

IEEE

NEWSLETTER



SONICS & ULTRASONICS GROUP

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Ford Motor Company
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24500 Glendale Avenue
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“1975 WAS A VERY GOOD YEAR”

by Alfred J. Bahr

Yes, I expect 1975 to be a very good year for the Sonics and Ultrasonics Group. Thanks to the efforts of many dedicated individuals, the Group is more viable and dynamic than ever before. As I take over as president of the AdCom for 1975 I am presented with a broad range of Group-supported activities that form a strong basis for the future development of the Group:

- . The Transactions—the publication of six issues per year starting in 1975 will result in a decreased publication time. In addition, the series of review articles being initiated by the editor is an important step in improving the coverage of the different areas in our field of interest.
- . The Ultrasonics Symposium—this symposium is well established as an international forum for the presentation of new results in the field. The recent symposium in Milwaukee was well attended and, in my opinion, was "one of the best ever." I expect next year's symposium in Los Angeles to be no exception.
- . The Symposium Proceedings—only three years old, this publication has proved to be a very valuable reference for the active workers in the field. The Proceedings is available within about two months after the Symposium and, therefore, often contains the very latest information on a particular subject.
- . The Technical Committees—the Group presently has one technical committee: the Technical Committee on Transducers and Resonators. Within the committee there are five subcommittees: piezoelectric crystals, piezomagnetism, delay lines, medical ultrasonics, and ferroelectricity. These groups have been particularly active in preparing definitions and standards. For example, the subcommittee on piezoelectric crystals has nearly completed a revised standards on piezoelectricity.

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PRESIDENT'S REPORT

by Norman F. Foster

During the last year I have had the opportunity to make contact with several of the IEEE groups and societies (G/S). Now as 1974 comes to an end, and with it my term as president of this group, I find the major impression left from these contacts is one of a basic similarity among the objectives, activities, and problems of the G/S rather than their differences. Each G/S is trying through its administrative committee (AdCom), to search out and meet the technical and professional needs of the members and, more broadly, of that segment of the scientific community which the G/S serves. The two basic media through which G/S communicate with their communities are Publications such as Transactions, Meeting Proceedings, and Newsletters, and Meetings such as Annual Topical Symposia and Chapter Meetings. The relative importance of these media vary somewhat from G/S to G/S, but many, including our own group, use all four. The most generally useful medium in the minds of you, the members of G-SU, appears to be the Transactions. In the 1971 survey carried out by the G-SU AdCom, over three quarters of the respondents indicated a principal interest in the Transactions; and in the more recent survey administered across all G/S, 93 percent of the G-SU respondents rated our Transactions as useful or very useful. Steve Wanuga, our Transactions editor, and his editorial staff have expended a great deal of time and effort in improving the breadth of coverage and reducing the turn-around time for the publication. The recent issues clearly show the fruits of their labors, and this continuing activity will ensure six - yes six - substantial issues next year. The Newsletters have also taken on a new look with substantially increased content and variety over the last few years under the editorship of Emmanuel Papadakis, who incidentally, will always welcome Newsletter material from members. The third in the series of Ultrasonics Symposium Proceedings will be available shortly and will be particularly valuable this year, as papers by over 90 percent of the symposium authors will be included, a fine tribute to the work of John de Klerk and his associates.

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"1975 WAS A VERY GOOD YEAR"

. The Chapters—the Group now has two active chapters, one in the Boston area and one in the western Pennsylvania area (Pittsburgh). Both chapters have excellent lecture programs planned for the forthcoming year.

With these activities well established, and with the Group in a sound financial position, I see my job for the forthcoming year not as one of major overhaul and innovation, but rather as one of developing and strengthening. With the help of my committee members I will be reviewing ways in general of improving the coverage of our areas of interest through our publications, symposia, and technical committees. In addition, we will be seeking to establish more chapters, perhaps in the form of joint chapters in places where local interest is not sufficient to support an Ultrasonics chapter on its own. On the administrative side, I plan to implement a long needed revision in the Group's Constitution and to examine the organization of the administrative committee with a view to improving its effectiveness.

