IEEE
North Jersey Section Seminar
PROGRAMMING IN THE LANGUAGE C

Thursdays, September 7- December 14, 1989, 6:30 PM - 9:00 PM
Jersey Central Power & Light Co.,
Madison Avenue & Punch Bowl Road, Morristown, N.J.

The North Jersey Section is offering an evening course titled "Programming In The Language C." The course will focus specifically on the Microsoft QuickC compiler, on the IBM PCs and compatible computers with DOS.

C is a general purpose programming language that has become one of the most widely used languages in the world. C features have been known to be efficient, economical and portable, and have proven especially useful in system programming because C facilitates writing fast, compact programs that are readily adaptable to other systems.

The lecture will be covered from fundamental to advanced data structures and handling. All the examples and techniques used throughout the course, are oriented toward the development and maintenance of serious, real-world C applications. Upon completion of the course, the student will have the skills to write useful and practical programs.

Students will be given assignments to do on their own IBM PC or compatible, if one is available; either at home or on the job. A **Microsoft QuickC compiler** and two **text books** will be supplied.

Prerequisites: The student should be familiar with at least one of the following languages - BASIC, COBOL, PASCAL, PROLOG and/or FORTRAN.

The instructor is Mr. Tuan Q. Nguyen, a Systems Engineer at Jersey Central Power and Light Company.

(1) September 7 - Introduction to C: Why learn C?; Why QuickC?; Hardware Requirements; Knowledge Requirements; Convention and Style; Directories and Files Used by QuickC; Setting up QuickC; Starting QuickC; Getting Help; Fixing Errors; QuickC Editor and Environment.

(2) September 14 - C Fundamentals: Basic Elements of C Programs; Punctuation and Spacing in C Programs; Using Comments in C; Data Types and Declarations of Variables; The Power of Printf ( ).

(3) September 21 - Getting Input with Scanf ( ); Shortcut Assignments, Increments, and Decrements; Relational Operators; Logical Operators.

(4) September 28 - Repetition and Looping: The For Loop; The While Loop; Debugging and Loops.

(5) October 5 - Decisions and Branching: The If Statement; The Conditional Assignment Statement?; Multipath Branching; The Switch Statement; The Break Statement; The Continue Statement; The Goto Statement; More Complex Conditions for Branching.

(6) October 12- Functions and Function Calls: Functions and Program Design; Declaring and Defining a Function; Local and Automatic Variables; Register Variables; Passing Information to a Function; Functions with Many Parameters; Functions that Return Information; Recursion; Noninteger Functions; Function Prototypes.

(7) October 19 - Arrays: How Arrays Are Stored in Memory; How to Declare Arrays; Referencing and Using Array Items; Bounds Checking Arrays in Your Code; How to Initialize Arrays; Arrays and Functions; How Array Offsets Advance; Multidimensional Arrays; Advanced Topics and Tricks; The Bitwise Operators, Tiny Arrays.

(8) October 26 - Addresses and Pointers: Addresses Reviewed; What Is A Pointer?; Accessing Variables with Pointers; Passing Pointers to Functions; Pointers and Arrays; Pointer Arithmetic; The Interchangeability of *amts and amts [ ]; 1value vs rvalue.

(9) November 2 - Advanced Pointers: Type Casting pointers and Addresses; Far Pointers; Functions that return addresses; Dynamic Arrays; Advanced Pointer techniques.

(10) November 9 - Strings: Declaring and Initializing Strings; The String Pool and String Addresses; Pointers and Initialized Strings; Formatting strings with printf ( ); String Input and Output; String Manipulation Routines; Arrays and Strings; The Arguments to main( )-argv and argc; Character Classification and Transformation.

(11) November 16 - Managing Files: Top-level I/0; Mid-Level (Unbuffered) File I/0; The File System; Advanced Error Handling.

(12) November 30 - Advanced Data Types: Structure - An Array of Different Types; Union-Multiple Types in the Same Space; Enumerated Data with enum; Bit Fields; Advanced typedef.

(13) December 7 - Large Project: Advanced C Preprocessor; Using QuickC for Large Projects.

(14) December 14 - C and the Hardware: Keyboard Input functions; Reading Non-ASCII Keys; Console I/0 Functions; Keyboard Control with ANSI.SYS; Using QuickC to Access BIOS; Cursor and Screen Control with BIOS Calls.

Class Size will be limited to a maximum of 25 with a minimum registration of 15. Early registration is recommended. Phone Reservations will not be accepted. Reservations accepted after September 1, 1989 will require an additional **late fee** of $25.

Where: Jersey Central Power & Light Co., Madison Ave. & Punch Bowl Rd., Morristown, N.J.
When: Fourteen sessions, Thursday evenings, starting September 7, 1989 from 6:30 PM to 9:00 PM.
Cost: With Text Books and QuickC compiler, IEEE Members $220; non-IEEE Members $295.
With Text Books only, IEEE Members $150; Non-IEEE Members $225.
Contact: Mr. John A. Baka at (201) 455-8534 (Business)

Registration "Programming In The Language C"

To: Mr. John Baka, Distribution Engineering, JCP&L Company, Madison Avenue at Punch Bowl Road, Morristown, NJ 07960

Name_____IEEE No. _____

Affiliation_____ Phone No._____

Address_____

_____

Check if QuickC Compiler is needed or not Yes [ ] No [ ] Enclose required fee made payable to **"North Jersey Section IEEE"**

Signature_____

The IEEE
Newsletter

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

Section Presents Student Awards

The National Energy Foundation sponsored its annual Student Exposition on Energy Resources at the Morristown Armory on May 5, 1989. The North Jersey Section sponsored three awards, one in each age category, which were presented by Kenneth J. Oexle, Past Chairman of the North Jersey Section.

