-S AdCom meeting on May 31st, 1997.

The UFFC-S's Bylaw revisions were discussed at some length, and the final revisions received a preliminary approval, subject to a final review by the UFFC-S's AdCom prior to their publication in the UFFC-S Newsletter and subsequent submission to IEEE for approval.

D. C. Malocha, UFFC-S AdCom President, presented certificates of appreciation to the four retiring elected UFFC-S AdCom members: G. R. Johnson, B. T. Khuri-Yakub, R. Lerch, and R. E. Newnham.

D. C. Malocha was elected UFFC-S AdCom President for 1997.

J. R. Vig was elected UFFC-S AdCom Vice-President for 1997.

A motion was introduced that the next UFFC-S AdCom meeting be held at 9:00 A.M., on May 31st, 1997, in conjunc-

tion with the 1997 IEEE International Frequency Control Symposium, in Orlando, Florida. The motion was approved. The UFFC-S AdCom meeting adjourned at 5:11 P.M.

Gary K. Montress
UFFC-S AdCom Secretary/Treasurer, 1996/1997

UFFC Financial Report

The accompanying UFFC Operating Financial Statement for 1996 shows that our Society ended the year with \$10.6K deficit versus a budgeted deficit of \$1.8K. Given the fact that we now have an income/expense budget of more than \$800K and actual income and expense this year of more than \$1.1M, this result is quite satisfactory.

The Transactions ended up with a deficit of \$8.3K instead of a surplus of \$25.4K. Individual non-member subscription income was down as a result of a steadily declining number of subscribers (primarily libraries), presumably due to tighter budgets at the various government, industry and university institutions. Voluntary Page Charge income was also down; as mentioned in previous reports, this income is very difficult to predict. At the other side of the ledger, the cost of producing the Transactions, such as editing/composition and printing/ mailing, were higher this year than anticipated. Also, the administrative costs incurred by the Transactions editor were up. As you know, all papers now flow through the Editor-in-Chief's office ensuring better control on the status of the papers submitted for publication. Starting this year, the Transactions will be produced by the American Dairy Science Association instead of the IEEE. Projected savings in 1997 are estimated to be \$40K, increasing to about \$75K in 2000.

The Symposia continue to do well. Apart from the 1994 International Ultrasonics Symposium (IUS) and the 1995 International Frequency Control Symposium (IFCS) which I already mentioned in last year's report, all other Symposia posted a surplus. The report for the 1995 IUS has not been finalized yet, but is expected to show a \$55K surplus. The 1996 IFCS had a surplus of \$31.8K and the 1994 International Symposium on Applications of Ferroelectrics (ISAF) closed the books in 1996 with a surplus of \$25.4K. Total outstanding loans at year-end were \$106K, although the 1995 IUS and 1996 ISAF loans have now been paid off.

The Society's net worth stands at \$519.3K. Long term investment is \$274.3K, up 37.2%.

Herman van de Vaart
Chair Finance & Operations Committee
March 5, 1997

Wanda Elliot to Retire

Ms. Wanda Elliot, the Bioacoustics Research Laboratory at the University of Illinois secretary for the past 22 years, and principle individual responsible for the timely publication of manuscripts by UFFC Transactions' authors for the past 12 years, has announced her retirement, effective sometime around September 1, 1997. There will be a special reception honoring her long and faithful service. Should you wish to be notified when the reception is scheduled, please notify Professor William O'Brien at 217/333-2407 or wdo@uiuc.edu.

UFFC OPERATING FINANCIAL STATEMENT 12/31/96

UFFC	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
INTEREST	27.6	36.3	0.0	0.0	27.6	36.3
TRANSACTIONS	265.7	261.3	240.3	269.6	25.4	-8.3
NEWSLETTER	0.0	0.1	11.9	11.1	-11.9	-11.0
NON-PERIODICALS	1.6	1.2	1.2	1.8	0.4	-0.6
SYMPOSIA	477.7	780.9	424.3	709.7	53.4	71.2
HQ ADMIN/BOOKBROKER	29.2	28.4	36.7	28.2	-7.5	0.2
ADCOM / OTHER	0.0	0.5	89.2	98.9	-89.2	-98.4
TOTAL	801.8	1108.7	803.6	1119.3	-1.8	-10.6

TRANSACTIONS	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
MEMBERSHIP FEES	26.3	25.9	0.0	0.0	26.3	25.9
INDIVIDUAL NM SUBS.	69.0	63.3	0.0	0.0	69.0	63.3
ALL TRANS. PACKAGE	113.6	111.4	0.0	0.0	113.6	111.4
AIRFREIGHT	2.6	12.4	4.3	4.6	-1.7	7.8
VOLUNTARY PAGE CHARGES	37.2	25.2	7.8	4.8	29.4	20.4
OVERLENGTH PAGE CHARGES	16.8	18.4	3.1	1.1	13.7	17.3
EDITING/COMPOSITION	0.0	0.0	101.5	111.1	-101.5	-111.1
PUB. ADMINISTRATION	0.0	0.0	5.5	5.9	-5.5	-5.9
UFFC EDITOR	0.0	0.0	26.0	40.6	-26.0	-40.6
INDEXING	0.0	0.0	2.3	2.4	-2.3	-2.4
PRINTING/MAILING	0.0	0.0	80.9	87.5	-80.9	-87.5
PERIODICAL RELATED	0.2	4.7	3.0	5.8	-2.8	-1.1
SUBSCRIBER HANDLING	0.0	0.0	5.9	5.8	-5.9	-5.8
TOTAL	265.7	261.3	240.3	269.6	25.4	-8.3

SYMPOSIA	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
1994 ULTRASONICS	0.0	284.3	0.0	287.3	0.0	-3.0
1995 FREQUENCY CONTROL	0.0	158.0	0.0	158.7	0.0	-0.7
1995 ULTRASONICS	227.7	0.0	199.3	0.0	28.4	0.0
1996 FREQUENCY CONTROL	160.0	202.5	140.0	170.7	20.0	31.8
1994 FERROELECTRICS	0.0	136.1	0.0	110.7	0.0	25.4
1996 FERROELECTRICS	90.0	0.0	85.0	0.0	5.0	0.0
CONFERENCE ADMINISTRATION	0.0	0.0	0.0	-17.7	0.0	17.7
TOTAL	477.7	780.9	424.3	709.7	53.4	71.2

ADCOM	BUDGET		ACTUAL		OUTSTANDING LOANS	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
PRESIDENT'S OFFICE	5.0	4.3			1995 ULTRASONICS	33.0
ADCOM TRAVEL EXPENSES	17.0	—			1996 ULTRASONICS	35.0
STUDENT SUPPORT	20.0	—			1997 ULTRASONICS	15.0
FOREIGN SPEAKER SUPPORT	20.0	—			1997 FREQ. CONTROL	8.0
TOTAL ADCOM EXPENSES	57.0	65.5			1996 ISAF	15.0
CHAPTERS / DIST. LECTURER	15.0	14.1			TOTAL	106.0
MEMBERSHIP	4.0	4.6			RESERVES 1/1/96	529.9
IEEE HQ EXPENSE	6.2	6.5			SURPLUS/DEFICIT	-10.6
MISC	2.0	3.9			RESERVES 12/31/96	519.3
TOTAL	89.2	98.9				

LONG TERM INVESTMENT 274.3 +37.2%

Chapter Activities

Tokyo Chapter

The Tokyo Chapter held 11 technical meetings in 1996, in conjunction with the Technical Group on Ultrasonics of the Institute of Electronics, Information and Communications Engineers of Japan:

Date	Papers	Place
1) January 25-26, 1996	25	Kyoto
2) February 26, 1996	7	Tokyo
3) April 26, 1996	7	Tokyo
4) May 17, 1996	6	Tokyo
5) June 21, 1996	7	Tiba
6) July 25, 1996	8	Tokyo
7) August 29, 1996	8	Tokyo
8) November 17-18, 1996	17	Sendai
9) December 22, 1996	9	Tokyo
10) October 21, 1996	7	Shimizu
11) November 16, 1996	9	Tokyo



Dr. T. E. Parker delivered an invited talk at the USE '96

17th Symposium on Ultrasonic Electronics

The Tokyo Chapter sponsored the 17th Symposium on Ultrasonic Electronics (USE '96) on October 23-25, 1996, at the Tokyo daiiti Hotel, Yonezawa Yamagata, attended by more than 350 participants. Three invited talks and 166 contributed papers were presented. The papers will be published in the May 1997 issue of the Japanese Journal Applied Physics.



