
Reliability Society Newsletter

Editors: Gary Kushner and Mark Snyder
Vol. 31, No. 1, January 1985 (USPS 460-200)

Editors' Message

We are finally feeling like veteran editors now that our third issue of the Reliability Newsletter has been published. Our appreciation goes out to those who have contributed material, BUT. . . where is the "Silent Majority?" This is a NEWSLETTER! News is defined as "recent events and happenings." AdCom is submitting inputs to each issue, but where are the chapters? Where are individual members with news to share? We know you're there and we're going to keep nagging until we're satisfied. This publication is the major nontechnical communication medium of the IEEE Reliability community and can only be as valuable as the readers care to make it.

As a stimulus for the wide range of possibilities, the following list is reprinted from the previous Newsletter issue:

- Chapter news
- Kudos, awards, promotions, etc.

- Opinions
- Chapter news
- Letters to the editor
- Obituaries
- Local conferences
- Chapter news
- Breakthroughs
- Newsletter critiques
- Helpful hints

As long as we're devoting the time to edit the Newsletter, why not help us bring the best possible product to your colleagues. We look forward to a plethora of inputs.

Best regards,


Gary and Mark

RS Newsletter Inputs

All RS Newsletter inputs should be sent to one of the associate editors, Gary Kushner, 499 Brigham St., Marlboro, MA 01752, or Mark Snyder, Digital Equipment Corp., 14 Walkup Drive, (YWO/G13), Westboro, MA 01581, per the following schedule:

For April Newsletter: by Jan 15
For July Newsletter: by Apr 15
For October Newsletter: by Jul 15
For January Newsletter: by Oct 15

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Chapter Report

In a letter dated March 2, 1984, Mr. Don Suppers, Staff Director of IEEE Field Services, announced approval of the establishment of the Tri Cities Reliability Chapter. Mr. John Edwards, Route 6, Box 397A, Blountville, TN 37617 is the Interim Chairman.

As mentioned in a report to the AdCom in January 1984, Chapters Chairman, Mr. Bernhard Bang, has sent letters to the Chairmen of the Connecticut, Northern New Jersey, and Twin Cities Sections advising them of the inactive status of the Reliability Society Chapters in their areas and soliciting their support in re-activating those Chapters. If no further word was received from those Chapters, they were to be dropped from our Society's roles. To date, no further word has been received.

This all sounds relatively good so far but now for the

problem area. Specifically, the new Tokyo Reliability Chapter has failed to respond to any and all attempts to contact them. There has been a minimum of five, perhaps six letters sent to their Interim Chairman. Without communications, we cannot know of their activities and we certainly cannot grant them a Charter. Similarly, we have not received any indication that the Ottawa Chapter has held elections and that they are indeed, a viable organization. (It should be noted that Ottawa has conducted joint meetings but no elections). It is hoped that the new Tri Cities group will fare better in this regard and that they will eventually be granted their official Reliability Society Chapter Charter. In the meantime, the thoughts, ideas, and recommendations of the membership on how to best remedy this situation are solicited.

Chapter Leadership at Work

The annual sharing of experiences among Reliability Chapter Chairmen and the AdCom of the Reliability Society occurred on September 20th at a dinner meeting in the Crystal City Marriott Hotel outside of Washington, D.C. Chapter Chairmen from Baltimore, Central New England, Denver, Philadelphia, Santa Clara Valley/San Francisco, and Washington/Northern Virginia were present.

By way of background, this is the fourth year that all chapter chairmen have been invited to participate in the fall meeting of the AdCom. This meeting was held on September 21 and provided an excellent opportunity for the chapter chairmen to become acquainted with the normal business of the AdCom. These meetings were unique, however, in that input from the chapter chairmen was encouraged, freely given, and gratefully accepted during the meeting. In effect, the chapters have an opportunity to participate, to learn, and to influence the actions of the AdCom.

The highlight occurred on the evening before, however, which was devoted to two events. The first was presentations of awards to the winning chapters. These details are discussed elsewhere in the Newsletter. But let me also extend my congratulations to the Washington/Northern Virginia, Philadelphia, and Denver chapters. The second highlight was the extensive discussion among the chapter chairmen, sharing among themselves and with the AdCom their experience during the past year.

It is important to note that joint meetings with the chapter chairmen from around the country are unique. When other societies found out about our meeting they expressed surprise and asked for details. Maybe the Reliability Society has started something.



Bernhard Bang, Chairman, Chapter Activities, and Sonya Rysko, Chairman, Santa Clara/San Francisco/Oakland/East Bay Chapter.

There are many differences between the chapters, some operate symposiums, some are affluent, some diversify with luncheon meetings, some are military or electronics oriented, some have commercial orientation. Basically, the needs of the members direct the format of the successful chapters. Diversity is significant.

The main common thread of success is enthusiasm of a core of leadership, sharing the leadership, and local company support.

I wish to extend my thanks to those chapter chairmen who participated. We on the AdCom learned from your experiences and some of your enthusiasm rubbed off on all of us. We look forward to next year when the new chapter chairmen will be invited to the fall meeting. Put it on your calendar.

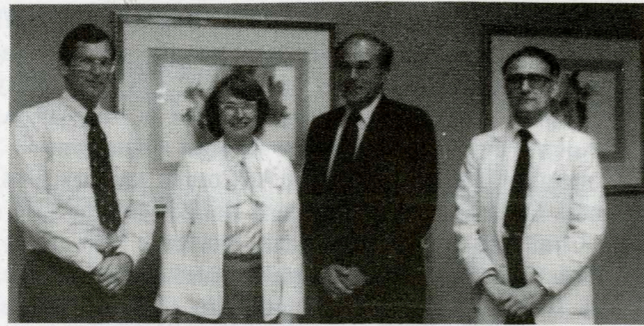
Bernhard Bang, Chairman

Chapter Awards

Congratulations

The 1983-1984 Chapter Awards were bestowed as follows:

- First Place:** Washington D.C./N. Virginia Chapter
Al Kelly, Chairman (1983-1984)
- Second Place:** Philadelphia Chapter
Fulvio E. Oliveto, Chairman (1983-1984)
- Third Place:** Denver Chapter
John Adams, Chairman (1983-1984)



(From left to right), John Watts, Denver; Ruth Smith, Washington D.C./N. Virginia; Maury Shumaker, Awards Chairman, and Fulvio Oliveto, Philadelphia.

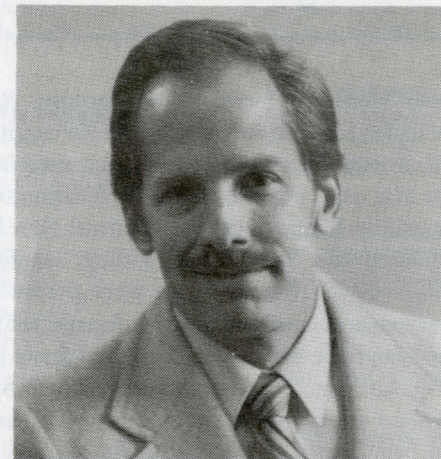
Annual IEEE Reliability Society Award

The Annual IEEE Reliability Society Award is presented each year to an individual who has made significant contributions in the field of reliability. These contributions can be in the areas of scientific development, professional achievement or management. Selection of the award winner is based on the overall impact of his or her contributions on the advancement of reliability theory, education, engineering, or its management. The award is presented at the Reliability Society awards function in January each year.

The recipient of the 1984 Annual Award is Dr. Murray Woods of Intel Corporation. Dr. Woods is cited for his accomplishments in improving the reliability of microelectronic devices. His efforts have led to widespread understanding of the effects of alpha particle impact on semiconductor devices. In addition to his own technical achievements, Dr. Woods has encouraged the dissemination of knowledge of device failure mechanisms through his active participation in the International Reliability Physics Symposium. Dr. Woods has set a path for those who desire to understand and eliminate the sources of device unreliability.

Murray H. Woods received the BSEE degree from Duke University in 1966, and the M.A., M.S.E., and Ph.D. degrees in Device Physics from Princeton University in 1968 and 1971, respectively.

He joined RCA Laboratories, Princeton, NJ in 1971 and worked on MNOS/SOS memory development and on transport, conduction and breakdown in insulators. He received two RCA Laboratories Awards for Outstanding Achievement. Dr. Woods has previously authored papers on high field conduction, ionic transport, internal photoemission, and hole trapping in SiO₂; impact ionization in Si Schottky barriers; MNOS degradation mechanisms; and double-dielectric instabilities. He holds several patents in these and related fields.



