



The IEEE

Newsletter

Published monthly except June and July by the North Jersey Section of the Institute of Electrical & Electronics Engineers, Inc. Office of Publications: 399 Howard Boulevard, Mount Arlington, N. J. 07856

Volume 19 September 1972 No. 2

NEWSLETTER STAFF

Editor.....Robert McMillan
Editor-Elect.....John Zieger
Managing Editor.....M.M. Perugini
Student Activities Editor.....Gary Woerner
Associate Editor.....Raymond Vaccari
Member, Editorial Staff.....Charles Giardina
Chairman, Publications.....Raymond Dusault

Newsletter Deadline

Deadline for receipt of material is the 20th 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 111, 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 Mount Arlington, 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.

SECTION OFFICERS 1972-1973

Chairman.....Carl C. Torell
Vice Chairman.....Harlan J. Perlis
Treasurer.....John Gerth
Secretary.....James F. Kampschoer
Member-at-Large.....Max J. Schindler
Member-at-Large.....Peter F.B. Jackson
Jr. Past Chairman.....Robert G. Sokalski

SECTION CHAIRMAN'S REPORT

When our Executive Committee meets monthly September through May the discussion usually includes finding ways of our better serving you as members of the North Jersey Section. Your suggestions and active participation in future meetings would be most welcome by our Chapter and Standing Committee chairmen. By making greater use of your varied interests and individual know-how we know that many additional interesting and worthwhile meeting subjects can be planned. Listed below are those chairmen with their telephone numbers who would like to hear your ideas. You are urged to contact any of them when you feel you have a good topic for a future meeting or for an educational course. We will do the necessary detailed work which is always required when lining up a program. Call us.

Elected Officers:

Chairman—Carl C. Torell, 589-7500
Vice Chairman—Harlan J. Perlis, 645-5492
Treasurer—John Gerth, 386-4191
Secretary—James F. Kampschoer, 386-4135
Member-at-Large—Peter F.B. Jackson, 539-6111
Member-at-Large—Max J. Schindler, 485-3900, Ext. 370 (Harrison)
Junior Past Chairman—Robert G. Sokalski, 334-1800

Standing Committee Chairman:

Awards—Heyward A. French, 284-2577
Education—Frank Gialanella, 966-2459
Group Coordinator—Alan H. Stolpen, 981-0100, Ext. 473
History and Procedures—Frank Polkinghorn, 239-6074
Membership—Maitland McLarin, 328-2351, 328-6265
Nominations—Robert G. Sokalski, 334-1800
Program—John Abraham, 622-7000
Publications—Raymond Dusault, 763-4780
Publicity—Max J. Schindler, 485-3900, Ext. 222 (Harrison)
Student Activities—Gary R. Woerner, 351-5000, Ext. 270
Ad Hoc Committee on Inter-Professional Society Relations—
Robert E. McMillan, 645-5467 or 645-5472 (Leave message)

Metsac Representatives:

Herbert E. Blaicher, Jr., 539-6111 & Robert G. Sokalski, 334-1800

Chapter Chairmen:

Antennas & Propagation/Microwave Theory & Techniques, G-3/17
Bernard Dimarinis, 284-3794
Control Systems Society—S-23, Dr. Frank Lupo, 796-9458
Communications Society—S-19, Norman Hettinger, 488-2100,
Ext. 211; Alt. (914) 694-2897
Computer Society—S-16, Maitland McLarin, 328-2351
Multi-Group—G-5/18/28/29, M. Hollander, 361-5000, Ext. 335
Power Engineering Society—S-31, Paul E. Orehek, 622-7000
Reliability—G-7, Stanley M. Cherkasky, 256-4000, Ext. 2937

Editor-Elect of Newsletter—John Zieger, 334-1800

Managing Editor, Newsletter—M.M. Perugini, 398-5524 or 398-3834

We hope you will plan to attend as many IEEE meetings as possible during the year, and bring one or more friends along with you whether they are IEEE members or not. Visitors are always welcome.

Joint Meeting On Venture Management

The New Jersey Chapter of the Communications Society and the New York Metropolitan Aerospace Electronics Group are jointly sponsoring a talk by Dr. Albert J. Kelley of Boston College titled: Technology, Entrepreneurship and Venture Management.

Time: Thursday, September 21, 8:00 PM
Place: ITT Auditorium, 500 Washington Avenue, Nutley, N.J.

Pre-Meeting Dinner: Copperhood Restaurant, 6:15 PM, 1 Park Avenue, Lindhurst, New Jersey.

Component Reliability

An October 11th meeting has been scheduled by the Reliability Group on the topic of Reliability Physics Approach to Components Evaluation. The speaker will be Ed Emery who will demonstrate a practical approach to this field. Many scanning electron microscope slides will be shown.

Time: Wednesday, October 11, 8:00 PM.
Place: Plant 3 Auditorium, Singer Kearfoot Division, 1156 McBride Avenue, Little Falls, New Jersey.

Contact: Stan Cherkasky, 256-4000, Ext. 2937.

Computer and Society

The North Jersey Control System Group and the Multigroup will hold a joint meeting on October 18, 1972. The speaker, Dr. Michael J. Rabins, will discuss the positive and negative feedback loop casualties that characterize some current problems of Society. Consideration of the Forrester-type models and simulations of such problems as well as pro and con arguments of applying this approach to real world problems will be presented.

Dr. Rabins is a professor of systems engineering and director of the Department of Operations Research Systems Analysis at Brooklyn Polytechnic Institute. His academic degrees are B. S. in M. E., Massachusetts Institute of Technology, 1953; M. S. in M. E. Carnegie

Institute of Technology 1954; Ph. D. in M. E., University of Wisconsin, 1959. Prof. Rabins is also co-author with Takahashi and Auslander of *Control* (Addison-Wesley, 1970).

Time: Wednesday, October 18, 8:30 PM.

Place: Bell Telephone Laboratories, Whippany Road, Whippany, N. J.

Pre-meeting dinner: Rod's 1890's Ranch House, Rt. 24, Convent Station, N. J.

Weather Service Tour

The North Jersey Section is sponsoring a tour of the National Weather Service Office located in Building 1 at Newark Airport.

This tour will enable you to see how the weather is monitored including the latest weather display charts, radar, and other working equipment at the National Weather Service Office. The tour will be followed by a question and answer session.

This will be your opportunity to correctly start the year 1972-73 by attending the first section tour. Bring with you another member, a friend, and/or a prospective member.

Those planning to attend should mail in the reservation slip below, or call Mr. Abraham on 611-7000, ext. 3065 no later than September 20, 1972.

Time: Wednesday, September 27, 7:00 PM.

Place: National Weather Service Office, Building 1, Newark Airport.

TOUR WEATHER SERVICE

Reservations may be sent to:

John Abraham
c/o Public Service Electric & Gas
80 Park Place, Room 612 MP
Newark, New Jersey 07101

I plan to attend the National Weather Service Office Tour on September 27, 1972. I will bring _____ guests.

Name _____

Address _____

Telephone _____

Public Interest Programs

The New Jersey Multigroup (SMC, BME, NS, GE) would like your help in planning and presenting a series of "Problem Presentation" sessions by public officials and later "Problem Solving" sessions on those problems involving your areas of engineering expertise. Whether you are a member of Multigroup or not, if you have ideas, contact: *Gerald Rabow*, 309 Grant Avenue, Nutley, New Jersey, 661-1968 (home) or 284-0123 (office) or *Martin Hollander*, 361-5000 (business).

True RMS Measurements

A seminar on True RMS Measurements, sponsored by the Metropolitan Joint Chapter on Instrumentation & Measurements, will take place on October 17.

The seminar will be a state-of-the-art look at True RMS measurements and instrumentation.

Introduction to the RMS Measurement Problem—Panel Speaker: Mr. Bruce A. Renz, Section Head, System Measurements, AEP.

Modern Thermocouple Techniques in the Measurement of True RMS—Panel Speaker: Mr. Jerry B. Folsom, Hewlett-Packard Company.

"The Junction FET as a Square Law Two Terminal Device"—Paper by Dr. K. H. Blankenburg, Rohde & Schwarz Co. Panel Speaker: Mr. Alan Freeland, Rohde & Schwarz Co.

The Use of Logarithmic Elements in the Design of True-RMS Converters—Panel Speaker: Mr. Hall Cary, Chief Engineer, B & K Instruments.

The Operational Circuit Module Approach to True RMS Measuring Systems—Panel Speaker: Mr. Alan Kezer, Appl. Engrg. Mgr., Intronic

Future Trends in True RMS Measuring Devices—General Panel Discussion.

For Further Information: (Fees: IEEE Members: \$10.00; non-members \$15.00) In New Jersey: Contact Mr. Ted Barabutes, Westinghouse Electric Corp., 201-465-2293.

Time: Tuesday, October 17, 9:00 AM to 4:00 PM.

Place: Alumni Center, Newark College of Engineering, 323 High St., Newark, NJ.

ELECTRIC POWER DISTRIBUTION FOR INDUSTRIAL PLANTS AND COMMERCIAL BUILDINGS

This 13 session course is an updated version of the very successful course given in 1967. The course is presented for the benefit of electrical, consulting and project engineers, contractors, architects and others concerned with power distribution systems. The course will provide a sound working knowledge of the engineering principles necessary to properly select and layout an economical, adequate, safe and reliable power system.

The text *Industrial Power Systems Handbook* by McGraw Hill plus supplementary updating data is included in the tuition. The instructors will be from among the top experts in the field on Industrial and Commercial Power Distribution.

September 26 — Introduction. Preview of material to be covered — Documentary films — Load surveys — Need for plot plans — One line diagrams — Things to check when designing a power distribution system.

Instructor: F. A. Leinberger, Appl. Engr., General Electric Co., Phila., Pa.

October 3 — Basic Considerations — Short Circuits. Introduction to short-circuit studies — Sources of short circuit currents — Symmetrical currents.

S. R. Folger, Mgr., Power Generation Engrg., General Electric Co., Schenectady, N. Y.

October 10 — Short Circuits. Effects of synchronous and induction machines — Decrement factors — Multiplying factors — Per unit and percent systems — Determination of system impedance data.

S. R. Folger, Mgr., Power Generation Engrg., General Electric Co., Schenectady, N. Y.

October 17 — Short Circuits. Calculating procedures — Effects of faults — How to make a short circuit study — Use of handbook data — Examples.

S. R. Folger, Mgr., Power Generation Engrg., General Electric Co., Schenectady, N. Y.

October 24 — Selection and Application of Protective Devices. Need for adequate devices — Significance of breaker and fuse ratings — Use of application tables — Equipment available — Movies of short-circuit tests.

Paul Reifschneider, Mgr. Appl. Engr., General Electric Co., Phila. Works.

October 31 — Selection and Application of Protective Devices. (continued) BRKR ratings and fuse ratings — Factors to consider in selection of equipment — Problem solutions.

Frank Shields, Consulting Appl. Engr., General Electric Co., Schenectady, New York.

November 7 — Power System for Industrial Buildings. Voltage and circuit selection for small, medium and large buildings, schools, etc. — 460Y/265-volt systems — Economic factors affecting selection — Over-current protection — Selection of proper and economical equipment for buildings fed from high short-circuit capacity networks.

J. C. Cranos, App. Engr., General Electric Co., New York City, New York.

November 14 — Power Factor Improvement and Voltage Calculations. P. F. fundamentals — Calculation methods — Capacitors facts and fallacies — Rate studies — Release of system capacity by P. F. improvement — Capacitor economics — Instruments and measurements for P. F. studies — Calculation of steady state voltage drop — Use of voltage drop charts.

W. C. Bloomquist, Mgr., Power Distribution Market Development, General Electric Co., Schenectady, New York.

November 21 — Voltage Improvement. Reasons for good voltage — Methods of reducing voltage drop, spread and flicker — Calculation of system voltage dips due to motor starting — Power considerations associated with SCR drives and AC/DC rectifier — Power conditioning for computers — UPS Systems.

D. H. Kirby, App. Engr., General Electric Co., Phila., Pa.

November 28 — Overvoltage-Grounding. Nature and cause of overvoltages — Demonstration of grounded versus ungrounded overvoltages — Demonstration of grounded versus ungrounded systems — Case studies — Selection of grounding methods — Selection of lightning arresters and surge capacitors.

George Walsh, Mgr. Elec. Power Systems, Advanced Engrg., General Electric Co., Schenectady, New York.

December 5 — Wire and Cable. Selection and application of cables for main and branch circuits — Overhead versus underground systems — Shielding practices — Splicing and terminating.

E. Politi, General Electric Co., