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1. Please circle the letter that best describes your exposure to the specific technology listed below.

- | ELECTRONICS          | OTHER ENG.     |
|----------------------|----------------|
| A. Digital           | O. Mechanical  |
| B. Analog            | R. Industrial  |
| C. Microprocessors   | S. Chemicals   |
| D. Signal Processing | T. Civil       |
| E. Components        | V. Structural  |
| F. Control Systems   | X. Nuclear     |
| G. Computers         | Y. Materials   |
| H. Communications    | Z. Other _____ |
| I. Power System      |                |
| J. Other _____       |                |
- SOFTWARE**
- K. Assembly/Microprocessor
- L. High Level/Operating Systems
- M. Firmware/Microcode
- N. Diagnostics
- O. Signal Processing
- P. Other \_\_\_\_\_

2. Please indicate your education below.

	Major	Year Graduated
PhD	_____	_____
Masters	_____	_____
Bachelors	_____	_____
Associates	_____	_____
Other	_____	_____

3. Circle the industries in which you have experience.

- A. Defense
- B. Navigation and Guidance
- C. Communications
- D. Computers/Peripherals
- E. Automatic Test Equipment (ATE)
- F. Medical
- G. CAD/CAM--Graphics
- H. Microwave
- I. Signal/Image Processing
- J. Process Control/Robotics
- K. Construction/Energy/HVAC
- L. PCBs
- M. Research
- N. Other \_\_\_\_\_

4. Indicate your principal job function below.

- A. Design
- B. Test
- C. Reliability/Quality
- D. Manufacturing
- E. Marketing/Sales
- F. Field Services
- G. Software
- H. Systems
- I. Management
- J. Project Leader
- K. Student
- L. Educational Instructor
- M. Other \_\_\_\_\_

Total Years Experience: \_\_\_\_\_  
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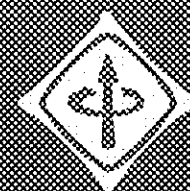
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# Newsletter

PUBLICATION OF THE NORTH JERSEY SECTION OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

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#### NEWSLETTER STAFF

Editor: M.M. Perigot  
Business Manager: A.M. Beattie

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It is not necessary to inform the North Jersey Section when you change your mailing address. The NEWSLETTER and other section mailings use a list provided by IEEE's national headquarters in New York. This means the Section has no need to maintain a mailing list or addressing plates. Section membership records are changed when Headquarters notifies us.

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## Contemporary Cryptography

"Contemporary Cryptography" is the title of a talk to be given by David Kahn at the September 24th meeting of the IEEE Joint Computer and Communications Chapter of the North Jersey Section.

A more detailed description of the material to be covered will appear in next month's newsletter.

David Kahn is the author of *The Codebreakers, The Story of Secret Writing*, published in 1967 by Macmillan. Quoting from the flyleaf of the book: "David Kahn, a journalist, has been an amateur cryptologist since 1943. He has written popular articles on the subject for 'The New York Times Magazine' and 'Scientific American' he has also written technical analyses of different types of cyphers for 'The Cryptogram' a publication of the American Cryptogram Association. His collection of works on cryptology is among the most extensive in the world."

All are welcome to attend the talk which will be held at 8 PM, in the ITT Laboratory Auditorium, 500 Washington Avenue, Nutley, N.J. A pre-meeting dinner will be held.

Time: 8 PM, Wednesday, September 24, 1986.

Place: ITT Laboratory Auditorium, 500 Washington Ave., Nutley, N.J.  
Further Information/Dinner Reservations: Fran Brork (201) 884-6042 or David Perry (201) 325-8415 (answering machine) or after 7 PM (201) 325-3769.

## Swapping Technical Info With Russia

At the September 16th meeting of the New York, North Jersey and Long Island Chapter on Instrumentation and Measurement "The Difficulties Encountered in the Exchange of Technical Information With Russia" will be discussed. The speaker will be Dr. Victor Lander.

### About The Talk

What are the effects of technology transfer abroad and its influence on the national economy, scientific development, and international relationship? Factors such as the level of trade activity, and methods of technology transfer will be emphasized in this talk. Various opinions of other experts will be highlighted and compared to the author's.