Dr. T. E. Parker delivered an invited talk at the 150th committee

UFFC-S 1996-1997

Distinguished Lecturer Program

Dr. T. E. Parker of National Institute of Standards and Technology Time and Frequency division Boulder in U. S. A., the UFFC-S 1996-1997 Distinguished Lecturer, was invited to Japan and he was here from October 22 to October 30. He favored us with impressive and instructive talks on the topics, "The Search for the Perfect Oscillator," at the USE '96 in Yamagata and at 150th Committee of Japan Society for the Promotion of Science. He was invited to three companies in Kawasaki and Kyoto.



Dr. Parker with the members of the IEEE-UFFC-Tokyo Chapter at the welcome party held in Shinjuku

1997 Officers

The new officers of the Tokyo Chapter for 1997 are:

Chairman: Professor Masatune Yamaguchi, Faculty of Engineering, Chiba University, Yayoi, Inage-ku, Chiba 263

Vice Chairman: Professor Junichi Kushibiki, Faculty of Engineering, Tohoku University, Aoba, Aramaki, Aoba-Ku, Sendai 980

Secretary: Associate Professor Keiji Sakai, Institute of Industrial Science, University of Tokyo, Roppongi 7-22-1, Minato-ku, Tokyo 106

Treasurer: Associate Professor Kenya Hashimoto, Faculty of Engineering, Chiba University, Yoyoi, Inage-ku, Chiba 263

Moscow UFFC-S Chapter: 1996 activity and plans for 1997.

For 1996 Moscow UFFC-S Chapter planned several events. One of them was running the Section of Signal Generation and Frequency Control at the Moscow Student Scientific Conference on Radioengineering. This Conference was organized by Moscow Power Engineering Institute (Technical University, MPEI-TU). Six students' papers were presented at the Section on Signal Generation and thoroughly discussed. The main event of 1996 was an International Symposium on Acoustoelectronics, Frequency Control and Signal Generation (September 17-19, Hotel

"Uzkoe", Moscow). Two scientific meetings of the Moscow UFFC-S Chapter (Moscow, June and July 1996) were devoted to the discussion of the papers, submitted for presentation at the Symposium and the state of art in the field of Acoustoelectronics and Frequency Control.

For 1997, the Moscow UFFC-S Chapter also planned several events. Some of them have already been held. One was running the Section on Signal Generation at the 1997 Moscow Student Scientific Conference (February 27-28) which was organized by MPEI-TU. 15 papers were presented by students from 5 Technical Universities. Another scientific meeting was held in St. Petersburg. It was devoted to the problems of "antifire" sensors. The members of the Chapter participated in it and discussed the possibilities of applications in this field based on BAW and SAW devices. In April 1997 the Chapter plans to launch seminars on "Acoustoelectronics and Physical Acoustics" which will be held monthly at IRE RAS. An important part of the Chapter activity is going to be the preparation for the Second International Symposium "Acoustoelectronics, Frequency Control and Signal Generation" which is planned for September 1998 (Moscow, Chairman Academician Yu. V. Gulyaev).

Moscow UFFC-S Chapter Chairman

George D. Mansfeld

Vice Chairman

Valentin N. Kuleshov

Orlando Chapter

Summary of activities and other highlights:

- So far this year the Orlando Chapter has had 3 technical meetings: The speakers were Dr. Clemens Ruppel (Siemens Corporate Research), Dr. Mauricio Pereira DaCunha (Univ. of Sao Paulo), and Dr. Thomas Parker (NIST).
- The meeting held with the current Distinguished Lecturer (Dr. Thomas Parker) was a great success. We had a total of 35 people between members and guests; the Orlando Chapter membership is around 25.
- Two additional meetings are planned for this spring
- We use an e-mail distribution list to inform our members of upcoming meetings as well as for general information purposes.
- Last year the Orlando Chapter won the Outstanding Chapter Award from the section.

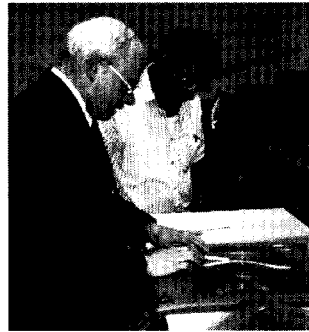
Alex Zajac

Chapter Chair

az@sawtek.com

Phoenix Chapter

The UFFC-S Phoenix Chapter joins with the five other IEEE societies in having bi-weekly seminars at Arizona State University. The group is called Waves and Devices and consists of the Microwave Theory and Techniques, Light and Electrooptics, Antennas and Propagation, Electromagnetic



Tom Parker at the Phoenix Chapter meeting

Compatibility and Electron Devices besides UFFC. Tom Parker, the UFFC-S Distinguished Lecturer was the key speaker representing our society on February 27, 1997. His talk drew some interesting discussion from attendees after the presentation.

Fred S. Hickernell
UFFC-S Representative

Boston Chapter

The Boston Chapter had a successful 1996-+97 season with seven presentations. Attendance ran from 15 to 40. We try to schedule the meetings around the 3rd Wednesday of the month. Our format is simple; 5:30 refreshments, 6:00 presentation, 7:00 adjourn to a local restaurant for dinner with the speaker. We are grateful to the Raytheon Company for providing the use of a lecture room for our meetings. Following is a list of the talks and speakers:

October 23, 1996. Electrostrictive Materials for Ultrasonic Transducer and Actuator Applications Jie Chen, Hewlett-Packard Company

December 11, 1996. 1-3 Piezocomposites, SonoPanels, Arrays, and SmartPanels Richard Gentilman, Materials Systems, Inc.

January 22, 1997. SAW Devices for Wireless Applications Bob Potter, Dong-Pei Chen & C. S. Lam, Vectron Technologies

February 26, 1997. Modeling Techniques for Ultrasound Pulse-Echo Systems Peder Pedersen, Worcester Polytechnic Institute

March 12, 1997. The Search for the Perfect Oscillator Thomas Parker, National Institute of Standards & Technology, 1996-97 UFFC Distinguished Lecturer

April 16, 1997. Buffered Flow Transducers for Hot Fluids Lawrence Lynnworth, Panametrics

May 21, 1997. Acoustic Imaging with 128x128 (16k) Element Transducer Hybrid Arrays Ken Erikson, Anthony Nicoli, Tim White Lockheed Martin Infrared Imaging Systems

Our officers for the year were Jerry Jennings, Chairman, Gary Montress, Vice-chairman and Bob Potter, Secretary-Treasurer. The officers for the +97-+98 year will be Gary Montress Chairman, Bob Potter, Vice-chairman and Norm Benoit, Secretary-Treasurer.

Jerry Jennings
1996-97 Chapter Chairman UFFC
Boston Chapter

Distinguished Lecturer - 1996/97 - Tom Parker The Search for the Perfect Oscillator

As of the middle of March, sixteen lectures have been presented. I have been all over the world and still not found the perfect oscillator. However, I have met some very wonderful people. The first lecture was delivered at NIST in Boulder. They unfortunately were the guinea pigs while I worked the bugs out of the presentation. The lecture tour got serious in September with a trip to Europe with my wife Karen. The first stop was Moscow for the 1996 International Symposium on Acoustoelectronics, Frequency Control & Signal Generation. Next came Tele Quartz in Germany and then the Institute of Solid State Physics of the Bulgarian Academy of Sciences in Sofia. The final stop in Europe was C-MAC in England. On the way back to Boulder a stop was made at Marquette University. With less than two weeks to recover I was off

to Japan. Here five lectures were presented at NEC, Toyocom, USE-96, Murata, and the 150th Committee. I also had the opportunity to spend a very pleasant weekend in Kyoto. After a break for the holidays the lecture tour resumed in February with a trip to Florida. Here lectures were presented at Motorola facilities in Plantation and Boynton Beach, and finally at the Orlando UFFC chapter. Later in February a quick trip to Phoenix was made for a lecture at a combined IEEE chapter meeting at Arizona State University. The final lecture so far was presented in March at the Boston UFFC chapter.

