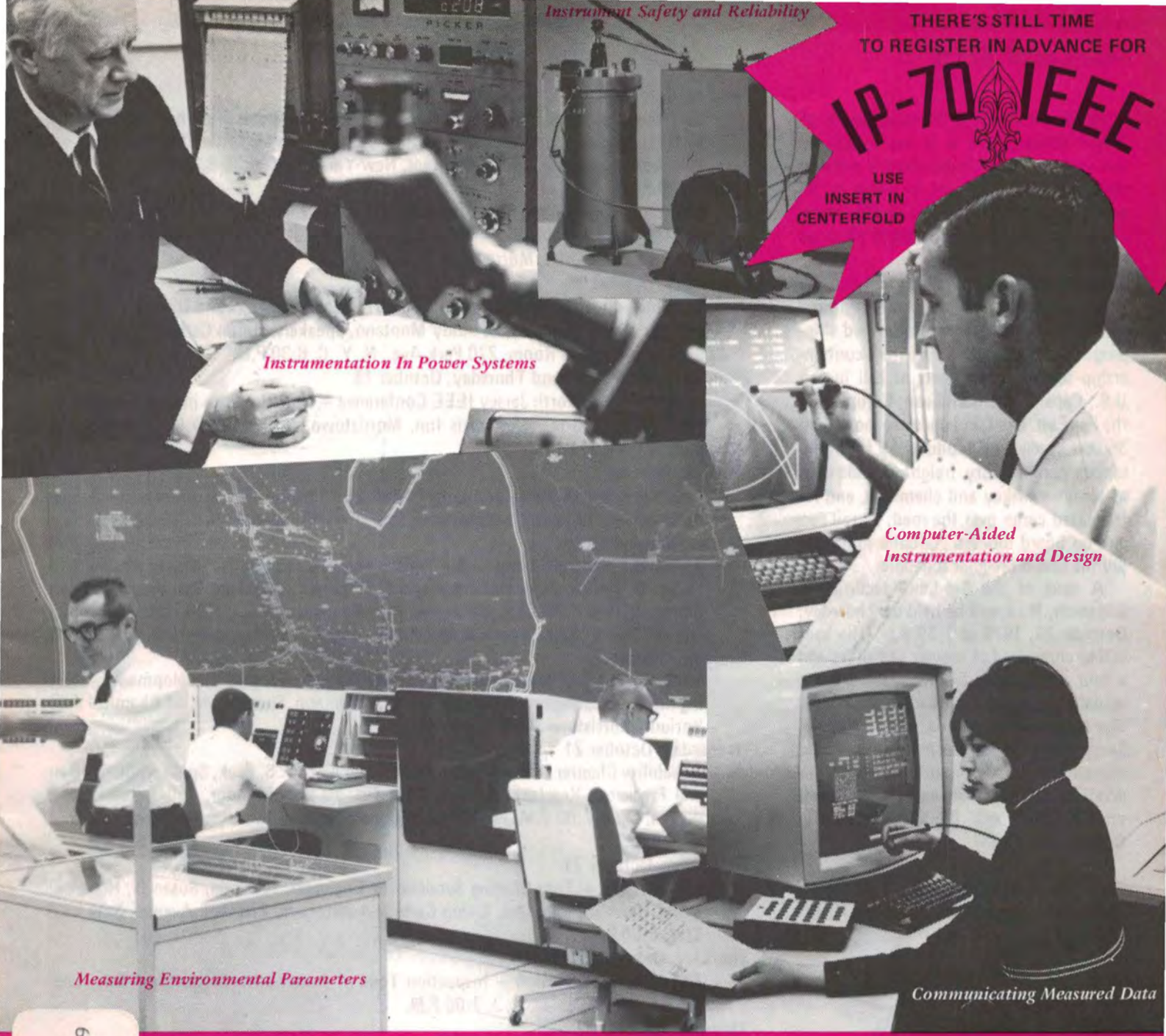


The IEEE

Newsletter

The Magazine of the North Jersey Section

0682914 A
R A DUSAULT JR
59 S WYOMING AVE
S ORANGE NJ 07079
F28

Preview of Instrumentation Panorama 1970

Second Annual Conference On Instrumentation & Measurement

√ Special Features √Keynote Speaker √ Selected Abstracts

√ Program Highlights √ Travel Directions

Read all about IP–'70 on Pages 4 & 5.

Complete outline of technical program on centerfold insert.

October, 1970

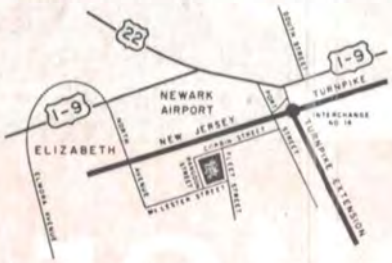
Sea-Land Tour

Containerization is the latest mode of freight delivery that is in use today. By this method, freight is delivered in a sealed container from its point of origin to its destination. Since the cargo is not rehandled during shipping, damage and pilferage are held to a minimum.

Sea-Land Service, Inc., formed only 15 years ago, calls on more ports around the world than any other containerized shipping company. Sea-Land provides containership service to 48 ports of call in the U.S., Canada, the Caribbean, Europe, and the Far East. Sea-Land operates more than 35,000 specialized modular 35 foot containers handling dry freight, liquids such as scotch whiskey and chemicals, and refrigerated cargo over the road, by rail car, and on board modern containerships that ply the seas on regular schedules.

A tour of the Sea-Land facilities in Elizabeth, N. J. will be held on Thursday, October 29, 1970 at 7:30 P.M. The tour will be comprised of movies and slides and a tour of the port facilities showing the actual loading and unloading of a ship. The tour will last approximately 2 hours. Sorry, no children are permitted. Those planning to attend should mail in the reservation slip below or call Mr. Abraham on 622-7000, ext. 3065 no later than October 23, 1970.

Time: Thursday, October 29; 7:30 P.M.
Place: Sea-Land Service, Elizabeth, N. J.



To: John Abraham
c/o Public Service Elec. & Gas Co.
80 Park Place, Room 8335-M
Newark, N. J. 07101

I plan to attend the Sea-Land Tour on October 29, 1970. I will bring.....guests.

Name.....

Address.....

.....Phone.....

MEETINGS CALENDAR

Tuesday, October 6
New York Section Comm Tech Group – Switching Systems and Their Applications, A. N. Daudelin, Jr., first lecture of six-lecture fall series, Little Theater, New York Telephone Company, 140 West Street, New York, N. Y. 6:30-8:30 P.M.

Thursday, October 8
New York Metropolitan PMP Groups (G-21) – The Electronics Industry–Conversion and the Import Problem, Dr. John E. Ullmann, Speaker. Main Auditorium, Bell Telephone Laboratories, Murray Hill, N. J. 8:00 P.M.

Wednesday, October 14
Transmission & Distribution Group, P&I Division – Underground Distribution, John Webster, Roch Cappelli and Andy Montano, Speakers, Union Carbide Corporation, 3rd Floor Meeting Room, 270 Park Ave., N. Y. C. 6:30 P.M.

Wednesday, October 14 and Thursday, October 15
Second Annual North Jersey IEEE Conference – New Horizons in Instrumentation, eight sessions, Governor Morris Inn, Morristown, N. J. 9:30 A.M.-9:00 P.M. and 9:30 A.M.-4:30 P.M.

Saturday, October 17
New York, North Jersey and Long Island Joint Chapter on Instrumentation & Measurement – USAECOM Laboratories Tour, Fort Monmouth, N. J. 10:00 A.M.

Monday, October 19
Automatic Control Group – Air Traffic Analysis and Control, Drs. S. Horing, L. J. Forys, H. Heffes, J. M. Holtzman and E. J. Messerli, Speakers. Bell Telephone Laboratories, Room 1H-009, Whippany Rd., Whippany, N. J. 8:00 P.M. Pre-Meeting Dinner: Rod's 1890's Ranch House, Madison Ave., Convent Station, N. J. 6:00 P.M.

Tuesday, October 20
Education Committee of the North Jersey Chapter – Recent Developments Affecting the Engineering Profession, Dr. John E. Ullmann, Speaker, Allied Chamical Auditorium, Morristown, N. J. 7:00 P.M.

Wednesday, October 21
Reliability Chapter – Integrated Circuit Reliability, D. S. Peck, Speaker, Singer-General Precision, Kearfott Division, Plant No. 10 Board Room, 150 Totawa Road, Wayne, N. J. 7:00 P.M. Pre-Meeting Dinner: Holiday Inn, Route 46, Wayne, N. J. 5:30 P.M.

Wednesday, October 21
P&I Division – Time-Sharing Services for Engineers, R. Roda, Susan G. Hahn and David Hawkins, Speakers, Union Carbide Auditorium, 270 Park Avenue, New York City, 6:00 P.M.

Thursday, October 22
P&I New York Section – Inspection Tour of Automotive Diagnostic Clinic, Lear-Siegler, Inc., Paramus, N. J. 7:00 P.M.

Thursday, October 22
North Jersey Power Group and Morris County Subsection of ASME – The Great Environmental Concern and the Power Industry, Clyde Ruffle, Speaker, Jersey Central-New Jersey Power & Light Headquarters, Route 24, Punch Bowl Auditorium, Morristown, N. J. 8:00 P.M.

Thursday, October 22
GMTT/G-AP – Optimization Techniques on Time-Sharing Computers for the Microwave Engineer, Ralph E. Grabowski, Speaker, Friar Tuck Inn, Route 23, Cedar Grove, N. J. 6:00 P.M. (Dinner meeting.)

Thursday, October 22
Engineering Management Group, Metropolitan Chapter, jointly with N. Y., N. J. and Long Island Sections, Portable Pensions, Dr. J. H. Mulligan, A. Shafitz, and D. A. H. Roethel, Panelists, United Engineering Center, Room 125, 345 East 47th Street, New York City. 7:30 P.M.