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PRESIDENT'S REPORT

Each of the surveys referred to above have shown that our annual symposia closely follow the Transactions in order of importance to our members. The November symposium in Milwaukee was yet another in the series of highly successful meetings, combining a broad spectrum of tutorial sessions with more than 20 topical sessions, including nearly 200 invited and contributed papers covering all of the major areas of activity within the group. Somewhat perhaps to the surprise of some attendees, Milwaukee proved to be an excellent host city. Moises Levy, Larry Kessler, and their many associates are to be congratulated for their organization and planning.

G-SU has not been an active group in terms of chapters. The Boston chapter under the chairmanship of Paul Carr has had another active year but until this year was our only chapter. A second chapter has now been formed in the Pittsburgh area by Professor Tsai from Carnegie-Mellon University; and with the additional support now being offered by IEEE, the formation of additional chapters in other areas, perhaps jointly with other G/S, seems likely. Any suggestions?

Altogether 1974 has been a good year for our group. I believe that the group has again provided a useful service to its members at a very reasonable cost—that is our *raison d'etre*.

Best wishes for a successful and enjoyable 1975.

G-SU ADCOM NOTES

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

The following is a brief account of the G-SU AdCom meeting of November 10, 1974, which was held during the 1974 Ultrasonics Symposium in Milwaukee, Wisconsin.

The group's scope is being modified to reflect more accurately the technical areas which G-SU represents.

The AdCom agreed to co-sponsor the Ferroelectrics Symposium to be held June 9, 10 and 11, 1975, in Albuquerque, New Mexico. C. Land is the General Chairman.

The Transaction's Editor (S. Wanuga) recently initiated a plan to include review articles. The first appeared in the July, 1974 issue on the topic "Ultrasound in Medicine - A Review."

The following topics will appear in future issues:

Filters and Resonators
Industrial Applications
Underwater Sound
Acoustic Holography
Physical Acoustics
Acoustooptic Interactions
Piezoelectric and Magnetostrictive Materials
Surface Waves

The financial condition of the group appears to be very stable. Over the past few years, the group showed a surplus. Under worse case analysis, the year end status for 1974 will be break even.

Future Ultrasonic Symposia will be held as follows:

1975: Los Angeles, California
September 22-24, 1975
R. Stern, General Chairman
G. Alers, Program Chairman
1976: Annapolis, Maryland
September 29 - October 1, 1976
L. Whicker, General Chairman
P. Carr, Program Chairman
1977: Phoenix, Arizona
October 12-14, 1977
F.S. Hickernell and I. Kaufmann, Co-chairmen
1978: Philadelphia, Pennsylvania
1979: Houston, Texas

G-SU's membership statistics reflect an increase in the number of members at a time when other groups are experiencing a decrease. The growth, in part, is attributed to the half-price membership offer at the Ultrasonics Symposium.

The Nomination Committee submitted a slate of six, from which three will be elected by the G-SU membership to serve as an AdCom member from January, 1975 to December, 1977. They are T.W. Bristol, K.H. Breck, P.H. Carr, F.S. Hickernell, M. Levy and F.L. Thurston.

The G-SU officers for 1975 were elected by the AdCom. They are:

A.J. Bahr, President
J. de Klerk, Vice President

1975 G-SU ADCOM

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1975 NOMINATIONS FOR THE G-SU ADCOM by Melvin G. Holland

The following people have been nominated for election to the G-SU AdCom for the three-year term, 1975-1977:

T.W. Bristol, Hughes, California
K.H. Breck, Sonic Instruments, Pennsylvania
P.H. Carr, AFCRL, Massachusetts
F.S. Hickernell, Motorola, Arizona
M. Levy, University of Wisconsin
F.L. Thurstone, Duke University, North Carolina

In accordance with our constitution, the nominating committee consisted of two members of the AdCom and two members from the Group at large. They were picked to represent a cross-section of the G-SU interests.

This year's committee included:

M.G. Holland, Chairman
R.N. Thurston, AdCom
F.J. Fry, AdCom
M.B. Schulz
L.C. Lynworth

The committee would welcome suggestions for appropriate nominees. Our by-laws allow for a nominating petition, carrying a minimum of twenty-five names of Group members, to place a nominee on the slate.

CONFERENCES OF INTEREST

10th SYMPOSIUM ON NONDESTRUCTIVE EVALUATION

The 10th Symposium on Nondestructive Evaluation will be held at El Tropicano Motor Hotel, San Antonio, Texas on Wednesday, April 23 through Friday, April 25, 1975. The purpose of this Symposium is to bring together technical and managerial personnel engaged in and concerned with fundamental and applied aspects of nondestructive evaluation for the exchange of new ideas, methods, and research and development results.

