



®The Institute of Electrical and Electronics Engineers, Inc.

NATIONAL CAPITAL AREA COUNCIL

# SCANNER

September 1995

Volume 10, No.4

## Microwave Systems for the 21st Century!

MTTS Again Sponsors a Series of Lectures  
by "Distinguished Speakers"

*(See Calendar of Events, page 4)*

## CHAPTER ORGANIZATIONAL MEETINGS

An Ambitious Program Designed  
to Revitalize our Chapters

*(See Calendar of Events for Sep 11 and ♦Story)*

## Our Readers Tell Us What they Think

We Received Three "Letters to the Editor"

Keep it up !!

*(See Page 12)*

## Fourier Transforms for High School Students?

YES — When George Rodgers Does It !!

*(See "Science and Technology in the Workplace,"  
and an Opportunity to Help George)*

Page 14

ISSN 0894-0452

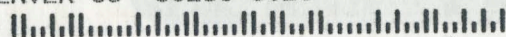
A Joint Publication of the Northern Virginia and Washington Sections

# SCANNER

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**1995/96 Season**

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**Calendar of Events**

**Attendance at IEEE Meetings.** IEEE meetings are open to members and guests. When meetings are combined with meal functions, it is not mandatory — although desirable — to attend the meal functions. Please make timely reservations for all meetings (cancel early, if necessary). Any IEEE member may attend Council and Section Administrative Committee (ADCOM) meetings.

**Announcements.** Calendar information should follow the format used in this Calendar of Events. The calendar item listing includes the abbreviation for the managing section after each society chapter listing. In the case of joint chapters, the managing section is listed first. A diamond (◆) preceding the event in a calendar item indicates that further information on that event is provided in the

"Diamond Stories" Department of that issue. Articles for the "Diamond Stories" Department should be limited to 150 words, and include a synopsis of the talk or event, and a biosketch of the speaker which lists, if available, his or her academic background, current position, and IEEE as well as other professional societies memberships, if any.

All announcements, diamond stories, and other material to be printed in an issue of the SCANNER must be sent or faxed to the Editor-in-Chief in time to arrive on or before the 25th of the second month preceding the month of desired publication. The deadline for camera-ready material (e.g., ads) is the first workday of the month preceding the month of desired publication.

**SEPTEMBER 1995**

**Tue Sep 5 NCAC Steering Committee Meeting, Washington Section and Northern Virginia Section ADCOM Meetings**  
**Place:** The Tower Club, African Room, 8000 Towers Crescent Drive, Suite 1700 (change elevators on the 14th Floor), Vienna, VA at Tyson's Shopping Center across street from Tyson's Marriott Hotel; Dress: "Casual Upscale Business" (No bluejeans, T-shirts, etc.)  
**Time:** 7:00 pm to 9:30  
**Contact:** Rex Klopfenstein 703/883-6862; Nino Ingegneri 301/279-4217; Nicholas Vlannes 703/280-1186; or Charles True, 703/448-7622

**Tue Sep 5 ◆ Networking and Business Meeting**  
**Sponsors:** NCAC PACE Consultants Network, (W/NV)  
**Place:** Univ of MD, College Park Campus, A.V. Williams Eng Bldg, Room 2460; from Beltway take Rt 1 south, turn right on Campus Drive, immediate right on Stadium Drive, 1-1/2 blocks to A.V. Williams Bldg on right. Park across street in Lot G. Premeeting dinner at Seven Seas Restaurant, 8503 Baltimore Blvd (Rt 1), College Park  
**Time:** Dinner 5:30 pm; Meeting 7:00  
**Contact:** For dinner resvns call Dave Lokerson, 301/460-4693

IEEE National Capital Area Council SCANNER is published six (6) times a year: bi-monthly Feb/Mar, Apr/May, Oct/Nov, Dec/Jan; monthly in Sep, and tri-monthly Jun/Jul/Aug by The Institute of Electrical and Electronics Engineers, Inc. Headquarters: 345 East 47th Street, New York, NY 10017. Sent automatically at a cost of \$1.00 per member per year (included in annual dues) to each member of the Washington and Northern Virginia Sections. Second class postage paid at New York, NY and at additional mailing offices. Postmaster: Send address changes to IEEE National Capital Area Council, SCANNER, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. (ISSN 0894-0452)

**Mon Sep 11 ◆ Chapter Organizational Meetings**

**Sponsors:** National Capital Area Council, Washington and Northern Virginia Sections  
**Participants:** Members of Division I and III Societies  
**Place:** George Washington University, Academic Center, Room T640, 801 22nd Street NW, Washington, DC one block from Foggy Bottom Metro Station

**Time:** 7:30 pm to 9:00  
**Contact:** For Reservations: NCAC Office 703/803-8701, or Fax 703/222-5971 by Sep 7

**Mon Sep 11- Fri Sep 15 ◆ Radar Target Signature Analysis and Coherent Signal Processing**

**Sponsor:** George Washington University Continuing Education Program (See also ad on page 5)  
**Instructors:** (See Diamond Story)  
**Place:** George Washington University Academic Center, Room 308, 801 22nd Street, Washington, DC  
**Time:** 8:30 am to 4:15 pm  
**Contact:** Monique Wilson, 202/994-0726; fax 202/872-0645; e-mail ceepinfo@seas.gwu.edu

**Tue Sep 12 ◆ Status of Operations and Future Plans for the Virginia Railway Express**

**Sponsor:** Vehicular Technology Chapter, Land Transportation Committee (W/NV)  
**Place:** University Club, George Washington University, Marvin Center, 3rd Floor, 800 21st St NW, Washington, DC  
**Time:** Lunch (\$17.00): 11:30 am; Meeting: 12:30 pm  
**Contact:** For lunch reservations, Lou Sanders, 202/898-4086, or Tom Guins, 202/639-2259

**Tue Sep 12 Chapter Organizational Meetings**

**Participants:** Division II and VII Societies (Reservation deadline: Sep 8. For all other information, see Sep 11 entry with same title)

**Mon Sep 18 Chapter Organizational Meetings**

**Participants:** Division IV Societies (Reservation deadline: Sep 14. For all other information, see Sep 11 entry with same title)

**Mon Sep 18- Wed Sep 20 ◆ LAN Technology: An Introduction**  
(For further details, see GWU entry for Sep 11-15)

**Tue Sep 19 Chapter Organizational Meetings**

**Participants:** Division VIII and IX Societies (Reservation deadline: Sep 15. For all other information, see Sep 11 entry with same title)

**Tue Sep 19 ◆ Dave's Database Magic to Getting and Keeping Business**

**Sponsors:** NCAC PACE Consultants Network, (W/NV)  
**Place:** Univ of MD, College Park Campus, A.V. Williams Eng Bldg, Room 2460; from Beltway take Rt 1 south, turn right on Campus Drive,

immediate right on Stadium Drive, 1-1/2 blocks to A.V. Williams Bldg on right. Park across street in Lot G. Premeeting dinner at Seven Seas Restaurant, 8503 Baltimore Blvd (Rt 1), College Park  
**Time:** Dinner 5:30 pm; Meeting 7:00  
**Contact:** For dinner resvns, call Dave Lokerson, 301/460-4693

**Tue Sep 19 September Crab Social**

**Sponsors:** Reliability Society (W/NV) and Institute of Environmental Science (Joint Meeting)  
**Place:** NASA Goddard Recreation Center  
**Time:** 6:00 pm; Cost \$10.00 per member, \$15.00 per guest; includes all the crabs you can eat, plus beer, soda, roast beef, salads, chips & dip, and more  
**Contact:** For further information and reservations call Ron Combs, 703/553-1733, or Harry Ascher, 301/762-4779  
**Note:** Registration must be made in advance; for security reasons, no walk-ins will be allowed!