Tuesday, October 27
Computer Group – Prevention and Treatment of Noise in Control Signals, Frank G. Willard, Arnold Auditorium, Bell Telephone Labs, Murray Hill, N. J. 8:00 P.M.

(Calendar continued on page 3)

The IEEE **Newsletter**

Published monthly except July and August by the North Jersey Section of the Institute of Electrical & Electronics Engineers, Inc. Office of Publication: 9 Little John Road, Morris Plains, N. J.

Volume 17 October 1970 No. 2

NEWSLETTER STAFF

Editor ..... Alan H. Stolpen
Managing Editor ..... M. M. Perugini
Student Activities Editor ..... Gary Woerner
Associate Editor ..... Martin Hollander
Associate Editor ..... Raymond Dusault
Associate Editor ..... Dr. Robert McMillan
Associate Editor ..... Mrs. Robert McMillan
Associate Editor ..... Dr. Walerian Kipiniak
Associate Editor ..... Barry Janoff

Deadline for receipt of material is the 25th of the second month preceding month of publication.

All communications concerning the Newsletter including editorial matter, advertising, and mailing, should be addressed to: The NEWSLETTER, c/o Girard Associates, Inc., P.O. Box 666, Mt. Arlington, N. J. 07856, Phone: 398-5524.

Subscription: $0.75 per year through dues for members; $1.50 per year for non-members.

Second Class Postage Paid
at Morris Plains, N. J.

REPORT ALL ADDRESS CHANGES TO:
Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street New York, N. Y. 10017

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.

NORTH JERSEY SECTION OFFICERS 1970-1971

H. E. Blaicher, Jr.

Robert G. Sokalski

Chairman ..... Herbert E. Blaicher, Jr.
Vice Chairman ..... Robert G. Sokalski
Treasurer ..... Carl C. Torell
Secretary ..... Dr. Raj P. Misra
Member-at-Large ..... John H. Gerth
Member-at-Large ..... Dr. Emil C. Neu
Jr. Past Chairman ..... Merle M. Irvine

Sponsored by NY, NJ and LI Sections

Portable Pensions — Now? How!?

The hottest topic being discussed today amongst engineers is the impact on their vested pension right of increasing job mobility. Therefore to determine the best course of action, three people closely involved with the subject of portable pensions* will kick off an open discussion to which all engineers are invited.

The three panelists are Dr. J. H. Mulligan, Jr., Executive Secretary, National Academy of Engineering, Washington, D. C., who has been nominated president of the IEEE and is a member of the IEEE Board of Directors; Mr. A. Shafitz, Associate Manager, Mutual of New York, N.Y.C., who is responsible for the administration of corporate pension funds and the training of agency representatives in this field; and Mr. D. A. H. Roethel, Manager (Professional Relations), American Chemical Society, Washington, D.C., whose office is in the process of impleting a portable pension plan for its membership after exhaustive studies.

David Roethel will address himself to the case for portable pensions and its application by ACS, Alan Shafitz will explain procedures currently being followed by corporations and Jim Mulligan will discuss actions taken so far and options available to the IEEE on the portable pension issue.

This milestone meeting, to be held on Thursday, October 22, is presented by the Metropolitan Chapter of the Engineering Management Group, jointly with the New York, North Jersey and Long Island Sections of the IEEE. Members and nonmembers are cordially invited.

Time: Thursday, October 22; 7:30 P.M.
Place: United Engineering Center, Room 125, 345 East 47th Street, N.Y.C.

**"Portable pensions" create a fund assuring professionals of retirement income based on all their jobs, regardless of length of service in each, provided each employer participates. (Comparable to that of college teachers - TIAA.)*

Environment and Electric Power - I

The North Jersey Power Group and the Morris County Subsection of ASME will co-sponsor a meeting on the impact of environmental concern on the electric utility industry. The speaker will be Mr. Clyde Ruffle, Director of Environmental Affairs at Public Service Electric and Gas Co. N.J.

Mr. Ruffle will discuss electric power growth concepts, the effects of generation and distribution facilities on the environment and the social decisions which must be resolved if the public is to have the energy it wants through the 1970's.

Mr. Ruffle is a graduate of Lehigh University, and holds an M.S. degree from Stevens Institute of Technology. Prior to being appointed Director of Environmental Affairs, he has served in several engineering and administrative posts at PSE&G.

Time: Thursday, October 22; 8:00 P.M.
Place: Punch Bowl Auditorium, Jersey Central-New Jersey Power & Light Headquarters, Route 24, Morristown, N. J.

CALENDAR (continued from page 2)

Thursday, October 29
North Jersey Section — Tour of Sea-Land Facilities, Sea-Land Service, Inc., Corner Fleet and Corbin Streets, Elizabeth, N. J. 7:30 P.M.

Tuesday, November 10
New York, North Jersey and Long Island Joint Chapter on Instrumentation & Measurements—Analog to Digital Conversion Today, NCE. 9:00 A.M.-4:00 P.M.

Wednesday, November 18
Multi-Group Joint Chapter — The Environment and Electric Power Generation, Francis J. Haughey and Robert Mittl, Speakers, Arnold Auditorium, Bell Telephone Laboratories, Murray Hill, N. J. 8:00 P.M.

Thursday, November 19
Metropolitan Electron Devices Chapter — Recent Innovations in Injection Lasers, Henry Kressel, Speaker, International Telephone and Telegraph Laboratories, Nutley, N. J. 8:00 P.M. Pre-Meeting Dinner: Copperhood Restaurant, South of Route 3 at the Park Avenue Exit. 6:00 P.M.

PREVIEW OF INSTRUMENTATION PANORAMA 1970

The North Jersey Section's Second Annual Conference On Instrumentation & Measurement
October 14-15, 1970 Governor Morris Inn, Morristown, New Jersey

A comprehensive review of the latest achievements in electronic instrumentation, scientific measurement techniques, and computer-aided technology.

IP – '70 offers an exceptional opportunity for engineers in every branch of the electrical/electronic art to **update their techniques and application experience.** Although the industry is currently experiencing some degree of recession, its technology is advancing and diversifying rapidly. Today, more than ever, every engineer owes it to himself . . . to his company . . . to his profession to **stay abreast of his technology.**

IP-70 IEEE

SEE CENTER-FOLD INSERT FOR COMPLETE PROGRAM SUMMARY and ADVANCE REGISTRATION FORM.

MEMBER OF PRESIDENT'S ENVIRONMENT COUNCIL TO CHALLENGE CONFERENCE

Dr. Thomas C. Winter, Jr.

Keynote address at IP–'70 will be delivered by Dr. Thomas C. Winter, Jr. a leading scientific staff member of the President's Council on Environmental Quality, on Wednesday, October 14. Dr. Winter will speak on "New Instrumentation Challenges for Environmental Analysis and Control in the 1970's." It is expected that Dr. Winter's address will present the attending engineers with new challenges arising from the nationwide programs for analysis and control of environmental pollution of all kinds.

An honor graduate of the U.S. Military Academy, Dr. Winter holds an M.A. degree in Astronomy (1961) and a Ph.D. in Planetary and Space Physics (1966), both from the University of California in Los Angeles. He is the author or co-author of papers on a number of topics in physics, astronomy, and environmental testing, including "The Determination of . . .The Night Sky Hydrogen . . . Emission Line," **Journal of Geophysical Research** (1967), and "Schaumann-Type Photographic Film . . . Environment Test Results," **NRL** Report 7072. He has had other articles in the **Military Review, Astronautics & Aeronautics, and Naval Research Reviews.**

Dr. Winter is on assignment from the U. S. Army Corps of Engineers, in which he holds the rank of Lt. Colonel. His previous military assignments have included work on the development of the U.S. Army Geodetic Satellite System (SECOR) and, with the Naval Research Laboratory, on two of the six major solar experiments to be used in the Apollo Telescope Mount (which will be part of the first NASA manned, earth-orbiting space station in the Sky Lab Program).

A SAMPLER OF ABSTRACTS FROM THE IP – '70 PROGRAM.

Using Computer Graphics To Speed Network Design. *Professor W. H. Surber, Princeton University*

A survey of some applications of digital computer programs for electrical network analysis and design using a CRT terminal as an INPUT/OUTPUT device. An interactive (or pseudo-interactive) mode of operation, combined with a graphical display of the resulting performance, allows the user to carry out an iterative design rapidly and very effectively. The participation of the user in the optimization process can not only simplify the required computer program logic, but can also greatly help the designer to obtain a better understanding of the performance "trade-offs." Such systems can be particularly useful in comparing different configurations and the effects of using various performance criteria.

Interface Considerations in Digital Measurement and Control with Minicomputers. *Brett Nordgren and Steve Stark, Hewlett-Packard*

This paper surveys the problems of interfacing instruments with a digital computer. Included are specific applications in which specific problems are illustrated and solved.

Ensuring the Safety of Instruments Used in Hospitals. *David E. Kelch, Medical Electronics Division, Hewlett-Packard*

Certain new surgical procedures have magnified the hazard of accidental, fatal electrical shock to the hospitalized patient. Since susceptibility to electric shock may be heightened by several orders of magnitude through intentional placement of electrical conductors in or around the heart, safety procedures designed for current passing through intact skin, are no longer adequate. A new 4 point protection program is described.

Detection of Potential High Voltage Failure Through Corona Testing Techniques. *Peter H. Reynolds, James G. Biddle Co.*

A powerful technique for investigating the integrity of high voltage insulation systems is by the measurement of corona or partial discharge. This is particularly true of modern designs using plastic insulation. This paper discusses corona detection, measurement of charge transfer, and typical applications. It also reviews circuits used in the detection of corona and its evaluation by digital techniques.