General Information may be obtained from: Herbert Hoffman or George Matzkanin Symposium Chairmen

Mailing Address: Tenth Symposium on NDE, Southwest Research Institute, P.O. Drawer 28510, San Antonio, Texas 78284

Telephone: (512) 684-5111

ACOUSTIC HOLOGRAPHY AND IMAGING

The University of California Extension, Santa Barbara is sponsoring a short course on ACOUSTIC HOLOGRAPHY AND IMAGING to be held June 18-20, 1975 on-campus in Santa Barbara. This tutorial course will review important developments in the field including the state-of-the-art in research. Subjects will be treated from both analytical and experimental viewpoints and will cover the general background, historical developments, categorization and characteristics of the modern systems, as well as the applications of acoustic imaging. Specific topics will include scanned acoustic holography, array-imaging techniques, imaging using acoustic lenses, and imaging with static-ripple, dynamic-ripple and Bragg-diffraction. Principal instructor and coordinator of the program will be Dr. Glen Wade, Professor of Electrical Engineering at the University of California, Santa Barbara. Guest speakers include Professors Calvin F. Quate, James D. Meindl, and Albert M. Macovski of Stanford University; Byron Brenden, Vice President of HoloSonics, Inc.; and Dr. Lawrence W. Kessler, Technical Director of Sonoscope, Inc.

This program is designed not only for specialists in acoustic holography and imaging, but also for non-specialists who wish to learn the various theories and applications of this far-reaching field. The fee is \$275 which includes materials. Housing will be available on the campus. Enrollment deadline is May 28, 1975. For further information regarding this course or others offered by the University of California Extension in Santa Barbara, please contact Science & Management, UCSB Extension, Santa Barbara, CA 93106 or phone (805) 961-3697.

ULTRASOUND IN MEDICINE

WHAT:

Annual Conference
American Institute of Ultrasound in Medicine (AIUM)
American Society of Ultrasound Technical Specialists (ASUTS)

WHEN:

October 4-9, 1975

WHERE:

Benton Convention Center
Winston-Salem, North Carolina

PURPOSE:

Present scientific papers on diagnostic ultrasound and advanced instrumentation
Present a day of lectures on basic diagnostic ultrasound education
Present a day of lectures on advanced education and diagnostic techniques
Present scientific exhibits on diagnostic ultrasound
Display commercial equipment relevant to diagnostic ultrasound field

DEADLINES FOR ABSTRACTS:

Scientific papers - May 1, 1975
Work-in-progress - July 1, 1975

FOR INFORMATION CONTACT:

Mrs. Sally Gulley
AIUM/ASUTS 1975
Division of Continuing Education
Bowman Gray School of Medicine
Winston-Salem, North Carolina 27103

1975 INTERNATIONAL CONFERENCE ON ADVANCED SIGNAL PROCESSING TECHNOLOGY

To be held October 14-16, 1975 - - Lausanne, Switzerland

Co-sponsored by the Swiss Federal Institute of Technology and the IEEE Swiss Section. A first day tutorial will be followed by papers on dedicated signal processors using microelectronic, ultrasonic or optical devices.

Contact: Secretarial of "Journées d'électronique"
Ch. de Bellerive 16
1007 Lausanne, Switzerland

HOW TO ORDER 1974 ULTRASONICS SYMPOSIUM PROCEEDINGS

Copies of the 1974 Proceedings can be ordered from:

IEEE
345 East 47th St.
New York, New York 10017

by requesting Cat. #74CHO-896-1SU. A check for \$11.25 (or \$15 for nonmembers) should accompany your order. A few copies of the 1972 and 1973 Proceedings are still available from IEEE and may be ordered by requesting Cat. #72CHO-708-8SU (for 1972) and/or 73CHO-807-8SU (for 1973). Price of each to members for the 1972 and 1973 Proceedings is \$7.50 (\$10 nonmembers).

J. de Klerk, Editor
Symposium Proceedings

PLANS FOR 1976 SYMPOSIUM

by Lawrence R. Whicker

The 1976 Ultrasonics Symposium has been scheduled for September 29 thru October 1 in Annapolis, Maryland. The meeting will be held at the Annapolis Hilton Inn which stands on the water's edge and overlooks the picturesque Annapolis harbor. It has been felt that colonial Annapolis provides an ideal setting for the meeting during the nation's bicentennial celebration. The meeting site is thirty minutes driving time from either Washington or Baltimore and is served by limousine from the Baltimore-Washington airport. Dr. Lawrence R. Whicker is General Chairman for this meeting and Dr. Paul Carr is Technical Program Chairman.

CHAPTER NEWS

IEEE G-SU A.B.C. (ACTIVE BOSTON CHAPTER)

by Andrew J. Slobodnik, Jr.

As one of the larger sections in the country, the Boston Section maintains an active and varied technical program. For example, during the last several months surface wave memory correlators were discussed by J. Cafarella, L. Lynnworth and N. Peterson presented a talk on ultrasonic flow meters for liquids and D. Vilkomerson discussed Ultrasonovision and its biological and medical uses. Other subjects of past or planned meetings include integrated optics, ultrasonic imaging, SAW filter banks and RAC devices. Joint meetings are held whenever possible in order to interchange ideas and preserve a balanced program. Generally these are with the Electron Devices or Engineering in Medicine and Biology groups. Boston Section officers are Dr. R. Addison of American Optical, Chairman; Dr. R. Williamson of MIT Lincoln Laboratory, Vice Chairman; and A.J. Slobodnik, Jr. of the Air Force Cambridge Research Laboratory, Secretary/Treasurer.

WESTERN PENNSYLVANIA CHAPTER REPORT

by Prof. Chen S. Tsai

The Western Pennsylvania Sonics and Ultrasonics Chapter was formally established as soon as a \$100 check from the IEEE Headquarters arrived. Starting this fall, the Chapter is holding joint meetings with the local chapter on Electron Devices. Chen S. Tsai serves as the program chairman for both chapters. It has been decided that four out of the eight talks for the current year will be in the areas of Sonics and Ultrasonics. The first invited speaker was Dr. John de Klerk of Westinghouse Research Labs, who spoke on "Elastic Surface Waves," on October 29, 1974. The attendance was approximately 30, with a large number of new faces and students. The talk was very well received.

MEMBERSHIP REPORT

by *Robert E. Lee*

The G-SU membership statistics for the past two years show a gradual but steady increase of approximately 2% per year

<u>Date</u>	<u>G-SU Membership</u>
Jan. 1973.....	1428
Jan. 1974.....	1464
Jan. 1975.....	1490

Viewed in light of the decreasing membership in some other IEEE groups, this growth shows the vitality and importance of the Sonics and Ultrasonics Group. The two major recruiting efforts which have contributed to the group's growth are:

(1) The traditional half-price membership offer that is extended to attendees of the yearly Ultrasonics Symposium. Through the efforts of Professor Moises Levy, Chairperson of the 1974 Symposium and his helpful staff (especially Ms. Liz Salvo) 22 new members joined the ranks of the G-SU at the Milwaukee Symposium.

(2) A new membership and transactions subscription brochure, prepared by A. J. Bahr and L. W. Kessler, has been printed and distributed to various groups that have allied interest in the field of ultrasonics, such as The American Society for Non-Destructive Testing and American Institute of Ultrasound in Medicine. The brochure has thus far resulted in 30 new G-SU memberships and 6 new library subscriptions.

The question of the benefits derived from group membership often arises. The Sonics and Ultrasonics Group serves two important functions for its members.

TECHNICAL PUBLICATIONS

. The group is responsible for technical information dissemination with up-to-date articles in the ultrasonics field published in the Transactions (to be issued bimonthly in 1975).

. Also, the yearly Ultrasonics Symposium Proceedings offer an important source of new information in the field.

TECHNICAL MEETINGS

. The G-SU sponsored Ultrasonics Symposium has a long history of success in serving the technical community. The meeting serves as a focus for the group's technical activities and allows important personal contact between our members.

. Local chapter meetings in the Boston and Western Pennsylvania areas are of added interest to members in those regions.

Conversely, there is a very important roll that G-SU members play with respect to the Group. Only through the support of the membership can G-SU remain vital to carry on its functions in the area of technical publications, meetings and symposia. Only through group membership can we continue to both improve and upgrade our regular and special issues of the Transactions (such as the recent special issue on Microwave Acoustic Signal Processing) and continue to "promote technical achievement in the ultrasonics field."

I suggest that all current G-SU members could help the Group by soliciting new members and encouraging old members to renew. If you have a colleague or friend who is interested in the sonics or ultrasonics area please take a moment to show them the listed benefits of G-SU membership and urge them to join the Group.

1977 ULTRASONICS SYMPOSIUM SCHEDULED IN SUNNY SOUTHWEST

by *Fred Hickernell*

Phoenix Arizona is the site of the 1977 IEEE Ultrasonics Symposium. The meeting will be held Wednesday, Thursday, and Friday, October 12th through 14th. Co-chairman of the meeting are Dr. Fred Hickernell of Motorola and Professor Irv Kaufman of Arizona State University. Professor Murry Sirkis of Arizona State University is the Local Arrangements Chairman.

NEWS AND NOTES

CADY [100] by Warren P. Mason

Wesleyan University held a celebration on December 5, 1974 in honor of Professor Walter G. Cady's birthday which occurred on December 10th. He is 100. In good health mentally, he has now moved to a rest home. Warren P. Mason gave a speech detailing Professor Cady's contributions which include the first crystal controlled oscillator, the first narrow band crystal filter, one of the originators of the interaction theory of ferro-electricity and the principal historian of the science of piezoelectric crystals.

CONGRATULATIONS TO NEW FELLOWS

The IEEE has just announced the elevation of four members of Group on Sonics and Ultrasonics to the grade of Fellow. For three, their citations were in ultrasonics.

The Fellows and their Citations are listed here:

<u>Fellow</u>	<u>Citation</u>
Dr. John de Klerk Westinghouse Electric Corp. Research and Development Ctr. Beulah Rd., Churchill Boro Pittsburgh, PA 15235	For contributions to the development of ultrasonic technology.
Dr. Adrianus Korpel Research Dept. Zenith Radio Corp. 6001 W. Dickens Ave. Chicago, IL 60639	For contributions to the understanding and application of acoustooptic interactions.
Dr. Erhard K. Sittig Bell Telephone Labs, Inc. Murray Hill, NJ 07974	For contributions to acoustic wave devices.
Prof. Jean G. Van Bladel University of Ghent St. Pietersnieuwstraat 41 B-9000 Ghent, Belgium	For contributions to electromagnetic theory.

A fifth new Fellow, a member of G-SU in spirit although not by the letter, is Dr. Klaus D. Bowers. Many of us know of him through his activities in the management of the development of ultrasonic delay lines.

Congratulations to these and to all the new IEEE Fellows!

POTENTIAL OF BIOMEDICAL ULTRASOUND APPLICATIONS

The medical applications area of ultrasound has been expanding rapidly, particularly in the last several years. This expansion is due to a number of factors, among which are wider clinical acceptance of this apparently safe method of visualizing soft tissues in the body, and availability of adequate devices on the commercial market.

It is apparent that a number of problems associated with the use of ultrasound in medicine are amenable to engineering treatment. A profound engineering impact can be made in this area when attention is given to both the medical and engineering aspects of the problem.

Although in the past there have appeared articles in the IEEE Transactions which relate ultrasound to medicine and biology, this journal has not been the publication vehicle for the significant work in the field. It is hoped that in the future more engineering type articles in this field will be submitted to this Transactions for publication consideration, particularly when the Sonics and Ultrasonics Group meeting has a large and diversified medical ultrasonics program. We are urging participants at the annual meeting to consider their journal as an appropriate publication vehicle.

NONDESTRUCTIVE EVALUATION

Donald O. Thompson
Science Center, Rockwell International
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The field of non-destructive evaluation has recently been recognized at national levels as a field in need of more research and development and the acquisition of a broadened scientific base. These assessments have been made on the basis of requirements for reliable performance, conservation of materials, and the costs associated with current inspection procedures. In order to broaden the scientific base of non-destructive evaluation, it is essential that interest in the subject be developed especially among the electronic engineers and the materials scientists. It is apparent that researchers trained in these disciplines have much to contribute to non-destructive evaluation research and development.

EDITOR'S REPORT ON THE TRANSACTIONS ON SONICS AND ULTRASONICS

by Stephen Wanuga, Editor

I. 1974 Transactions

The Volume SU-21 Transactions on Sonics and Ultrasonics has a total of 326 manuscript pages for 4 issues. With covers, the figure is 342 pages.