Dr. Murray Woods

He joined Intel Corporation, Santa Clara, CA, in 1976 where he has managed the Process Reliability Department since its inception. This function is responsible for the study of fundamental failure mechanisms and their impact on new and existing technologies. In this role, he has been involved in and authored papers on metal and contact electromigration, EPROM and E²PROM reliability physics, scaling implications on VLSI reliability, alpha particle induced soft errors, Krypton and other radiation effects on MOS devices and air breakdown ESD in packages. He has received Best Paper and Outstanding Paper Awards for papers he co-authored at the 1978 and 1982 International Reliability Physics Symposiums, respectively. He was also co-recipient of the IEEE 1981 W.R.G. Baker Award.

Dr. Woods is a member of the IEEE as well as Sigma Xi

and Eta Kappa Nu. He was General Chairman of the first IEEE Nonvolatile Semiconductor Memory Workshop and co-edited a special issue of the *IEEE Transactions on Electron Devices* based on those proceedings. He was also Technical Program Chairman, Vice General Chairman, General Chairman, and Chairman of the Board of Directors for the IEEE International Reliability Physics Sym-

posium in 1980, 1981, 1982 and 1983, respectively, and a member of Management and Program Committees for the IEEE Semiconductor Interface specialists Conference. He was also a member of the National Research Council's National Materials Advisory Board Committee on Materials and Processing Influences on Electronic Component Reliability.

Chapter News

Central New England Council

The Central New England Council recently concluded a successful fall lecture series entitled "New Technologies in Integrated Circuits—A Reliability Viewpoint."

The lecture series consisted of four individual sections. The first was on new areas of semiconductor memories, primarily in the area of 256K DRAMs and was presented by Hansel Collins of Digital Equipment Corporation. The second was presented by Mike Cooper and Paul Peterson of GTE and concerned PALs, Gate Arrays, and standard cell arrays (MCA). The third and fourth segments were presented by Aaron DerMarderosian of Raytheon and consisted of areas of interest in failure analysis of IC's, specifically in the area of hermeticity of plastic vs. ceramic

packages, and failure types associated with surface mount of leadless chip carriers.

The lecture series also consisted of a tour of DEC's semiconductor facility in Hudson, MA. The tour was hosted by Mark Snyder and Cindy Capuano.

We also held our December monthly meeting with a talk on TESTABILITY by Peter Bachant, President of System Effectiveness Associates (SEA).

In the upcoming months we will be hosting talks on availability modeling, new reliability standards, and reliability testing. We are also in the early stages of preparing for our all day seminar in April.

Gary Kushner, Chairman

IEEE Fellow Nominations

It is time to consider any members of the Reliability Society who have earned the honor of being advanced to Fellow grade. The IEEE Bylaws define the Fellow grade as one of unusual distinction in the profession, to be conferred only by invitation of the Board of Directors upon a person of outstanding and extraordinary qualifications and experience in IEEE designated fields, who has made important individual contributions to one or more of these fields. A nominee must be a Senior Member of the Institute, and have been a member in any grade for at least five years prior to January 1 of the year of election.

The Fellow Committee, appointed by the Board of Directors, has the responsibility of making recommendations to the Board of Directors for nominees to be conferred the grade of Fellow. The Fellow Committee depends primarily upon information furnished by a *nominator* to point out the qualifications and unique contributions of a candidate. This information is supplemented by an evaluation by the appropriate society and comments from Fellow grade references who can attest to the candidate's achievements.

Any person who is sufficiently knowledgeable of a candidate's achievements can serve as a nominator. If you are aware of a deserving candidate and would like to pursue a nomination, please contact the Reliability Society Awards and Nominations Chairman for assistance.

Carl Bird
353/0306
IBM Corporation
Owego, NY 13827
Telephone (607) 751-3729

You may also obtain a nomination kit by request to:
Staff Secretary
IEEE Fellow Committee
345 East 47th Street
New York, NY 10017
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Included in this Newsletter is a listing of all Fellow grade members of the Reliability Society who may be used as references for a proposed candidate.

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Health Care Policy Committee Liaison Report

The activities of the Health Care Policy Committee have been reported in the following recent IEEE Publications:

In CONTINUUM, page 17 of the Aug. 1984 issue of the *Spectrum*.