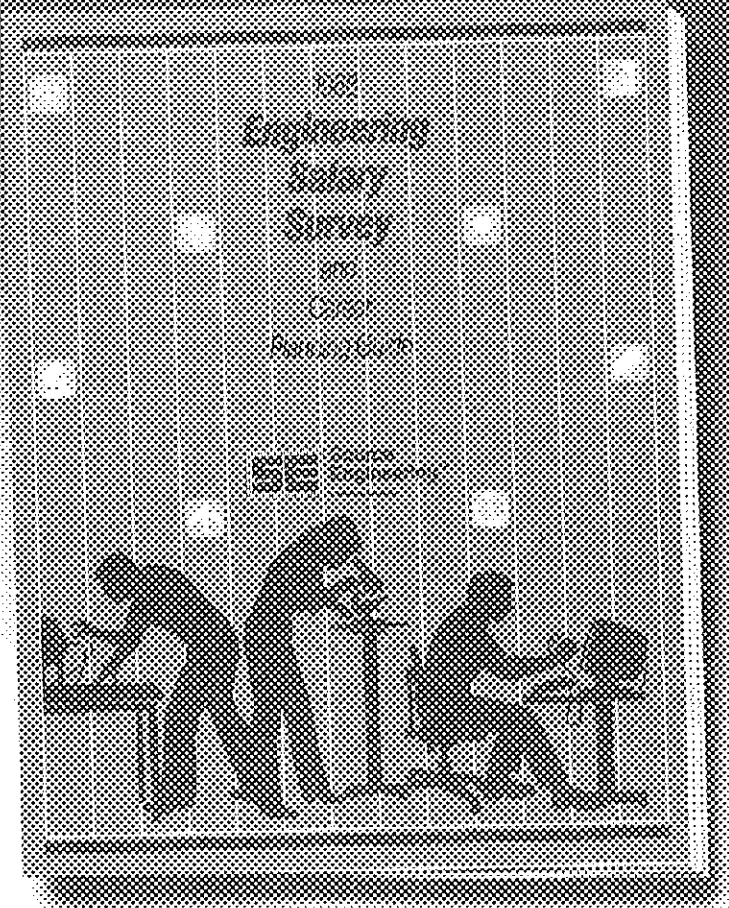
The Electronic industry and communication technology will be emphasized in the discussion and several examples of the technology transfer will be analyzed. Refreshments Served

Refreshments consisting of sandwiches with beer or wine will be provided prior to the meeting.

Time: 7:00 PM, Tuesday, September 16, 1986.

Place: ITT Country Club Building, Nutley, N.J.

# New, free 1986 Salary Survey



## **Comprehensive data on industry trends and salaries**

The new 1986 *Engineering Salary Survey and Career Planning Guide* is based on information from more than 25,000 engineers and 10,000 firms across North America. Over 27 position titles and salaries are reviewed, including those in design and development, manufacturing, test, quality control, technical support, engineering sales, marketing, engineering management and more. You'll learn whether your salary is keeping pace with your peers, what you can expect to earn as you advance, and how to direct your career by taking advantage of emerging trends.

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## ANNUAL MEETING---continued

yet recognize that autocratic management cannot enhance productivity. We must somehow impart to those schools of business administration which teach short-term optimization and autocratic management that managers must be knowledgeable about what happens on the manufacturing floor. Furthermore, top managers should be literate in technology and should recognize and benefit from the value of individual contributions.

The report of the President's Commission on Industrial Competitiveness, chaired by John Young, Chairman of the Board of Hewlett-Packard, made many recommendations, including the creation of a federal Department of Science and Technology and the development of a focal point for foreign trade by creating a federal Department of Foreign Trade and Investment. IEEE has testified for many years before Congress in support of the trade proposal, particularly as addressed in Senator Roth's bills.

We also learned from our colleagues that engineers must be coupled with the needs of the marketplace. We heard from Mr. Uenohara, Executive Vice President of NEC Corp., that approximately 80 percent of NEC's manufacturing engineers are in direct contact with customers. Engineers at Siemens and Philips also relate closely to the marketplace. We learned from Dean Morton of Hewlett-Packard that a large percentage of H-P's marketing force are graduate engineers. This is

probably one of the reasons why Hewlett-Packard continues to be so successful. But this practice is not customary in U.S. industry.

Because the general status of Japanese education is so high, their average of mathematics and the sciences taught through high school may be up to three times higher than that of the United States. This results partly from Japan's longer school day (with added half-days on Saturdays) and shorter vacations, which yields approximately two more years of pre-college schooling. As a result, the average Japanese high-school graduate can understand and use the tools of statistical quality control in the factory. The United States, on the other hand, requires college-educated workers for that level of performance.

There is less job mobility for engineers in Western Europe and Japan. This encourages employers to make long-term investments in continuing education. IEEE may support a tax proposal that would make continuing education more attractive to U.S. companies by defining its cost as a tax credit.

In summary, the technologically advanced nations of the world may well be learning from one another that some of the successful technologies used to bring useful products to the marketplace may not be as country-specific as once believed. While some technologies may be limited in their transferability because of cultural differences, others may work just as well in any advanced nation, providing informed legislators, industrialists, and others of influence help pave the way.

## New Developments in Career Issues

by **Robert Bruce**, Editor  
Career Activities Council

The Pension Committee has its hands full. Recent news has described how the Senate Finance Committee is proposing tax "reform" that would eliminate the tax-sheltered status of IRAs. Recall the long campaign for pension reform that IEEE conducted, starting with lobbying for ERISA in 1974. Engineers are particularly in need of liberalized pension provisions, since their careers entail so much involuntary job mobility, but vesting normally requires 10 years of service. The Pensions Committee is scheduling a conference call to plan strategy. IEEE members are urged to write their Senators promptly!

The Age Discrimination Committee produced a Source Sheet on Age Discrimination, and it is currently updating this document to add a section on IEEE procedures for entering an *amicus curiae* brief in court cases. You will remember the first time that IEEE wrote such a "friend of the court" brief; it was for the BART engineers who were dismissed for holding public safety above job security. A recent case involved ownership of an invention. The Committee is also planning another publication for IEEE members who feel they've been victims of age discrimination. It will tell what to do before seeing an attorney, and how quickly to do it.

## At Press Time:

### Call Your Senators!

The Pension Committee has just released a special *Legislative Alert* entitled "Your IRA: An Endangered Species?" Sent to approximately 10 percent of higher-grade U.S. members, the Alert explains briefly the tax reform bill that is soon to be debated by the United States Senate. HR 3838, or "The 27-Percent Solution" as it is known by the Senate Finance Committee, includes provisions that will significantly change private pension plans and supplementary retirement income programs.

The Pension Committee recommends that members communicate immediately with their U.S. Senators on the following Senate Finance Committee actions:

- Support the Finance Committee's mandatory five-year vesting provisions;
- Support the Finance Committee's expansion of pension plan coverage requirements;
- Support the Finance Committee's improvement in the integration rules;
- Oppose the elimination of IRA deductibility for employees covered by an employer-sponsored pension plan; being "covered" and "vested" are not the same.

Members are urged to contact their Senators first by telephone and then by follow-up letters. Copies of any correspondence should be sent to the IEEE Washington Office, Attn: Vin O'Neill.

## What We Learned at IEEE's Annual Meeting

by Bruno O. Weinschel, 1986 IEEE President

This year's Annual Meeting, with the theme of "The Impact of Cultural Values on Engineering Excellence," brought together some of the leaders of high technology industries from Western Europe, Japan, and the United States. In listening to their presentations, we learned some of the differences among their business and engineering cultures, especially in education, continuing education, and the levels of education and skills of the general work force.

Professor Tsurumi of City University of New York warned us that unless corporations adapt to changing economic conditions and changing technologies, they may not survive. Many U.S., Western European, and Japanese corporations are practicing principles that will assure survival: adaptiveness, an appreciation of the individual, participative management, decision-making at the lowest possible level, and good two-way communication.

Dr. Lawrence P. Grayson, an adviser on mathematics, science, and technology at the U.S. Department of Education, reported the comparative achievements in pre-college education, especially in mathematics and the sciences. For the past 15 years Japanese students have always come out ahead. Additionally, West Germany has a very successful apprenticeship system. About half of the country's high school students are enrolled for a four-year term in this program, in which several hundred thousand organizations participate. Young people go to school one day a week and work four days. Apprenticeships are the backbone of West Germany's work force skills. An equivalent system does not exist in the United States.

If the United States expects to improve its educational system, it will have to interact locally with some 50 state jurisdictions, each of which encompasses an average of 20 counties. This cannot be done centrally through the Federal government, nor can it be done with a mere infusion of money. Individual school boards must be convinced that it is in the best interests of their communities to invest in the future and to increase both the skill levels and remuneration of teachers. Last year, more than 75 percent of the general membership endorsed IEEE's involvement in local-level education matters through projects sponsored by the Regional Activities Board and the United States Activities Board, as well as through joint projects with other societies.

The Annual Meeting also underscored the importance of manufacturing engineering. U.S. trading partners in Western Europe and Japan guide their most brilliant engineers into manufacturing, while U.S. universities stress untargeted research for their brightest students. We also learned from our Japanese colleagues that their research projects are strongly market-driven. Product goals are decided at upper management levels. Then, subsidiary process technologies are developed to enable the manufacture of products. Fortunately, a renaissance of interest in and understanding of the importance of manufacturing engineering in the United States is under way.

The United States must begin to practice manufacturing engineering in a much larger framework---from the original R&D of the product and the manufacturing process through product design, manufacturing engineering, quality assurance, and customer training in the use and servicing of the end product or service. This in turn requires a change of emphasis and values in academia. The United States has 280 engineering schools that are approved by the accreditation board and has a faculty of about 20,000 engineering professors. Yet very few schools make it their business to teach the design of products or of services that are manufacturable, reliable, high-quality, maintainable, pleasing to the user and cost competitive. These values must be stressed, if the United States is to become more competitive in world trade.

One of IEEE's goals in 1986 is to understand better the needs of continuing education. We learned from several studies and heard from our overseas colleagues that the best teaching does not come from academia, but rather from industry by industry specialists. Some of today's commercial developments are ahead of the research in academia. Some are even ahead of our defense technology, which leads to peculiar problems of dual-use and export control. There must be more two-way communication between academia and advanced sectors of industry. We must bring professors on sabbatical into industry while advanced-industry employees should serve as adjunct professors at universities.

Dr. Robert Noyce, Vice Chairman of Intel Corp., identified a very real problem. He observed that the Federal government deficit sets a bad example for the rest of the country and must be brought under control. There is little we, as a group, can do about it. But as individuals, we can exercise our influence at the polls. Also, as Dr. Noyce properly said, the Federal government does not fully comprehend the role of capital formation. For example, the present proposal for reshaping the internal revenue code would have an adverse impact on industry because it would discourage investment in new equipment and technologies. Trade associations, such as the American Electronics Association and the Electronic Industries Association, seem the best mechanism for bringing our views to legislators.

Professor Tsurumi noted that the root of many problems in the United States is the quality of industrial management. Of course, we have organizations like IBM, AT&T, General Electric, and Hewlett-Packard that are managed beautifully, but there are many more that do not

## North Jersey Section IEEE Presents Fall Lecture Series PROGRAMMING IN THE LANGUAGE BASIC

The North Jersey Section is offering an evening course titled "Programming in the Language BASIC."

The course is designed for professional personnel and will deal with BASIC primarily as it is implemented in the Microsoft version; by far the most popular and the "de-facto" standard in the microcomputer industry. Other versions will be considered, however, and some attention will be given to many of their differences and their impact on the user.

The language will be covered through various applications in real, practical examples. Numerous techniques will be discussed; many of which do not appear in textbooks. Implementation of the language on several different computer systems will be considered, with open discussion on advantages and/or disadvantages.

Students will be given assignments to do on their own computer, if one is available; either at home or on the job. Assignments will be designed to emphasize the techniques covered in the lectures. Upon completion of the course, the student will be able to write practical, useful programs and will have an in-depth awareness of the language, on which to build highly sophisticated skills.

The instructor is Mr. Roy S. Reichert, District Manager Technical Education and Training Division of Bell Communications Research.

- (1) October 7, 1986-What is BASIC?-Origin of the language; Dialects; Interpreter vs. Compiler versions; Constants, variables, keywords, syntax; ASCII coding; Direct mode vs. Program control mode.
- (2) October 14-I/O And Control Methods-Input/Output techniques; Program control; branching; making decisions; Built-in data; Data types; The type-ahead buffer.
- (3) October 21-Executable Structures-Loops; switches; Dimensioned arrays; Subroutines; Properties of the stack register.
- (4) October 28-Functions-Library Functions; User-defined functions.
- (5) November 4-Character Strings-String definition; Built-in String functions; Data Strings; String manipulations.
- (6) November 11-File Structure and Usage-Sequential files; Random-access files; Disk formats; structures.
- (7) November 18-Program Testing and Debugging-Diagnostics; Error handling techniques; Error simulation; Positive use of error conditions.
- (8) November 25-Computer Graphics-Resolution considerations; Graphics commands; functions; Graphics peripherals; Color techniques.
- (9) December 2-Snow Date, if needed.

Homework Assignments will be given and it is expected that you will have access to a computer or time sharing system that runs BASIC. Class size will be limited to 40. Early registration is recommended as past course offerings have been filled quickly.

**Where:** Jersey Central Power & Light Company; Madison Avenue (Rt. 24) at Punch Bowl Road, Morristown, N.J.

**When:** Eight sessions, Tuesday nights, starting October 7, 1986 from 6:45 PM to 9:15 PM. One snow date has also been arranged.

**Cost:** IEEE Members \$40; non-IEEE Members \$100. Text book supplied and considers syntax for IBM, Apple, TRS-80 and Commodore.

**Additional Information:** Mr. John A. Baka at (201) 455-8634 (Business).

### REGISTRATION -- "PROGRAMMING IN THE LANGUAGE BASIC"

**To:** Mr. John Baka, Distribution Engineering, Jersey Central Power & Light Company, Madison Avenue at Punch Bowl Road, Morristown, N.J. 07960.

Name ..... IEEE No. ....

Affiliation ..... Phone No. ....

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Please enclose required fee made payable to "North Jersey Section IEEE"

## "Let's Blow Away The Smokescreen...."

To the Editor:

I am writing to comment on Walter R. Nial's article in the May 1986 issue of "The IEEE Newsletter." Mr. Nial is past chairman of the USAB Age Discrimination Committee. His overview on age discrimination covers the usual ground and he dismisses as a smokescreen and not at the heart of the issue the motivations and factors that may lead to apparent, not real, age discrimination.

Sure, there is age discrimination and it is ethically wrong, illegal, and bad for the country whenever it is practiced. Without a doubt some companies and some individual managers do let older engineers go or not hire them on the assumption that they are not getting or would not get value for their loaded salary dollars. If they have a perception that performance decreases with age and apply the concept broadly in a layoff situation, or avoid hiring older engineers on principle, they are practicing age discrimination and violating the law of the country even if they believe that what they are doing is good for the company. It surely is a mistake. In the absence of illness the older person can be more productive and valuable than a younger person. Experience is a key plus for the older engineer.

Now let's blow away the smokescreen that Mr. Nial has created and get at what I think is the heart of the issue. He dismisses the realities and the plight of the typical manager under pressure to meet budget and nose count constraints and schedules. On an individual basis the manager observes an older engineer or lower level manager who has skills in a quite limited area, is inflexible, and is making no attempt to avoid obsolescence. The engineer has not advanced over the years because of limitations in intellect, motivation, personality, or leadership skills. In other words the engineer is the residue of a starting group from which the better performers have advanced. The engineer has substituted other interests and become involved in family, hobbies, church, civic, educational and professional activities. The older engineer may even have a small business on the side. We all know such engineers, they are anecdotal. They have grown old on the job.

The late Marvin J. Kelley, President of Bell Labs, speaking to a group of new employees, including me, made a comment I shall never forget. He said "you get paid for what you do during the 7½ hour working day. You get raises and promotions for what you do during the other 16½ hours." He was reflecting the fact that engineering is a profession, not a trade. Many older engineers are doing nothing to upgrade or maintain their capability, or maintain their relative rating, much less get raises or promotions.

Mr. Nial takes great pains to prove that older engineers can be good performers. No one disputes that. Not at all. We all know older engineers who are good or great performers. However they are also anecdotal. We say they have retained their youth on the job. Unfortunately, for the reasons given above, the older engineers as a group are below average in performance. This is the heart of the matter.

Furthermore, the salary of the older engineer has advanced over the years in recognition of increasing experience. However, the marginal increment in experience of the older engineer no longer commands raises. In our society decrements in salary do

not occur gracefully to reflect increasing obsolescence and inflexibility. Thus, even though some productivity and reasonable performance may be present, it comes at a higher price than for younger, better trained, more ambitious and better motivated engineers.