New Transducers for the Micro-G and Micro PSI Domains. *David N. Meinecke, Inertial Instrument Division, Endevco*

A new accelerometer designed principly for taking highly accurate, long term, low-level acceleration measurements is described. The Q-Flex force-balance servo accelerometer combines high nickel-iron alloys and fused quartz to provide long-term stability, low thermal sensitivity, and high resistance to excessive shock and vibration. A version of the instrument designed to perform environmental acceleration measurements is described.

Systems for Water Quality Instrumentation for Continuous Pollution Monitoring. *H. L. Shubrooks, Instrument Division, Honeywell*

Pollution problems and water quality can be assessed by continuous measurement of such parameters as dissolved oxygen, conductivity, pH, temperature, ORP, and turbidity. This is accomplished with integrated systems of instrumentation that include sample/sensing, signal conditioning, and recording phases. The sensors provide the key to reliability, accuracy, and maintenance frequency. Included are: sensors, retrieved data, and typical systems and installations. Finally, current sensor needs are reviewed.

Optimal Design of Centralized Data Communications Networks.
Howard Frank, Network Analysis Company

For centralized data communications networks, link layout and capacity assignment are major problems. Cost/traffic ratios must be minimized. This paper, describes an algorithm to select globally optimum link capacities for specified tree structures. The programs are capable of handling thousands of nodes.

SEE CENTERFOLD FOR REGISTRATION FORM.

IP—'70 MEETING PLACE

All conference activities will be held in the Governor Morris Inn, Whippany Rd. & Lindsley Dr., Morristown, N. J., easily reached by car, train, or bus.

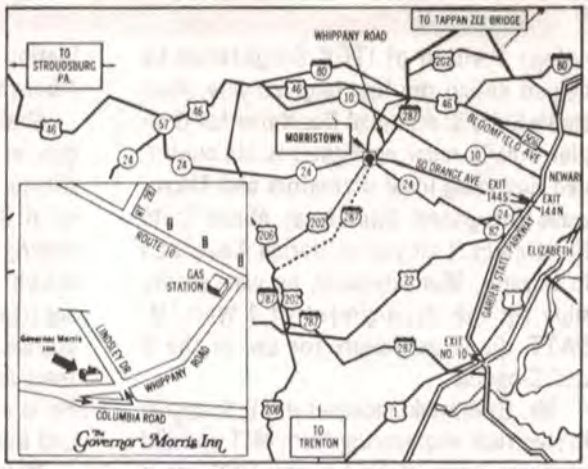
By car: Use the map at right.

By bus: From Newark— Public Service Bus No. 70. 90 min. from Public Service Terminal.

DeCamp Bus No. 146. 66 min. from Penn. R. R. Station

From New York— DeCamp Bus No. 77 80 min. from Port Authority Bus Ter.

By train: Erie-Lackawanna, Morris & Essex Branch. All stops from Hoboken — Morristown — Dover. (New York connec. via PATH tubes to Hoboken.)



LADIES' PROGRAM PLANNED

An interesting special program has been planned for the ladies who accompany their husbands to INSTRUMENTATION PANORAMA 1970.

The program will include: leisurely shopping — or just window shopping — in any of the fashionable stores at the Short Hills mall; private Thursday luncheon, visit to historical Washington's Headquarters; tour of the Duke Gardens in Somerville, New Jersey.

Performance Measurement Of Data Transmission Sets Over Telephone Lines. *Mark Wall, Data Science Corporation*

This paper describes a comparative on-line evaluation of available 4.8 kb/s and 9.6 kb/s modems on typical dedicated and switched data-grade circuits. To accomplish this task, which resulted in the accumulation of over 2,000 hours of on-line test data, an automated test facility capable of simultaneous testing of two modems at a time and periodic line measurement was developed. Test methods and results will be presented, along with some general conclusions concerning operation of modems and the statistical characteristics of the measured lines.

The Effects of Distorted Waveforms on Energy Measurement. *Bruce Renz, Amer. Elec. Power Service Corp.*

The increasing presence of non-linear loads on the power system is generating renewed interest in the performance of measuring devices under non-sinusoidal conditions. The effects of predominant current harmonics upon meters and instrument transformers has been studied by various researchers over the years on both theoretical and experimental levels. This paper will review some of the highlights of this research and discuss its implications in the light of today's conditions.

Optimization Techniques Applied To Hybrid Thick-Film Amplifier Design
Ralph F. Eschenbach, Hewlett-Packard

Thin film, and accurate characterization of high-frequency transistors permit advances in VHF and microwave amplifiers — e.g., cable television repeater amplifiers. An amplifier has been developed and produced that gives 31 dB of flat gain (±0.1dB) over the 40—270 MHz frequency band (noise figure <8.0 dB at the high frequencies). The amplifier is built on a .50 by .60 inch sapphire substrate.

After the topology and component parameters are determined, an optimization program is used to calculate the best values for the feedback and matching network elements. This program involves stochastic gradients, which, in contrast with "steepest descent" and other common techniques, virtually guarantees avoidance of local minima.

Printed Circuit Lumped Constant Filmbrid Couplers — Design & Application
Richard V. Snyder, Merrimac Research

A careful definition of circuit parasitics, together with proper control of materials, has made possible the development of printed lumped constant quadrature couplers. Through the use of a unique network synthesis, these couplers are realized as electrically "short" structures with concomitant lower insertion loss than that of distributed line devices. As discontinuities can be permuted in lumped systems, parasitics are compensated fully at the terminals.

Costs of Unreliability in the Marketplace
John Mihalasky, Newark College of Engineering

The 1970's have been labeled the "Age of the Consumer." Formerly, the customer — industrial, military, or ordinary civilian — had little recourse if the product purchased did not perform as advertised. Even when malfunctioning damaged other equipment, or caused injury and death, recovery of damages was difficult. However, a different situation prevails today: an unreliable design will have to be answered for by the engineer or designer who was responsible for it. The military already has an information system that pinpoints responsibility for the smallest of defects. Engineers and other technical personnel have been dismissed because of poor equipment or system performance. On the consumer front, engineers will shortly be called to task in product liability cases.

HIGHLIGHTS

- **4 Valuable "Cram Courses** — taught by experts to clear up questions, and to update your own technical "know-how." Lecture notes included. Attendance limited to 100 per course.
- **Engineer Re-Education** (panel discussion)— a possible way to fill the personnel gap in rapidly developing new specialties and technologies— the necessity for today's engineers to keep professionally competitive.
- **"Chips-Down" Papers Program**— emphasis on computer-aided instrumentation, environmental pollution measurement and control, state-of-the-art design and measurement techniques — the tools for flexible transition to the needs of tomorrow.

SEE CENTER-FOLD INSERT FOR PROGRAM DETAILS AND ADVANCE REGISTRATION FORM

P. S.— **On the lighter side,** social relaxation in a luxurious environment, an excellent cuisine, comfortable over-night accommodations (reserve them now).

STUDENT ENGINEERS URGED TO ATTEND IP—'70

Dr. Harlan J. Perlis

The competition that graduating engineers must face in the job market is becoming increasingly keen. Any new engineer who wants to establish his professional career "where the action is" must be able to offer more than his shiny new EE degree to get started right. He must also have a basic understanding of the "now" problems and the practical approaches to their solution.

The IEEE in general, and the North Jersey Section in particular, are vitally concerned with the practical needs, as well as the professional interests, of electrical engineering students. This is one major reason why we have broadened the scope of our annual conference — to make the program of immediate practical value to upperclassmen — and have established special low fees for student registration.

Whether your chosen area of specialization is in computers, communications, controls, devices, microwave, reliability, or power systems, you will find specialists in your field at IP—'70, who will discuss today's challenges and responses, on the practical, working level. Their subjects will include such "burning issues" as environmental protection, bioengineering, and user safety. Graduate students can also attend special 3-hour condensed courses offered in four especially pertinent subjects.

IP—'70 is a unique opportunity for you to get a "head start" in the career marketplace. We urge you to attend.

Dr. Harlan J. Perlis, General Chairman, IP—'70

SEE CENTERFOLD FOR REGISTRATION FORM.

Optimization for Microwave Engineers

The October dinner meeting of the North Jersey Section of GMTT/G-AP will feature a talk on "Optimization Techniques on Time-Sharing Computers for the Microwave Engineer" by Mr. Ralph E. Grabowski, of Applicon, Inc.

About the Talk

The successful creation of general purpose circuit analysis programs has stimulated the development of the next generation of computer design aids to take over where simple circuit analysis ends.

Mr. Grabowski will describe the use of MATCH and MICRONET, the first time-sharing programs to automatically adjust component values, transmission line lengths, dielectric constants and other parameters so as to optimize the circuit to the desired frequency response.

He will discuss filter design to correct for parasitics, microwave device modeling amplifier broadbanding, and the general why and how-to of optimization for microwave engineers.

About the Speaker

Ralph E. Grabowski is an applications engineer at Applicon Incorporated, Burlington, Massachusetts. His responsibilities are to help customers solve design problems with Applicon's computer-aided-design tools and include the user-interface, definition, and documentation of these computer programs.

Prior to joining Applicon early this year, he was involved in solid-state microwave circuit design. At the Applied Technology Division of ITEK Corporation he helped design the first large volume ultra-stable Solid State Local Oscillator for doppler missile radar applications. He continued designing local oscillators and Microwave Integrated Circuits at Micro State Electronics. Last year at Varian Associates in Beverly, Massachusetts, he was responsible for the development of 1 Watt IMPATT diode oscillators for use in the S and C-bands.

Mr. Grabowski received the B.S. degree in electrical engineering from MIT and did graduate work at UCLA and USC. He is the secretary of the Boston MTT Group.

Time: Thursday, October 22; 6:00 P.M. Mr. Grabowski's talk will immediately follow the dinner.
Place: Friar Tuck Inn, Route 23, Cedar Grove, N. J. For reservations write or call George Zysman, Bell Laboratories, Whippany, N. J. 07981, (201) 386-2054, before October 16.
Price: Ham steak dinner at $5.25.