**Wed Sep 20 ◆ The Chicago Circulator**

**Sponsors:** Northern Virginia Section, Control Systems Society (NV/W), and Alumni Chapter of Tau Beta Pi  
**Speaker:** Ardell Hoveskeland, Manager, Intelligence Transportation System Program, DeLeuw Cather & Company  
**Place:** Aegean Taverna, 2950 Clarendon Blvd, Arlington; one block from Clarendon Metro stop on Orange line. Dinner prices range from \$9.75 to \$15.75 plus tax  
**Time:** Refreshments 6:30 pm; optional dinner 7:00; meeting: 8:00.  
**Contact:** NCA Office, 703/803-8701

**Thu Sep 21 ◆ Comparison of the Current Cellular Technology with "Iridium"**

**Sponsor:** Communications Society (W/NV)  
**Speaker:** Yvette Hubbel, Lockheed Martin Corporation  
**Place:** George Washington University, Academic Center (22nd and I Streets, NW), Room T-640, EE Dept. One block from the Foggy Bottom Metro Station; parking across from the Academic Center  
**Time:** Lunch 11:45 am (bring your own brown bag); Registration 12:00 noon; Presentation 12:15 pm to 1:00  
**Contact:** Robert J. Hollingshead, 301/464-8900

**Thu Sep 21- Fri Sep 22 ◆ LANs: Design and Installation of Networks that Support Voice, Data and Video Applications**

(For further details, see GWU entry for Sep 11-15)

**Mon Sep 25 Chapter Organizational Meetings**  
**Participants:** Division VI Societies  
 (Reservation deadline: Sep 21. For all other information, see Sep 11 entry with same title)

**Mon Sep 25- ♦ Optical Systems Fundamentals**  
**Tue Sep 26** (For further details, see GWU entry for Sep 11-15)

**Tue Sep 26 Chapter Organizational Meetings**  
**Participants:** Division X Societies  
 (Reservation deadline: Sep 22; For all other information, see Sep 11 entry with same title)

**Tue Sep 26 ♦ Professional Networking in Photonics**  
**Sponsor:** Laser and Electrooptics Society (W/NV)  
**Place:** The Inn & Conference Center, Univ of MD College Park, MD  
**Time:** Call contact  
**Contacts:** For further information and registration materials, Nick Vlannes, 703/280-1186, e-mail vlannes@aol.com, or Frank Bucholtz, 202/767-9342, e-mail bucholtz@nrlfs1.nrl.navy.mil

**OCTOBER 1995**

**Tue Oct 3 NCAC Steering Committee, Washington Section ADCOM, and Northern Virginia Section ADCOM Meetings**  
**Place:** The Tower Club, African Room, 8000 Towers Crescent Drive, Suite 1700 (change elevators on the 14th Floor), Vienna, VA at Tyson's Shopping Center across street from Tyson's Marriott Hotel; Dress "Casual Upscale Business" (No bluejeans, T-Shirts, etc.)  
**Time:** 7:00 pm to 9:30  
**Contact:** Rex Klopfenstein 703/883-6862; Nino Ingegneri 301/279-4217; Nicholas Vlannes 703/280-1186; or Charles True 703/448-7622

**Mon Oct 9- ♦ Interconnect Design and EMC**  
**Fri Oct 13 Considerations: Measurements in High-Speed Digital Circuits and Systems**  
 (For further details, see GWU entry for Sep 11-15)

**Tue Oct 10 ♦ Microwave Systems for the 21st Century**  
**Sponsor:** Microwave Theory and Techniques Society (W/NV)  
**Place:** University of Maryland Adult Education Center (For further details, see Diamond Story)  
**Contact:** Saurabh Dalal, 202/404-7639, or e-mail s.dalal@iee.org

**Mon Oct 16- ♦ Radar Operation and Design**  
**Tue Oct 17 Fundamentals**  
 (For further details, see GWU entry for Sep 11-15)

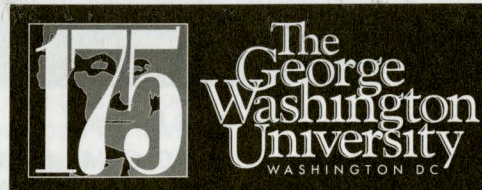
**Mon Oct 16- ♦ Wireless Infrastructure Network**  
**Fri Oct 20 Engineering for Cellular, PCS, LEO, and WPBX**  
 (For further details, see GWU entry for Sep 11-15)

**Tue Oct 17 Access Car**  
**Sponsor:** Vehicular Technology Chapter, Land Transportation Committee (W/NV)  
**Place:** University Club, George Washington University, Marvin Center, 3rd Floor, 800 21st St NW, Washington, DC  
**Time:** Lunch (\$17.00): 11:30 am; Meeting: 12:30 pm  
**Contact:** For lunch reservations, Lou Sanders, 202/898-4086, or Tom Guins, 202/639-2259

**Wed Oct 18 Power Supply Reliability**  
**Sponsor:** Reliability Society (W/NV)  
**Speakers:** James Gucinski and Robert Saum, NSWC Crane  
**Place:** Dinner: Anchor Inn, University & Georgia Ave, Wheaton, MD; Meeting: Vitro Corporation, Intersection of Aspen Hill Road and Connecticut Ave, Silver Spring, MD; Enter off Aspen Hill Road (immediately behind Shell Station) into Parking Lot of Bldg 4 (park anywhere); sign in at guards station; meeting will be held in main Conf Room  
**Time:** Dinner 6:00 pm; Meeting 8:00  
**Contact:** For more information and reservations, call Ron Combs, 703/553-1733, or Harry Ascher, 301/762-4779 Rad &aur Silver Spring, MD

**Thu Oct 19 ♦ Overview of the Globalstar Communications System**  
**Sponsor:** Communications Society (W/NV)  
**Speaker:** Dan Smith, Globalstar  
**Place:** George Washington University, Academic Center (22nd & I Street, NW) Room T-640, EE Dept. One block from Foggy Bottom Metro. Parking across from the Academic Center.  
**Time:** Lunch 11:45 am (bring your own brown bag); Registration 12:00 noon; Presentation 12:15 pm to 1:00  
**Contact:** Robert J. Hollingshead, 301/464-8900

**Mon Oct 23- ♦ Antennas and Antenna Systems:**  
**Thu Oct 26 Practical Design, Implementation, and Testing**  
 (For further details, see GWU entry for Sep 11-15)



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## ◆ DIAMOND STORIES ◆

This Department of the SCANNER provides short abstracts and biosketches to accompany those calendar items which show a diamond (◆) before the item's subject or event.