Recipients for the awards included:

Brian Sullivan, Hopatcong Middle School, Hopatcong, N.J.; James V. Bellemare, Warren Hills High School, Asbury, N.J.; Kristen Berrian, Villa Walsh Academy, Morristown, N.J.

The purpose of the annual competition is to develop student proficiency in research and scientific experimentation, Nearly 300 students participated in the program.

The photo above shows Past Chairman Oexle with award winner Sullivan.

IEEE North Jersey Section Calendar

August 10, 1989--"PACE Meeting: Professional Programs"--North Jersey Section PACE, 7:30 PM, ITT Auditorium, 500 Washington Ave., Nutley, NJ. Richard Tax (201) 664-0803.

August 29--"President Elect & Director-Region 1 Candidate's Night—in **New York**"--METSAC & NY/NJ/LI/Princeton Sections, 5:30-8:30 PM, Con Edison, 4 Irving Place, NYC. **RSVP** to Robert Noberini (212) 460-2809.

August 30--"President Elect & Director-Region 1 Candidate's Night—in **New Jersey**"-METSAC & NY/NJ/LI/Princeton Sections, 5:30-9:30 PM, ITT, 417 River Road, Nutley, N.J. **RSVP** to Richard Tax (201) 664-0803.

September 7-Dec. 14--"Seminar: Programming In The Language C"-North Jersey Section, Thursdays, 6:30-9:30 PM, Jersey Central Power & Light Co. Madison Ave., & Punch Bowl Rd., Morristown, NJ. John Baka (201) 455-8534.

September 12--"Fiber Optic Sensors"--North Jersey Section, Industry Application Society, 6:00 PM, ITT Auditorium, 500 Washington Ave., Nutley, N.J. **Reservations required for dinner buffet.** David Perry (201) 325-8415.

September 21--"Quasioptical System Design For Millimeter Wavelengths"--North Jersey IEEE MTT-AP Chapter, 7:30 PM, ITT Auditorium, 500 Washington Ave., N.J. **Reservations required for pre-meeting free buffet dinner at 6:00 PM.** Dick Snyder (201) 492-1207.

September 26-Dec. 5--"Seminar: Design Of Passive Microwave Components"--North Jersey Section, Tuesdays, 6:30-9:00 PM, ITT-Avionics Auditorium or Clubhouse, Nutley, NJ. John Baka (201) 455-8534 (Business Hours).

October 3--"Tour Of Resource Recovery Facility"--North Jersey Section, IEEE Power Engineering Society, 7:00 PM, Warren County Resource Recovery Facility, Oxford Twsp., Warren County, N.J. **Reservations Required.** Joseph L. Kane, Jr., (201) 455-8456.

November 11--"Symposium: Protection of Equipment And Systems In Utility/Industrial Facilities From Lightning, Switching Surges And EMI"--North Jersey Section, Industry Application Society, 9:00 AM-12:30 PM, Secaucus Hilton. **Reservation/Fee Required.** Vittal Rebbapragada (201) 265-2000, Ext. 3449.

PLEASE POST
Members and Non-Members Welcome

AUGUST, 1989
Volume 36, Number 2

AUGUST 1989
Volume 36, Number 2

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NEWSLETTER STAFF
Editor ..... M.M. Perugini
Business Manager ..... A.M. Beattie

Deadline for receipt of material is the 1st of the month preceding the month of publication. All communications concerning editorial and business matters, including advertising, should be addressed to: The Newsletter, c/o Girard Associates, Inc., 6 Robert Terrace, Mt. Arlington, N.J. 07856 (201) 398-5524.

REPORT ADDRESS CHANGES TO:
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445 Hoes Lane, P.O. Box 1331
Piscataway, N.J. 08854-1331
(201) 981-0060
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.

The North Jersey Section Executive Committee meets the first Wednesday (except holidays and December) of each month at 7 PM. These meetings (held at ITT, 500 Washington Ave., Nutley, N.J.) are open to all members. Information on each meeting agenda is available from Richard Snyder, Section Secretary at (201) 492-1207.

Elected Section Officers are listed above.

Fiber Optic Sensors

On September 12, 1989 the IEEE North Jersey Section Industrial Applications Society will host a presentation on "Fiber Optic Sensors." The speaker will be Vittal Rebbapragada, P.E., of Burns and Roe Company.

About The Talk

Mr. Rebbapragada's presentation is on the application of Fiber Optic Technology in the areas of sensors to measure such parameters as magnetic/electric fields, current, voltage, temperature, pressure, etc. It will cover the sensor mechanizations, types of sensors, practical applications, advantages and the limitations of technology.

About The Speaker

Vittal Rebbapragada is the Chairman of IAS, North Jersey Section and is employed at Burns and Roe as Manager of Electrical Projects. He is a member of the Power Engineering, Industrial Application, and Instrumentation and Measurement Societies of IEEE and has given technical presentations on topics of interest in the area of Utility/Industrial Applications

Dinner Buffet

There will be a dinner buffet preceding the meeting. Reservations required (RSVP below).

Time: 6:00 PM, Tuesday, September 12, 1989.
Place: ITT Auditorium (next to the tower, use rear door), 500 Washington Ave., Nutley, N.J.
Further Information/Reservations: David Perry (201) 325-8415.

CHAIRMAN'S CORNER

First, I would like to congratulate three members of our Section that received distinguished awards at the IEEE Medals Presentation in San Francisco, California, on June 2nd. Within this issue you will find more details on their contributions and accomplishments.

C. Kumar N. Patel (F), of AT&T Bell Laboratories, Murray Hill, N.J., received the 1989 Medal of Honor, IEEE's highest award for contributions to quantum electronics including the carbon dioxide and Spin-flip Raman lasers. This award, for exceptional achievement, is not awarded annually.