Tom Parker
National Institute of Standards and Technology
Boulder, CO USA

AWARDS

Gerald W. Farnell - Fellow Award, The Royal Society of Canada

Professor Gerald Farnell has been elected a Fellow of the Academy of Science of the Royal Society of Canada and was officially inducted during a ceremony held in Ottawa on November 22, 1996. His citation read: "Gerald Farnell, Department of Electrical Engineering, McGill University, is one of the founders of the contemporary scientific and technological field of Surface Acoustic Waves. His research played a key role in establishing a rigorous analytical and computational basis for that subject. Farnell was first to show that surface acoustic waves can propagate on all nonisotropic materials and in all directions. This discovery paved the way for a large variety of applications, creating a major field of research

and an entire industry. He has continued to build on his findings, generating a string of important contributions which have been recognized throughout the world." The Royal Society of Canada is a national academy whose objective is the promotion of learning and research in the arts and sciences. The Society recognizes distinguished accomplishments and provides timely information and advice to governments and the public.

On a lighter note, Eric Adler, a colleague and friend of Professor Farnell noted that "In a local ceremony at McGill University to recognize new Fellows in the Montreal area, each Fellow presented a brief talk at the reception in their honor. Jerry's talk was entitled "Communications using Micro Earthquakes."



Gerry and Norma Farnell at Awards Ceremony

Chen S. Tsai

Prof. Chen S. Tsai has received the "International Microoptics Award" in October, 1996, in Hiroshima, Japan, with a citation: "For pioneering and sustained contributions on Integrated Acoustooptics and Magneto-optics." The biennial award is jointly sponsored by the Japanese Society of Applied Physics and the Optical Society of Japan. Chen delivered the plenary lecture at the meeting with a paper entitled, "The Versatile Photon: Express Messenger of the Information Superhighway," for the occasion. Prof. Tsai is a professor at the University of California, at Irvine.

WELCOME NEW UFFC-S MEMBERS

We welcome the following new members to the IEEE Ultrasonics, Ferroelectrics,
and Frequency Control Society who have joined in the past six months

ALABAMA

Gibson, Rhett D.

ARIZONA

Briggs, David
Doyle, James T.

CALIFORNIA

Cashin Jr., William F.
Culhane, Thomas A.
Flory, Curt A.
Hu, Chung-Hsing A.
Jaduszliwer, Bernardo
Jin, Xuecheng
Karlquist, Richard K.
Kim, Guesup
Kwon, Richard
Mallette, Leo A.
Mamayek, Don S.
Nau Ph, William H.
Rafii, Keihan
Roessig, Trey Allen W.
Sumanaweera, Thilaka S.

COLORADO

Downb III, Justin G.
Harrison, Dewitt E.
Kessman, Paul

CONNECTICUT

Bosso, Frank C.
Dufilie, Paul A.
Elliott, Janet
George, Wallace R.
Raunig, David L.
Welch, Laurence R
Zeitler, Raymond

FLORIDA

Carter, Scott E.
Deyanju, Vincent S.
Gray, Donald G.
Kwon, Jea D.
Remoundos, George
Riza, Nabeel A.
Rogers, Sara N.
Ross, D.
Ruser, Claus W.
Stroschine, Jamey D.
Walden, Alan K.
Whan, Kim L.

GEORGIA

Folds, Don L.
Glaser, Michael S.
Kan, Steven W.
Mojica, Raymund L.

ILLINOIS

Bi, Frank Z.
Bielick, Brian
Chien, Hual-Te
Craig, S. E.
El-Dinary, Ayman Said
Fishkin, Alexander

Harris, John G.

Kenny, David J.
Neill, Gifford
Stewart, Jonathan

INDIANA

Filler, Roman Y.
Jackson, Lisa
Yulius, Aristo

IOWA

Polikar, Robi
Stucky, Paul A.

KANSAS

Chaturvedi, Pawan

LOUISIANA

Tassin, Randal T.

MAINE

Allen, Benjamin
Monteith, Jr., C. R.

MARYLAND

Renshaw, Richard A.
Roloff, Ronald C.
Sherrill, David

MASSACHUSETTS

Barzilai, Uzi
Briggs, David S.
Imhof, Matthias G.

Sarles, F. Williams

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Haddadin, Osama S.

MINNESOTA

Muthupillai, Raja

MISSOURI

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Witham, Benjamin M.

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Bender, C. J.
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Schweitzer, Norman E.
Vigliotti, Anthony J.
Winn, Steven W.

NORTH CAROLINA

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Alkoy, Sedat

Anderson, Michael L.

Bietz, Sean M.
Chandran, Sanjay
Goldblum, Charles E.
Kucera, John-Paul
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Touchton, Scott F.
Wang, Hong
Weaver, Gregory L.
Zhang, Giming

SOUTH DAKOTA

Smith, Thane

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Bengtson, David
Bos, Laurence W.
Chen, Tung-Sheng
Erb, Tom L.
Fujioka, Taira
Jackson, Jerry L.

Li, Yunlei
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Marr, Kenneth

Tempsta, Francis

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Hallaj, Ibrahim M.
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Hippe, Richard A.

WASHINGTON D. C.

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Howarth, Thomas R.

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Maciel, Carlos Dias
Santa Cruz, Carlos E.
Shinohara, Armando H.
Silva, Valberto F.

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Davis, Don P.
Johnson, Stephen P.
Kraeutner, Paul
Kucar, Andrew

Mander, Todd

Moidu, Abduljaleel K.
Paul, James G.
Porlier, Claude
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Wallace, Jack B.

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Germany

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Weiland, Thomas

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Lang, Sidney B.

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Faabri, Davide
Ferrario, Reginaldo

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Goto, Miki
Inui, Shinichiro

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Iwameji, Kazuaki
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Kondo, Sadao
Kudo, Subaru
Kuze, Naohiro
Masuda, Kohji
Nakamura, Masatoshi
Ohki, Michio
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Tanaka, Hiroyuki
Yamagata, Sekiji
JORDAN
Kassab, Nizar M.
KOREA
Baek, Kwanag H.

Choi, Jae-Ha
Jeong, Mok-Kun
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Kim, Jaewan
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Man, Hwang S.
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You, Il-Hyun
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NORWAY
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POLAND
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ROMANIA
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Souchkov, Sergey G.
Vassiliev, Dmitry V.
SLOVENIA
Pavlic, Bogdan
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SWITZERLAND
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Shen, Chi-Yen
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ULTRASONICS SYMPOSIA

1997 IEEE International Ultrasonics Symposium

Toronto, Ontario, Canada — 5 - 8 October 1997

For information contact:

F. Stuart Foster, *General Chair*

University of Toronto

Sunnybrook Health Science Center

Department of Medical Physics

Reichmann Research Building

2075 Bay View Avenue

Toronto, Ontario

CANADA M4N 3M5

(416) 480-5716 (Phone)

(416) 480-5714 (FAX)

stuart@srcl.sunnybrook.utoronto.ca (e-mail)

Katherine W. Ferrara, *Technical Program Chair*

University of Virginia

Department of Electrical Engineering

1105 West Main Street

Stacey Hall

Room 1421

Charlottesville, Virginia 22903 USA

(804) 243-6321 (Phone)

(804) 982-3870 (FAX)

kathyf@virginia.edu (e-mail)

1998 IEEE International Ultrasonics Symposium

Sendai, Miyagi, Japan - 5-8 October 1998,

For information contact:

Noriyoshi Chubachi, *General Co-Chair*,

Tohoku Gakuin University,

Faculty of Engineering

Tagajo, Miyagi 985,

Japan

(81)22-368-1115 (Phone);

(81)22-263-9230 (Fax)

or

Bernhard R. Tittmann, *General Co-Chair*,

The Pennsylvania State University,

Department of Engineering & Mechanics,

210 Hallowell Building

University Park, Pennsylvania 16802,

(814) 865-7827 (Phone);

(814) 865-3626 (Fax),

James F. Greenleaf, *Technical Program Co-Chair*,

Mayo Clinic.

Ultrasound Research

200 First Street SW

Rochester, Minnesota 55905

(507) 284-8496 (Phone)

(507) 284-1632 (Fax)

Kazuhiko Yamanouchi, *Technical*

Program Co-Chair,

Tohoku University,

Research Institute of Electrical Communication

Katahira, Aobaku, Sendai 980-77

Japan

1999 IEEE International Ultrasonics Symposium

San Francisco Bay Area, CA

For information contact:

Pierre B. T. Khuri-Yakub, *General Chair*

Stanford University

Department of Electrical Engineering

E. L. Ginzton Laboratory

Room 11

Stanford, California 94305-4085

USA

(415) 723-0718 (Phone)

(415) 725-7509 (FAX)

khuri-ya@ee.stanford.edu

2000 IEEE International Ultrasonics Symposium

San Juan, Puerto Rico

For information contact:

Madjid A. Belkerdid, *General Chair*
University of Central Florida
Department of Electrical & Computer Engineering
Orlando, Florida 32816-2450
USA
(407) 823-5793 (Phone)
(407) 823-5835 (FAX)
mab@enr.ucf.edu (e-mail)

325 Broadway

Boulder, Colorado 80303

(303) 497-7881 (Phone)

(303) 497-6461 (FAX)

tparker@bldrdoc.gov (e-mail)

Gary R. Johnson, *Technical Program Chair*

Sawyer Research Products Inc.

35400 Lakeland Boulevard

Eastlake, Ohio 44095

(216) 951-8770 (Phone)

(216) 951-1480 (FAX)

g.johnson@ieee.org (e-mail)

2001 IEEE International Ultrasonics Symposium

Location, dates, and contacts not approved yet

2002 IEEE International Ultrasonics Symposium

Munich, Germany

For information contact:

Reinhard Lerch, *General Chair*
University of Linz
Institute fuer Elektrische Messtechnik
Altenberger Strasse 69
A-4040 Linz
AUSTRIA
(43) 732-2468-9209 (Phone)
(43) 732-2468-822 (FAX)
r.lerch@jk.uni-linz.ac.at (e-mail)

1999 IEEE International Frequency Control Symposium

Besancon, France

For information contact:

Donald B. Sullivan, *General Co-Chair*
National Institute of Standards & Technology
Time & Frequency Division
Division 847
325 Broadway
Boulder, Colorado 80303
(303) 497-3772 (Phone)
(303) 497-6461 (FAX)

or

Raymond J. Besson, *General Co-Chair*

LCEP-ENSMM

la Bouloie - route de Gray

25030 Besancon Cedex

FRANCE

(31) 81-66-66-32 (Phone)

(31) 81-88-57-14 (FAX)

Frederick L. Walls, *Technical Program Chair*

National Institute of Standards & Technology

Time & Frequency Division

Division 847

325 Broadway

Boulder, Colorado 80303

(303) 497-3207 (Phone)

(303) 497-6461 (FAX)

FREQUENCY CONTROL SYMPOSIA

1997 IEEE International Frequency Control Symposium

Orlando, Florida - 28 - 31 May 1997

For information contact:

Thomas E. Parker, *General Chair*
National Institute of Standards & Technology
Time & Frequency Division
Division 847
325 Broadway
Boulder, Colorado 80303
(303) 497-7881 (Phone)
(303) 497-6461 (FAX)
tparker@bldrdoc.gov (e-mail)

Gary R. Johnson, *Technical Program Chair*

Sawyer Research Products Inc.

35400 Lakeland Boulevard

Eastlake, Ohio 44095

(216) 951-8770 (Phone)

(216) 951-1480 (FAX)

g.johnson@ieee.org (e-mail)

1998 IEEE International Frequency Control Symposium

Pasadena, California

For information contact:

Thomas E. Parker, *General Chair*
National Institute of Standards & Technology
Time & Frequency Division
Division 847

FERROELECTRICS SYMPOSIA

1998 IEEE International Symposium on Applications of Ferroelectrics

Montreaux, Switzerland

For information contact:

Nava Setter, *General Chair*

Ecole Polytechnique Federale de Lausanne (EPFL)

Laboratoire de Ceramique

MX-D Ecublens

CH-1015 Lausanne

SWITZERLAND

(41) 21-693-2961 (Phone)

(41) 21-693-5810 (FAX)

nava.setter@lc.dmx.epfl.ch (e-mail)

An Invitation to Toronto - The 1997 IEEE International Ultrasonics Symposium

It is indeed a pleasure to invite you to join me in Toronto for the 1997 IEEE International Ultrasonics Symposium. The long history of our symposium dates back to the first meeting which was held in 1958 at Stanford University. Every year this symposium is held in a location that offers more than just convenience. We have come to expect an atmosphere that stimulates interaction and motivates enthusiasm. The 1997 meeting marks the third time the symposium has been held in Canada and the first time it has been held in Toronto. The word Toronto actually means "meeting place" so it is fitting that we should gather here to share the latest and most exciting discoveries in the field of ultrasonics. Toronto has an international reputation as a large multicultural city with a dynamic arts community. In fact Toronto is famous for its theater which rivals London and New York in terms of its variety and vitality. In October you can expect the weather to be cool (not cold) but beautiful as the fall colors are at their peak. This fall don't miss the opportunity to sample the excitement. Even if you have to stay an extra day or two, it will be well worth the effort.

As it does every year, the technical program promises to provide the world's most authoritative and up to date

view of research in ultrasonics. One of the wonderful features of the Ultrasonics Symposium is its' multidisciplinary nature which brings together basic and applied research in a number of different fields. Attendees will have the opportunity to interact with the worlds leading authorities in everything from fundamental materials issues through to commercial devices and their applications.

The members of the organizing committee (Kathy Ferrara, Tony Sinclair, Peter Smith, Doron Kishoni, Jian-Yu Lu, Peter Burns, and Susan Schneider) have toiled mightily on your behalf to make this the best Ultrasonics Symposium ever. I thank each of them for their generosity and their commitment to this endeavor. In turn we appreciate the efforts of the technical program committee and the guidance of the Administrative Committee of the ultrasonics, Ferroelectrics, and Frequency Control Society under whose auspices the Ultrasonics Symposium is organized.

See you in Toronto!

Stuart Foster
General Chair

1997 IEEE International Ultrasonics Symposium

Invited speakers for Toronto meeting

George Alers - National Institute of Standards & Technology

"Magnetostrictive Ultrasonic Transducers (MUTs)-
Their Complexity is Their Utility"

Jie Chen - Hewlett-Packard

"DC-biased PMN-PT materials and imaging transducers"

Prof. Gerald Diebold - Brown University

"Chemical Generation of Sound Waves: A 'Giant'
Photoacoustic Effect"

Peter Eccardt - Siemens AG, Germany

"Fabrication of Micromachined transducers"

Katherine Ferrara - University of Virginia

"Ultrasound contrast agents: bubbles in motion"

Professor Nesbitt Hagood - Department of Aeronautical and Astronautical Engineering, Massachusetts Institute of Technology

"Smart Structures"

Ken-ya Hashimoto - Chiba University JAPAN

"Optimum Leaky-SAW Crystal Cuts for Minimised
Insertion Loss Devices"

Professor Gordon Hayward - Ultrasonic Research Group

"Air Coupled NDE - Constraints and Solutions
for Industrial Implementation"

Fred Hickernell - Motorola, SSTG

"From PGUE to SU to UFFC, 1953 to 1997;
A Historical Perspective"

Kullervo Hynynen - Harvard Medical School

"Magnetic Resonance Imaging to monitor
ultrasound therapy"

Jin Kim - Motorola Inc.

"SAW Device Design Requirements for
Cellular System Applications"

Fred Lizzi - Riverside Research Institute

"Advances in ultrasound tissue characterization"

Matt O'Donnell - University of Michigan

"Signal processing strategies to simplify and
improve ultrasound imaging"

Kenneth S. Suslick - University of Illinois at
Urbana-Champaign

"Sonoluminescence and sonochemistry"

John Ullo - Schlumberger-Doll Research

"Recent developments in seismic exploration
and reservoir characterization"

Richard M. White - Berkeley Sensor and Actuator Center

"Micromachined Sensors and Actuators"

Henry Wohltjen, President - Microsensor Systems, Inc.

"Surfing the acoustic wave for fun and profit"

Social Program and Guest Tours - 1997 IEEE International Ultrasonics Symposium

Social Program

Evening Events

Sunday, October 5, 1997

Social Reception

6:00 PM to 8:30 PM

This year, we have decided to move the reception to the evening prior to the first technical sessions. So take this opportunity to relax and meet old and new acquaintances before the formal part of the Symposium begins. A cash bar will be available.

Monday, October 6, 1997

Anyone for the Theatre?