### Consultants Network

#### Networking and Business Meeting

See Calendar of Events, Tuesday, September 5)

During this meeting we will exchange resumes and have groups of colleagues review and make suggestions for modifying and improving your resumes. We expect to review about 3-5 resumes that day. This will be a hands-on peer review of what it is that your resume says about you, as compared to what you want it to say. Having multiple eyes review your resumes and/or capabilities statements should serve to improve them. Often it is what you do or don't say that can make a difference. It is a hard thing to evaluate your own — since you have looked at it too many times! So, bring those resumes and become part of the critics corner! Learn from your colleagues.

### Chapter Organizational Meetings

(See Calendar of Events, Monday, September 11)

The Northern Virginia and Washington Sections of the IEEE are in the process of forming a Joint Society Chapter Support Committee, as announced in the 1994 edition of the NCAC, Washington, and Northern Virginia Directory. The mission of this committee is to:

1. Provide guidance and assistance to the officers of active chapters as requested by the chairman of the chapter,
2. Reconstitute inactive chapters and assist the new chapter officers in preparing and implementing a program to revitalize each chapter,
3. Establish new society chapters or joint chapters where there is no local society chapter.

Each chapter should have the following officers: Chairman, Vice Chairman, Secretary, Treasurer, Program Chairman, and Professional Activities Chairman. If necessary, specific officers could combine more than one of these functions, but the function should be recognized.

To implement this program, all Life Fellows, Fellows, Life Senior Members, Senior members and Life Members in a society are being asked to indicate their interest in supporting the division or society of their choice in time for the committee to be formed prior to the start of the series of organizational meetings on September 11.

Others wishing to participate are asked to contact Jim Strother (703/751-6186) or Jackie Hunter (703/803-8701).

The series of six organizational meetings is planned to present information required for a successful chapter annual program. Each chapter officer will receive a copy of a new NCAC reference manual and other information.

A telephone listing and master label set will be distributed to each chapter or chapter organizing committee.

Chapters are assigned to Divisions as follows:

- Division I: Circuits and Devices (CAS, CHMT, ED, LEO)
- Division II: Industrial Applications (DEI, IA, IM, PEC)
- Division III: Communications Technology (COMM)
- Division IV: Electromagnetics and Radiation (AP, BT, CE, EMC, MAG, MTT, NPS)
- Division V: Computer A
- Division VI: Engineering and Human Environment (ED, EMS, PC, R, SIT)
- Division VII: Energy and Power Engineering ((E)
- Division VIII: Computer B
- Division IX: Signals and Applications (AES, GRS, OE, SP, UFFC, VT)
- Division X: Systems and Control (CS, EMB, IE, IT, RA, SMC)

We are looking forward to seeing you on the day designated to your chapter.

### Status of Operations and Future Plans for the Virginia Railway Express

(See Calendar of Events, Tuesday, September 12)

Mr. Stephen P. Roberts is the Director of Operations for the Virginia Railway Express. He will discuss the current status of the railroad's operations and future plans for commuter service in the Northern Virginia Area.

### Radar Target Analysis and Coherent Signal Processing

(See Calendar of Events, Monday, Sep 11 to Friday, Sep 15)

This course addresses the interpretation of radar cross section (RCS) data in terms of measurement range performance, target characteristics, generic threat radars, and combat simulations. Unlike other courses that treat radar systems and RCS separately, this course presents actual radar clutter data and target signatures to illustrate radar processor performance for surveillance and target detection, discrimination, classification, and noncooperative target identification (NCTI).

The course discusses RCS measurement and data validation, processing, interpretation, and utilization. It presents RCS versus aspect data; high-resolution imagery; Doppler signatures; and polarimetric signatures of full-scale targets including fixed-wing aircraft, helicopters, missiles, tanks, periscopes, and antennas. Dynamic RCS testing, bistatic RCS testing, RCS testing and data processing techniques that minimize error, and glint measurement procedures are also covered.

Instructors: David Stein, Alan Siegel, Robert Hayes; Course #1917; Fee \$1,295; CEUs: 3.60

### Consultants Network

#### Dave's Database Magic to Getting and Keeping Business

(See Calendar of Events, Tuesday, September 19)

Dave Perlmutter will discuss his proven system of keeping track of existing and potential customers. His successful consulting experience in the Washington, DC metropolitan area over the past 10 years speaks for itself. He has compiled a good, solid database of former clients and business contacts

that he has dealt with over the years. In his talk, Dave will tell us how he works his contact list, how he adds new people to it, and what tools he uses to keep track of what to do next. In addition to letting us know what works for him, he will bravely tell us what didn't. This good nuts-and-bolts talk about making your marketing work is essential to all of us who wish to succeed and improve their prospects. Come to this meeting and hear how others have done it —It may work for you too!

### LAN Technology: An Introduction

(See Calendar of Events, Monday, Sep 18 to Wed., Sep 20)

This course introduces professionals to local area network (LAN) technology. The course presents IEEE's LAN standards and the associated higher-level protocols necessary for constructing a complete LAN-based network. The course emphasizes LAN interconnections, including the use of bridges and routers. It discusses client-server and peer-to-peer PC LANs. It summarizes design and management issues including cable plant design, network partitioning, network security, and fault detection.

The course is specifically organized to enable participants to attend a follow-up course in LAN applications — LANs: Design and Installation of Networks that Support Voice, Data, and Video Applications (Course 1188)." Together, the courses will give participants an excellent understanding of the technology.

Instructor: John Carson, Ph.D. Course #1195; Fee: \$975; CEUs: 2.16

### The Chicago Circulator

(See Calendar of Events, Wednesday, September 20)

The ten-mile Chicago Circulator will provide critical connections between Chicago's commuter, business, commercial and institutional centers in the downtown area, using modern light rail transit technology. Planned to operate reliably in a dense street traffic environment at relatively high speed, the system is considering use of an innovative train control system to meet objectives.