Billy B. Oliver (SM), recently retired from AT&T Communications, received the Alexander Graham Bell Medal for contributions to the implementation of dynamic non-hierarchical routing in communications networks.

Edward J. Doyle (SM), retired from the Bell System in 1958, received the 1989 Haraden Pratt Award for "dedication to the effective utilization of the Institute's resources, leadership in Professional activities, and the development of Institute Facilities." I might add that Jack Doyle has made some contributions to our own PACE programs over the years on presenting and defending entity positions. Jack is the Chairman of the Government Committee of USAB in addition to his many other assignments.

METSAC, under the direction of its new chairman, Roger Sullivan, will be jointly sponsoring two meet-the-candidates nights within the New York and the North Jersey Sections. See the flyer on our candidates night set for Wednesday, August 30th. The IEEE will serve you best if you take the time to select the best candidates. This is your chance to hear the candidates in person and ask any questions that may be on your mind. The IEEE candidate ballots will be mailed before the end of August and must be received back by November 12th. If you receive your ballot early, we hope you will wait and attend the candidates night before making your decision.

At the last meeting, the Section voted to establish a joint Laser Electo-Optics (LEO) Chapter with our existing joint Computer/Communications Chapter. The intent is to allow LEO type programs to be presented now jointly and in the future to have the LEO become an independent chapter. Any of you 150 LEO members are welcome to help establish an independent chapter with Edward A. Whittacker, Professor of Physics, Stevens Institute of Technology, (201) 420-5707, who will be leading the LEO efforts under this new joint chapter.

For those of you that would like to become active in our other active chapters please contact the appropriate chapter chairman. If we don't have an active chapter that you're interested in, contact George Graul, Vice Chairman 2, on the procedure to follow to establish a new chapter.

AS&SP (Co-Chairmen)	Steve Laico	(201)	386-2031
	John Burgess	(201)	386-2736
AP/MTT	Dr. Richard Snyder	(201)	492-1207
Computer/Comm/LEO	Norman Hettinger	(212)	607-6717
Control Systems	Dr. William Bigley	(201)	322-7405
Engineering Management	Al Bottani	(201)	265-7797
Industrial Application	Vittal Rebbapragada	(201)	265-2000
Power Engineering	Dennis Sobieski	(201)	430-6698
Reliability	Henry Moss	(201)	785-6458
Systems, Man & Cybernetics	Dr. Michael Liechenstein	(201)	471-0721

HOWARD LEACH
North Jersey Section Chairman

IEEE
North Jersey Section Seminar
DESIGN OF PASSIVE MICROWAVE COMPONENTS

Tuesdays, September 26 - December 5, 1989 - 6:30 to 9:00 PM
ITT-Avionics Auditorium or Clubhouse, Nutley, N.J.

The North Jersey Section is offering an evening course titled "Design of Passive Microwave Components." The course is designed for those graduate EE's who have taken the IEEE Introductory Microwave Component Design course (or the equivalent), and who are working in the microwave design field. The course will go into depth in the particular combination of electromagnetic and network theory that is required for efficient passive (and for that matter, active), microwave component design. Design problems will be assigned each week. Familiarity with PC usage is helpful but not required; however, the student will use matrix combination in the design process. Equivalent circuits will be developed that will be both network and E-M based. These will form the basis for the various designs of filters, couplers, ferrite and other non-reciprocal devices and power splitters. Design philosophy will cover the frequency range from 1 MHz well into the millimeter region.

The instructor is Dr. Richard V. Snyder, President of RS Microwave (201) 492-1207.

(1) September 26 - Review of electromagnetic waves theory, including temporal and special field variations as applicable to the "innards" of components.
(2) October 3 - Scattering and other linear matrices, including mathematical theory and application to characterization of resonators, obstacles and structures.
(3) October 10 - Chaining and cascading multiport networks. Application of equivalent circuit principles to lumped and distributed situations. Local equivalent circuits. Lumped networks coupled with field variables.
(4) October 17, (Clubhouse) - Filter design from the lumped equivalent circuit point-of-view. Network transformations.
(5) October 24 - Filter design from the distributed circuit point-of-view, including combination of lumped and distributed variables. Principles of optimization applied to filter design.
(6) November 7 - Evanescent mode components, effects of dissipation, various printed structures. More optimization.
(7) November 14 - Multiplexing. Common junction combinatory techniques, including crossover at less than 3 dB points.
(8) November 21, (Clubhouse) - Coupled line principles. Directional couplers hybrids, power dividers, magic tee, quadrature couplers, etc. Lumped and distributed versions of various coupled structures.
(9) November 28 - Principles and equivalent networks for various ferrite and other non-reciprocal devices, including the principles of active circulators.
(10) December 5 - Review and Question week (topics of the day).

Texts: 1. Class notes handed out each week. **2.** *Microwave Filters, Impedance-Matching Networks, and Coupling Structures.* Matthaei, Young and Jones, Artech Books (Included as part of registration cost)

Other References: (Not included in cost). **1.** *Notes on Microwave Circuits,* Vol. 1, Darko Kajfez, University of Mississippi. **2.** *Microwave Circuits,* Altman, Van Nostrand. **3.** *Microwave Engineers' Handbook,* Vol. 1 & 2, Artech Books. **4.** *Optimum Seeking Methods,* Wilde, Prentice-Hall. **5.** *An Introduction to the Finite Element Method,* J.N. Reddy, McGraw-Hill.
Class Size will be limited to 35 maximum. The course will not be held until receipt of 15 registrations.