In addition to the regularly published manuscripts, the following publications appeared:

1973 Ultrasonics Symposium Abstracts	Jan. Issue
Committee Changes	Jan. Issue
Membership Editorial	Apr. Issue
Membership Application	Apr. Issue
Editorial Page - S. Wanuga	July Issue
Review Paper - Erikson, Fry, Jones	July Issue
Book Review - Mason	July Issue
1974 Ultrasonic Symposium & Proceedings Announcement	July Issue
Membership Editorial	July Issue
Review Paper - Hafner, Pearman, Rennick, Johnson, Guenter, Schussler	Oct. Issue
1974 Transactions Index	Oct. Issue
Committee Changes	Oct. Issue

II. Voluntary Page Charge Summary

The voluntary page charges from authors were:

<u>Month</u>	<u>Pages</u>	<u>Pages Honored</u>	<u>Percent Return</u>
Jan. 1974	60	26	43
Apr. 1974	51	40	78
July 1974	76	67	88
Oct. 1974	90	43	47

Years Average = 64%

The totals for October 1974 are not yet completed and are subject to change. However, the 64 percent average is indeed quite good.

III. Review Papers

The review papers began with our July 1974 issue. Many favorable comments have been received on:

1. The implementing of review papers.
2. The professional and technical contents of our Transactions.

With the addition of the Review Papers, our Transactions have taken on an additional new appearance and although they may require some reshuffling, the review papers are doing very well.

IV. 1975 Transactions

January 1975 marked the beginning of our Transactions going to 6 issues per year. Our projected page total for the year is 432 or an average of 72 pages per issue. The January 1975 issue should have been mailed the last week in December 1974.

The March issue will contain the 1974 Ultrasonics Symposium Abstracts and the Review Paper "Industrial Applications of Ultrasound". 1975 looks like a good year for our Transactions as we embark on our bimonthly status.

V. Paper Status

A total of 6 papers were rejected throughout the year 1974. At this point in time, with the January and March 1975 issues fulfilled, there appears to be no problem in the amount of manuscripts available for the May and July 1975 issues.

VI. Associate Editorial Change

Art Braun, the Associate Editor of "Filters and Resonators" has bowed out as of January 1, 1975. We would like to thank Art for his excellent job and dedicated work in fulfilling this position. Taking Art's place will be Tim Pearman of Bell Labs at Allentown, Pennsylvania.

VII. Other Items

- a. New forms have been organized which have speeded up correspondence between the IEEE publications staff and myself.
- b. I am planning to publish an IEEE calendar of events emphasizing our Group's sponsored meetings and related symposiums.
- c. A short publication in the IEEE Spectrum announcing our review paper coverage in our Transactions.

VIII. Summary

The concept of adding "Review Papers" to our Transactions has been well received. By working together with IEEE, the format and style of our Transactions has been altered to give a new appearance. An emphasis on attaining a more overall balance of papers covering all our responsible areas has been achieved. Editorials, book reviews, and other relevant information have been included in some of our issues. All of these have added measurably in giving a new dimension to our Transactions. Many favorable comments have been received regarding the contents and new look of our Transactions.

Our intermediate goals are to continue with our plans of: "Review Papers," "Book Reviews," well-balance subject content, fulfilling our 6 issues per year, and striving to continue to obtain our high voluntary page charge return.

SPECIAL PROCEEDINGS WILL COVER SURFACE ACOUSTIC WAVES

Surface acoustic wave devices and applications will be the subject of a special issue of the PROCEEDINGS of the IEEE which is being organized for publication in March 1976. The performance and limitation of passive and active surface wave devices will be treated in invited and contributed papers. The major categories to be covered include properties of materials, surface wave filters, adaptive surface wave devices for signal processing, surface wave optical and acoustic scanning devices. In addition, contributions are solicited which describe applications of surface waves to communication systems, oscillators, radars and television.

Contributed papers in any of these categories are welcome. Prospective authors should submit 500 word summaries before May 15, 1975, to guest editors Ernest Stern, M.I.T., Lincoln Laboratory, Lexington, Massachusetts 02173; Lou Claiborne, Texas Instruments, Dallas, Texas 75222 or Gordon Kino, Stanford University, W.W. Hanson Laboratory of Physics, Stanford, California 94305. Three copies of full-length manuscripts will be due by September 1, 1975.

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