An article, entitled "Both Engineers and Doctors Should Sit on Health-Care Boards," on page 2 of the Sept. 1984 issue of *The Institute* reports that the chairman of the committee, Dr. William B. Jarzembki, filed testimony on June 7, 1984 with the Senate Labor and Human Resources Committee on the importance of utilizing engineering expertise in the proposed new institute to assess health care technology.

An article entitled, "IEEE Endorses Health Technology Assessment Utilizing Engineers," on page 10 of the Aug.

1984 issue of *Impact* reporting the testimony filed on June 7.

A letter by Dr. William B. Jarzembki entitled "To Be or Not to Be," which appeared on page 18 of the Aug. 1984 issue of *Impact*.

The following three position papers have been rewritten based on a meeting with TAB:

Medical Device Approval Process, draft 3.

Government Management Positions Responsible for Engineering Decisions, draft 4.

Government Advisory Entities concerned with Health Related Issues, draft 4.

It is understood that USAB approval is required prior to TAB approval.

Membership Report

As of August 31, 1984, Reliability Society membership stands at 3,431 world-wide compared to 3,258 members at the same time in 1983. This increase of 173 members since 1983 represents a growth of 5.3 percent which is better than the 4.7 percent average for all IEEE societies combined and

is indicative of the continuing interest in and significance of the field of Reliability in today's world. It is interesting to note that 11 of the IEEE Societies actually experienced reductions in membership with one Society (SIT 30) shrinking by 13.1 percent.

1985 Annual Reliability and Maintainability Symposium

The 1985 Annual Reliability and Maintainability Symposium (RAMS) will be held at the Franklin Plaza Hotel, Philadelphia, PA, January 22-24, 1985. This Symposium is sponsored by the following engineering societies: (ASME) American Society of Mechanical Engineers, (ASQC) American Society of Quality Control (Electronic and Reliability Division), (IIE) Institute of Industrial Engineers, (IEEE) Institute of Electrical and Electronics Engineers, (SOLE) Society of Logistic Engineers, (IES) Institute of Environmental Sciences, (AIAA) American Institute of Aeronautics and Astronautics, SSS and (SRE) Society of Reliability Engineers.

The purpose of the symposium is to present and exchange data and information between government and industry in the fields of reliability, maintainability, safety, logistics, human factors, and related assurance disciplines.

During the three days, parallel sessions will cover the following topics: Influencing the Front End, Reliability Improvement Techniques, RADC System R&M Program, Statistical Applications in R&M Development, R&M Economic Factors, Mechanical Reliability, Computer-Aided R&M, Reliability Testing and Screening Processes, Maintenance Planning and Field Data Analysis, Product Reliability Growth Processes, Measures of Customer Satisfaction, Integrated Diagnostics, R&M Education and Training, Software Reliability, Modern R&M Management, Methodologies and Simulation, Maintainability, R&M

Modeling, and Operational Readiness and Availability.

Special events at the symposium will include two panel sessions and an exhibits program, displaying modern equipment and items of interest to the R&M professional. The first panel on International R&M Standards will discuss the existing and proposed standards, designed to satisfy the needs of international customers. The panelists will be members of the International Electrotechnical Commission (R&M Technical Committee). The second panel on Civil Aircraft System Safety will explore the impact of federal aviation regulations on the design, R&M, and maintenance of civil aircraft. The panelists will be aircraft systems professionals from industry and government regulatory agencies.

The symposium also sponsors tutorial sessions for neophytes and as refreshers for practitioners of assurance technologies. The first tutorial will be held Monday afternoon, January 21, 1985, on Thermal Design for Reliable Equipment. Tuesday's tutorials, January 22, 1985, are: Basic Reliability, Statistical Concepts for R&M, and Statistical Design of Experiments. Wednesday's tutorials, January 23, 1985 are: Basic Maintainability and Basic Testability. Thursday's tutorials, January 24, 1985, are: Design to Cost/Life Cycle Cost, Reliability of Repairable Systems, and Software Reliability.

For more information write to: Dr. W. T. Weir, Evaluation Associates, Inc., GSB Building, 1 Belmont Avenue, Bala Cynwyd, PA 19004; telephone: 215-667-3761.

1985 International Reliability Physics Symposium

March 26-28, 1985 • Sheraton-Twin Towers Orlando, Florida

The twenty-third Annual Symposium, cosponsored by the IEEE Reliability and Electron Devices Societies, emphasizes device reliability as the dominating influence in the development of new VLSI technologies and circuit designs. With the awareness that today high reliability is the norm for VLSI, the 1985 Symposium will emphasize the role of design, processing, packaging and testing for building-in high reliability. Work in all areas of reliability physics will be included in the program.