Mr. Ardell S. Hoveskeland, an IEEE member, received his BSEE degree from the North Carolina State University, Fargo, where he was elected to Tau Beta Pi. He is a registered professional engineer in the District of Columbia, Massachusetts, California, and Colorado. He has had more than twenty-six years of experience, six of which have been with DeLeuw, Cather & Company. Prior to joining that organization, he was Director of Equipment and Systems Engineering for the Maryland Mass Transit Administration. (He pronounces his name HO'-VES-KE-LAND).

### Comparison of the Current Technology with "Iridium"

(See Calendar of Events, Thursday, September 21)

This presentation will provide an overview and comparison of the upcoming mobile satellite system "Iridium" with the present cellular telephone system. The comparison will focus on architecture issues such as the methods used for call registration, call set-up, call hand-off, and cell frequency reuse.

Yvette Hubbel is a senior engineer/analyst with the Lockheed Martin Corporation. She holds a BSEE from the University of

Maryland, and is currently enrolled in an MSEE program at John Hopkins University.

### LANs: Design and Installation of Networks that Support Voice, Data, and Video Applications

(See Calendar of Events, Thursday Sep 21 to Friday, Sep 22)

Local Area Networks (LANs) are major components of the facility environment. LANs provide a backbone transmission system that can replace many individual distribution systems. A variety of applications enable the LAN to distribute large amounts of information in a number of communications modes, such as voice, data transmission, and video.

A LAN in a multisensor environment can provide support for office automation, video distribution, and a wide range of future telecommunications needs. For organizations currently examining these needs now met by telephone, data transmission, and other automated systems, LANs offer a communications system that can meet present needs and provide reserve capacity to support future services.

Participants will have the opportunity to install and experiment with a PC LAN during a workshop session.

Instructor: Lee Afflerbach, P.E.; Course #1188; Fee \$790; CEUs: 1.44.

### Optical Systems Fundamentals

(See Calendar of Events, Monday, Sep 25 to Tuesday, Sep 26)

The evolution of low-cost, solid-state optical components such as laser diodes, light emitting diodes (LEDs), PIN detectors, and fiber-optic interconnects has rapidly expanded the applications of optical systems. Today, numerous calibration, communications, and industrial controls comprise optical components and subsystems. Timely and cost-effective utilization of these developments requires understanding of optical concepts and technology.

This course provides a basic understanding of optical systems. It is designed for technical professionals who are beginning to work with optical systems and for those who need to review and reinforce their current knowledge. The course covers optical components, integration of components into systems, and resulting performance characterized by resolution and signal-to-noise ratio (SNR). The components discussed include passive components such as lenses and mirrors as well as light sources, modulators, and optical sensors. The performance of a variety of optical instruments and systems is reviewed, and similarities among optical systems are explored to derive fundamental limits for system performance. A laboratory period is included where basic optical instruments are assembled and fundamental design rules are verified.

Instructor: Michael Price, Ph.D.; Fee: \$790; CEUs: 1.44

### Professional Networking in Photonics Opportunities and Resources for Business, Government, and Universities

(See Calendar of Events, Tuesday, September 26)

This conference is presented to enhance the networking of photonics professionals and those that support the photonics profession. The objective of this conference is to develop

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Talk to hiring managers from some of the Washington, DC area's top companies. On-the-spot interviews for a variety of Engineering and Information Systems positions.

See our ad in the *Washington Post* Help Wanted classifieds on Sunday, Sept. 10 for further information.

If it is impossible for you to attend, mail or fax your resumé,  
Attn: 9DCIEEE, to the address below. For more information  
call the 24-Hour Infoline: 1-800-765-HIRE (4473) x9112 after 8/28/95.

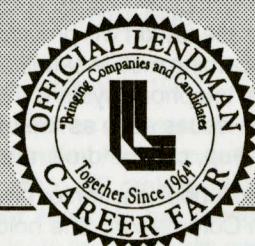
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## DIAMOND STORIES-cont'd

contacts and awareness of opportunities and resources that are available in the metropolitan Washington, D.C. area. Information exchange as to potential public and private funding sources, laboratory facilities, topics of interest, commercial programs, and mechanisms by which cooperative endeavors can be achieved is the primary emphasis of the conference. Invited speakers currently scheduled include Arpad Bergh (OIDA), Anis Husain (ARPA), John Frasier (ARL), Thomas Giallorenzi (NRL), Deborah Crawford (NSF), James Harvey (ARO), Dean Collins (NIST), Yoon Soo Park (ONR), Alan Craig (AFOSR), Mario Dagenais (UMCP), Ravi Athale (CO OP/GMU), Jack Ahearn (Lockheed Martin).

### Interconnect Design and EMC Considerations: Measurements and Simulations in High-Speed Digital Circuits and Systems

(See Calendar of Events, Monday, Oct 9 to Friday, Oct 13)

Transmission-line effects now appear in many conventional transistor-transistor logic (TTL) and complementary metal-oxide semiconductor (CMOS) buses that were not designed to work in a transmission-line environment. As a result, digital designs are prone to noise interference from reflections at improperly terminated interconnections, from high crosstalk levels along printed circuit board (PCB) interconnections and connectors, and from excessive simultaneous switching in parallel systems. Adequate signal quality in high-speed computer and communications designs can be obtained, however, using simple wave propagation rules and design criteria.

This course presents the physical principles of signal propagation and degradation through interconnects in high-speed digital systems. Topics covered include design, simulation, and measurement of interconnect components, including transceivers, connectors, and printed-circuit and cable interconnections in high-speed buses and clock routes. Through the use of illustrations, the course demonstrates that intuitive design is often counterproductive and can, in fact, lead to performance deterioration. Simple rules based on wave propagation concepts that account for the effects of vias, through-holes, and connector pins are presented; and trade-offs for different multilayer stackup arrangements, grounding, and bypassing component selection and location are given.

Case studies taken from actual designs, design reviews, and research and development projects are used to emphasize important aspects of practical design. Large-screen computer demonstrations of case studies and simulations accompany the lectures.

Instructor: Istvan Novak, Tech.D.; Course #2018;  
Fee: \$1295; CEUs: 3.60

### Microwave Systems for the 21st Century

(See Calendar of Events, Tuesday, October 10)

This is the first of a series of lectures sponsored by the Washington/Northern Virginia chapter of the Microwave Theory and Techniques society. The series will run on the second Tuesday of each month from October '95 through April '96 at the Maryland University's Adult Education Center. Two MTTS "Distinguished Lecturers," as well as some other well-known speakers, have been identified for this program. For further details contact Saurabh Dalal at the numbers shown in the Calendar of Events.

### Radar Operation and Design Fundamentals

(See Calendar of Events, Monday, Oct 16 to Tue, Oct 17)

This course provides a thorough review of radar fundamentals, basic principles of radio waves and propagation, target and clutter scattering of radar signals, and radar operations and apparatus used for effective radar performance. Participants learn basic radar calculations and are introduced to many of the tools used in radar description and design. The statistical nature of detection is reviewed, and design approaches are enumerated for each of the major subsystems of radar.

Instructor: Robert Hill; Course #1063;  
Fee: \$1125; CEUs: 2.88

### Wireless Infrastructure Engineering for Cellular, PCS, LEO, and WPBX

(See Calendar of Events, Monday, Oct 16 to Fri, Oct 20)

Construction of wireless communications systems continues to expand at compound growth rates greater than 40%/year, even in regions of the world where these systems are considered mature. As wireless infrastructures grow in sophistication, differences between wireless systems and wireline systems blur. These developments tend to reduce the price differences between the two systems. As low earth orbit (LEO) satellites, cellular, wireless private branch exchanges (WPBX) and upbanded cellular and personal communications services (PCS) become primary communications systems, they must offer wireline features, heavy traffic handling capabilities, reliable 911 emergency services, and superior survivability and reliability figures-of-merit. To accomplish these objectives, wireless infrastructures must be reengineered or, in cases such as LEOs and PCS, the networks must be engineered for the first time. This affords the opportunity to provide unique, network-based subscriber features that can be identified with a brand label over wide geographic areas. Service branding could even extend from one medium to another. Highly refined network infrastructures could be developed, for example, that hand over cellular calls to a LEO system transparently, while only generating one bill for the customer.

Originally developed as an in-house course for cellular carriers and companies entering into PCS competition, this course presents the technological concepts and engineering principles necessary to size channels, switches, and backbone facilities in an industry characterized by rapid growth and nontraditional customer behaviors. The course presumes that switches and networks must be robust and engineered with

disaster tolerance in mind. Methods for developing network architectures that can integrate multiple wireless services into one unified customer offering are also described. By the conclusion of the course, participants will be able to participate in network configuration planning and engineering with an understanding of the technological implications of the available alternatives.

Instructor: Ernest Simo, Ph.D.; Course #1896;  
Fee: \$975; CEUs: 2.16

### Overview of the Globalstar Communications System

(See Calendar of Events, Thursday, October 19)

Globalstar is a \$2 billion commercial venture to provide worldwide mobile voice and low-rate data communications. Globalstar's constellation of 48 low-earth orbiting satellites will be launched beginning in 1997 to allow the use of hand-held cellular type phones anywhere. This presentation will give an overview of the Globalstar program and review some of the many technical challenges involved in a system of this magnitude. Challenges range from launching 12 satellites at a time to operating 48 satellites with a minimal staff, to working with the FCC for licensing and CDMA bandsharing.

Dan Smith is the Principal Engineer of the Globalstar Satellite Control Center. He has over 15 years experience in developing satellite control centers, was the technical lead for the Hubble Space Telescope control center, and the program manager for NOAA's GOES weather satellite control centers.

### Antennas and Antenna Systems: Practical Design, Implementation, and Testing

(See Calendar of Events, Monday, Oct 23 to Thursday, Oct 26)

Antennas are critical components in communications and radar systems; their characteristics significantly affect system size, weight, cost, and performance. Accordingly, in order to effectively conceive, design, specify, and evaluate systems that employ antennas, it is essential that technical managers and systems and component engineers understand the fundamental and practical aspects of antennas.

This course presents the basic concepts and formulas for selecting, designing, analyzing, and testing antennas and antenna systems. The course begins with a quantitative definition of the general characteristics of all antennas. Next, the different antenna types are categorized by relating the specific performance of each type to general antenna characteristics and describing the system applications for which each antenna type is best suited.

The course covers the concepts used in analyzing antenna response and applies these concepts to fundamental antenna geometries. Modal theory and introduction to numerical methods applicable to more complex configurations are also discussed. The course demonstrates how the design progresses from a set of electrical and mechanical requirements for an application to a preliminary design and then to a more detailed design. Finally, procedures for testing the experimental model and relating the results to the requirements are described.

Instructor: Herbert Thal, Jr., Ph.D.; Course #1967;  
Fee: \$1125; CEUs: 2.88

### National Capital Area Council Chairman's Message

This year we are planning to streamline the activities of the NCAC and to work more closely with the Northern Virginia and Washington Sections. As a first step, the sections have agreed to combine their monthly administrative meetings with the NCAC's Steering Committee meeting. Our plan is to first conduct the NCAC meeting, and follow it with a breakout for the sections to conduct their own meetings. Through this combination, we hope to speed communications between the three groups and to reduce the number of meetings required for section officers who normally attend both the NCAC meetings and their own section meetings. Please note the calendar item for the location of the first combined meeting, which will be held on Tuesday, September 5.

We are also planning to increase support to the local society chapters through the establishment of a Joint Society Chapter Support Committee that will operate within each section. Many of you have received a letter from me this summer outlining the program and requesting your ideas and support. If you have not contacted Jim Strother or me as yet, please do so soon. Our telephone numbers are listed at the top of page 2.

For those IEEE members in this area who are facing or anticipating business downsizing, we will continue our sponsorship of the Technical Career Fair program in association with the Lendman Group. This program provides on-site private interviews with potential employers (see ad on page 8).

These are some of the steps and ideas we will be working on this year. What ideas do you have? Contact me or the other NCAC and Section officers listed on page two, and become involved.

Rex Klopfenstein

Chairman, National Capital Area Council

### Washington Section Chairman's Message

Welcome to a new program year. As your incoming Washington Section Chairman, I would like to thank the preceding officers for the outstanding job they have done in the past year. Also, let me introduce and welcome the other new Washington Section officers: Ron Aasen will be the Vice Chairman; Dave Straw the Treasurer; and Bill Regotti the Secretary. You can find their telephone numbers near the top of page 2.

Our section meetings will from now on be held concurrently with the National Capital Area Council and the Northern Virginia Section, as shown in the first calendar-of-events item in this issue of the SCANNER (Sep 5).

Again, I thank the executive and administrative committees and officers for their time and efforts during the past year. I look forward to the challenges of the upcoming year, to serving you, and will do my best to make your membership in the IEEE worthwhile.

Nino Ingegneri

Chairman, Washington Section

### Northern Virginia Section Chairman's Message

Greetings and felicitations for a happy new IEEE year! I wish to welcome you to the continuing opportunity to enhance your interests as an IEEE member and expand your professional horizons. The officers, directors, and committee and chapter chairs of the Northern Virginia Section are planning to explore new methods of supporting our membership and community, and welcome traditional and avant-garde ideas and programs from you. One of the principal goals of this year is to enhance chapter communications to their society members with a coordinated effort that utilizes modern electronic means. A prototype program is being explored with the Washington/Northern Virginia Chapter of LEOS, and we will keep you informed as to its success.