WHEELER LABORATORIES, INC.
A Subsidiary of Hazeltine Corporation
Engineering for Radar and Communications
Microwave Systems and Components
Antennas and Feed Networks
Solid-State and Laser Applications
Smithtown, N. Y. (516) AN 5-3810

DATA DELAY DEVICES
253 CROOKS AVENUE
CLIFTON, NEW JERSEY 07011
(201) 772-1100

DELAY LINES	LUMPED, DISTRIBUTED MECHANICALLY VARIABLE ELECTRICALLY VARIABLE
FILTERS	H-P; L-P; B-P TUNED CIRCUITS
COILS	TOROIDS, VARITORS DECADE STANDARDS

Air Traffic: Analysis and Control

At the October meeting of the North Jersey Automatic Control Group, five members of the technical staff of Bell Telephone Laboratories will present a talk on a recently completed study of the analysis and control of the flow of air traffic. They are Drs. S. Horing, L. J. Forys, H. Heffes, J. M. Holtzman and E. J. Messerli. Dr. Horing, who headed the study, will serve as moderator of the presentation.

About the Talk

The talk will describe the results of an exploratory study aimed at developing a model which could form the basis of a comprehensive analysis of the Air Traffic Control system. This model could be used to evaluate the effects of proposed changes in the system. The work is broken into four parts. First, a traffic flow model which computes the means and variances of delays to individual aircraft will be presented. This model requires as an input a statistical description of the arrival and departure service processes which was obtained using the theory of semi-Markov processes. The problem of designing a (real-time) flow control system will be described and representative results obtained via an optimization algorithm will be presented. The question of model validation will also be discussed.

About the Speakers

Sheldon Horing received the Ph.D. degree in 1962 at Brooklyn Polytechnic Institute. Except for two years on the faculty of Brooklyn Polytechnic Institute, Dr. Horing has been engaged since 1957 in research and consulting in control theory are related areas at Bell Telephone Laboratories. He is currently Head of the Systems Analysis and Modelling Department. He is a member of Sigma Xi, Tau Beta Pi and Eta Kappa Nu.

Harry Heffes received the Ph.D. degree from New York University in 1968. Since 1962, he has been working in the areas of modern control theory, filtering theory and system modelling at Bell Telephone Laboratories where he is currently a supervisor in the System Analysis and Modelling Department. He is a member of IEEE, Tau Beta Pi and Eta Kappa Nu.

Jack M. Holtzman received the Ph.D. degree at Brooklyn Polytechnic Institute in 1967. He worked at Hughes Aircraft Co. from 1958 to 1963. Since 1963, he has worked in various aspects of systems and control theory at Bell Telephone Laboratories where he is currently supervisor of a group engaged in research and consulting in systems theory and applied mathematics. Dr. Holtzman authored a book on nonlinear system theory. He is a member of SIAM.

Leonard J. Forys has done research and consulted on various communication and control theory problems since joining Bell Telephone Laboratories in 1968 after receiving the Ph.D. degree at the University of California at Berkeley. He is presently engaged in a study of domestic satellite usage. Dr. Forys is a member of IEEE.

Edwin J. Messerli received the Ph.D. degree in 1968 from the University of California at Berkeley where he was an Assistant Professor until joining Bell Telephone Laboratories in 1969. His main interests are in optimization theory. Dr. Messerli is a member of IEEE.

Time: Monday, October 19; 8:00 P.M.
Place: Room 1H-009, Bell Telephone Laboratories, Whippany Rd., Whippany, N. J.
Pre-Meeting Dinner: Rod's 1890's Ranch House, Madison Avenue, Convent Station, New Jersey. 6:00 P.M.
Additional Information: Contact G. A. Ford, Bell Telephone Labs., Whippany Rd., Whippany, N. J. 07981. (201) 386-5103.

TECHNICAL PROGRAM

WEDNESDAY, OCTOBER 14, 1970

Morning

Session I —

Computer-Aided Instrumentation for Everyman

1— Using Computer Graphics to Speed Design of Passive Networks
2— Static and Dynamic Testing at the Card Level Under Computer Control
3— Using a Time-Shared Computer for Calculating & Interpreting Measured Data
4— The Role of the Small "Dedicated" Computer in Industrial Instrumentation

Afternoon

Session II —

Designing "Hazard-Free" Instrumentation

1— Electronic Instrument Safety — an Environmental Point of View
2— A Safety Standard for Electrical Instrumentation
3— Ensuring The Safety of Instruments Used in Hospital Environments
4— Predicting High-Voltage Hazards by Corona-Test Interpretation

Session III —

New Analog & Digital Transducers & Sensors

1— A New Sensor for Continuous Dynamic Measurement of Blood Pressure
2— New Transducers for the Micro-G and Micro-PSI Domains
3— A Pressure Transducer with High-Resolution Digital Output
4— A Sensor and Circuitry for Continuous Monitoring of Biochemical Pollutants

Evening

Cram Session A — Design of Active Filters
Cram Session B — Application of Memory Systems to Instrumentation

THURSDAY, OCTOBER 15, 1970

Morning

Session IV —

Data Communications for Acquisition & Computation

1— Optimal Design of Centralized Data-Communication Networks
2— Representative Performance of Data Transmission over Telephone Lines
3— Characteristics of Tropo-Scatter Channels by Impulse-Response Measurement
4— Selecting the Class of Data Terminals Best Suited to a Specific Instrumentation System

Session V —

Modern Power-System Measurement Techniques

1— Operating Experience with a Large Digital Data Acquisition System
2— Automatic Reading of Watt-Hour Meters
3— Measuring and Correcting for Waveform Distortion Caused by SCR's
4— Semi-Automatic Wattmeter and WattHour Meter Calibration

Luncheon Penel

Session VI —

Will Re-Educating Engineers Close the Gap?

Afternoon

Session VII —

Gigahertz Measurements — Hardware & Techniques

1— Utilization of a Time-Shared Computer in Designing Thick-Film Networks & Components
2— Optimal Design of a Filter for the Gigahertz Domain
3— Design and Applications of "Lumped" Strip Lines
4— Single-Sweep Broadband Return-Loss & Attenuation Measurement

Session VIII —

What Cost Reliability in Instrumentation?

1— The Cost of Ensuring Reliability in the Manufacture of Scientific Instrumentation
2— The Cost of Operating a Parts-Analysis Operation
3— Calibration Longevity vs Cost of Purchase and Maintenance
4— The Costs of Unreliability in the Marketplace

Evening

Cram Session C — BASIC — A Programming Language for English-Speaking Persons

Cram Session D — Secondary-Standard Metrology

REDUCED FEES FOR EARLY REGISTRATION

Members save up to $11.00 by signing up early.
Save money and time — don't wait in line.

HOTEL ACCOMMODATIONS AVAILABLE

Request reservation form when you register.

4 SPECIAL "CRAM" COURSES

. . . . . Brush up — catch up — clear up
. . . . . Subjects taught by experts.
. . . . . Lecture notes (not included in Proceedings).

REGISTER TODAY
DO IT NOW

Attendance limited to 100 per course.

OTHER SPECIAL EVENTS

Industry Reception • Technical Book Fair • Prominent Keynote Speaker

ATTENDANCE LIMITED TO 700

SCHEDULE OF EVENTS

TIME	WEDNESDAY OCTOBER 14, 1970	THURSDAY OCTOBER 15, 1970
8:00 A. M.	Registration	Registration
9:45 A. M.	Welcome Address	
10–12:00	Technical Session I	Technical Sessions IV, V
12:45 P.M. 1:30 P. M.	Luncheon Keynote Address	Luncheon Panel, Session VI
3–5:00 P. M.	Technical Sessions II, III	Technical Sessions VII, VIII
5–7:00 P. M.	Industry Reception and Dinner Hour	Technical Book Fair and Dinner Hour
7–10:00 P. M.	Cram Courses A, B	Cram Courses C, D

Detach here, fill out, and mail — no postage required unless mailed in envelope with check.

BUSINESS REPLY MAIL
No Postage Required if Mailed in United States

Postage Will Be Paid By

IEEE INSTRUMENTATION PANORAMA 1970
P. O. Box 365, Union, New Jersey 07083

SAVE TIME

no standing in line

REGISTER NOW

Earlybird discount

SAVE MONEY

TO: Instrumentation Panorama — 1970, IEEE

Please register me for your Second Annual Conference on Instrumentation & Measurement, to be held October 14-15, 1970 at the Governor Morris Inn, Morristown, New Jersey.

Name (print) _____

Company _____

Address _____

City _____

State _____ Zip _____

IEEE Affiliation:

☐ Member ☐ Student Member ☐ Non-Member

Section _____ Group _____

Matriculated engineering student at _____

☐ Undergraduate Student ☐ Graduate Student

Please register me for:	Reg. Mem.	Non-Mem.	Stud. Mem.	Stud.
☐ Wed. & Thurs. sessions (including PROCEEDINGS)	$40.00	$60.00	---	---
Earlybirds† save $10.00	30.00	50.00	---	---
☐ Wed. & Thurs. sessions*	35.00	50.00	8.50	15.00
Earlybirds† save $10.00	25.00	40.00	---	---
☐ Wed. 10/14 sessions only*	20.00	27.50	5.00	8.00
Earlybirds† save $5.00	15.00	22.50	---	---
☐ Thurs. 10/15 sessions only*	20.00	27.50	5.00	8.00
Earlybirds† save $5.00	15.00	22.50	---	---

*PROCEEDINGS not included in registration fee unless indicated.

†Advance registrations received by Sept. 25, 1970 earn Earlybird discount.

☐ Reserve a copy of the PROCEEDINGS for me**.	5.00	10.00	5.00	10.00

**Above prices to conference registrants only. Price to others $12.50

☐ I also wish to attend "CRAM" courses as checked: ☐A ☐B ☐C ☐D

Additional fee, per course	10.00	12.50	‡‡	‡‡
‡‡ For graduate students only, per course			10.00	12.50

(CRAM Courses are available to Conference Registrants only, and will not be included in the PROCEEDINGS.)

☐ Please reserve luncheon tickets for me, at $5.50 per ticket. (Luncheon tickets $6.00 each at the door, if space is available.)
☐ Wed., 10/14 ☐ Thurs., 10/15

☐ Check or money order enclosed. Please send me a signed receipt for expense accounting. (Make checks payable to Instrumentation Panorama 1970.)

☐ Please bill me. I understand that my registration will not be confirmed until payment has been made. ☐ Please bill my company (mail bill to me).

Signature _____ Date _____

☐ Send me information on Hotel Reservations.
☐ Send me information on LADIES' PROGRAM plans.

ADVANCE PROGRAM and ADVANCE REGISTRATION FORM for INSTRUMENTATION PANORAMA 1970

IEEE Second Annual Conference
on
Instrumentation & Measurement

•

Technical Program By
N. Y. — North Jersey — L. I.
Joint Chapter
IEEE Group On
Instrumentation & Measurement

•

Sponsor
North Jersey Section IEEE

Cooperating North Jersey Groups
Communication Technology • Computers •
Automatic Control • Power • Reliability •
Microwave Theory & Techniques/Antennas & Propogation

8 MAJOR-TOPIC SESSIONS
32 TOP-FLIGHT PAPERS
4 VALUABLE "CRAM" COURSES
OTHER SPECIAL EVENTS

Significant Measurement Topics for Every Branch of the Electrical/Electronic art

October 14-15, 1970
Governor Morris Inn
Morristown, New Jersey

more . . .

IP-70 IEEE

IEEE
NORTH JERSEY SECTION
LECTURE SERIES

FALL 1970

INTRODUCTION TO DIGITAL COMPUTER DESIGN

A nine-week course for those who want to know about computers and be able to communicate with computer people; to receive an understanding of operations within a computer and an understanding of the significance of programming.

Starts October 14, 1970

Jersey Central/New Jersey Power & Light Company
Madison Avenue at Punch Bowl Road
Morristown, New Jersey

RELIABILITY – PART I

An eight-session course providing an introduction to the basic concepts and methods of electronic equipment reliability, not intended for the reliability specialist, but rather for someone seeking a survey of the reliability field.

Starts October 15, 1970

Bell Telephone Laboratories
Whippany Road
Whippany, New Jersey

ELECTRIC HEATING/COOLING

An eight-session survey course designed for all who are concerned with the problems and considerations involved in the design, application, and construction of buildings incorporating electric heating and cooling systems.

Starts October 27, 1970

Jersey Central/New Jersey Power & Light Company
Madison Avenue at Punch Bowl Road
Morristown, New Jersey

(See Details and Registration Forms on Following Pages)

IEEE NORTH JERSEY SECTION LECTURE SERIES—FALL, 1970

Introduction To Digital Computer Design

A nine-week course for those who want to know about computers and be able to communicate with computer people. To receive an understanding of operations within a computer and an understanding of the significance of programming.

October 14—NUMBER SYSTEMS, BOOLEAN ALGEBRA

October 21—LOGIC CIRCUITS: GATES, FLIP-FLOPS, NETWORKS

October 28—BOOLEAN SIMPLIFICATION, KARNAUGH MAPPING

November 4—COMPUTER ARITHMETIC, SIGNED NUMBER, BASIC ADDERS, HIGH SPEED ADDERS

November 11—MEMORIES: MAGNETIC AND SEMICONDUCTOR

November 18—COMPUTER ORGANIZATION

November 25—I/O CHANNELS: DIGITAL, A/D, D/A

December 2—SOFTWARE: MACHINE LANGUAGE PROGRAMMING, HIGH LEVEL LANGUAGES, OPERATING SYSTEMS

December 9—SUMMARY: COMMERCIALLY AVAILABLE COMPUTERS, TIME SHARING SYSTEMS

INSTRUCTOR: Mr. Charles Hunnicott, a member of the Technical Staff at Bell Telephone Laboratories and is presently associated with the design and analysis of large computer systems. He has a BSEE from Worcester Polytechnic Institute and an MSEE from Rensselaer Polytechnic Institute.

TIME: 7:00 P.M. to 9:00 P.M., Wednesdays, starting October 14, 1970, and ending December 9, 1970.

PLACE: Jersey Central/New Jersey Power & Light Company, Punch Bowl Room, Madison Avenue & Punchbowl Road, Morristown, New Jersey.

REGISTRATION FORM – INTRODUCTION TO DIGITAL COMPUTER DESIGN

Send to: *Mr. B. G. Geertsma*
Jersey Central/New Jersey Power & Light Company
Engineering Department-Substation
Madison Avenue at Punchbowl Road, Morristown, N. J. 07960
Phone: (201) 539-6111, Ext. 513

Name..... Tech. Society.....

Firm..... Position.....

Business Address..... Phone.....

Home Address..... Phone.....

Check enclosed Member: $53.00..... $58.00 after October 1.....
Non-Member: $63.00..... $68.00 after October 1.....

Please make checks payable to: North Jersey Section IEEE.

IEEE NORTH JERSEY SECTION LECTURE SERIES—FALL, 1970

Reliability — Part I

This course will provide an introduction to the basic concepts and methods of electronic equipment reliability. It is not intended for the reliability specialist, but rather for someone seeking a survey of the reliability field. Highlights of the various listed topics will be presented and references given for additional study. A general engineering background is the only prerequisite.

October 15—PRACTICE OF RELIABILITY—Reliability concepts, factors, and their application
Speaker: G. H. Ebel, Singer-General Precision

October 22—PROBABILITY BASICS—Probability principles pertinent to reliability problems.
Speaker: K. Grace, Bell Telephone Laboratories
FAILURE DISTRIBUTIONS—Meaning and physical interpretation of failure distributions.
RELIABILITY OBJECTIVES—Establishment and interpretation of reliability objectives.
Speaker: S. J. Amster, Bell Telephone Laboratories

October 29—COMPONENT PART RELIABILITY—Time dependent properties of active and passive electronic component parts, their specification, and failure mechanisms.
Speakers: R. C. Winans and M. C. Wooley, Bell Telephone Laboratories

November 5—FAILURE ANALYSIS—What can be learned by failure analysis and procedures involved.
Speaker: M. C. Wooley, Bell Telephone Laboratories
ELECTRONIC CIRCUIT RELIABILITY—Circuit stresses, margins, equipment design and their effect on reliability.
Speaker: R. C. Winans, Bell Telephone Laboratories

November 12—ELECTRONIC CIRCUIT RELIABILITY (Cont'd.)
Speaker: R. C. Winans, Bell Telephone Laboratories
INTEGRATED CIRCUITS—Reliability characteristics of integrated circuits, failure modes and mechanisms, screening tests.
Speaker: G. H. Ebel, Singer-General Precision

November 19—MECHANICAL RELIABILITY AND ENVIRONMENTAL EFFECTS—Mechanical aspects of electronic parts and equipment's associated failure tendencies, achieving equipment reliability in different environments.
Speaker: R. Haiken, Consultant
RELIABILITY AND MAINTENANCE PARAMETER ESTIMATION—Failure rate and maintenance time estimation based on experience and design considerations.
Speaker: G. L. Hetzel, Bell Telephone Laboratories

December 3—RELIABILITY AND MAINTENANCE PARAMETER ESTIMATION (Cont'd.)
Speaker: G. L. Hetzel, Bell Telephone Laboratories
FAULT PATTERN IN EQUIPMENT—Failure modes and effects analysis as related to equipment reliability and maintenance.
Speaker: F. A. Mendez, Northern Precision Laboratories

December 10—MEASURES OF EFFECTIVENESS—Ways in which time dependent properties of systems can be expressed.
Speaker: K. Grace, Bell Telephone Laboratories
MULTIFUNCTIONAL SYSTEMS—Analysis of systems and equipment groups which perform several functions.
Speaker: S. J. Amster, Bell Telephone Laboratories

Reference Text: ARINC Research Corporation (W. H. von Alven) "Reliability Engineering," Prentice-Hall 1964.

Spring 1971 — RELIABILITY — PART II — Further development of selected topics from first semester based on class interest. Also, additional topics might be included such as reliability aspects of redundancy, large scale integration (LSI), connections, etc.

TIME: 7:00-9:00 P.M. Thursday evenings starting October 15, 1970 and ending December 10, 1970.
PLACE: Room 1H-009, Bell Telephone Laboratory, Whippany Rd., Whippany, N. J.
INFORMATION: For additional information contact K. Grace, Bell Telephone Laboratory, Inc., Whippany Road, Whippany, N. J. 07981. Phone: (201) 386-6030.

REGISTRATION FORM — RELIABILITY — PART I

Send to: Mr. J. E. Schmidt, Automatic Switch Co., 6 Watsessing Ave., Bloomfield, N. J. 07003

Name..... Tech. Society.....

Firm..... Position.....

Business Address..... Phone.....

Home Address..... Phone.....

Check or Money Order Enclosed: ☐ Member-$59.00; Registration prior to October 15 - $54.00
☐ Non-Member-$69.00; Registration prior to October 15 - $64.00

Please make check or money order payable to: North Jersey Section IEEE.

IEEE NORTH JERSEY SECTION LECTURE SERIES—FALL, 1970

Electric Heating/Cooling

This eight-session survey course is designed for all who are concerned with the problems and considerations involved in the design, application, and construction of buildings incorporating electric heating and cooling systems. Men who are experts in design, materials, and equipment for electric heating and cooling will be our speakers. The course will be beneficial to engineers, architects, contractors, and others who have an interest in this field.

October 27—FUNDAMENTALS OF COMFORT—Body heat generation and heat loss. Comfort vs. discomfort. Space requirements for comfort.
Electric Heating/Cooling Consultant

November 3—CONSERVING THE INTERNAL GAINS—Types of internal heat gains. Effect of internal gains on heating loads. Heating with light. Designing for heat recovery.
Electric Heating/Cooling Consultant

November 10—ELECTRIC HEATING/COOLING METHODS—Heat transfer principles. Types of in-space electric heating systems. Typical performance of in-space electric heating systems. Central unit heating systems.
Electric Heating/Cooling Consultant

November 17—CONTROL OF ELECTRIC HEATING/COOLING METHODS—Line voltage thermostats. Low voltage thermostats. Solid-state controls. Control of central unit heating systems.
Electric Heating/Cooling Consultant

November 24—RESIDENTIAL BUILDINGS—Types of insulation. Insulation requirements. Walls, floors, roofs and basements. Vapor barriers. Glazing. Control of infiltration losses. Heat loss calculations. Equipment sizing.
Arthur Johnson, Certainteed/St Gobain Insulation Corp.

December 1—COMMERCIAL BUILDINGS—Typical wall and roof constructions. Insulation applications. Control of solar loads. Air infiltration and ventilation. Heat-loss and heat-gain calculations.
Thomas Beers, Consulting Engineer

December 8—ELECTRIC HEAT FOR LARGE BUILDINGS—Heat recovery. Heat storage. Heat by light. Simultaneous Heat-Pumps. The Three-Pipe System. Decentralized unitary systems. Special applications. The pros and cons of on-site generation. Advantages of an all-electric installation.
Thomas Beers, Consulting Engineer

December 15—THE ELECTRIC HEAT-PUMP—Residential heat-pump units. Commercial heat-pumps. The economics of heat-pump applications.
Speaker from Lennox Industries, Inc.

TIME: 7:00-9:00 P.M. Tuesday nights, starting October 27, 1970 and concluding December 15, 1970

PLACE: Jersey Central/New Jersey Power and Light Co., General Operating Headquarters, Madison Avenue at Punch Bowl Road, (Rt. 24) Morristown, New Jersey, Punch Bowl Room

FEE: $40.00 to members (IEEE,ASME, NJSSPE, etc.), $50.00 to non-members. $5.00 discount for registrations received prior to the first session.

SPONSORS: P. E. Watson, Jersey Central/New Jersey Power and Light Co. Phone (201) 539-6111, Ext. 511; J. C. Gass, Allis-Chalmers, Phone (201) 687-3700, Ext. 28.

REGISTRATION FORM—ELECTRIC HEATING/COOLING COURSE

Send to: *Mr. P. E. Watson, Jersey Central/New Jersey Power and Light Co.*
Madison Avenue at Punch Bowl Road, Morristown, N. J. 07960

Name..... Tech. Society.....

Firm..... Position.....

Business Address..... Phone.....

Home Address..... Phone.....

Check Enclosed: Member: $35.00.....; $40.00 after October 20.....
Non-Member: $45.00.....; $50.00 after October 20.....

Make checks payable to: North Jersey Section IEEE.

Electronic Industry: Two Major Problems

The PMP Group (G-21) will hold a meeting on October 8, covering the topic of "The Electronics Industry—Conversion and the Import Problem."

About the Talk

Currently, the electronics industry is faced with two major problems: (1) a reduction in military electronics demands, and (2) rising competition from imports. This has a serious impact upon technical manpower. Possible solutions to cope with this situation are proposed and discussed. Their adoption could result in ultimate improvement of the entire industry.

About the Speaker

John E. Ullmann is professor of management and chairman of the Department of Management, Marketing and Business Statistics at Hofstra University in Hempstead, New York. He received a B.S. degree in mechanical and civil engineering from the University of London in 1948 and the M.S. and Ph.D. in industrial engineering from Columbia University in 1951 and 1959. He has had diversified experience in industry as well as in the academic world, and has served as a consultant to government and industry on a variety of economic and technical areas. An author of many papers, Dr. Ullmann is well qualified to speak on this topic.

Time: Thursday, October 8; 8:00 P.M.
Place: Main Auditorium, Bell Telephone Labs, Murray Hill, N. J.
Pre-Meeting Dinner: 6:00 P.M., Wally's Tavern on the Hill, Watchung, N. J.
Dinner Reservations: Call H. Feibus, Office (201) 386-5563, Home (201) 464-0228.

Underground Systems

The Transmission & Distribution Group of the P&I Division has scheduled a Technical Discussion Group Meeting for October 14 to discuss "Underground Radial Systems—Application, Protection, Costs and Reliability."

Radial residential underground systems with two or three transformers will be covered, with slide illustrations, in addition to a modified radial underground with manual backup.

The speakers will include: Mr. John Webster, Jersey Central Power & Light, New Jersey Power & Light; Mr. Roch Cappelli, Con Edison, and Mr. Andy Montano, Public Service Electric & Gas Co.

Additional information may be obtained from Mr. J. A. Lenge, 5th floor, Station 8, Consolidated Edison Co. of New York, 708 First Avenue, New York 10017.

Time: Wednesday, October 14; 6:30 P.M.
Place: Union Carbide Corporation, 3rd Floor Meeting Room, 270 Park Ave., New York City.

Integrated Circuit Reliability

At the October meeting of the North Jersey Section Reliability Chapter, Mr. D. S. Peck of Bell Telephone Laboratories, Inc. will discuss specification techniques utilizing high stress testing to achieve integrated circuit reliability in a shorter time and at lower cost than with methods currently in general use.

Mr. Peck is well known for his extensive use of accelerated stress testing in reliability screening of semiconductor devices. Anyone interested in the problem of economically getting high quality IC's without prolonged test times is encouraged to attend.

Time: Wednesday, October 21; 7:00 P.M.
Place: Singer-General Precision, Kearfott Division, Plant No. 10 Board Room, 150 Totowa Road, Wayne, N. J.
Pre-Meeting Dutch Treat Dinner: 5:30 P.M., Holiday Inn, Route 46, Wayne, N. J.
For further information, contact: G. L. Hetzel, (201) 386-2509 or F. A. Mendez, (201) 227-4800.

Environment and Electric Power - II

The Multi-Group Joint Chapter is planning a discussion on "Environment and Electric Power Generation." It will concern itself with the conflict between the growing need for electrical power and the deteriorating environment. The speakers will zero in on the situation in New Jersey and its immediate surroundings.

The speakers will be Professor Francis J. Haughey, Environmental Sciences, Rutgers University, and Robert Mittl, Project Manager for the Newbold Island Nuclear Generator, Public Service Electric and Gas Company.

About the Speakers

Professor Haughey will speak on "The Alternatives, Fossil or Nuclear—The Public View." He is Professor of Environmental Sciences, associated with the Radiation Science Program at Rutgers University. He received his Ph.D. in environmental sciences at Rutgers and is a Certified Health Physicist.

Mr. Mittl is the assistant to the Chief Engineer at Public Service. He received his M.E. degree from Stevens Institute and his M.S. in Nuclear Science from Carnegie Institute of Technology. He has been with Public Service since 1954. Mr. Mittl will discuss the Power Company's approach to the development of suitable electric power generators and their concern for the environment.

Time: Wednesday, November 18; 8:00 P.M.
Place: Arnold Auditorium, Bell Telephone Laboratories, Murray Hill, N. J.

Reducing Computer Control System Noise

The computer group will hold a meeting in which Mr. Frank G. Willard, Advisory Engineer, Westinghouse Electric Corporation, Computer Instrumentation Division will speak on the Prevention and Treatment of Noise in Control Signals. Mr. Willard will discuss some practical means to recover information and reject noise by employing some characteristic difference between them.

About the Speaker

Mr. Willard received his A.B. and M.S.E.E. degrees at Dartmouth College. He has been a Westinghouse employee since 1954 and is currently in their Computer Instrumentation Division where he is responsible for consultation on hardware development of computing equipment, generation of systems architecture for new computer products, and serves as the Division's liaison with Research and Development Center.

Time: Tuesday, October 27; 8:00 P.M.
Place: Arnold Auditorium, Bell Telephone Laboratories, Murray Hill, N. J.

****

FELLOW'S NIGHT
February 13, 1970
Governor Morris Inn, Morristown, N. J.

****

New Injection Lasers

The Electron Devices Group will hold a meeting on November 19 at ITT Labs, Nutley, N. J. Mr. H. Kressel will speak on "Recent Innovations in Injection Lasers."

About the Speaker

Henry Kressel received the B.A. degree from Yeshiva University in 1955, the M.S. degree in Applied Physics from Harvard University in 1956, and the M.B.A. (1959) from the University of Pennsylvania. He joined RCA in 1959 and is presently Head, Semiconductor Optical Devices Research at the RCA Laboratories, Princeton.

The room temperature performance of diode lasers has been dramatically improved in the past two years as a result of new theoretical insights and improved materials technology. A state of the art review will be presented of the new heterojunction diode laser performance and key theoretical concepts. Some of the major applications of present and potential interest will be discussed.

Time: Thursday, November 19; 8:00 P.M.
Place: International Telephone & Telegraph Laboratories, Nutley, N. J.
Pre-Meeting Dinner: Copperhood Restaurant, south of Route 3 at Park Avenue Exit, 6:00 P.M.

Impact On Engineers

The Education Committee of the Northern New Jersey Chapter of IEEE, in conjunction with the ASME will present a lecture entitled "Recent Developments Affecting the Engineering Profession--the impact of reduced defense expenditures, increased technical activity abroad, and how the profession can cope with ensuing dislocations." Specific recommendations will be advanced to foster effective utilization of the nation's technical resources, and will include suggestions to individual engineers whose professional marketability is imperiled. The speaker, Dr. John E. Ullmann, is Professor of Management at Hofstra University; he has written a number of papers on the subject and is a recognized authority in the field.

Time: Tuesday, October 20; 7:00 P.M.
Place: Allied Chemical Auditorium, main entrance Columbia Road at Park Avenue, Morristown, N. J. Ample parking.

COMMUNICATIONS TECHNOLOGY GROUP

Switching Systems and Their Applications

The objective of this three-part lecture series is to provide a general understanding of telephone switching systems and how they are applied to meet varying local requirements. The fall series, Part I, will cover the most common types of electromechanical switching systems which are in service in North America. A brief review of switching systems used in other countries will also be presented. In addition, traffic theory applied to telephone practice and techniques used to determine where switching centers should be located will be discussed.

The winter series, Part II, will go into considerable detail regarding electronic control of switching systems. Electronic switching systems are being installed in ever increasing numbers. Manufacturers throughout the world are working on new systems which take advantage of the speed possible with electronic control. Part II will provide for a basic understanding of electronic control.

The spring series, Part III, will describe switching systems utilizing electronic techniques. Information on Part III will be available in future issues of this publication.

PART I – FALL SERIES

October 6 – "History of Switching," A. N. Daudelin, Jr., Bell Telephone Laboratories
October 13 – "Step-by-Step and all Relay Systems," J. J. Brumblatt, GT&E
October 20 – "Panel, No. 1 and No. 5, Crossbar Systems," Speaker to be announced
October 27 – "International Systems," Speaker to be announced
November 10 – "Traffic Theory," B. J. Cole, GT&E
November 17 – "Locating Switching Centers by Computer Techniques," J. P. Rooney, N. Y. Telephone Company

Included as part of the registration fee for those taking all three parts of the lecture series is a textbook entitled *Switching Systems.*

Other individuals desiring to acquire the textbook may purchase a copy at the lecture hall. Note: Since orders for the textbook are required in advance only those who indicate on the enrollment form their desire to purchase a copy will be provided with one.

Fee: Members - $45.00 for full three-part series; $20.00 for each individual part.
Non-Members - $60.00 for full three-part series; $35.00 for each individual part.
Location: Little Theater, New York Telephone Company, 140 West Street, N. Y. C.
Time: 6:30-8:30 P.M.

For registration and additional information write or phone Mr. Alexander F. Karman, RCA Frequency Bureau, 60 Broad Street, Room 730, New York, N. Y. 10004. Phone: (212) 586-3000, Ext. RR 3002.

REGISTRATION FORM – SWITCHING SYSTEMS AND THEIR APPLICATION

Send to: Mr. A. F. Karman, RCA Frequency Bureau,
60 Broad Street, Room 730, New York, N. Y. 10004

Name.....

Firm.....Position.....

Business Address.....Phone.....

Home Address.....Phone.....

Check of Money Order Enclosed: $.....

Member:	$45.00 Complete Series	Non-Member:	$60.00 Complete Series
	$20.00 Per Lecture		$35.00 Per Lecture

Partial Enrollment (Circle Part Desired) Part I II III .....Want Textbook
Make check or money order payable to Comm Tech Group, N. Y. Section IEEE.

Analog to Digital Conversion Seminar

The New York Joint Chapter on Instrumentation & Measurements is sponsoring an all-day seminar on analog to digital conversion which will be held at Newark College of Engineering on November 10. The seminar, entitled "Analog to Digital Conversion Today" will be a state of art look at analog to digital conversion with emphasis on specifications, limitations, and technical and economic trade-offs in instrument and system applications. The seminar panel will consist of technical experts representing various facets of analog to digital converter design and application. Each panel member will give a presentation on analog to digital conversion from his particular viewpoint, which will be followed by audience questions and general panel discussion.

Seminar topics and panel speakers will include:

Digital Instrument Applications of Analog to Digital Converters - Mr. Austin T. Kelly, Chief Electronics Engineer, Weston Instruments, Inc.

New Techniques of Analog to Digital Conversion for Communication Applications - Dr. Henry S. McDonald, Assistant Director, Communications Principles Research Laboratory, Bell Telephone Labs.

Analog to Digital Converters as Applied to Computerized Digital Control Systems The panel speaker will be a control engineer from Taylor Instrument Co.

The Advantages of Monolithic Construction in Analog to Digital Converter Design - Mr. E. Barry Hilton, Manager of Converter Product Engineering, Analog Devices, Inc.

Military Applications of Analog to Digital Converters - Panel speaker to be announced.

Future Trends of Analog to Digital Converters - General panel discussion.

Time: Tuesday, November 10; 9:00 A.M.-4:00 P.M.
Place: Alumni Center, Newark College of Engineering, 323 High St., Newark, N. J.
Registration Fee: IEEE Members, $10.00
Non-Members, $15.00
For Further Information: In New York call: Mr. Karl Sommer, (212) 460-6176.
In New Jersey call: Mr. James W. Harte, Jr., (201) 243-4700, Ext. 555.

Early Advanced Registration is suggested using the form below.

.....

Mr. Daniel Cotte
c/o RFL Industries, Inc.
Powerville Road
Boonton, New Jersey 07005

Enclosed please find my check (or money order) made payable to the Joint Chapter, I & M, IEEE in the amount of..... (IEEE member $10, non-member $15) for registration for the Analog to Digital Conversion Seminar to be held on November 10, at Newark College of Engineering.

Enclosed is a self-addressed stamped envelope for use in confirmation of my reservation.

Name.....

Address.....

.....

.....Phone.....

Students to Tour Electronics Laboratories at Fort Monmouth

The New York, North Jersey, and Long Island Joint Chapter on Instrumentation & Measurement will sponsor a tour of USAECOM Laboratories, Fort Monmouth, N. J. on October 17, at 10:00 A.M.

A short film, *Eyes, Ears, and Voice of Fighting Men*, which shows accomplishments of the laboratories and how they apply to the needs of the U.S. Army, will introduce the tour.

Electronics Components Laboratory

Visitors to the Electronics Components Laboratory will see the frequency standards room where atomic standards control frequencies to such a degree of stability that a driven clock would not vary more than one second in 300 years, and all stages in the manufacture of a crystal unit (from the cutting of raw quartz with diamond saws, through plating, to oscillation of the finished device) in the Laboratory's crystal processing facility.

Communications and ADP Laboratory

Present and future laser communications systems are on display and will be discussed briefly. A demonstration of a helium-neon laser communications system illustrates the major components of a laser communications system. Basic problems involved in automatic pattern classification will be discussed also and USAECOM's adaptive learning facility demonstrated. This facility uses a pre-processor to filter and extract pertinent object signature data directly from a raw data field. Signature data are then classified by adaptive-learning networks that are pretrained on similar but not necessarily identical data.

Avionics Laboratory

Cockpit mockups of the Utility Tactical Transport Aircraft System (UTTAS) and the Advanced Army Aircraft Instrumentation System (AAAIS) will be used to demonstrate new cockpit instrumentation techniques and displays, including the Head-up Display, Electronic Flight Director, and Map Display System currently under evaluation. An animated display of the Tactical Avionics System Simulator Facility will be used to show the mission and capabilities of the facility. Examples of simulation and the operation of the equipment in the facility will be discussed.

Institute of Exploratory Research

Scientific instruments used to support research on the characterization and structure-property relationships of electronics, optical, and magnetic materials are discussed and demonstrated.

Registration

The nature of this tour makes it necessary to limit the attendance to 100 college student registrants. For information and reservations, contact Irving Levine, USAECOM, Attn: AMSEL-VL-N, Avionics Laboratory, Fort Monmouth, N. J. 07703, Phone (201) 535-1006; or Karl Sommer, Consolidated Edison Company, 4 Irving Place, New York, N. Y. 10003, Phone (212) 460-6176.

Time: Saturday, October 17; 10:00 A.M.
Place: USAECOM Laboratories, Fort Monmouth, N. J.

How Electronics Helps Fix Your Auto

The New York Section of the Power and Industrial Division is sponsoring an inspection tour to an Automotive Diagnostic Clinic at Lear Siegler, Inc., Paramus, N. J., on Thursday, October 22, 1970. The trip which starts at 7:00 P.M. will include a descriptive film and a tour through the Automotive Clinic. The trip is limited to members only and you must arrange for your own transportation.

For tickets and directions contact: Mr. Andy Montano, Public Service Electric & Gas Co., 80 Park Place, Newark, N. J. 07102. Phone: (201) 622-7000, Ext. 3154.

All requests must be received by October 7, and must be accompanied by a stamped, self-addressed envelope.

Time: Thursday, October 22; 7:00 P.M.
Place: Lear Siegler, Inc., Paramus, N. J.

Computer Officers

At its June meeting, the North Jersey Chapter of the Computer Group elected the following officers for the 1970-1971 year:

Chairman: Richard R. Shively, Bell Telephone Laboratories, Whippany, N. J. 07981. (201) 386-4715.

Vice-Chairman: Sy Salowe, Westinghouse, Newark, N. J. (201) 465-2470.

Secretary-Treasurer: Daniel C. Russ, Westinghouse, Newark, N. J. (201) 465-2301.

An administrative committee was formed to suggest topics and speakers; the committee comprises the officers and Maitland McLarin, Picatinny Arsenal; and Clarence A. Ellis, Bell Telephone Laboratories, Whippany, N. J.

Other members of the group are welcome to join the administrative committee and may do so by telephoning the Chairman.

******

FELLOW'S NIGHT
February 13, 1970
Governor Morris Inn
Morristown

******

NJ Section Sponsors Students' Night

The North Jersey Section will sponsor its Third Annual Students' Night at Newark College of Engineering during the first week of November 1970.

The topic of this meeting will be "The New Engineer in the Power Industry." A panel of engineers from the power industry will outline career opportunities, various engineering challenges associated with the power field, and the future of the power engineer. They will indicate that which is expected in assuming the many advanced job responsibilities in this era of ever changing and advancing technology. The meeting will provide a forum for the engineers and students to exchange their views and discuss problems of mutual interest.

A buffet supper will be served free to all attending before the meeting. All students and engineers are cordially invited to attend this meeting.

North Jersey Executive Committee Report:

MULTIGROUP — What's That?

If you were to take 325 scientific type people with interests in things like bio-medical engineering, earth sciences, nuclear engineering, environmental sciences, and cybernetics, and try to find a thread of common interest among them--people would say that you were a good candidate for the "booby-hatch." Surprisingly enough, a sampling of the 325 were able to find that thread which turned out to be the North Jersey Section MULTIGROUP.

The desire to participate in local technical meetings was the foundation for a group of people to band together in the struggle to form a local chapter. One of the first obstacles was to choose a course to sail for the newly-christened ship "IEEE MULTIGROUP." Prior to official commissioning by the Section, the good ship MULTIGROUP headed out on her maiden cruise. It found its way to a meeting on "Instrument Safety" where the passengers heard about safety in medicine, nuclear power plants and some legal aspects of safety.

Continuing on her course, the MULTIGROUP toured the islands of "Network Analysis in Highway and Power Systems." Her last port-of-call was Arnold Auditorium where "Moonrocks" were "speculated upon."

As summer set in, MULTIGROUP pulled into drydock for some internal maintenance and eventual commissioning by the Section. Now, she is ready to sail again carrying the colors of the IEEE North Jersey Section. The MULTIGROUP looked promising enough for the Section to agree to a November 18 rendezvous at Arnold Auditorium (a favorite port) for a joint Section-MULTIGROUP affair on: "The Effects of Power Plants on the Ecological System." The crew of MULTIGROUP is looking forward to an enjoyable and informative trip on this cruise.

The MULTIGROUP membership has decided to do its utmost to get the best qualified speakers for the coming year. There will be fewer, but better, meetings aimed at all segments of the MULTIGROUP's population. It was found that one single thread is not sufficient to weave a useful garment, so the MULTIGROUP is working to present pertinent and up-to-date thoughts which should be of interest to many segments of the Section. The watchword is now QUALITY.

As you peruse your monthly copy of the Newsletter this year, don't be surprised if you see MULTIGROUP meeting notices which stir up more than "a little interest." All of you out there are asked to read the meeting notices of the MULTIGROUP (as well as your own Chapter's notices) with the hope that one month, you might see something interesting coming from the MULTIGROUP.

The MULTIGROUP considers problems in environment to be one of the most important topics of the decade. As such, the environment will be implicated in many of its meetings. There are too many scientific people who do not fully realize the impact of science on our habitat. The MULTIGROUP feels that this must change and has planned its first meeting to explore one aspect of this pressing problem.

In the issues to come you will see articles pertaining to each of the local chapters. This policy has been established to foster interest and participation in the technical meetings of each chapter. You are encouraged to participate in these meetings since the Section feels that they are an important medium of communication within the scientific and engineering community.

Joseph Wroblewski, Secretary
North Jersey Multi-Group

Time-Sharing Services for Engineers

Mr. J. J. Collins, Group Head-Engineering Data Control, Otis Elevator Co., will be the moderator for a general meeting of the Power & Industrial Division of the IEEE on October 21. The three speakers, Mr. R. Roda, Mrs. Susan G. Hahn, and Mr. David Hawkins, will discuss "Time-Sharing Services for Engineers."

Mr. Hawkins is responsible for supervising the Computer Applications Engineering staff at Con Edison. He graduated from Kalamazoo College in 1962 with a B.A. in physics, and from the University of Michigan in 1963 with a B.S. in electrical engineering.

Mr. Hawkins is a Professional Engineer, a member of the EEI Computer Task force, and a member of the Educational Committee of the New York Section, IEEE Power and Industrial Group. He will give a brief review of user considerations when selecting Time-Sharing services and terminal equipment.

Mrs. Hahn is a mathematician with IBM and earned her Ph.D. at New York University in 1957. Prior to joining IBM where she is currently specializing in APL/360 at the New York Time-Sharing Systems Center, Mrs. Hahn taught mathematics and physics in England and later worked as a personal assistant at the Courant Institute of Mathematical Sciences.

As applications analyst for Tymshare, Inc., Mr. Roda is responsible for the technical support of "the computer time-sharing concept." He holds a B.S. degree in system science and an M.S. degree in operations research from the Polytechnic Institute of Brooklyn.

Time: Wednesday, October 21; 6:00 P.M.
Place: Union Carbide Auditorium, 270 Park Avenue, N. Y. C.

LI Engineers Will Quiz Candidates

The Long Island Section of the Institute of Electrical and Electronics Engineers, with the co-sponsorship of other technical and engineering organizations, will conduct a non-partisan political forum on the evening of October 21. All congressional candidates for the counties of Nassau and Suffolk have been invited to answer questions of interest to the technical community. The forum will be held in the auditorium of the Walt Whitman High School in South Huntington, Long Island.

Among the co-sponsors are the American Institute of Aeronautics, The American Society of Mechanical Engineers, The Society for Information Display and the New York State Society for Professional Engineers.

This unprecedented program has been organized by the IEEE in response to what is clearly unprecedented interest on the part of engineers in today's burning national issues. At the head of the list are questions of particular interest to engineers, such as job security, economic conversion and national scientific goals and priorities. But beyond this, engineers, more than ever, are asserting their roles as citizens and are vitally concerned with such issues as foreign policy, pollution control, poverty, urban decay, etc. Questions reflecting these interests have been provided to the candidates in advance and each will be given an opportunity to answer. In addition, there will be opportunities for questions from the floor.

Members of the IEEE, of the co-sponsoring organization, and their guests are urged to attend this public meeting to listen and to be heard. The candidates will become aware, if they are not already, that the technical community comprises a substantial portion of their electorate and that this strength will be felt at the polls. The meeting will be covered by the press and it is our hope that the candidates' statements will be widely publicized.

Last minute details of the meeting will be provided through other media.

North Jersey Executive Committee Report:
Professional Group Activities

Eleven Professional Groups are represented by seven Chapters in the North Jersey Section of the IEEE. These Chapters promote the exchange of technical information concerning their special areas of interest particularly among the membership of the North Jersey Section. If you would like to participate in the activities of these Chapters, watch *The Newsletter* for meeting notices or call the appropriate Chairman listed below. If you would like to organize a new Chapter, please contact your Group Coordinator, John H. Gerth, (201) 386-4191.

The New Chapter Chairmen for the 1970-71 year are:

G-3/17 – Antennas and Propagation/Microwave Theory and Techniques
Mr. R. V. Snyder - (201) 228-3890, Ext. 218, Merrimac R/D Corporation

G-7 – Reliability
Mr. G. L. Hetzel - (201) 386-2509, Bell Telephone Laboratories

G-16 – Computer
Mr. Richard Shively - (201) 386-4715, Bell Telephone Laboratories

G-19 – Communications Technology
Mr. G. C. Parowski - (201) 529-4600, Ext. 2460,
Western Union Technical Center

G-23 – Automatic Control
Dr. Gerard A. Ford - (201) 386-5103, Bell Telephone Laboratories

G-31 – Power
Mr. Peter Jackson - (201) 539-6111, Ext. 460, Jersey Central/N.J P&L Co.

G-5/18/19/35 – Multi-Group
Dr. Carl Kuehne - (201) 647-0288, Cybersystems, Inc.

In addition to the above, the North Jersey Section jointly sponsors the following Chapters with the New York, Long Island and Princeton Sections.

G-6	Vehicular Technology
G-9	Instrumentation & Measurement
G-10	Aerospace and Electric Systems
G-12	Information Theory
G-14	Engineering Management
G-15	Electron Devices
G-21	Parts, Material and Packaging
G-27	Electromagnetic Compatibility

John H. Gerth, Group Coordinator, North Jersey Section

This Fall at Pace College

Data Processing Courses for Professionals and Beginning Students

This Fall the Center for Data Processing Education at Pace College offers a choice of four courses in data processing with career advancement application for both professionals and beginning students. The courses are held at convenient evening hours and are taught by professional practitioners in their career specialties.

ADVANCED COURSES

PROGRAMMING LANGUAGE ONE (PL/1)
October 27 – December 17 $150.
Tuesday – Thursday 6:00 - 8:40 p.m.
Instructor: Mr. Kenneth J. Gordon, Project Leader, PL/1 Programming Group, Morgan Guaranty Trust Company.

IBM SYSTEM 360/OS: A Conceptual Description
October 26 – December 16 $150.
Monday – Wednesday 6:00 - 8:40 p.m.
Instructor: Mr. James M. Gaudette, Senior Staff Member, Systems Research and Development Department, Dun & Bradstreet.

BEGINNING COURSES

BASIC COMPUTER PROGRAMMING
October 26 – December 16 $150.
Monday – Wednesday 6:00 - 8:40 p.m.
Instructor: Mr. Judah Magnus, Director of Management Information Services, J. Miller Co., Inc.

SYSTEM ANALYSIS: BASIC CONCEPTS AND TECHNIQUES
October 27 – December 17 $150.
Tuesday – Thursday 6:00 - 8:40 p.m.
Instructor: Mr. Joel W. Darrow, Senior Research Applications Analyst, Merrill, Lynch, Pierce, Fenner & Smith.

REGISTER BY MAIL OR IN PERSON

To register for any of the above courses, simply fill out the form below, attach money order or check (payable to Pace College) for the fee indicated for the course, and mail to:

The Center for Data Processing Education
PACE COLLEGE, Pace College Plaza
New York, N. Y. 10038

Dear Sirs:

Please register me for the following course:.....

.....

Full Name (Please Print).....

Home Phone.....Bus. Phone.....

Address.....
(Number and Street)

.....
City State Zip Code

Social Security Number.....Signature.....

NOTE: You may also register in person at the College between October 19 and 26. Pace College is conveniently located directly opposite City Hall Park, just a ten minute subway ride from Grand Central or Times Square.

The Center for Data Processing Education

pace college

Pace College Plaza
New York, N. Y. 10038

Telephone:
(212) 285-3575