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NATIONAL CAPITAL AREA COUNCIL

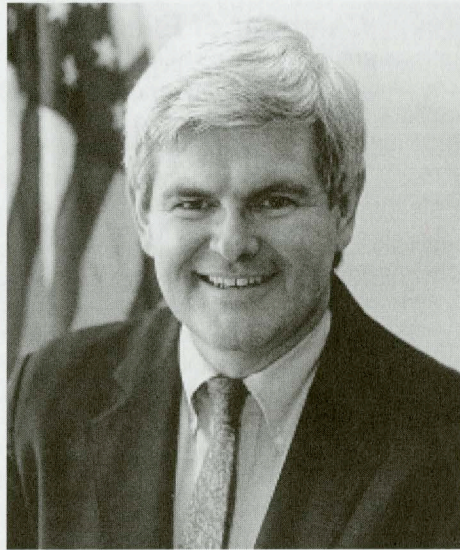
# SCANNER

December 1995/January 1996

Volume 10, No.6

*Happy Holidays (?)*

## The Impact of "NEWT" on Our Institute



*Santa Claus* – or **Scrooge ?**

(See "Editor's Corner," page 10)

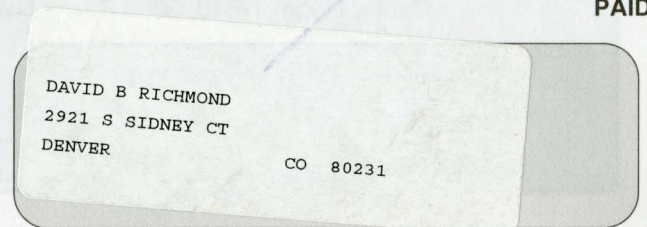
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A Joint Publication of the Northern Virginia and Washington Sections

# SCANNER

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**1995/96 Season**

**National Capital Area Council**

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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.

**DECEMBER 1995**

**Mon Dec 4 ◆ Utility of "Finite Difference Time Domain" in Antenna Analysis and Design**

**Sponsor:** Antennas and Propagation Society (W/NV)  
**Speaker:** Dr. Raymond Luebbers, Remcom, Inc.  
**Place:** Comsat Corporation  
**Time:** 6:30 pm  
**Contact:** Andy Humen, 301/982-5264

**Mon Dec 4 Applications of Superconductivity**

**Sponsor:** Power Engineering Society (W/NV)  
**Speaker:** James B. Lowe, Director, Business Development, Raytheon Federal Engineers and Constructors  
**Place:** George Washington University, Academic Center Room T-640, 22nd Street NW, Washington, DC; One block from Foggy Bottom/GWU METRO Station

**Time:** 12:00 noon; Sandwich lunch available; order by Nov 30  
**Contact:** William D. Jackson, 301/946-1586; Fax 301/946-4374; e-mail HMJJUTLAND@AOL.COM

**Tue Dec 5 NCAC Steering Committee Meeting 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

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**Contact:** Rex Klopfenstein 703/883-6862; Nino Ingegneri 301/279-4217; Nicholas Vlannes 703/280-1186; or Charles True, 703/448-7622

**Tue Dec 5 ◆ Consultants Network: Networking/Business Meeting and "American Power Conversion" Presentation**

**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 further details and/or reservations, call 301/924-2610, or 301/460-4693

**Tue Dec 12 Controlling Chaos in Fast Optical Systems**

**Sponsor:** Lasers and Electro-optics Society (W/NV)  
**Speaker:** Daniel Gauthier, Duke University  
**Place:** A.V. Williams Bldg, Room 2460, Univ of MD, College Park MD

**Time:** Dinner 6:00 pm at Calvert House Inn, 6211 Baltimore Ave, Riverdale, MD; Talk 8:00 pm  
**Contact:** For more information and to make dinner reservations, call Hal Heaton, 301/953-5025, or Li Yuan, 410/455-3558

**Tue Dec 12 ◆ Wireless Personal Communication Systems**

**Sponsor:** Microwave Theory and Techniques Society (W/NV)  
**Speaker:** Dr. Bernhard Keiser, Keiser Engineering  
**Place:** Univ of MD Adult Education Center, University Blvd & Adelphi Road, Adelphi, MD  
**Time:** Cocktails 5:45 pm; Meal 6:30; Meeting 7:30  
**Contact:** Information and dinner reservations: Dave Hinzl, 703/729-6000 x3737

**Thu Dec 14 ◆ Dept of Commerce Information Structure**

**Sponsor:** Communications Society (W/NV)  
**Speaker:** Jerome T. Gibbon, Dept. of Commerce  
**Place:** The George Washington University, Academic Center (22nd and I Streets, NW, Room T-640 (EE Dept Conference Room). One block from Foggy Bottom/GWU Metro Station. Limited on-street parking; cheapest parking garage is across from Academic Center (Use I-Street visitors' entrance)  
**Time:** Lunch (bring your own brown bag) 11:45 am; Registration 12:00 noon; Presentation 12:15 pm to 1:00

**Contact:** Howard Luterman, 301/214-8687  
Reservs: IEEE NCA Office, 703/803-8701

**Tue Dec 19 ◆ Consultants' Network — Discussions on Recent Meeting in Boston**

**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 further details and/or reservations, call 301/924-2610, or 301/460-4693

**JANUARY 1996**

**Tue Jan 2 Consultants' Network: Networking/Business Meeting**

**Sponsors:** NCAC PACE Consultants' Network (W/NV)  
**Time:** Dinner 5:30 pm; Meeting 7:00  
**Place:** Dinner: Sir Walter Raleigh Restaurant, Falls Church, VA; Meeting: Virginia Tech @ Falls Church

**Contact:** For further details and/or reservations, call 301/924-2610, or 301/460-4693 by noon, Dec 29

**Tue Jan 9 Applications of Electro-optics Technology to Fluorescence Microscopy**

**Sponsor:** Lasers and Electro-optics Society (W/NV)  
**Speaker:** Kenneth Spring, National Institutes of Health  
**Place:** A.V. Williams Bldg., Room 2460, Univ of MD, College Park, MD  
**Time:** Dinner 6:00 pm at the Moose Creek Steak House, 10000 Baltimore Blvd, College Park (at the Holiday Inn, Beltway exit 25A;) Talk 8:00 pm

**Contact:** For more information and to make dinner reservations: Hal Heaton, 301/953-5025, or Li Yan, 410/455-3558

**Tue Jan 9 ◆ Automotive Electronics — Challenges and Opportunities**

**Sponsor:** Microwave Theory and Techniques Society (W/NV)  
**Speaker:** Rahul Dixit, TRW's Automotive Electronics Group

**Tue Jan 16 ◆ Consultants' Workshop**

**Sponsors:** NCAC PACE Consultants' Network (W/NV)  
**Time:** Dinner 5:30 pm; Meeting 7:00  
**Place:** Dinner: Sir Walter Raleigh Restaurant, Falls Church, VA; Meeting: Virginia Tech @ Falls Church

**Contact:** For further details and/or reservations, call 301/924-2610, or 301/460-4693 by noon, Jan 15

**Wed Jan 17** ♦ **The Productivity Paradox: Where Has All the Money Gone?**

**Sponsor:** Society for Social Implications of Technology (NV/B/W)  
**Speaker:** Dr. Thomas B. Fowler, The MITRE Corporation  
**Place:** Tysons Corner Magic Pan Restaurant: Tysons Corner Center, lower level, near Lord & Taylor  
**Time:** Social 6:15 pm (Cash Bar); Dinner 7:00; Presentation 8:00  
**Contact:** Bill Kelly (e-mail) wjkelly@mitre.org, or tel 703/883-5745 for dinner reservations and info on Metro accessibility

**Thu Jan 18** ♦ **Electromagnetic Modeling**

**Sponsor:** Electromagnetic Compatibility Society (W/NV)  
**Speaker:** Dr. Jose Perini  
**Place:** Fred's Place Restaurant, 2d Floor, Holiday Inn Crystal City; two blocks north of Crystal City Metro stop; Some free parking in garage; stop at front desk for parking permit.  
**Time:** Registration/cash bar: 11:30 am; Lunch (optional, but encouraged) 12:00 noon; Meeting 12:30 pm  
**Contact:** For information: Larry Cohen, 202/404-7726 (W) or 301/258-9120 (H); for lunch reservations (required):

Larry Cohen, or IEEE NCA Office, 703/803-8701 by COB Jan 17

**Thu Jan 18** ♦ **Industry.Net On-line Service for the Electrical Industry**

**Sponsor:** Industry Applications Society (W/NV)  
**Speaker:** Dave Thompson, Industry-Net Co.  
**Place:** Holiday Inn, 10000 Baltimore Blvd, College Park, MD (Beltway & US1 North)  
**Time:** Social 6:30; optional Dinner (\$20) 7:00; Presentation 7:30  
**Contact:** Ron Aasen, 703/516-1928, or Bill Regotti, 202/789-4453. Reservations are requested by Jan 16.

**Thu Jan 18** ♦ **Overview of Mobile Satellite Systems**

**Sponsor:** Communications Society (W/NV)  
**Speaker:** Mr. Don Rickerson, Staff Systems Engineer Lockheed Martin Corporation  
**Place:** George Washington University, Academic Center (22nd & I Streets, NW) Room T-640, EE Dept. One block from GWU/Foggy Bottom Metro Station; Parking across from Academic Center  
**Time:** Brown bag lunch (bring your own) 11:45 am; Registration 12:00 noon; Presentation 12:15 pm to 1:00  
**Contact:** Everyone is welcome; for information call Howard Luterman, 301/214-8687

◆ **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.*

**Utility of Finite Difference Time Domain in Antenna Analysis and Design**

*(See Calendar of Events, Monday, Dec 4)*

The Finite Difference Time Domain (FDTD) method has become widely used as an electromagnetic analysis tool. It is geometrically very general, and can readily include complicated shapes and lossy materials. It scales well for higher frequencies/larger objects, especially when dielectric materials are involved. In the talk some example applications of FDTD will be presented, primarily involving spiral and microstrip antennas. Results shown will include input impedance, radiation patterns, and scattering. Some "tricks" for reducing the amount of time required for convergence will be discussed. The XFDTD software package, which combines an FDTD calculation program with an X-Window Graphical User Interface, will be presented. Applications of XFDTD to antenna analysis and design will be demonstrated.

Raymond Luebbers is Professor of EE at Penn State University, and President of Remcom, Inc. He is author or

coauthor of a series of papers on the FDTD method, and coauthor of the book "The Finite Difference Time Domain Method for Electromagnetics" by CRC Press. He is a Fellow of the IEEE, and co-author of the paper which won the 1993 Schelkunoff Prize for the best IEEE AP-S Transactions paper.

**American Power Conversion Presentation**

*(See Calendar of Events, Tuesday, Dec 5)*

"American Power Conversion" is a leading manufacturer of uninterruptible power supplies and surge protection products for personal, professional, and network applications. The discussion will focus on causes/effects of power problems and the use of uninterruptible power supplies for critical applications, such as computers and telecom. The differences between on-line and standby systems will be discussed, as will the various types of power line disturbances and methods of minimizing/reducing these problems. The discussion will also include product descriptions for an assortment of UPD equipment, power line monitors/controls, and software.

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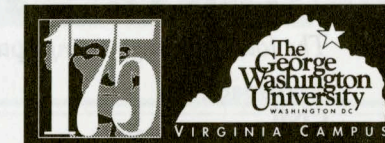
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## Wireless Personal Communication Systems

(See Calendar of Events, Tuesday, Dec 12)

Interest in personal communication systems, the availability of the 1900 MHz band, and smaller and cheaper handsets will keep this market growing. The speaker will discuss the standards being implemented for the new systems. A brief overview of TDMA and CDMA, which form the basis for the seven new standards, will be outlined. Propagation differences between the 800- and 1900-MHz bands will be presented. Insights into industry trends will be included.

Dr. Bernhard E. Keiser, DScEE, is a consulting engineer in telecommunications. His consulting assignments have included network architecture for a maritime mobile telephone system, interconnection of telephone subscribers with a major data network, digital signal processors, and low bit-rate voice coding techniques. Dr. Keiser is a Fellow in the IEEE and co-author of the text "Digital Telephony and Network Integration," Van Nostrand, 1995. This lecture is the third in the IEEE-MTT course entitled "Microwave Systems for the 21st Century."

## Department of Commerce Information Structure

(See Calendar of Events, Thursday, Dec 14)

The U.S. Department of Commerce (DOC) is one of the most diversified agencies in our government, providing a variety of information and management services to the nation as well as to industry and the rest of the Federal Government. To perform these functions, the department has developed an elaborate network of information access

resources using LANs and WANs spanning the nation and the globe to provide information on trade, travel and economics, including data important to patents, census, environment, fishing, and search/rescue activities.

The speaker will discuss how the DOC's administrative network is linked through gateways to Internet. The presentation will focus on the architecture of the department's backbone network which connects over 800 local area networks and client servers through a packet switching network that is controlled by the network control center (NCC). The backbone spans over 9,000 domestic miles and over 30,000 global miles.

Mr. Gibbon, a senior member of the Telecommunications staff at DOC headquarters in Washington, DC, is responsible for management of the department's Wide Area Network. As the Contracting Officer's technical representative, he provides telecommunications engineering and management support to major networking projects. He has 35 years experience in industry and telecommunications. In the IEEE he is Vice Chairman of the National Capital Area Council, a past chairman of the Washington Section and of that section's Communications Society chapter. He has associate and bachelor degrees in electronics engineering and is a member of the Board of Trustees at Capitol College.

## Consultants' Meeting in Boston

(See Calendar of Events, Tuesday, Dec 19)

Bill Westcott from the NCAC Consultants' Network ventured up to Boston and participated in a regional meeting dedicated to methods of bettering the profession. He will present his findings along with many tips for improved consulting.

## Automotive Electronics — Challenges and Opportunities

(See Calendar of Events, Tuesday, Jan 9)

Automotive electronics will continue to increase for added safety and ergonomic interfaces. Mr. Dixie's talk will present trends in automotive electronics, areas of product application, the array of product families, and advanced product development, including radar.

Mr. Rahul Dixit is Director of Engineering at TRW's Automotive Electronics Group. Prior to this, he developed space communications hardware and GaAs ICs. He is a Distinguished Microwave Lecturer for the IEEE MTT-S.

## Consultants' Network Workshop

(See Calendar of Events, Tuesday, Jan 16)

We IEEE engineers are all highly trained in our technical specialties, but are often untrained in business. To address this shortcoming, the NCAC Consultants' Network presents this Consultant Workshop Series.

This session will have a noteworthy speaker who will present a topic of utmost importance to consultants. Be sure to attend this meeting in order to keep methods and techniques of consulting current and relevant.

## The Productivity Paradox: Where Has All the Money Gone?

(See Calendar of Events, Wednesday, Jan 17)

Telecommunications and information systems have become ubiquitous in offices, factories, and government, but at a cost of hundreds of billions of dollars. This enormous investment has been called into question with respect to benefits it delivers.

This talk discusses reasons why benefits from infrastructure technologies such as telecommunications are often hidden, and then systematically categorizes and examines its major application modes: (1) personal/office productivity enhancers; (2) move work to people; (3) reduce "dead time;" (4) permit new modes of business organizers; (5) enable enterprising restructuring; (6) improve manufacturing and service delivery; and (7) supply faster and better information. Also discussed are limits to the efficiency improvements possible in each of these areas.

Mr. Thomas B. Fowler is a Principal Engineer in MITRE's Telecommunications and Network Division. He joined MITRE in 1973 and has worked on computer-aided education systems, air traffic control, information systems, and telecommunications systems. He is currently involved with planning the next generation of government telecommunications. He also teaches graduate courses at George Washington University, and does independent research in the application of systems concepts to problems in engineering, public policy, and biology. He is a senior member of the IEEE.

## Electromagnetic Modeling

(See Calendar of Events, Thursday, Jan 18)

Our speaker will discuss the various types of models available today as well as their applicability to specific electromagnetic compatibility (EMC) problems. Dr. Perini is a Professor Emeritus from Syracuse University. He has over 30 years experience in EMC

predictions, analysis, and assessment, as well as in antenna design. He is the "father" of the Perini Radar Absorption Material Barrier used on U.S. Navy ships. He is a Fellow in the IEEE.

## Industry.Net On-line Service for the Electrical Industry

(See Calendar of Events, Thursday, Jan 18)

This presentation is a hands-on overview of Industry.Net's On-line market place for technical and catalog information for over 3,500 vendors. Additionally available is specifying information, software & shareware, industry news, forums, and a calendar of trade shows. Industry.Net is a free service available to professionals in the electric industry. Mr. Th-

ompson will also provide a demonstration of the IEEE website. This presentation is intended for the novice as well as the experienced user of the Internet.

## Overview of Mobile Satellite Systems

(See Calendar of Events, Thursday, Jan 18)

Mobile (handheld) satellite terminals for voice and data communications are a reality. Various satellite technologies in LEO, MEO and GEO orbits are or will be offering regional and global services. These terminals will be affordable for the mass market. It is therefore important that every engineer become familiar with the types of satellite services offered, as they will soon be used worldwide. Our speaker will explain each of these technologies: For voice systems that means big low earth orbiting systems (LEOS), medium earth orbiting systems (MEOS), and their regional and global services. Data systems will use the Little LEOS, Ultrasats, and GEOS services. The presentation will also focus on how these different services can meet various subscriber needs.

Mr. Rickerson is a Staff Systems Engineer for Lockheed Martin, working with Air/Ground Communication Systems Engineering at the FAA. He holds a BS in CS from Edinboro University, is a former Signal Corps officer, and a graduate student in Telecommunications at George Mason University.

## Seasons Greetings

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Dr. Patrick F. Cunniff  
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## CHAIRMAN'S CORNER

### National Capital Area Council Chairman's Message

Last August, I asked the 2,000 most senior and experienced local IEEE leaders to help in revitalizing the Northern Virginia and Washington Section and their society chapters, and to support their many important activities in the National Capital Area. I appreciate the many responses that I have received. Many who have replied have been contacted and are involved in the areas for which they volunteered, while others will be consulted soon. Progress is being made on revitalizing the society chapters, but more officers and advisors are needed. Those who volunteered for NCAC or section committees are being assigned as requested. Many volunteered to participate in professional activities programs at the local level, and with the national programs conducted by IEEE-USA. However, there is a need for more members to participate in the local program to support precollege education science, mathematics, and technology education in grades K-12. If you are interested in participating in any of these programs or activities,

please contact the NCAC Office at the address and telephone numbers listed on Page 2.

Significant actions have been taken recently on plans for organizational improvements of the IEEE. As I reported in the Oct/Nov SCANNER, there were many objections to the first three reorganizations proposed. As a result, Task Force 5 was appointed with Joel Snyder as chairman to develop a more conventional plan. All four plans were reviewed at the PACE Conference in Cedar Rapids over the Labor Day weekend. The results of the discussions are summarized in the lead article "PACE RAPS RESTRUCTURING" in the November '95 issue of the Institute. Joel Snyder also presented his plan at the Region 2 Committee meeting in October. His draft proposal, titled "IEEE 2010," establishes a long-range plan to be implemented in four steps to attain the final organization structure. After discussion, the committee passed the following resolution: "Resolved, the Region 2 Committee recommends that any changes in the organization of the IEEE be implemented only after a non-binding referendum of the membership." The

IEEE Board of Directors is expected to vote on approval of one or more of the proposals at its December 1995 meeting.

As we approach the holiday season, I extend my best wishes and my hopes for a successful and productive 1996 to all of you.

*Rex Kloppenstein*

Chairman, National Capital Area Council

### Northern Virginia Section Chairman's Message

Greetings and Felicitations for the Holiday Season! At the beginning of the IEEE year I had indicated that new methods of supporting the community were being explored, and I would like to report on a very successful one. The Laser and Electro-optics

Society (W/NV) concluded a most productive one-day conference: Professional Networking in Photonics: Opportunities and Resources for Business, Government, and Universities. This conference was a new approach to serving the LEOS community and the optoelectronics profession. The objective of the conference was to develop contacts and awareness of the opportunities and resources that are available in the metropolitan Washington, D.C. area, expand the interaction of the photonics community in the Washington, D.C. region, and generally provide a networking forum. The format of the conference was a full day's activity that included seminars, exhibits, and displays presented by federal agencies, private industry, and university programs. One of the primary goals of the conference was to have participants engage in direct dialogue with their colleagues, and this opportunity was well received by the participants and actively pursued. This conference proved to be an excellent vehicle by which photonics professionals were able to discover the range of activities in which their colleagues are involved. Several benefits were achieved: regional publicity for W/NV LEOS, its calendar of technical seminars; an expanded data base of email addresses for announcements; and additional names of people for the LEOS Chapter officers to pursue some arm twisting. I would encourage other local chapters of the IEEE to try this type of activity to engage their members.

Speaking of arm twisting - You out there! Yes, YOU! The Northern Virginia Section still has plenty of

opportunities to enhance your engineering profession and your personal career. As we approach that time of year of good cheer, we shall try some kinder and gentler arm twisting. Since this is the season of heartfelt giving, the Northern Virginia Section would appreciate your giving a little of your time and effort to the IEEE. Where would the SCANNER be without IEEE volunteers? How about the local technical seminars and sponsorship of technical career fairs? How about the educational opportunities for Northern Virginia students that the Northern Virginia Section sponsors? (George Rogers certainly can use help.) Give the Northern Virginia Section officers a call, fax, or email a message to us, and we will be more than willing to discuss with you the IEEE opportunities and have you aboard, and there is no doubt that Jim Strother will be more than happy to find several ways to get you involved with the IEEE. I hope this kinder and gentler arm twisting will appeal to your "noblesse oblige," and if not -- well, I'll let you think about it.

Happy Holidays!

*Nick Vlannes*

Chairman, Northern Virginia Section

## LETTERS TO THE EDITOR

Dear Mr. Editor:

The September issue of the SCANNER, in announcing the September 20 meeting of the Control Systems Society (NV/W), stated that the speaker, Dr. Hoveskeland, was from the North Carolina State University, Fargo. Our apologies: he is from the North Dakota State University, Fargo, where Dr. Edward C. Bertnolli is Chairman and Professor of the Department of Electrical Engineering. (It was three years ago that Dr. Bertnolli — with a correct biography — was a candidate for IEEE President-Elect and received 49-1/2 percent of the vote in a two-person contest).

Out there in North Dakota, the geographical center of North America, they occasionally make the mistake of confusing Washington, DC, and Washington State. According to an unconfirmed story there was an occasion where the citizens of North Dakota were very displeased with the US. Congress, and it was decided to send a delegation to Washington to protest. The delegation set out and encountered several travel difficulties, but those descendants of the Vikings persevered. Eventually the delegates reached Idaho. There a helpful native explained to them that they were headed for the wrong Washington. They were headed west for Washington State, whereas they should be headed east for Washington, DC. So the delegation returned to North Dakota, reporting a highly successful mission with no need for further action.

V.E. (Veg) Gardner  
10/3/95

## TECHNICAL CAREER FAIR

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



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3pm - 7pm**

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## EDITOR'S CORNER

### The Impact of "NEWT" on Our Institute

"... Thereafter, within the first hundred days of the 104th Congress, we shall bring to the House Floor the following bills, each to be given full and open debate, and each to be given a clear and fair vote, and each to be immediately available this day for public inspection and scrutiny."

With these words, the Speaker of the House, the Honorable Newt Gingrich, introduced what is now commonly known as the "Contract with America." It contains ten specific bills which have, or will have, reduced congressional spending to a considerable degree, thereby making it possible to cut federal taxes. Thus, an image of Mr. Gingrich as "Santa Claus."

Are all these cuts wise? Are they responsive to our country's post-World War II tradition as the leader of the "Free World," or is that even important?... We will consider here primarily the impact of the "Contract with America" on you and me as members of the IEEE. But we also are thinking about the impact of the cuts specified in the Contract on the scientific and engineering community in our country.

Let us first examine what "savings" or other impact the Contract is likely to have on organizations or areas in which IEEE members are employed or involved.

The following chart is an excerpt from a chart prepared by the House Budget Committee Republican Staff. It lists "Examples of Possible Offsets (read cuts!) for Contract with America." (Our excerpts list only the dollar figures of "savings" for those areas which most affect IEEE members). The figures represent millions of dollars to be cut from planned budgets during the years 1996 and 2002.

National Science Foundation	346
Energy Technology Development	2,139
Geological Survey (to be abolished)	3,261
National Biological Survey (to be abolished)	139
National Oceanic and Atmospheric Administration (NOAA)	805
Cooperative State Research Service	331
Agricultural Research Service	830
Public Telecommunications Facilities Program (to be reduced)	85
Advanced Technology Program (to be abolished)	891
Federally Sponsored University Research (to be reduced)	1,620
Total	M\$: 10,375

In other words, over ten billion dollars worth of funding of potential interest to IEEE members would be involved. In addition, not included in these figures are proposed cuts still on the drawing board, such as closing down the National Institute of Science and Technology (NIST) and privatizing its laboratories; abolishing the National Telecommunications and Information Agency (NTIA); both of which employ a large number of IEEE members.

In all fairness, it should be added that at least some of the functions currently performed by these activities and agencies listed for closure would probably be continued by the private sector, and that IEEE members would be needed to carry them out. Nevertheless, the closures will, at best, be traumatic and disruptive for the continuity of the functions involved, and for the IEEE members affected.

Another victim of the "Contract with America" is the highly respected Office of Technology Assessment (OTA). This office was created in 1972 "as an analytical arm of the Congress to help legislative policymakers anticipate and plan for consequences of technological

changes and to examine the many ways (expected and unexpected) in which technology affects peoples lives." OTA, until it was abolished on September 30, 1995, provided Congress with independent and timely information about the potential effects—both benefits and hazards— of technological applications.

The demise of the OTA increases the importance of IEEE-USA's role in providing inputs to Congress. Specifically, it highlights the need for IEEE-USA's Congressional Fellow program. This will not replace the substantial contribution of the OTA over the past several decades, but should cause the IEEE to reassess (and strengthen) the resources which can be made available to the Hill in our areas of competence and interest.

The United States has a long reputation for excellence in theoretical scientific and engineering research and the attendant willingness to take chances. Witness the space program where, after a disastrous start, we finally had successes which culminated in the moon landing. The result of this program was not only the "prestige" for U.S. technical know-how, but, possibly more important to society, the serendipitous inventions that it spawned, e.g., hand-held calculators; miniaturization of computers, including the first uses of "chips;" teflon; GORE-TEX (a water proofing material which permits fabric to breathe without leaking water); "Tang" (a powdered orange drink that became popular); and a plethora of other breakthroughs that are now available to all mankind. In fact, NASA was mandated by Congress to "proactively pursue technology transfer of its results." Interested scientists and engineers were, and at this time still are, given access to this information by means of the "NASA Briefs."

The success of our space program, as well as that of many of our other high-cost ventures in the search for the "truth" [in cosmology, in particle physics, in medicine, (e.g., cancer research), in DNA research,

etc.] was possible only because our federal government had taken the financial risks which industry could not have been expected to take. Another, more down-to-earth example of such a program is our highly successful Interstate Highway System, started under President Eisenhower in the 1950s. This system, if developed by private industry, would probably have resulted in a network of toll roads bypassing the "non-profit" routes.

During the last couple of years, our country has blinked on one such program: the supercollider, and winked on another, the space station. A bipartisan Congress first spent several billion dollars to support the supercollider, and then, after having built a large part of it, decided to spend another billion or so to destroy it. We will never know what benefits our country — and the rest of the world— would have reaped from its completion...

Mr. Gingrich (and Congress) must now decide which way they want to turn: to recognize the need for active participation of our Government in major scientific and engineering research and development projects and keep the momentum and benefits of this role in this country, or to let other countries grab that leadership from us by default, thereby reducing the prestige and viability of our country, and taking jobs away from our members. Based on their actions during the next year or so, our members will decide whether to label Mr. Gingrich "Santa Claus," or "SCROOGE."

*Tom Doepner*, Editor-in-Chief

*(I would like to express my thanks to Chris Brantley of the IEEE-USA staff for providing the information on the "Contract with America" on which this article is based, and for his many valuable comments on the text; to George Hagn for helpful discussions, as well as for his suggestions for editorial changes; and to Sam Fishbein and Dr. Ed Walker for their recommendations of additions to the results of the NASA program.)*



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## YOUR LOCAL REPORTER

### NOSTALGIA

In this holiday season, it seems appropriate to think back to the early days of our Institute. The following is a reprint of a poem that appeared in the report of the Washington Section's very formal evening meeting of January 26, 1916. A Mr. T. Lincoln Townsend offered the following toast:

Here is a toast that we want to drink to a fellow we'll never know  
The fellow who's going to take our place when it's time for us to go.

We wonder what kind of a chap he'll be, and we wish we could take his hand,

Just to whisper: "We wish you well, old man," in a way that he'd understand.

We'd like to give him the cheering word that we've longed at times to hear;

We'd like to give him the warm handclasp when never a friend seems near.

We've gained our knowledge by sheer hard work, and we wish we could pass it on

To the fellow who'll come to take our place some day when we are gone.

### Three IEEE Members Awarded National Medal of Science and Technology

President Clinton, during a major science and technology address, presented the National Medal of Science and Technology, "the Nation's honors for accomplishments in advancing boundaries of scientific knowledge and contributing to the innovation, development, and commercialization of technology" to three IEEE members.

Dr. Hermann Haus of the Massachusetts Institute of Technology received the Medal of Science for his work in the field of quantum electronics, noise, and ultra-fast optics. Dr. Jerome Cuomo of North Carolina State University and Dr. Richard Gambino of the State University of New York at Stony Brook received Medals of Technology for their work in developing advanced materials used in erasable, optical storage techniques while with IBM's Research Division.

### White House Announces National Initiative to Promote K-12 Technology Literacy

*Engineers Asked to Volunteer for National Tech Corps*

On Tuesday, October 10th, the White House announced three new national initiatives to promote technological literacy among K-12 students. This includes Technology Learning Challenge Grants made to 19 communities to support innovative projects to retool "Schools for the 21st Century," the formation of an American Technology Honor Society, whose student members would help their schools incorporate and use new technology, and a call for engineers and other

high-tech professionals to join a National Tech Corps to use their expertise to assist their communities.

Details on the initiatives were released in October, following a speech given by President Clinton in late September, in which he announced his intent to work with private sector leaders to build partnerships drawing on the resources and expertise of business, educators, community groups, and other interested organizations to connect every classroom in America to the information superhighway by the year 2000.

### George Abraham Memorial Trust Fund

All of us were saddened by the recent death of our friend and colleague, Dr. George Abraham. Many of us have asked his family whether appropriate contributions in his memory would be accepted, and to whom they should be addressed. The family has established the George Abraham Memorial Trust Fund in response to these requests, and is considering plans for scholarships and special lectures in his memory. If any of you wish to contribute to this fund, a check made out to the Trust Fund should be sent to George's son, Dr. Ted Abraham, National Institutes of Health, Building 10, Room B3-B59, 9000 Rockville Pike, Bethesda, MD 20892. Dr. Ted Abraham can be reached at 301/496-1211.

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### Region 2 Library in Operation

The IEEE Region 2 Library has been placed into full operation by the NCAC Administrative Office. The library consists of video tapes, audio tapes, and several books which have been consolidated in one location for easy access in Region 2. The material in the library is classified in several major categories:

Career Development  
Management  
Professional Activities  
Technical

Members may obtain a copy of the Region 2 Library Accession List by request to the NCAC Administrative Office, P.O. Box 220521, Chantilly, VA 22022-0521, or tel 703/803-8701, or fax 703/222-5971.

### Job Descriptions for IEEE Presidents?

Recent events in the IEEE, including various plans for reorganization of the Institute, have prompted discussions on the role and responsibilities of an IEEE President, and the requirements of that position in the foreseeable future.

We have provided here a set of requirements which we feel are necessary, and possibly sufficient, for a successful president to possess. To arrive at this set, we have examined the characteristics of past presidents who, in our judgment, have been the most successful ones. Your comments on this list will be appreciated.

**A. Professional Experience.** Applicants for the position of IEEE President-Elect must possess a wide variety of professional experience in positions of increasing

responsibilities in the fields of electrical engineering, electronics engineering, or computer science. Specific requirements are:

#### I. Mandatory Requirements

\* A minimum of five years experience as a working engineer or computer scientist

\* Lead engineer, university department head, or equivalent

\* Recognized leader in fields of expertise

#### II. Desirable Requirements

\* Chief engineer, chief scientist, or dean of engineering

\* Engineering or scientific program manager

\* Recognized as an authority by business, government, and industry

**B. IEEE Activities.** Applicant must have served in a variety of IEEE volunteer activities in positions of increasing responsibilities. Specific requirements are:

#### I. Mandatory Requirements

\* Service in local society chapter and section activities

\* Service as a chapter and section chairman

\* Service as a region or division director

#### II. Desirable Requirements

\* Service as a society president

\* Service as the general chairman of a major symposium or conference

\* Service on committees of major boards

\* Service as a vice president of the Institute

\* Ability to communicate with leaders in business, government, and industry

## 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]*

(The following item is based on an article by Mr. James H. Sharp of the National Air and Space Museum's "Aerospace Technology Committee:")

### The Truth about the "Grand Alignment" of the Planets

Once again, certain supermarket tabloids have announced impending doom, this time in the form of huge tides generated by an upcoming "grand alignment" of the planets — on a conveniently unspecified date. Since there is no configuration of planets that a rational person would call an "alignment" occurring at any time in the foreseeable future, it is interesting to look hypothetically at the absolutely worst imaginable planetary alignment and calculate what the tidal effect on our planet would be.

Using a typical mid-Atlantic East cost lunar tide of five feet as a basis, the appropriate calculations were made; and it was noted that if all planets were pulling in a straight line at minimum possible distance from Earth, the tide height would increase by about the thickness of this sheet of paper.

### American Public Voices Strong Interest in Technology Research

Two out of three Americans think the U.S. Government should increase its spending for research and development in advanced electronics and computer technologies, according to a consumer survey released by IEEE.

In the nationwide survey, Americans indicated that advances in these fields could have the highest impact on health and medical care, and education. Nearly 60 percent of respondents predicted that greater use of advanced technology in these areas would improve the quality of their lives in the next ten years.

The IEEE Technology Attitude and Use Survey, a study of more than 1,000 people across the United States, shows attitudes, perceptions, and behaviors concerning the impact of technology on everyday life. The survey also measured usage patterns for computers in the home.

"At a time when technology funding continues to be attacked in Congress, it's encouraging that the public perceives a need for additional support in this area," said James T. Cain, IEEE President. "People clearly recognize that advanced technology can continue to make significant improvements in their quality of life."

### **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 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 Wiberg 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 Rohrabacher, R-Calif., the newly appointed chair of the House Science Subcommittee on Energy and the Environment. Crilly will continue to advise Rohrabacher 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 (e-mail).

### **Hitachi Ltd. Presents 20 Million Yen Gift to IEEE Computer Society**

Hitachi Ltd. has presented the IEEE Computer Society with an endowment of 20 million yen (approximately US \$20,000). The gift, the largest monetary donation ever given to the Computer Society, will be used to fund the new Ksutomi Kanai Award, named in honor of Hitachi's current president.

"Every year the Kanai Award will recognize an individual who has made exceptional contributions in the general area of distributed computing systems — an area of technology that Hitachi believes is critical to future progress,"

said Dr. Ronald G. Hoelzeman, President of the IEEE Computer Society. "We greatly appreciate that Hitachi, with its exceptional history of technical innovation and leadership, has given this generous gift to the Computer Society."

Hoelzeman said details of the Kanai Award are currently being finalized, and that the nomination process will begin later this year. The first Kanai Award will be presented at a Computer Society-sponsored conference that is related to distributed computing research. The award will consist of a medal, illuminated certificate, honorarium, and research and travel support, with a total value of US \$20,000.

### **How to Bridge the Gap between Humans and Computers**

You are standing in front of a vending machine at a nearly deserted highway rest area. The machine doesn't take bills, and you have no coins. You reach into your pocket, pull out a bank card, slide it into the machine and put it back in your wallet just before sipping that desperately needed cup of coffee. You've just used a stored-value card, a convenient replacement for cash that is being promoted by more than 200 companies, including Visa International, belonging to the Smart Card Forum.

Stored-value cards, according to Visa's Jean McKenna, are a kind of smart cards that use very thin microchips to store a predetermined amount of cash value for small purchases. A replacement for the common magnetic strip cards, smart cards are already in use in several countries outside the U.S. Visa will launch them in North America next year at the Olympics in Atlanta. In the next few years, these cards also may be equipped to store such personal data as identification and emergency contact information, medical and insurance records, and bank account data.

Ms. McKenna, vice president of Payment Technologies and chair of the Smart Data Forum, is one of 10 experts who spoke at an IEEE Media Briefing in New York recently. The all-day event, "Humans and Computers: Personalizing Technologies for a New Century," featured speakers who provided information on a range of new and emerging technologies that are moving society to a more convenient and productive world.

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