Where: ITT-Avionics Auditorium or Clubhouse, Nutley, N.J.
When: Ten (10) sessions, Tuesday nights, starting September 26, 1988 from 6:30 PM to 9:00 PM. Coffee will be provided.
Cost: IEEE Members $200 (registration by Sept. 1). Non-IEEE Members $275 (registration by Sept. 1). Texts 1 & 2 above, included in the cost.
Late Fee: $25 (registration by Sept 12).
Contact: Mr. John A. Baka at (201) 455-8534 during business hours.

Registration "Design of Passive Microwave Components"

To: Mr. John Baka, Distribution Engineering, Jersey Central Power and Light Company, Madison Ave. at Punch Bowl Rd., Morristown, N.J. 07960

Name _____ IEEE No. _____

Affiliation _____ Phone No. _____

Address _____

_____

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

employer sets up an identical replacement plan or a better one, he would be required to establish a cushion in the amount of 125% of projected benefit liabilities in the new plan to protect future obligations to plan participants. If he hasn't previously done so, the employer would also have to provide a one-time cost of living adjustment for retirees before he could recover any excess or surplus assets from the overfunded plan.

If the employer elects to establish a less generous replacement plan, he would be required to transfer a cushion of 135% of projected benefit liabilities into the plan and provide retirees with a one-time cost of living adjustment before being permitted to recapture excess assets.

If no replacement plan were provided, the employer would be barred from any of the excess assets. Active employees would receive 135% of their projected benefit liabilities and retirees would be awarded a one-time cost of living adjustment. Any remaining assets would then be allocated to the pension benefits of active workers on a pro-rata basis.

Urge Your Senators and Representatives to Support This legislation!

Concerned engineers and scientists should send a letter or a telegram to their elected representatives in Washington at their earliest convenience. Senators can be reached c/o the United States Senate, Washington, DC 20510 and should be asked to support S 685, sponsored by Senator Howard Metzenbaum (D-OH). Members of the House of Representatives should be urged to support HR 1661 as introduced by Representative Bill Clay (D-MO). They can be reached c/o the U.S. House of Representatives, Washington, DC 20515.

Favorable action on this important legislation is needed to reduce overfunded pension plan terminations and to protect the future retirement security of workers and retirees whose plans are terminated.

For more information contact Vin O'Neill in the IEEE-USA Washington, DC office, at 1111 19th St., N.W., Washington, DC 20036 or call (202) 785-0017.

The sample letter is to be modified for members of Congress:

Honorable _____
United States Senate
Washington, DC 20510

Dear Senator_____:

I am writing to urge you to support S 685/HR1661, the Employee Pension Protection Act of 1989.

The Employee Pension Protection Act would require employers who wish to take reversions from overfunded pension plans to establish identical or substantially similar replacement plans before dispersal of excess or surplus assets would be permitted. To the extent that benefits have not previously been adjusted for inflation, employers would also have to provide a one time cost of living increase for retirees.

Prompt enactment of this important legislation is needed to reduce the incidence of pension plan terminations by corporate raiders and help to protect the future benefit security of active and retired workers whose plans are terminated.

Thank you for your help and please keep me advised of your position on this issue.

Sincerely,

PACE Committee Meets Monthly

The PACE Committee meets on the second Thursday of every month at the ITT Auditorium, 500 Washington Avenue, Nutley, N.J. (near the the ITT Tower) at 7:30 PM. Our Section Executive Committee meets there on the first Wednesday of every month (except in December) at 7:00 PM. Any questions or comments will be well received. Contact Richard Tax at (201) 664-0803 (after 7:00 PM) or write to R. Tax, 630 Montview Place, River Vale, N.J. 07675.

1989 Officer Nominations

The following IEEE Members have been nominated to serve as officers of the North Jersey Section Administrative Committee (ADCOM):

Chairman:	Raymond Sears, Jr.
Vice Chairman-1:	George Graul
Vice Chairman-2:	David Perry
	Richard Snyder
Treasurer:	Dr. M.E. Liechenstein
Secretary:	David A. Dietsche
Member-At-Large:	Sergei Bogaenko
	Thomas De Nigris
	Norman Hettinger
	Steve Laico

The official election of officers will take place in the fall and a ballot will be published in the Newsletter. IEEE members in good standing may nominate an IEEE member or themselves for any of these positions. The term of office is: 1 January 1990 to 31 December 1990 (1 year term).

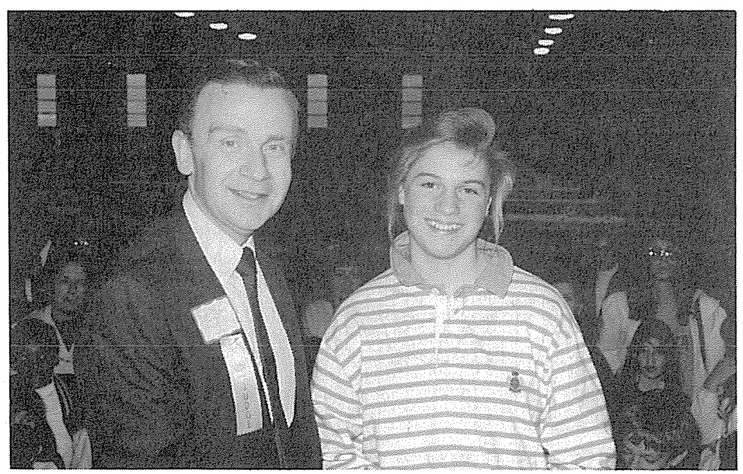
I wish to remind you that the IEEE is successful due to the work of its members. Some of the North Jersey Section group societies can use your help. If a member is interested in becoming active in any North Jersey Chapter he may call any of the current officers listed on the mast in this newsletter.

Nominations in addition to those made by the Nominating Committee may be made by petition from the membership. Such nominations must be signed by not fewer than 25 voting members of the North Jersey Section and transmitted to the Section Secretary for submission to the Executive Committee not later than October 1, 1989. The petition must certify that the person(s) nominated have agreed to serve, if elected.

The nominating committee members are:

John Van Savage, Chrmn.	(201) 544-2503
Richard Tax	(201) 664-6954
Alan Stolpen	(201) 368-3703
Alex Brown	(201) 284-2570

John F. Van Savage
Senior Past Chairman.



WINNER— Kristen Berrian, shown with Past Chairman Ken Oexle, received award at Student Exposition on Energy Resources. Story on page 1.

METSAC
The Metropolitan Sections Activities Council and the New York - North Jersey - Long Island - Princeton Sections Present
The Candidates for IEEE's President Elect and Director of Region 1

President Elect
Merrill W. Buckley Jr.
Wallace S. Read
Eric E. Sumner

Director - Region 1
John Kaczorowski
Frank E. Schink

In New York
August 29, 1989 — 5:30 to 8:30 PM, Con Edison, 4 Irving Place, New York, NY

In New Jersey
August 30, 1989 — 5:30 to 9:30 PM, ITT Clubhouse, 417 River Road, Nutley, NJ

For Information call

Robert Noberini
(212) 460-2809

Richard Tax
(201) 664-0803

The Program
Each Candidate will deliver a few brief remarks. This will be followed by a lively discussion of questions posed by those in attendance. Think of your questions in advance, and please have them in writing.

Refreshments
A buffet and refreshments will be served affording you a relaxed atmosphere and opportunity to meet the candidates and socialize with your friends and associates.

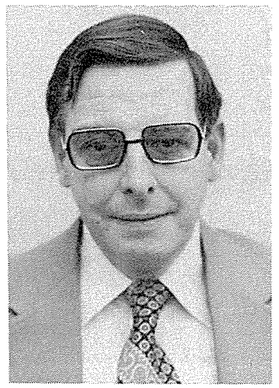
All IEEE Members and their guests are invited and encouraged to attend.

This is a Rare Opportunity to meet the Candidates before this Fall's Election.

Please RSVP by August 25th

PLEASE POST

In Memorium
Charles Augustin Coulomb, 3d



Charles A. Coulomb, 3d, our Section Publicity Chairman, died on July 11th, at home, Washington Township, after a long fight with cancer. Charlie was dedicated to the IEEE, particularly to our Section operations for a long period of time and he was awarded the IEEE Centennial Medal, 1984, in recognition of his many contributions.

In addition to his publicity work, he was Co-Chairman with Anne Giedlinski of the Student Assistance Committee which has been handling the responsibility of awarding about six thousand dollars in scholarships using surplus Electro funds. He was also Co-Chairman of the Ad Hoc Committee that worked to recognize the invention of the telegraph in New Jersey and to mark the site with an IEEE Historic Milestone plaque.

He also served the North Jersey Section as Secretary where he developed some of the first policy and procedure guidelines, many of which are still in use today. He served as Treasurer for many years and helped develop the guidelines for IEEE student member financial assistance. He was a member of the Banquet Committee for many years, serving on the reception committee. Also, he was active in the Power Engineering Society Chapter and served as program chairman for a number of years.

Outside the Section, Charlie also served the IEEE as a member of the Admission and Advancement Committee at the IEEE Service Center. He also served as an Electro volunteer handling VIP reception functions as well as serving on the registration and transportation committees. Charlie was an outspoken advocate of IEEE activities, particularly at the Section level and will be missed for the depth of knowledge and experience he attained through the many years of his volunteer efforts.

Charlie is a direct descendant, of Charles Augustin de Coulomb, 1736-1806, a French physicist known for scientific work on electricity, magnetism, and friction. This work resulted in the invention of the magnetoscope, the magnetometer, a torsion balance, and establishment of Coulomb's Law. The coulomb is defined as the quantity of electricity carried past a given point in one second. Generally, one coulomb per second is one ampere. Charles Augustin de Coulomb was Charlie's great, great, great grandfather.

Charlie, born in Chester, Pa., graduated from Bucknell in 1954 with a BA degree. He served in the Air Force during the Korean War in the electronics field. This kindled an interest in the EE field to the point he entered Fairleigh Dickinson University for an EE degree on a part-time basis while still working in the insurance field. It wasn't too long before he started working as an engineer at the former Tung-Sol Electric Co., in Washington Township. Not long after that, Charlie joined JCP&L for a 25 year career in the system planning area where he was a manager of district planning for 10 to 12 years.

Also, active in the community in which he lived, Charlie was president of both the Washington Board of Education and the Warren County Board of Education. Charlie is survived by his wife, the former Barbara Ann Smith of Wyckoff; his mother, Mrs. Beatrice Coulomb; his two sons, Charles and Philip; two sisters, Mrs. Sara Cochrane and Marie; and two grandchildren.

Charlie will be missed and long remembered by members of the North Jersey Executive Committee for his many contributions, leadership, and helpful advice. Part of our next Executive Committee Meeting will be devoted to remembering Charlie and his service. Contributions to the Warren County Unit of the American Cancer Society, RD 1, Box 342, Oxford, NJ 07863, may be made in his memory.

PACE NEWS
By R. Tax

The following article by Robert Rivers refers to the Deutsch, Shea and Evans High Technology Recruitment Index (HTRI) printed in our July issue of this Newsletter. The article is reprinted from the "Bay Area Grid".

WHEN THE DEUTSCH AND SHEA INDEX IS AT 100, WE'RE IN TROUBLE

By Robert A. Rivers (F)

The Deutsch and Shea Index (also called the High Technology Recruitment Index or HTRI) is a useful predictor of engineering unemployment. Correlation of the bureau of labor statistics engineering unemployment with the index from 6 month previous is now -0.678. The small sample size in the BLS engineering unemployment leads to rather noisy data with a standard deviation of 0.65. Averaging that data would lead to a lower standard deviation, but it would lose its value as a leading indicator. The present correlation leads to the following relationship:

FENUM = 5.416-0.0281*DSHINDX

Where FENUM = the forecast percentage level of engineering unemployment 2 quarters hence.