Toronto has become one of North America's centers for the performing arts. Guests interested in theatre or opera are invited to take the opportunity and attend one of the many events. Further information will be posted when the schedule has been finalized.

Alternatively, if sports is your game, Toronto offers you basketball with the NBA Raptors, hockey with the Maple Leafs, Canadian football with the Argonauts, and baseball with the Toronto Blue Jays (should the team make it once again to the World Series). Tickets will be procured for anyone wishing to attend such events.

Tuesday, October 7, 1997

Canada

Ontario Science Centre

6:15 PM to 10:00 PM

Price per person: US\$50

The major social event of the Symposium week is an evening at the Ontario Science Centre (<http://www.osc.on.ca>). Busses will leave the hotel starting at 6:00 PM for a 15-minute ride to the Centre. The evening will begin with hors d'oeuvres and an aperitif in the lobby. Guests will then be invited to view two short films in the adjoining Omnimax theatre. This theatre projects IMAX films onto a spherical screen that surrounds the spectators, and provides an ideal setting for showing the vast wilderness and spectacular sights from across Ontario and Canada.

The buffet dinner will be hosted in the Centre's Valley Restaurant and will have a Canadian theme. Enjoy British Columbia salmon, Alberta beef and a multitude of Ontario vegetables, greens, fruits and deserts.

Following dinner, you will be free to walk around many of the exhibits, including those on the Rain Forest, Environment, Transportation, and Science and Technology. Your admission will include two free alcoholic beverages. A cash bar will be available.

Guest Program. A varied program is being planned to entertain and inform visitors who register for the Symposium as guests. Registration permits you to enjoy our continental

breakfast each morning as well as the Sunday evening Social Reception. Detailed schedules for all activities including breakfast location, and exact times, prices, and departure points for tours will be available in the Symposium registration area, as well as at each breakfast.

Guest Tours

Monday, October 6, 1997

Full Day Tour of the Niagara Peninsula

This tour will begin with a visit to the mighty Niagara Falls (<http://tourismniagara.com/destniag/select.htm>), since no visit to Southern Ontario is complete without this stop. A Maid-of-the-Mist boat ride to the base of the Falls is included.

The bus will then follow the shore of the Niagara River to picturesque Niagara-on-the-Lake for lunch. The original capital of Upper Canada (now Ontario), and now home of the Shaw Festival, the town has maintained its New England style charm, with exclusive boutiques and fine dining.

The leisurely return trip along the Niagara wine route (<http://www.wineroute.com/>) will include a stop at the Henry of Pelham Winery. In recent years, Ontario wines have routinely won international wine competitions, of which wines from Henry of Pelham have won over fifty. The tour includes a detailed explanation of grape growing, winemaking and wine appreciation, and ends with a tasting in the winery inn.

Price per person (including lunch): US \$40.00

Tuesday, October 7, 1997

Full Day Tour - Canadian Art

The focus of this tour will be the McMichael (<http://www.mcmichael.com/>) Art Gallery. Located in a rustic log and stone building nestled in a woodland setting with spectacular views of autumn foliage, it is home to one of the largest displays of 20th-century Canadian art. It includes works by Tom Thomson and the famous Group of Seven, as well as an extensive collection from First Nations, Inuit and contemporary artists. The Gallery Shop is well stocked with exquisite, moderately priced and unusual items.

Following lunch at the McMichael Gallery restaurant, you will visit the Black Creek Pioneer Village, an authentic mid-19th century village with over 40 restored homes and shops staffed by costumed interpreters.

On the return trip, the bus will drive by many of the architectural sights on Toronto, including trendy Yorkville Village, the Ontario Legislature, the University of Toronto, Casa Loma, Ontario Place, the CN Tower and China Town.

Price per person (including lunch): US\$35.00

Wednesday, October 8, 1997

Half-Day Walking Tour of Toronto

Since the Symposium is being held in the center of Toronto, why not just wander around and enjoy the city? Within four blocks of the Marriott Hotel, you can visit the Eaton Centre,

the Art Gallery of Ontario, Yonge Street, . . . For those of you wishing to venture a little further afield, the Toronto subway is a fast and easy way to get around. Maps will be provided.

Price per person: Free.

Advanced registration for tours is encouraged and should be made on the Advance Registration Form. Note that the tours have minimum registration levels in order to be offered, so your help in planning is appreciated!

CALL FOR PAPERS

Special Issue on Sensors and Actuators (Submission Deadline: September 1, 1997)

The IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control invites the submission of manuscripts on the topics of sensors and actuators that fall within the scope of the UFFC Transactions, including, but not limited to:

- Accelerometers
- Actuators
- Actuator materials
- Actuator theory and design
- Biosensors
- Electric and magnetic sensors
- Flow sensors
- Gas sensors
- Liquid sensors
- Mechanical sensors
- Microactuators
- NDE sensors
- Sensor materials
- Sensor theory and design
- Temperature, pressure, humidity and dew point sensors

All contributions must be sent to the Editor-in-Chief

William D. O'Brien, Jr.
Department of Electrical and Computer Engineering
University of Illinois
405 North Mathews
Urbana, IL 61801
217/333-2407

In the transmittal letter identify that the contribution is being submitted for publication consideration for the Sensors and Actuators Special Issue. Consult the "Information for Contributors" for manuscript preparation requirements published in the January, 1997 issue. All papers are subjected to the normal peer-review process. Submission deadline is September 1, 1997 and the expected publication date is early- to mid-1998.

IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control

INFORMATION FOR CONTRIBUTORS

(Also available on the web:

<http://bul.eecs.umich.edu:80/uffc/index.html>)

Field of Interest: The scope of interest of the IEEE Ultrasonics, Ferroelectrics and Frequency Control Society shall include the theory, technology, materials, and applications relating to: (1) the generation, transmission, and detection of mechanical waves and vibrations and their interactions with other phenomena; (2) medical ultrasound, including hyperthermia, bioeffects, tissue characterization and imaging; (3) ferroelectric, piezoelectric, and piezomagnetic materials, including crystals, polycrystalline solids, films, polymers, and composites; (4) frequency control, timing and time distribution, including crystal oscillators and other means of classical frequency control, and atomic, molecular and laser frequency control standards. Areas of interest range from fundamental studies to the design and/or applications of devices and systems within the general scope defined above. Broad categories of the field of interest include:

1. Acoustic Microscopy
2. Actuators
3. Bulk Acoustic Wave (BAW) Devices
4. Biological Effects
5. Biophysical Mechanisms
6. Chemical Effects and Mechanisms
7. Elastic Wave Phenomena
8. Exposimetry and Dosimetry
9. Flow Techniques - Industrial
10. Flow Techniques - Medical
11. Ferroelectrics
12. Frequency Control
13. Geophysical Ultrasonics
14. High Power Ultrasound
15. Industrial Measurement and Control
16. Materials
17. Medical Imaging
18. Micromachining
19. Nondestructive Evaluation
20. Optical Interaction
21. Physical Acoustics
22. Sensors
23. Surface Acoustic Wave (SAW) Devices
24. Systems Applications
25. Therapeutics
26. Thin Films
27. Transducers - Air Coupled
28. Transducers - High Power Industrial
29. Transducers - Imaging
30. Underwater Ultrasound

Submission: Contributions should be specifically prepared for this TRANSACTIONS and submitted directly to the Editor-in-Chief:

William D. O'Brien, Jr.
Department of Electrical and Computer Engineering
University of Illinois
405 N. Mathews
Urbana, IL 61801
217/333-2407
FAX: 217/244-0105
Internet: wdo@uiuc.edu

Types of Contributions: There are three types of contributions as follows. PAPERS may be of any length and must generally satisfy requirements for completeness. Approximately ten weeks for the initial review cycle should be allowed. Manuscripts may be returned to authors for revision in response to reviewers recommendations. CORRESPONDENCES are narrower in scope and shorter than Papers. Correspondences typically do not occupy more than four TRANSACTIONS pages. Both Papers and Correspondences receive the same level of review. LETTERS are short, rapid communications for which timeliness is essential. Letters will be reviewed only for acceptance or rejection and, if accepted, will normally be published within three months (from receipt to appearance in print). Published Letters must occupy no more than two TRANSACTIONS pages.