Regardless of the ideas generated by the membership and the resources from national headquarters provided to us, your participation in the Northern Virginia Section and technical chapters is essential for the success of our local IEEE. I have been informed that one of the primary responsibilities of the new administration is arm twisting, hence consider your arms twisted. If a bit of arm twisting cannot convince you to participate, maybe a financial incentive is required. Remember the funds we receive for operations. YOU have already paid; and you receive the most from your investment by active personal participation — whether in attending functions, acting as an officer or director of an IEEE organization, or taking the lead in advancing an active IEEE program or establishing a new one. Keep your eye on the SCANNER calendar for events and announcements of meetings. We look forward to your involvement.

In keeping with our goal of improving communications, please do not hesitate to contact the officers of the Northern Virginia Section if you have questions or would like information about our activities. I can be reached at telephone/fax number 703/280-1186, and email address vlannes@aol.com.

Best regards for this IEEE year, and best wishes in all your endeavors.

Nickolas P. Vlannes

Chairman, Northern Virginia Section

## INFORMATION TECHNOLOGY: IT IS TOMORROW

A Look at the Rapidly Changing  
Technology of  
Information Systems

FRIDAY, NOVEMBER 3, 1995  
9:00 A.M. - 4:00 P.M.

A Technical Information  
Seminar Co-sponsored by:  
Capitol College, IEEE, and  
AFCEA

#### • KEYNOTE ADDRESSES BY:

Ana Sol de Gutiérrez,  
Deputy Administrator for Research and  
Special Programs Administration  
Department of Transportation  
Milton Cooper  
President, Systems Group  
Computer Sciences Corporation

#### • TOPICS:

Virtual Community • World Wide Web  
Satellite and Mobile Satellite Communications  
Object-Oriented Design • Network Architecture  
Cellular Radio • Advanced VSAT Technology  
Network Architecture

#### • PRESENTORS/EXHIBITORS:

Lockheed Martin Corp. • Bell Atlantic  
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## LETTERS TO THE EDITOR

June 26, 1995

Dear Mr. Doepfner,

I recently received your June/July/August 1995 Scanner issue, and noticed the new Editor's Corner. The IEEE Reliability Society is sponsoring a new reliability standard to replace MIL-STD-785, which many of your readers may find interesting. The Reliability Program Standard Development Working Group is chaired by Dr. Michael Pecht, director of the CALCE EPRC, and includes members from the U.S. government and electronic industry, the United Kingdom's Ministry of Defence and prominent participants in the European and international reliability standards arena, to ensure the new standard will be an effective starting point for updating international standards.

In order to create a generic reliability program that may be used for many specific products, the Working Group decided that the standard should depart from the Mil-Std-785 model, and instead of specifying and describing the tasks to be performed, it should specify the objective of the tasks. This will enable the supplier, who is often more expert in the product technology than the customer, to describe what will be done to achieve the objective. This will also ensure that the proposed work really adds value to the development program.

The new standard provides guidance to suppliers to plan a program that suits their design philosophy, the product concept, and the resources at their disposal, so that every activity adds value. The overall objective is to provide products that satisfy the customer's needs; those needs are expressed in the form of three questions:

- Does the supplier understand the customer's needs?
- What is the supplier doing to satisfy the customer's needs?
- How will the supplier assure the customer that the needs have been met?

These three questions translate to three objectives which form the Reliability Standard.

The standard is currently undergoing revision, and will be submitted to the IEEE standards board for approval in the near future. Please contact me by phone at (301) 405-5901, by fax at (301) 314-9269, or by e-mail at maj@eng.umd.edu with any questions or comments.

Thank you for your time and attention.

Sincerely,  
Margaret A. Jackson  
CALCE EPRC

June 27, 1995

Dear Tom:

I have read with interest the material that is published in the most recent issue of The Institute concerning the reorganization of the IEEE. Some of these proposed arrangements, and others, have been discussed for some time by a number of Life Fellows. I believe some comments

based on our long experience would be valuable in helping members to form an opinion.

I have been dismayed in my more recent contacts, which have included about twenty nations in the past few years, to see the image that the IEEE was developing in these countries, many of whom have their own electrical engineering societies. Some are beginning to view the IEEE as a "huge American bully" out to take over their membership and their activities. Some of these national activities in the various nations are related to their specific problems and to their specific relationships with their governments, trade unions, and employers. I believe there is a strong need to continue these individual country societies. In addition, in the electric power area there is an international organization already in existence for electric power engineering — CIGRE — in which the various nations have national committees. In the World Energy Conference the various nations also have national committees whose activities often concern electric power matters.

I cite this background because I feel it must be recognized as we proceed in reorganizing the IEEE. The IEEE should try, to the extent feasible, to develop an organization that can work cooperatively with these other organizations. It should not destroy the existing organizations which are so beneficial in many nations. For this reason, we strongly recommend the Federation model for the future of the IEEE, if it truly wishes to be active on a worldwide basis. With the Federation approach, there can be a U.S. National Committee, a Costa Rican National committee, a Venezuelan National Committee, a French National Committee, a British National Committee, etc., each of which could be that country's own professional society. Each National Committee would have representation on the IEEE Board of Directors, which could have some form of a weighted voting procedure.

These same national societies also could constitute their representation in such organizations as CIGRE and the World Energy Conference. Through a "Federation" type of organization coordination between the various professional organizations would be fostered, and undesirable competition discouraged. It also leaves us with an organization that represents USA electrical engineers. We are one of the few large nations that do not have our own electrical engineering organization. This lack led to the formation of USAB and all the consequent conflicts with TAB.

I am sure many in the IEEE are concerned about this growing image of a huge American giant out to take over the professional organizations that currently exist. The "Federation" alternative offers us an opportunity to continue these organizations while utilizing them as part of a new IEEE structure.

I hope these comments will be considered by the IEEE Board of Directors, and by all IEEE members in making their preferences known.

J.A. Casazza  
Life Fellow

*(Editor's Note: Jack Casazza is an "IEEE Distinguished Lecturer" who has been instrumental in helping to organize IEEE sections — particularly power society sections — in other countries. He is the recipient of four major IEEE awards, among them the prestigious "Herman Halperin" Award and the USAB Citation of Honor. He also has been a member of ten major IEEE Committees, dating back to 1943, and of the National Research Council's Energy Engineering Board since 1990. TWD)*

July 12, 1995

Do Not Abolish USAB!

With another unemployment crisis in our profession a strong possibility, a crisis that unfortunately could even be more serious than the one of the early seventies, this does not seem to be the appropriate time for our IEEE leaders to propose a reorganization of our Institute that will replace USAB — now supported with mandatory dues — with a professional society to be supported with optional dues. Abolishing USAB could have a devastating effect on its many successful professional programs in support of the well-being of our U.S. members.