DSHAINDX - present value of the HTRI.

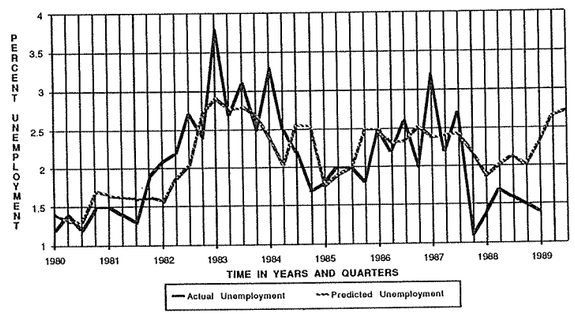
Misunderstanding of the meaning of the Deutsch and Shea Index is unfortunately widespread due to their having chosen 100 as their starting value and allowing the inference that 100 is "normal". In fact, when the index is at 100 we are dislocating a significant number of engineers.

Reviewing the expression, it is obvious that zero unemployment theoretically would occur when the index is at 192. Historically, the full employment period from 1966 to 1969 had an average unemployment rate of 0.6%. Practical full employment is thus at an index value of 164. When the index value is at 100 as at the present, unemployment should be registering 2.6%, a value that usually indicates significant dislocation.

In the first quarter of 1983 we had an unemployment value of 3.8% and a 2 quarters previous index value of 89. A crude analysis of the effect on new graduates indicates that an extra 15% of the class of 1983 were permanently lost from the profession. While that is only about 10,000 engineers, it is significant.

During that same recession, engineering employment did not grow. The average growth rate of engineering employment during the 80's is 47.4 thousand per year. Total dislocation during that year was thus in the 50,000 range with 10,000 of those being new graduates that have not reentered as of 1989.

6 MONTH FORECAST OF ENGINEERING UNEMPLOYMENT



Summarizing then, a Deutsch and Shea Index at 100 or below indicates serious dislocation. Full employment is at a level of 162 on the index. The highest level of demand was experienced in 1989 with an index of 146 and an unemployment level of 1.2%. The chart shows FENUM, the forecast unemployment from the above expression. There is no need to show the index since FENUM is linearly related by the above expression.

Robert A. Rivers is a past member of the IEEE Board of Directors, and is presently serving on the IEEE USA Manpower Committee specializing in forecasting.

WE MAY BE WRONG

If you read the July issue of Spectrum you may have seen the following. In referring to what engineers do, the author writes: "Instead of hypothesizing a fundamental theory, we hypothesize a system to do a certain job. We test the system or parts of it. We find errors in our hypothesis; the system seldom works the way we hoped it would. We fix. Test. Redesign, Test again. Eventually, after many errors and blind alleys, we produce a useful system. Sometimes we don't."

I would appreciate your response to the quote. Perhaps some of our seasoned engineers might comment. Timely responses will be published in our next issue.

ESP-ENGINEER SHORTAGE PROPAGANDA

There is a new group crying wolf about a "critical" shortage of trained scientists and engineers. Again, basing their statements on the projection of supply and ignoring the demand, utilization and other factors, they are spreading their propaganda thru the media.

CORETECH (Council on Research and Technology) is the name of the organization and it consists of representatives from 51 companies, 78 universities and a variety of 34 other affiliates. CORETECH is a new name in the same game with the same old players. The corporate MBA's and the academic administrators appear to be serving their own financial interests at the expense of the technical community.

CORETECH's policy agenda includes:

1. Substantially increasing support for academic research.
2. Establishing a program to expand and improve the basic research infrastructure including university and research institute facilities, equipment and instrumentation.
3. Strengthening incentives and support for industry research and development and removing disincentives to domestic siting of company R & D facilities.
4. Encouraging cooperative research through programs and incentives.
5. Increase financial support to ensure an adequate and well-trained supply of engineers and scientists.
6. Improving, accelerating, and strengthening the commercialization of new and useful technologies.

They also stress "A steady and substantial increase in research funding through the National Science Foundation." Few of the above are in the best interests of our engineering members and some will eventually be detrimental to the demand for engineers and their economic security. The last few organizations noted for the fabrication and distribution of ESP were the American Electronics Association, the National Science Foundation, and Commission on Professionals in Science and Technology.

LEGISLATIVE ALERT—PENSIONS

Here is an opportunity for you to help yourselves and your associates. The following includes information about the "Employee Pension Act of 1989" and a brief sample letter you may use as a guide. Fan out will help.

Employee Pension Protection Act of 1989

The new Metzenbaum-Clay legislation would require employers who wish to recover surpluses from overfunded pension plans to establish either a "complete replacement plan" or a "substantial replacement plan" to take the place of the plan being terminated before dispersal of excess assets would be permitted. If an

At The ANNUAL SECTION BANQUET
May 3, 1989

Quasioptical Techniques For Transmission

The September 21, 1989 meeting of the North Jersey IEEE MTT-AP Chapter will feature "Quasioptical System Design For Millimeter Wavelengths." The speaker will be Dr. Paul F. Goldsmith from Five College Radio Astronomy Observatory.

About The Talk

Quasioptical propagation is gaining increasing acceptance as a valuable transmission medium for millimeter wavelengths. The reasons for this include the low loss, broad bandwidth, multiple polarization handling, and large range of circuit functions that can be obtained. A wide variety of radar and radiometric systems and subsystems have been developed using quasioptical techniques. Quasioptical systems depend on availability of building blocks or components for carrying out particular functions. Some of these are quite similar to waveguide approaches used at longer wavelengths, and some derive from infrared and optical technology.