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Submitted Contribution Format: Submit an original plus four typewritten, double-spaced, single-column, single-sided copies, including references and figure captions, on 8.5 x 11 in. (21.6 x 27.9 cm) to the Editor-in-Chief. Each contribution must contain an abstract (not more than 200 words for Papers and 50 words for Correspondences and Letters). References must be complete, in IEEE style, and appear in a separate reference section at the end of the contribution, double-spaced, single-column, single-sided, with corresponding items in the text referred to by numerals in square brackets. Reference style for papers: Author, first initial followed by last name, title, periodical, volume, inclusive page numbers, month, year. Reference style for books: Author, title. Location: publisher, year, chapter or page numbers. Biography and a recent photograph of the

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 - title
 - author(s) names and locations
 - abstract
 - body of text including equations

- references in IEEE format
- tabular material with captions
- figure captions
- biographies

Tabular data:

- Tables can be included as part of the text file.
- Do not use vertical rules.

Acceptable word processing programs include:

- TeX
- LaTeX
- AmiPro
- Microsoft Word
- Microsoft Works DOS
- Microsoft Works Windows
- Word DOS
- Word for Windows
- WordPerfect DOS
- WordPerfect MAC
- WordPerfect Windows
- WordStar

Page layout software such as Ventura, Pagemaker, and Quark are not acceptable.

General comments for graphics:

- Include on same disk or separate disk but as separate files.
- Save graphics as DOS-encoded or Macintosh .tif or .eps.
- If separate disk, label with author name(s), computer hardware and software used.
- Do not put boxes around art.
- Include paper copies of all art.
- Photographs must be glossy with no screens.
- Laser prints are not acceptable in place of photographs.
- All art must be in black and white unless approval for four-color has been given.
- Lettering should be large enough to be readily legible when the drawing is reduced to 1 or 2 column width.
- Number each graphic at the bottom front of the sheet.
- Corrections cannot be made to a graphic at proof stage. Author must submit a new corrected disk version and paper copy of an incorrect figure.

Information for IEEE Transactions and Journal Authors is available on request from IEEE Operations Center, Transactions/Journal Department, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, by email to "trans@ieee.org", by fax at 908-562-0545 or by the World Wide Web at "http://www.ieee.org".

IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control

REQUEST FOR REVIEWERS

The *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* endeavors to maintain a pool of highly qualified reviewers. The following list contains the main and sub-topics included within the technical scope of the *UFFC Transactions*. If you would like to serve as a reviewer please circle the appropriate main and/or sub-topics. Current reviewers are also requested to complete the form. Return this form to William D. O'Brien, Jr., Editor-in-Chief, Department of Electrical and Computer Engineering, University of Illinois, 405 N. Mathews, Urbana, IL 61801.

Name & Title: _____

Complete Mailing Address: _____

Phone: _____

FAX: _____

1. Acoustic Microscopy

Applications
 Biological
 Condensed Matter
 Industrial
 Medical
 Backscatter Microscopes
 Calibration Techniques
 Field Measurements
 Image Formation
 Inanimate Material Properties
 Instrumentation
 Models and Modeling
 Quality Control
 Quantitative Measurements
 Signal Processing
 Through-Transmission Microscopes
 Tissue Properties
 Transducers
 Types of Acoustic Microscopes
 Spectroscopy

2. Actuators

Arrays
 Bimorphs
 Control Systems
 Electrostrictives
 Materials
 Modeling
 Piezoelectrics
 Pyroelectrics
 Stack Transducer
 Theory
 Transducers

3. Bulk Acoustic Wave (BAW)

Devices

Delay Lines
 Dielectric Characterization
 Filters
 Frequency Sources
 Frequency Synthesizers
 Hysteresis Modeling
 Materials
 Models and Modeling
 National/International Standards
 Phenomena

Resonators
 Sensors
 Signal Processing
 Transducers

4. Biological Effects

Clinical Safety
 Epidemiology
 Industrial Safety
 Intermediate Effects
 Models and Modeling
 Thermal Effects
 Nonthermal, Noncavitation Effects
 Risk Assessment

5. Biophysical Mechanisms

Absorption Mechanisms
 Attenuation Mechanisms
 Boiling of tissue by cavitation or thermal or combination
 Contrast Mechanisms (for Imaging)
 Free Radical Production
 Intermediate Mechanisms
 Mechanical Force Effects
 Models and Modeling
 Nonlinear Phenomena
 Nonthermal, Noncavitation Mechanisms
 Scattering Mechanisms
 Shock Waves
 Spallation (Lithotripsy)
 Streaming Mechanisms
 Synergism among Mechanisms
 Thermal Mechanisms
 Ultrasound wave propagation in inhomogeneous media

6. Chemical Effects and Mechanisms

Cavitation and Bubble Dynamic
 Chemical effects on materials
 Field Measurements
 Generation Techniques
 Homogeneous
 Heterogeneous, Liquid-Liquid Reactions
 Heterogeneous, Liquid-Solid Reactions
 Measurement Techniques
 Mechanisms
 Models and Modeling
 Sonoluminescence

7. Elastic Wave Phenomena

Bluestein-Gulyaev Waves
 Bulk Acoustic Waves
 Diffraction and Scattering Phenomena
 Direct Solutions
 Fluid/Solid Interaction/Interfaces
 Interfacial Waves
 Inverse Solutions
 Joint Time-Frequency Signal Processing
 Lamb Waves
 Loss Mechanisms
 Love Waves
 Rayleigh Waves
 Steady State Solutions
 Stoneley Waves
 Structural Acoustics
 Surface Acoustic Waves
 Transient Solutions
 Waveguides and Resonators

8. Exposimetry and Dosimetry

Biophysical Endpoints
 Calibration Techniques
 Calorimeters
 Chemical Techniques
 Derating Models
 Exposure Quantities
 Hydrophones
 Intensity Measurements
 Measurement Techniques
 Models and Modeling
 National/International Standards
 Optical Techniques
 Power Measurements
 Pressure Measurements
 Radiation Force Techniques
 Thermal Measurements
 Thermocouple Techniques
 Tissue Phantoms

9. Flow Techniques - Industrial

Applications
 Calibration Techniques
 Contrast Agents
 Doppler Techniques
 Flow Imaging Systems
 Flow Transducers

- Frequency-Domain Techniques
- Models and Modeling
- Narrow-Band Techniques
- National/International Standards
- Performance Evaluation Techniques
- Pseudorandom Code Doppler
- Signal Processing Techniques
- Time-Domain Techniques
- Theory
- Transverse Doppler
- Wide-Band Techniques

10. Flow Techniques - Medical

- Applications
- Calibration Techniques
- Color-Flow Doppler
- Contrast Agents
- Doppler Techniques
- Flow Imaging Systems
- Flow Transducers
- Frequency-Domain Techniques
- Models and Modeling
- Narrow-Band Techniques
- National/International Standards
- Performance Evaluation Techniques
- Perfusion
- Power Doppler
- Pseudorandom Code Doppler
- Signal Processing Techniques
- Spectral Doppler Techniques
- Time-Domain Techniques
- Theory
- Transverse Doppler
- Wide-Band Techniques

11. Ferroelectrics

- Actuators
- Antiferroelectrics
- Capacitors
- Ceramics
- Composites
- Devices
- Dielectric Characterization
- Electrostrictors
- Ferroelectric Devices
- Ferroelectric Filters
- Free-Energy Expansions
- Grain Boundaries
- Hysteresis Modeling
- Liquid Crystals
- Material Properties
- Models and Modeling
- National/International Standards
- Polar Dielectrics
- Polymers
- Pyroelectrics
- Sensors
- Single Crystals
- Smart Materials
- Storage
- Switching Systems
- Thin Films
- Transducers

12. Frequency Control

- Ageing
- Applications
- Atomic, Molecular, and Optical Techniques
- Bulk Acoustic Wave Techniques
- Circuits
- Distribution
- Filters
- Frequency Sources

- Frequency Synthesizers
- Materials Properties
- Measurements
- Models and Modeling
- National/International Standards
- Oscillators
- Packaging
- Quartz
- Resonant Structures
- Satellite Techniques
- Surface Acoustic Wave Techniques
- Theory

13. Geophysical Ultrasonics

- Applications
- Field Measurements
- Imaging Techniques
- Models and Modeling
- National/International Standards
- Non-Imaging Techniques
- Sensors
- Signal Processing
- Transducers