How effective would other professions be in their lobbying efforts, such as the American Medical Association, or the American Bar Association, if their positions on professional issues would only represent the views of part of their total

membership? What would happen if members of the proposed IEEE professional society lobby before a congressional committee, and the committee would find out that the views presented before it only represent, say, 50 percent of the U.S. membership? Would this IEEE professional society be as effective as the current USAB? Clearly not.

USAB must address many of the new issues that are facing our profession as we move into the twenty-first century; among them are the downsizing of defense as well as non-defense industry, which will result in many of our colleagues ending up as part-time employees without company-sponsored employee benefits (pension, health insurance, etc.). Similarly, the reduction in research funding by both government and industry will make many young Ph.D. graduates underemployed. Without USAB, these issues cannot be dealt with in an effective manner.

I urge those of our members who are opposed to the elimination of USAB to write to our President, James T. Cain (e-mail: t.cain@ieee.org) on this matter, with copies to Bill Middleton, IEEE-USA "Professional Perspective" editor (w.middleton@ieee.org) and PACE Network Chair Charles S. Lessard (ieeeusa@ieee.org). USAB needs your support now!

Gideon Kantor  
Life Fellow, IEEE

*(Editor's Note: See also Bill Middleton's article in the "Your Local Reporter" Department below)*

## YOUR LOCAL REPORTER

### Request for Information

The Washington/Northern Virginia chapter of the Reliability Society is updating its membership records. Members are requested to provide the following information by e-mail (preferred), FAX, or telephone:

Name  
Address  
Telephone  
FAX  
e-mail (internet)

E-mail address is extremely important, so be sure to include it if you have one. Send the information to one of the following:

Ken LaSala — e-mail kenl@sao.noaa.gov;  
FAX 301/713-4149

Bill Wallace — e-mail wwallace@sao.noaa.gov;  
FAX 301/713-4149

or telephone them at 301/713-3352, or -3353. Thank you.

### My Perspective on the Institute's Restructuring Efforts \* by William W. Middleton, Editor-in-Chief IEEE-USA Professional Perspective

"If it isn't broke, don't try to fix it!" We are constantly hearing this popular saying in regard to legislation, governmental actions and

corporate restructuring. Can the same be said of recent efforts to overhaul the IEEE organizational structure?

Strategic Planning Committee, OICC Efforts — Our Board of Directors recently approved a strategic plan to prepare us for the next century. The Strategic Planning Committee is now implementing elements of this plan by forming an Organization Improvement Coordinating Committee (OICC), which has held several retreats to develop a new IEEE structure.

Some preliminary results of OICC's efforts were unveiled at the February Board meetings in Calgary. Three disparate approaches emerged from seven individual scenarios.

Three Scenarios for Reorganization — The first "evolutionary" approach has a number of variations, creates three activity groupings, and lends itself to slow changes over time.

The second "federation" approach contains technical and geographic units, includes a "membership congress," and has the ultimate objective of allocating individual costs for member services.

The third "matrix" board approach appoints directors to represent both technical and geographic interests, producing a minimum 36-member Board of Directors based on six groupings. Unquestionably, this plan was the most radical proposal and raised many questions.

What about IEEE-USA and USAB? — How do these scenarios affect the United States Activities Board (USAB), IEEE-USA, professional activities, and the IEEE's U.S. members? Financially compartmentalizing member services, as contained in the second

## YOUR LOCAL REPORTER

approach, causes me serious concern. Currently, U.S. members' dues assessments support professional activities. Just as fire fighters cannot break down expenses "per fire," IEEE-USA needs funding to continue basic levels of activity and maintain stability. The six U.S. Regions need a similar stable base for their consolidated activities.

Efforts are under way to prepare two integrated proposals for further Board review. Professional activities is still an element in two of seven individual scenarios. USAB is either eliminated or severely diminished in its visibility and responsibility.

**Why Are USAB and IEEE-USA at Risk?** — First and foremost, the membership-at-large may not recognize IEEE-USA's contributions to the profession, despite extensive communication efforts. Also, with the Institute's globalization thrust, professional activities is being viewed from a worldwide perspective. This deemphasizes USAB's role as a Board-level entity, despite the fact that IEEE-USA seeks to promote the professional careers and technology policy interests of most of the IEEE's membership — our quarter-million U.S. members.

**Support and Preserve Professional Activities** — The Institute cannot tolerate a major organizational overhaul. Incremental structural changes can be made. They should not diminish the important work of IEEE-USA in spearheading professional activities. We need your help to preserve professional activities.

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### "Science and Technology in the Work Place" IEEE Volunteers Needed in an Exciting Cause

Continuing his successful work in sponsoring "link seminars" for selected classes of local high school seniors and juniors, our George Rodgers (IEEE Life Senior Member, Northern Virginia Section) has developed a special segment on Fourier Analysis for the October and March seminars in the 1995-96 school year. Each seminar will originate from the Thomas Jefferson High School, to be televised live on Channel 21 to County Schools, and possibly some other locations. Runs to date indicate the desirability of using "proctors" at each location. George is looking for two IEEE volunteers at each off-site class. (No instructional preparation is

necessary, but proctors will be given full classnote sets in advance; two proctors per class are desirable to cover absences.) Modest goals of this long term project include validation of alternative link techniques for implementation of up to a 16-PT Fast Fourier Transform to selected classes of high school seniors and juniors.

Successful students are awarded IEEE Certificates of Completion, entered on official records, to be useful for later summer work as well as ensuing college applications, as evidence of scholarship and ability.

If you are interested in this worthy cause, call George Rodgers at 703/591-4412 or -4357 for an information packet.

### Future Federal Support for Research and Development: A Paradigm Shift

The 1995/96 MIT Seminar Series begins October 10 with a lecture on "Technology and Economic Growth: The Government Role." Seminars in future months will cover "Changes in Federal Support and The Impact on Research Universities and Corporations."

There will be one Tuesday evening seminar each month from October through March. This is the 14th annual MIT Seminar series. Like the previous series, it will consist of six dinner meetings held at the University Club of the Mary Gradon Center at the American University, Washington, D.C. The cost for the series is \$195. All IEEE members are welcome to attend.

For further information on subscribing to the series, call Dr. Kenneth Gordon at 301/469-9240.

### 25th General Assembly of the International Union of Radio Science (URSI) Call for Papers

Abstract deadline for this Call for Papers is January 8, 1996. The areas covered include: Electromagnetic Metrology; Field and Waves; Signals and Systems; Electronics and Photonics; Electromagnetic Noise and Interference; Wave Propagation and Remote Sensing; Ionospheric Radio and Propagation; Waves in Plasmas; Radio Astronomy; Electromagnetics in Biology and Medicine. Abstracts should be sent to Prof. Degaube, Univ de Lille, F-59655 Villeneuve d'Ascq Cedex, France; tel (33) 20 33 72 06; fax (33) 20 33 72 07;

e-mail: agursi@univ-lille.fr; server: <http://www.univ-lille.fr/ursi96>.