The relatively large (compared to optical) wavelength means that for compact systems, diffraction is an important consideration. Nevertheless, quasioptical techniques are continuously being extended to perform new tasks as well as being refined to occupy less volume. Recent developments include a system for high accuracy measurements of materials properties, quasioptical tuning elements for a frequency multiplier, and analysis of power combiners using a free space resonant cavity.

Quasioptical propagation using Gaussian beams (Gaussian optics) has been the basis of most system design employing free space transmission. The relative simplicity and comprehensiveness of the theory allows accurate and efficient calculations of the performance of many components.

Critical questions then are:

1. In what situations is Gaussian optics the optimal choice of propagation medium?
2. How is the Gaussian optics portion of a complete system interfaced to the parts using other transmission media?
3. How is system design using Gaussian optics carried out?

This talk reviews the basics of Gaussian beam propagation, and the Gaussian optics components which have proven especially useful. Guidelines for the use of different components and their integration into systems are also developed to aid the designer in assessing the utility of Gaussian optics and examples of quasioptical systems are also presented to illustrate the design principles.

About The Speaker

Paul F. Goldsmith was born in 1948 and received his undergraduate and graduate training at the University of California, Berkeley. His doctoral research involved the development and use of the 230 GHz radiometer for observation of emission from carbon monoxide molecules in interstellar clouds. After completing his PhD degree in 1975, he received an appointment as Member of the Technical Staff at Bell Telephone Laboratories, Holmdel, N.J., where he developed instrumentation for the 7m antenna used for radio astronomical observations. In 1977 he was appointed Assistant Professor at the University of Massachusetts at Amherst, in the departments of Physics and Astronomy and Electrical and Computer Engineering. He has been actively concerned with the development of low noise receivers and other equipment for the 14m radome-enclosed radio telescope operated by the Five College Radio Astronomy Observatory, as well as using this instrument to study the composition and structure of molecular clouds in the interstellar medium of our Galaxy. His work in the area of receiver systems for millimeter and submillimeter wavelengths has led to ongoing interest in quasi-optics--the application of optical techniques to these relatively low frequencies. Dr. Goldsmith is presently professor of Physics and Astronomy at the University of Massachusetts, and Associate Director of the Five College Radio Astronomy Observatory. In 1982 he was one of the founders of the Millitech Corporation, a company dedicated to design and production of millimeter and submillimeter conponents and systems, where he is Vice President for Research and Development. Dr. Goldsmith is a member of the American Astronomical Society, Sigma Xi, USRI, SPIE, and a Senior Member of IEEE.

Members and guests interested in this topic are invited.

Free Buffet Dinner

There will be a free buffet dinner for attendees in the lobby at 6 PM. **Reservations for the complimentary dinner are requested.**

Time: 7:30 PM, Thursday, September 21, 1989. (Pre-meeting buffet dinner at 6:00 PM. **Reservations required.**)
Place: ITT Auditorium (at the tower), 500 Washington Ave., Nutley, N.J.
Information/Reservations: Dick Snyder (201) 492-1207; Willie Schmidt (201) 284-2255.

Patel Receives Highest IEEE Award

The IEEE has presented its highest award, the IEEE Medal of Honor, to C. Kumar N. Patel, Executive Director, Research, Materials Science, Engineering and Academic Affairs Division at AT&T Bell Laboratories, Murray Hill. Dr. Patel was recognized for his fundamental contributions to quantum electronics, including the carbon dioxide laser and the spin-flip Raman laser.

The 1989 Medal of Honor was presented during a special awards ceremony on June 2, 1989, at the Hyatt Regency-San Francisco,

Dr. Patel is the discoverer of the carbon dioxide laser. His invention of efficient energy transfer between nitrogen and carbon dioxide led to his first recognition and demonstration of the very high continuous wave power output from the carbon dioxide lasers at high efficiencies.

Dr. Patel conducted the first nonlinear optics experiments using carbon dioxide lasers and created the field of infrared nonlinear optics. In 1969 he invented turnable spin-flip Raman lasers, which have been used for high resolution spectroscopy and polution detection. In 1970, he invented a tunable laser opto-acoustic measurement technique for detecting extremely small concentrations--1 part in a trillion--of pollutant gases. Later he measured variations in the concentration of stratospheric nitric oxide proving crucial data to the study of ozone depletion.

Recently, Dr. Patel has extended the optoacoustic technique to measurement of small absorptions in liquids and solids.

PACE Meeting:
PROFESSIONAL PROGRAMS

The North Jersey Section's Professional Activities Committee for Engineers will meet on Thursday, August 10, 1989 to revise and discuss their current programs:

- Computer Networking for Engineers
- Alternate Career Paths; teacher certification
- Legislative Alerts - Pension Reform Act of '89
- Engineer Shortage Propaganda - ESP
- Job Market for Engineers

All IEEE members and guests are invited to attend.

Time: 7:30 PM, Thursday, August 10, 1989.
Place: ITT Auditorium, 500 Washington Avenue, Nutley, N.J.
Further Information: Richard Tax (201) 664-0803.

Tour Of Resource Recovery Facility

The October 3, 1989 meeting of the North Jersey Section, IEEE Power Engineering Society will feature a tour of the Warren County Resource Recovery Facility. This is a state-of-the-art resource recovery system dedicated on September 28, 1988. It can burn 400 tons of refuse per day and generate 13.5 megawatts of electric power, enough for over 10,000 households.

This facility meets all of New Jersey's strict air quality standards through the use of a scrubber and a baghouse.