14. High Power Ultrasound

- Applications
- Cleaning
- Calibration
- Cavitation Phenomena
- Material Processing
- Measurement Techniques
- National/International Standards
- Thermal Phenomena
- Welding

15. Industrial Measurement and Control

- Applications
- Process Control
- Process Measurement
- Models and Modeling
- National/International Standards
- Sensors
- Signal Processing

16. Materials

- Backing Materials
- Ceramics
- Composites
- Crystals
- Electrostrictives
- Ferroelectrics
- Fluids
- Lens
- Liquid Crystals
- Magnetostrictives
- Matching Layers
- Models and Modeling
- National/International Standards
- Piezoelectrics
- Polymers
- PVDF
- PVDF-Copolymer Composites
- Pyroelectrics
- Thin Films

17. Medical Imaging

- Aberration correction
- Adaptive Beamformation
- Artifacts
- B/A Imaging
- Beamforming
- Beam Steering
- Contrast Agents
- Elasticity Imaging

- Elevation Focusing
- Focusing Techniques
- Harmonic Imaging
- Image Contrast and Point Resolution
- Image Metrology
- Image Processing
- Image Rendering
- Image Scan Converter
- Imaging Systems
- Imaging through Inhomogeneous Media
- Intraluminal Imaging
- Inverse Problem
- Medical Imaging Systems
- Models and Modeling
- National/International Standards
- Parametric Imaging
- Phase Aberration
- Quantitative Imaging
- Scatter Imaging
- Signal Processing
- Strain Imaging Techniques
- Three-Dimensional Imaging
- Tissue Characterization Imaging
- Tomography
- Ultrasonic Imaging

18. Micromachining

- Limited to piezoelectric or other electromechanical phenomena, including
 - Bulk Micromachining
 - Electromechanical Phenomena
 - Microelectromechanical Structures/Systems (MOMS)
 - Models and Modeling
 - Piezoelectric Phenomena
 - Silicon Processing
 - Solid State Electrical and Mechanical Effects
 - Surface Micromachining
 - Ultrasonic Motors

19. Nondestructive Evaluation

- Acoustic Emission
- Calibration Techniques
- Defect Detection
- Dimensional & Surface Features
- Field Measurements
- Focusing Techniques
- Imaging Techniques
- Intrinsic Material Properties
- Material Elasticity
- Materials Testing and Evaluation
- Micro-optomechanical Structures/Systems (MOMS)
- Models and Modeling
- National/International Standards
- Scattering Phenomena
- Signal Processing

20. Optical Interaction

- Acoustooptics (Active and Passive)
- Applications
- Devices
- Electrooptics
- Fiber Optics
- Integrated Optics
- Magnetooptics
- National/International Standards
- Piezooptics
- Theory

21. Physical Acoustics

- Absorption Phenomena
- Anisotropic media
- Diffraction Phenomena

Dispersion Phenomena
 Electron-Phonon Interaction
 Field Measurements
 Granular Media
 Internal Friction
 Laser Excitation of Acoustic Waves
 Layered Media
 Magnetoelastic Phenomena
 Models and Modeling
 National/International Standards
 Nonlinear Phenomena
 Phase Transitions
 Phonon-Phonon Interaction
 Phonon-Plasmon Interaction
 Phonon-Polariton Interaction
 Photoacoustics
 Piezoelectric Phonons
 Porous Media
 Propagation Phenomena
 Quantum Fields
 Relaxation Processes
 Scattering Phenomena
 Solid/Liquid Helium
 Spectroscopy
 Spin-Phonon Interaction
 Superlattices
 Thermoultrasonics

22. Sensors

Bulk Acoustic Wave Based Sensors
 Calibration Techniques
 Control Systems
 Electrostrictives
 Ferroelectrics
 Fiberoptics
 Ionic Conductors
 Laser Detection of Acoustic Waves
 Micromachined Systems
 Models and Modeling
 National/International Standards
 Optical Systems
 Oscillators
 Photonics
 Piezoelectrics
 Pyroelectrics
 Robotics
 Signal Processing
 Surface Acoustic Wave Based Sensors
 Transducers
 Thermocouples
 Thin Film

23. Surface Acoustic Wave (SAW)

Devices

Acoustic Charge Transport Devices
 Acoustoelectronics
 Convolver
 Correlators
 Delay Lines
 Filters
 Frequency Sources
 Frequency Synthesizers
 Harmonics
 Leaky Surface Acoustic Waves
 Materials
 Models and Modeling
 National/International Standards
 Phenomena
 Pulse Compression/Expansion
 Reflective Array Compressors
 Resonators
 Resonator-Filters
 Sensors
 Signal Processing

Surface-Skimming Bulk Waves
 Surface Transverse Waves
 Theory
 Transducers
 Wave Guides

24. Systems Applications

Bulk Wave and Surface Acoustic Wave Based Applications
 Computer clocks
 Filters
 General communication systems
 Mass, temperature and acceleration sensors
 Oscillators
 Surface Acoustic Wave Based Applications
 Chirp radars
 Coded filters for spread spectrum and code division multiple access (CDMA) communication systems
 Identification Tags
 Modulators
 Organic and inorganic sensors
 Real time convolvers and correlators
 Spectrometers
 Timing recovery elements for fiber optic networks
 Touch screens
 Wireless keys and remote entry

25. Therapeutics

Ablation Techniques
 Calibration Techniques
 Diathermy
 Duplex System (Imaging and Therapy)
 Field Measurements
 Heating Inhomogeneous Media
 High Intensity Focused Ultrasound (HIFU)
 Hyperthermia
 Interaction Mechanisms
 Lithotripsy
 Models and Modeling
 National/International Standards
 Signal Processing
 Surgery
 Temperature Measurements
 Transducers

26. Thin Films

Acoustic, Mechanical and Dielectric Properties
 Acoustoelectronics
 BAW Transducers
 Contact Phenomena
 Dielectric Films
 Electrostrictive Films
 Ferroelectric Films
 Magnetoelastic Films
 Magnetostrictive Films
 Models and Modeling
 National/International Standards
 Piezoelectric Thin Films
 Pyroelectric Films
 Resonators
 SAW Transducers
 Sensors
 Stacked-Crystal Filters
 Stacked-Crystal Resonators

27. Transducers - Air Coupled

Applications
 Calibration Techniques
 Fabrication Techniques
 Field Measurements
 Matching-Acoustic

Matching-Electrical
 Matching-Mechanical
 Materials
 Models and Modeling
 Theory
 Types

28. Transducers - High Power

Industrial

Applications
 Calibration Techniques
 Fabrication Techniques
 Field Measurements
 Horns
 Machining
 Materials
 Matching-Acoustic
 Matching-Electrical
 Matching-Mechanical
 Models and Modeling
 Theory
 Welding

29. Transducers - Imaging

Apodization
 Arrays
 1.5-D
 2-D
 Annular
 Circular
 Curvilinear
 Linear
 Phased
 Sparse
 Cabling and Switching
 Fabrication Techniques
 Focusing
 Interconnections
 Matching-Acoustic
 Matching-Electrical
 Matching-Mechanical
 Materials
 Models and Modeling
 Theory

30. Underwater Ultrasound

Calibration Techniques
 Detection
 Echo Ranging
 Equipment
 Field Measurements
 Generation
 Heterogeneous Media
 Imaging
 Interaction Phenomena
 Models and Modeling
 National/International Standards
 Noise
 Biological
 Bubbles
 Cavitation
 Scattering Phenomena
 Signal Processing
 SONAR (Active and Passive)
 Transducers
 Waveguide Phenomena

EXPRESS YOUR VIEWS.

Your ideas are valuable!

Nominations for UFFC-S ACHIEVEMENT AWARD

The Achievement Award is the highest Society-wide award presented to a member in special recognition of outstanding contributions. You are encouraged to identify members you feel deserve to be honored. The award is granted for significant technical publications in the field of ultrasonics, ferroelectrics, or frequency control; for presentation of lectures; and/or for service to the Society.

The award embraces all technical fields in the society, and includes both technical and organizational achievements. Each nomination receives serious consideration by the Officers and the Awards Committee. Participate by filling out the attached form.

Photocopy this section and send via FAX or mail:
(You may submit more than one if you wish.)