## ELSEWHERE IN OUR PROFESSION

[The following items are excerpted from IEEE and National Institute of Standards and Technology (NIST) news sources and — starting with this issue — from the Aerospace Technology Committee of the National Air and Space Museum, Smithsonian Institution]

### New Survey Shows Electrical Engineering Salaries Slightly Up, Unemployment Down

Income for electrical, electronics and computer engineers increased 5.9 percent during the past two years, outpacing the rate of inflation.

Those working in their primary specialty in 1995 had total incomes averaging \$71,900, according to a biennial survey of U.S. members conducted by the U.S. Activities division of the

IEEE. Two years ago, average income was \$67,900. Between 1993 and 1995, the consumer price index rose 5.6 percent. Highest incomes were recorded in the Northeast; the lowest in the Midwest.

According to Robert S. Duggan, Jr., chairman of the IEEE-USA Survey Committee: "After the major economic disruptions of the past several years, the results of this survey should prove encouraging to the beleaguered engineering workforce. We find that the income pie is getting a little bit larger, and there are also more slices to go around."

The IEEE-USA survey shows more retired electrical engineers and fewer EEs working full-time. Part-time employment registered 4 percent, and retirement accounted for 15.4 percent

of respondents. Nearly 70 percent were employed full-time in their primary specialty, and another 7.5 percent were working full-time outside their fields. Among the remaining, 2.3 percent were involuntarily unemployed, down from a record high of 2.7 percent in 1993.

The poll provides extensive statistical data regarding engineering income by industry sector. The highest median incomes were reported by engineers in communications (\$70,138), computers (69,929), and aerospace (\$69,500), while the lowest were reported in the automotive industry (\$62,000) and transportation (\$60,000). By job function, engineers in general management have the highest income, those in manufacturing and production the lowest.

A minority of respondents, 20.1 percent, are registered professional engineers. Another 13.3 percent qualify for Engineer-in-Training status. The most commonly held degrees are the Bachelor of Science in electrical engineering, or in electrical and computer engineering.

Almost all (94.9 percent) respondents were men, and 88.2 percent identified themselves as non-Hispanic white. Asian-Americans represented the largest minority group with 7.6 percent.

### Electrical Engineers Would Save More With Expanded IRAs

According to a poll conducted by IEEE-USA, electrical engineers would increase their personal retirement-savings rates if Congress enacts pending savings-incentive legislation. "The poll reveals an overwhelming consensus that engineers will do their part to rebuild the collapsing national savings rate — if Congress gives them the tools," stated IEEE-USA Board Chair Joel P. Snyder, "Engineers are telling us that they're worried about retirement security, but they simply can't afford to increase their savings and their tax bite at the same time," he said.

The poll results come as Congress considers ways to encourage personal savings. The American Dream Restoration Act, passed by the House as part of the "Contract with America" Tax Relief Act, permits individuals to make taxable contributions of up to \$2,000 a year to new "American Dream Savings Accounts" (ADSAs) irrespective of income or pension-plan participation. The distributions from these accounts would not be subject to additional tax or penalty if used for retirement, a first-time home, educational expenses or major medical costs. The Individual Retirement Account (IRA) Equity Act, also passed by the House, raises the dollar amount that a non-working spouse can contribute to a conventional tax-deductible IRA from \$250 to \$2,000.

Critics of the current proposals claim that tax incentives to use savings instruments would lead Americans merely to redistribute their investments, not actually increase their savings. "Our survey data suggest that new savings incentives will result in more investment — increased savings to ensure Americans' retirement security, and more private capital to boost U.S. economic competitiveness," said James V. Leonard, chair of IEEE-USA's Engineering Employment Benefits Committee. "As members of the nation's second-largest profession — and

a major portion of its middle-class savers — electrical engineers are a bellwether on this issue," he added...

The survey group was virtually united in its commitment to save more with additional tax incentives. Of those reporting they would participate in the new plans, nearly four of five said their contributions would constitute an increase in their overall level of savings. Only 22 percent indicated they would merely shift their investments to gain the tax advantages.

IEEE Contact: Chris J. Brantley, Manager, Government Activities, IEEE-USA, Tel 202/785-0017.

### IEEE Government Fellows Have Begun Assignments in Congress, Commerce Department

The Congressional Fellowships Program places qualified volunteers in one-year terms on staffs of interested Members of Congress or congressional committees.

Robert Duane Shelton, Donald M. Wiberg, and Paul B. Crilly have begun assignments as 1995 IEEE-USA Congressional Fellows; and James C. Denisson has embarked on an Executive Fellowship with current U.S. Commerce Department Under Secretary Mary L. Good.

IEEE-USA's Executive Fellowship Program assists the U.S. Commerce Department's new Technology Administration in advancing U.S. competitiveness in electronics, manufacturing and technology.

Robert Shelton accepted his Fellowship with Rep. Lloyd Doggett, D-Texas, a member of the House Science Committee and its Subcommittee on Basic Research. Working as a legislative assistant for environment, science and technology issues, Shelton will also serve as liaison to high-technology industry and educational institutions within Doggett's Austin-area district.

Concentrating on energy and defense policy, Donald Wiburg is conducting his Fellowship in the office of Senator Tom Harkin, D-Iowa. He will be advising Harkin on Appropriations Committee science and technology funding issues and the Senate version of the hydrogen research bill.

IEEE-USA has extended Paul Crilly's 1994 Congressional Fellowship for one year at the request of Rep. Dana Rohrbacher, R-Calif., the newly appointed chair of the House Science Subcommittee on Energy and the Environment. Crilly will continue to advise Rohrbacher on general science and technology issues.

For more information on the Government Fellowship programs, contact Chris Brantley at the IEEE-USA Office, 202/785-0017, x303, or [c.brantley@ieee.org](mailto:c.brantley@ieee.org) (e-mail).

SCANNER is read by about 15,000 of the most influential engineers and managers in the capital area electronics industry. Half work primarily for the government, and the typical reader is 43 years old and earns \$55,000. If you want to showcase your high tech product or service before the people who need it most, call the Advertising Manager, Charlie True at 703/448-7622



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- o Structure information for transmission, storage, manipulation and retrieval.

The next group will begin January, 1996. Classes meet one day per week on alternating Fridays and Saturdays. Class size is limited. Call now for information on upcoming briefings or to request an admissions packet.

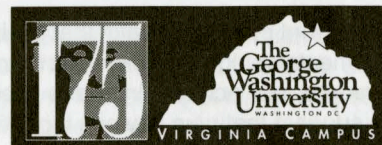
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