Reservations Required

Tour attendance is free, but telephone reservations must be made due to limited tour facilities. For reservations, please call: Joseph L. Kane, Jr., (201) 455-8456.

Time: 7:00 PM, Tuesday, October 3, 1989.
Place: Warren County Resource Recovery Facility, Oxford Township, Warren County, N.J.
Reservations/Information: Joseph L. Kane, Jr., (201) 455-8456.
Directions: Take Route 78 West to Exit 16. Take Route 31 North. The facility is one mile South of Route 46, on the left hand side.

IAS Seminar On Equipment And Systems Protection

On November 11, 1989 the North Jersey Section Industrial Application Society will present a panel symposium consisting of four presentations covering the primary area of concerns to the electrical engineer. The chairman and moderator will be R.V. Rebbapragada, P.E., Chairman, IAS/North Jersey Chapter.

The presentation topics will be given by speakers (to be announced later) with extensive design experience having worked on several utility and industrial installations.

1. Nature and source of lightning and switching surges.
2. Lightning protection design considerations.
3. Protection of control and instrumentation circuits from switching surges.
4. Shielding and grounding of sensitive instrumentation circuits from EMI/RFI.

These in-depth talks will be presented on Saturday, November 11, 1989 starting at 9:00 AM and ending by 12:30 PM. The location is the Secaucus Hilton.

Cost for this complete technical discussion, including the luncheon is as follows: $90 Non-Members; $60 Members; $35 Students.

In order to provide the presentation at this price, reservations with a $30 per person deposit should be made by October 10, 1989. The remainder will be accepted at the door. Check or money order for the deposit should be made payable to "IEEE North Jersey Section" and sent to Mr. David P. Perry, Treasurer, IEEE North Jersey Section, 57 Forest Hill Rd., West Orange, NJ 07052, (201) 325-8415.

Coffee and danish will be served before the talks commence and coffee will be available throughout the morning. A buffet luncheon will be served immediately following the seminar break to offer an opportunity for people to get together to discuss various side issues at length.

Time: 9:00 AM-12:30 PM, Saturday, November 11, 1989.
Place: Secaucus Hilton.
Further Information: Vittal Rebbapragada (201) 265-2000, ext. 3449.

Doyle Honored For IEEE Service

Edward J. "Jack" Doyle, Engineering Consultant has received the 1989 Haraden Pratt Award from the IEEE for his "dedication to the effective utilization of the Institute's resources, leadership in Professional Activities, and the development of Institute facilities." The award was bestowed during the 1989 Medals Presentation ceremony on June 2nd at the Hyatt Regency-San Francisco.

Since his student days at the University of Wisconsin in the 1950s, when Mr. Doyle was treasurer of the local Student Branch of the American Institute of Electrical Engineers, IEEE's predecessor organization, he has taken an active role in Institute activities. He participated in the formation of the IEEE Communications Society, serving as its first Director of Administration and also as Society Governor and Secretary.

He has contributed to the IEEE in many capacities over the years, including member of the Board of Directors, Vice President for Professional Activities, Treasurer, and as Division III Director representing societies involved in communication technology. Mr. Doyle worked on numerous Institute boards, most importantly the Technical and United States Activities Boards. As Chairman of the Facilities Committee, he has been an energetic force in the planning of the new IEEE Piscataway facility.

Mr. Doyle's long career with the Bell System culminated in his retirement in 1985. During his close to 40 years with the company, Mr. Doyle held many positions, his last being General Manager, Support Services at New Jersey Bell. He was made Bell System Technical Liaison to the White House in 1963, serving both the Kennedy and Johnson administrations.

Included among Mr. Doyle's many honors are: the Key Award of the Chicago Jaycees, the Donald McClennan Award of the IEEE Communications Society, and the Distinguished Service Citation of the University of Wisconsin.

The service award is named for Haraden Pratt, Director Emeritus of the IEEE, who served the Institute as officer and director for more than 40 years. He was a pioneer and important leader in the planning, implementation, and administration of international telecommunication. The award recognized individuals who have given "outstanding service to the Institute."

Billy Oliver Shares Bell Medal

Billy B. Oliver, a communications consultant and former Vice President of Engineering at AT&T Communications in Bedminster, received the 1989 Alexander Graham Bell Medal of the IEEE during ceremonies June 2nd in San Francisco. He was recognized for contributions to the conception and implementation of Dynamic Nonhierarchial Routing (DNHR) in telecommunications networks. Mr. Oliver received the medal jointly with Gerald R. Ash, Supervisor of the Traffic Network Design Group, AT&T Bell Laboratories, Holmdel.

Dynamic Nonhierarchial Routing (DNHR) is a computer system which lets long distance phone calls "detour" around busy, clogged connections. AT&T Bell Laboratories and AT&T Communications worked together to develop DNHR; it was merged into the long distance phone system in 1984, and now is used in all long distance switching.

Prior to his retirement in 1985, Mr. Oliver was Vice President for Engineering Planning and Design at AT&T Long Lines Headquarters, where he was accountable for planning, designing and directing the development of the company's long distance network. Along with the addition of DNHR to the AT&T system, Mr. Oliver oversaw the installation of the 4ESS digital switches and the first fiber optic cables. During his forty years at AT&T he held a variety of Engineering, Plant and Sales positions.

In 1954, Mr. Oliver graduated with honors from North Carolina State University with a degree in electrical engineering; he also received the "Outstanding Engineering Senior" Award. At the university he was a member of the IEEE, Tau Beta Pi, Eta Kappa Nu, and was also active in student government. During World War II he served in the U.S. Navy.

Mr. Oliver holds three patents, Currently he serves on the Board of Directors of Digital Microwave Corporation, Communications Network Enhancements Inc., and LOCATE.

At The ANNUAL SECTION BANQUET May 3, 1989