Here is my nomination for **Achievement Award**:

Nominee's Name & Main Contributions: _____

Your Name/Address: _____

Send at anytime to: Roger H. Tancrell
Chair, UFFC-S Awards Committee
7 Valyn Lane
Wilmington, MA 01887-1147
Tel/FAX: (508) 657-9748
e-mail: r. tancrell@ieee.org

Nominations for DISTINGUISHED LECTURER AND/OR TOPIC

The UFFC-S Distinguished Lecturer is welcomed by organizations around the world to present an up-to-date review of new developments in ultrasonics, ferroelectrics, or frequency control. The Distinguished Lecturer represents the Society to the larger technical community and stimulates interest in the Society's professional areas. Recent lecturers have spoken to local chapters, universities and companies throughout North America, Japan, Europe, China, and South America.

Which topics would you like to hear? Which member would give a stimulating lecture? Fresh ideas are always welcome. Be heard by filling out the attached form.

Photocopy this section and send via FAX or mail:
(You may submit more than one if you wish.)

Suggestions for the next **Distinguished Lecturer and/or Topic**:

Your Name/Address: _____

Send at anytime to: Prof. Mack A. Breazeale
Chair, UFFC-S Distinguished Lecturer
Subcommittee
The National Center for Physical Acoustics
University of Mississippi
University, MS 38677
Tel: (601) 232-7490
FAX: (601) 232-7494

Notes from the Editor

The first part of the spring issue of the newsletter brings you a State of the UFFC-S message from our president, Don Malocha. Don manages to wade through all of the extra work it takes for the UFFC Society and still keep a broad smile on his face. I think he expresses quite well the pride we all take in our UFFC Society. The fellow with the mischievous grin and the handle-bar moustache is our 1997/98 Distinguished Lecturer, William D. O'Brien Jr. Be sure and schedule him for a presentation. His biography and abstract are near the front of this newsletter. His email address is wdo@uiuc.edu

The 51st meeting of the Frequency Control Symposium is coming up the end of May. Tom Parker, General Chair, is looking forward to our participation in the 1997 FCS meeting. There is information on the meeting in the newsletter. They are looking for a good turnout from the sensor community. If you need an advanced program contact Mike Mirarchi at (908) 280-2024.

In August the International Symposium on the Applications of Ferroelectrics was held near Rutgers University with Ahmed Safari as the General Chair. It was a great meeting and Ahmad and Bill Wilber have captured the spirit of that meeting with an article and some wonderful photographs. I just wish they had captured the vocal groups on tape. Are you saving your Swiss Francs for the 1998 Symposium?

The 1996 Ultrasonics Symposium in San Antonio was another great meeting. Jeff Schoenwald provides a summary followed by some photographic reminders. Elke Lerch took her responsibility of covering the guest program very seriously and the results are her reflections and photos.

Thanks to Professor George Mansfeld and Valentin Kuleshov for the report on the Acoustoelectronics, Frequency Control, and Signal Generation Symposium held this past September in Moscow. They are planning another symposium in September of 1998 and encourage participation from the international community.

Biographies and pictures of the newly elected Administrative Committee members; Bill Hunt, Dennis Pape, Bob Potter, and Kazuhiko Yamanouchi are lead off the Society business section in this issue. Also Peter Wright has been appointed as an AdCom member, taking the place of Tom Shoup who has moved out of the field of Ultrasonics. Contact the president or any of the AdCom members to express any concerns or suggestions. Herman van de Vaart reports an excellent financial picture. Gary Montress reports on the the minutes of the AdCom meeting. Welcome to our new members, which represent quite a cross-section

of our world. We may have missed a few due to computer glitches and I apologize if you do not see your name on the list. Chapters' news is picking up. The Japanese and Russian Chapters are very active. In the United States, Boston, Orlando, and Phoenix have reported in. If you want to get a UFFC-S Chapter going in your area contact Emad Ebbini at emad@eecs.umich.edu.

Take note of the schedule of future symposia. Stuart Foster has provide you with some very enticing words and an unbeatable social program for the Ultrasonics Symposium in October. An interesting international schedule is in store for all the symposia over the coming years.

There are again a couple of continuing action items for members. Society nominations for the Achievement Award and for the Distinguished Lecturer are solocited. Take time to let Roger and Mack know who your choices are. A simple form is available to fill out and send in.

We salute Gerald Farnell for his Fellow award and Chen Tsai for his Microoptics award. Your newsletter editor is anxious to publicize member activities and happenings, so don't hesitate to inform the newsletter editor. Bruce McAvoy sent me the article about Len Cutler.

Note the Web sites listed and tune in for information you need about IEEE, UFFC, and a new sensor site. We are looking for some assistance with the UFFC site.

I trust you will enjoy this issue of the newsletter. Special thanks go to Robin Edwards and her coworkers at IEEE Magazines/Newsletters for final assembly of this newsletter edition. It is their touch that makes this newsletter come alive. The nimble fingers of my wife Thresa put some of the articles in electronic form. The invitation is always there to any of our members to submit articles, photographs, and information which will be of interest to our readership. The next deadline falls around August 15, 1997, for the fall newsletter. The easiest way to communicate is email if you have it available. My address is f.hickernell@ieee.org. I have a fax-(602) 441-7714, a phone-(602) 441-2923, and an address-Motorola SSTG, 8201 E. McDowell, Scottsdale, AZ 85252. I look forward to hearing from you.

Fred Hickernell
Newsletter Editor

UFFC-Soc on the Web

<http://www.ieee.org/society/uffc>

The UFFC-Soc web site became operational in early 1996, thanks to the efforts of Prof. Emad Ebbini and graduate student Osama Haddadin, University of Michigan. Haddadin has been the software webmaster since the site's inception. He has done an excellent job (at no cost to the Society).

In its first year of existence, the web site has been accessed ("hit") at an increasing rate. The counter passed 5,000 on 10 March 1997. As the site accumulated more and more information, and as the various search engines discovered and catalogued its contents, the rate of hits reached about 200 per week, as of February-March 1997. In April it has increased to 300 hits per week.

The site consists of four sections: a main section, and a section for each of the three UFFC-Soc areas of interest, Ultrasonics, Ferroelectrics, and Frequency Control. The main section includes: the scopes of each of the areas of interest, the Administrative Committee membership, the Society Constitution, information on our Transactions and related publications, membership information, and links to chapters and UFFC related Internet resources.

The Ultrasonics page consists of links to Ultrasonics Symposium related information, and to related Internet resources. The Ferroelectrics page consists of a link to the International Symposium on the Applications of Ferroelectrics (ISAF) and to the Ferroelectricity Newsletter.

The Frequency Control page is the only page which has a content webmaster so far (see the article that follows). UFFC-Soc V.P. John Vig is the webmaster. In addition to a listing of the areas of interest, the page includes information on the 1997 and subsequent Frequency Control Symposia, a searchable database of the abstracts of all Symposium proceedings ever published (since 1956), ordering information for all the Proceedings, a link to table of contents of current issues of all IEEE Transactions, a listing of past winners of the Cady, Rabi and Sawyer Awards, a listing of all past Symposium chairmen, reference information, and links to related Internet resources. The reference information includes "The Constants of

Quartz," by Roger Ward, and a tutorial, "Introduction to Quartz Frequency Standards," by John R. Vig. The links include: "Directory of Companies, Organizations and People," "Glossary of Time and Frequency Control Terms," "Glossary of Telecommunication Terms," and "Fundamental Physical Constants".

Web Contributors Wanted

The UFFC-Soc. needs volunteers in the following areas:

- Content webmaster for the Ultrasonics page. This person will decide what should be included on the page, and gather or generate the information.
- Content webmaster for the Ferroelectrics page.
- Content webmaster for the main page.
- Contributors of reference materials, including tutorial and review papers. A suggestion has been received to also include software code which others may use (and modify). Previously published material is acceptable, provided that no copyright violations result from posting the document or software.
- Contributors of historical information of general interest.
- HTML document generators - convert documents (contributed by others) into HTML. Scan, OCR and spell check the documents, if necessary.
- A person to organize and lead a group of volunteers in an effort to scan, etc. abstracts of past Ultrasonics Symposia for building a database and posting it onto the web.
- Suggest links to UFFC relevant (noncommercial) information which is available on the web. Suggestions for links to commercial web sites can be sent to Ji Wang, webmaster of the above mentioned "Directory of Companies, Organizations and People" (jiwang@epal.smos.com).

If you wish to volunteer, or would like further information, please contact John Vig at J.Vig@IEEE.org.



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