When business is good, marginal performers are frequently kept on the payroll. The decision to let go or lay-off is extremely difficult. Issues of loyalty, friendship, personality, etc. come into play. The marginal or below average performer gains advantage from inertia and poor management practice. When business turns bad, management is finally forced to take the tough steps. The weeding out process, performed in the absence of age discrimination, done with great care and with high integrity will result unavoidably in a layoff with a higher than average percentage of older engineers. Nevertheless, individuals like Mr. Nial unerringly conclude that age discrimination is at the heart of the issue.

So far I have sidestepped the important issue of loyalty. That's a tough one. I point out that it works both ways but the older engineer who becomes obsolete is not being loyal to the employer. Moreover, at a time when the nation's economy is under heavy pressure from foreign competition, and military and social needs place increasing demands on economic health, what special obligation does the employer have to support engineers who are counting the days to retirement, who are not producing commensurate with their salaries, and who are filling slots that could be occupied by more productive individuals at a lower salary? An equally relevant question that could be asked and is worthy of considerable discussion and thought is, what special obligations do older engineers have to make themselves fit to continue serving their employers and their country productively, economically and professionally. They have a special edge because of experience and because they can serve as an example for younger engineers. When an engineer fails to maintain and expand productivity, the employer has an obligation to act in a businesslike way. When he does, he is not necessarily practicing age discrimination.

To get at the heart of the issue let's focus some attention on the obligations of the older engineer. Among the group of employers who lay off people are those who are exercising good business practice. Let's not indiscriminately tar all employers with the charge of age discrimination. However, through ignorance, bias or bad management it does exist and we must be wary.

It is interesting to note that the U.S. Court of Appeals in Cincinnati, (*Runyon V. National Cash Register*) on April 7, 1986, approved private settlements of age discrimination claims. Thus the legal system can deal with individual cases on a factual basis. Individuals and companies can negotiate settlements without EEOC approval. IEEE no longer has to be concerned about the controversial nature of the topic. In fact, it is now a civil, not a professional issue, and IEEE can withdraw from the field. It would be better that IEEE focus its energies on motivating older engineers to improve their capabilities, rather than convincing them their problems arise from age discrimination.

*EUGENE L. GORDON, Chairman & CEO, Lytel, Inc.*

*Editors Note: The writer is an active member of the North Jersey Section Awards Committee.*

## Video Test Equipment

On September 24, 1986 the New York Chapter of the Broadcast Technology Society will present a mini seminar on "Test Equipment and Video Analysis."

Seminar speaker will be Gerry McGinty, Engineering Consultant at Leader Instruments Corporation and author. His talk will highlight the use of test equipment aimed at video applications in both studio operations and maintenance. Equipment will be available for hands-on review.

Mr. McGinty, formerly assistant vice president, Engineering for Sony Corporation of America, was involved in the first NTSC TV studios and color receiver development, and has authored several books, including *Videocassette Recorders, Theory and Maintenance*, and *Video Cameras Theory and Maintenance*.

Whether you are an Equipment Planning Specialist, Design Engineer, or Student, interested in video test equipment, you should plan to attend. Admission is FREE to everyone. Any hand-outs will only be available at the time of the meeting.

Time: 7:00 PM, Wednesday, September 24, 1986.

Place: United Engineering Center, 345 East 47th Street, NYC.

Additional Information: George Lowe (718) 868-8768.

## CONGRATULATIONS New Senior Members

A.V. Aho  
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You may also be qualified for Senior Member grade. Get information by contacting Don Weinstein, Kulite Semiconductor, 1039 Hoyt Avenue, Ridgefield, N.J. 07657 (201) 945-3000.

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## Winter Seminar On Communications Nets

The New York Chapter of the IEEE Communications Society, is presenting a Fall Seminar on "Management and Maintenance of Communications Networks."

Communication requirements and technical progress are driving forces responsible for new networks, public and private, which are emerging to satisfy users needs. Many networks rely on equipment and services provided by multiple suppliers, making the task of management and maintenance more difficult. This seminar is dedicated to this topic, and speakers; developers, suppliers, users and vendors, will describe what is going on in this exciting field.

This seminar will be held on Thursday, December 4, 1986, from 9 AM to 5 PM at the United Engineering Center, 345 East 47th Street, NYC. For further information contact Phil Paterno at (201) 234-7272 and watch future issues of this section publication.