Papers will deal with work on:

- Physics of Failure Mechanisms—Quantitative models and mechanisms of component failure.
- Failure Analysis Techniques—Advanced or simplified, as they are applied to specific problems.
- Accelerated Testing and Screening—Emphasizing the physical mechanisms which validate testing and screening techniques.

- Design and Process Control for Reliability—Relating specific design concepts and process controls to part reliability.

In the following or related areas:

- VLSI (Microprocessors, Memory, PLA, Redundancy, etc.)—MOS, Bipolar, CMOS, I²L, SOS.
- Semiconductor/Insulator Interfaces, Contacts and Metallization
- Packaging, Bonding, Die attach, Coatings and Encapsulation
- Hybrids (Materials, Processes and Components)
- Displays, Sensors, and Solar Cells
- Microwaves, Optoelectronic, and SAW Devices
- GaAs Devices and Interface Effects on III-V Devices
- New Devices and Technologies
- Passive Components
- Attachment of Leadless Ceramic Chip Carriers

A special one-on-one session also planned for significant

papers on very specialized subjects and papers with high mathematical content. In this session, authors will display significant data, equations and a summary of their work on posters or other suitable format and be available during the entire session to discuss their work.

For general conference information contact:

John W. Peeples, General Chairman
1985 International Reliability Physics Symposium
NCR Corporation
3325 Platt Springs Rd.
West Columbia, SC 29210
(803) 796-9250

Inter-RAM

INTER-RAM, the International Reliability-Availability-Maintainability Conference for the Power Industry will hold its 12th Annual Meeting April 9-12, 1985 at the Hilton Hotel, Baltimore, MD. Further information may be obtained by writing:

Mrs. Melissa Bradley
Technical Program Chairman
Baltimore Gas and Electric Co.
Fort Smallwood Road Complex
P.O. Box 1475
Baltimore, MD 21203

Preliminary Call for Papers: Conference on Software Tools

Sponsored by the Center for Advance Telecommunications Technology of the Polytechnic Institute of New York, with the Technical Cooperation of the IEEE Computer Society TCSE, the ACM SIGSOFT, and the Software Committee of the National Security Industrial Association.

A three day conference on state-of-the-art software tools will be held in New York City on April 15-17, 1985. Proceedings will be published. Tutorials, research papers, and proposals for panel sessions are invited in the following areas:

Software Engineering and Development:

- Requirements
- Design
- Implementation
- Testing/Verification
- Maintenance
- Configuration Control
- Project Management
- Workstations

Programming Environments:

- Ada⁺ Language
- UNIX* System
- DOD/Embedded Software
- Personal Computers

Application Areas:

- Banking
- Insurance
- Investment and Securities
- Modeling and Simulation
- Knowledge Based/Expert Systems
- Telecommunications
- Office Automation
- Scientific
- MIS

Potential authors should contact one of the following people as soon as possible:

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⁺ Ada is a trademark of the U.S. Government.
^{*} UNIX is a trademark of AT&T Bell Laboratories.

Conference and Course Calendar

DATE	CONFERENCE	PLACE	CONTACT
1985 Jan. 22-24	RAM Symposium	Franklin Plaza Hotel Philadelphia, PA	Dr. W. T. Weir Evaluation Associates, Inc. GSB Building 1 Belmont Ave. Bala Cynwyd, PA 19004
Jan. 28-30	Introduction to Design of Fault-Tolerant Microcomputer Systems		The Wisconsin Center 702 Langdon St. Madison, WI 53706
March 26-28	1985 International Reliability Physics Symposium		Dave Yaney 1985 Int. R. Physics Symposium AT&T Bell Labs. 555 Union Blvd. Allentown, PA 18103
April 9-12	INTER-RAM		Mrs. Melissa Bradley Tech. Program Chairman Baltimore Gas and Electric Co. Fort Smallwood Road Complex P.O. Box 1475 Baltimore, MD 21203
April 15-17 Call for Papers	Conference on Software Tools		Marianne E. Erdos Hazeltine Corp. Research Laboratories Greenlawn, NY 11740
April 25	23rd Annual Spring Reliability Seminar	Sheraton Tara Framingham, MA	Jane Ferguson Haemonetics Corp. 400 Wood St. Braintree, MA 02184 (617) 848-7100 X261
May 20-22	Electronics Components Conference	Capital Hilton Hotel Washington, DC	Electronic Industries Association 2001 Eye ST., N.W. Washington, DC
June 23-26	Intern. Conference on Communications	Palmer House Chicago, IL	Elmer Scherman (312) 681-7341
July 1-3	International Workshop on Timed Petri Nets	Torino, Italy	Prof. M. A. Marsan Dipartimento Di Elettronica, Politecnico Di Torino Corso Duca Degli Abruzzi, 2 10129 Torino, Italy
Aug. 26-30	Relectronic '85	Budapest, Hungary	Scientific Society Telecommunication Organizing Committee of Relectronic '85 H-1372 Budapest P.O. Box 451 Hungary 531-027
Oct. 8-10	MELECON '85	Madrid, Spain	Prof. A. Luque Instituto de Energia Solar E.T.S.I. Telecomun. UPM Ciudad-Univer. Madrid-3, Spain

1983 Index To IEEE Publications

New York, NY, October 12, 1984: The Institute of Electrical and Electronics Engineers, Inc. announces publication of the *1983 Index to IEEE Publications*. In 1983, IEEE's massive periodicals and book publishing programs accounted for over 120,000 technical pages. The annual Index is the only index that covers the totality of IEEE publishing.

The latest combined Index provides quick access to all IEEE-published papers, articles, conference records, and other communications covering every facet of electrical/electronics/computer science and engineering. The 1983 Index lists over 21,000 technical items and contains 130,000 entries. Information is provided by author and subject.

The Author Index contains a primary entry for each item arranged alphabetically under the name of the first author. Complete bibliographic information, including coauthor

names, title of the item and type of item, is given. The Subject Index, also arranged alphabetically, contains multiple index entries for each item, as well as cross-reference pointers where required by subject matter.

The 1983 Index covers 52 periodicals—including the IEEE Transactions, journals and magazines specializing in various sub-fields such as biomedicine, geoscience, nuclear and plasma science, pattern analysis, oceanic engineering and cybernetics. Access to over 50,000 periodical pages is provided. In addition, the Index covers over 70,000 nonperiodical pages, including all new IEEE and ANSI/IEEE Standards, IEEE Press Books, IEEE Technical Reports, and miscellaneous publications. The Index also cites all papers presented at over 100 major IEEE-sponsored conferences held worldwide.

The Annual Index is an essential reference for all those who need to keep abreast of new developments in science and engineering. The *1983 Index to IEEE Publications* (JH68916) is priced at \$100.00 for IEEE members and \$190.00 for nonmembers. The Index can be ordered postpaid from the IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854.

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Washington, DC 20375



THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Announces the 13th Annual Competition for

1985-1986

Congressional Fellowships

A CONGRESSIONAL INTERNSHIP FOR MEMBERS OF IEEE

PROGRAM: Electrical and Electronics Engineers and Allied Scientists are competitively selected to serve a one-year term on the personal staff of individual Senators or Representatives or on the professional staff of Congressional Committees. The program includes an orientation session with other Science-Engineering Fellows sponsored by the American Association for the Advancement of Science (AAAS).

PURPOSE: To make practical contributions to more effective use of scientific and technical knowledge in government, to educate the scientific communities regarding the public policy process, and to broaden the perspective of both the scientific and governmental communities regarding the value of such science-government interaction.

CRITERIA: Fellows shall be selected based on technical competence, on ability to serve in a public environment and on evidence of service to the Institute and the profession. Specifically *excluded* as selection criteria shall be age, sex, creed, race, ethnic background, and partisan political affiliations. However, the Fellow must be a U.S. citizen at the time of selection and must have been in the IEEE at Member grade or higher for at least four years. Additional criteria may be established by the selection committee.

AWARDS: IEEE plans to award two Congressional Fellowships for the 1985-1986 term. Additional funding sources may permit expansion of awards.

APPLICATION: Further information and application forms can be obtained by calling W. Thomas Suttle (202) 785-0017 at the IEEE Washington, D.C. Office or by writing:

Secretary, Congressional Fellows Program
The Institute of Electrical and Electronics Engineers, Inc.
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Applications must be postmarked no later than March 30, 1985 to be eligible for consideration.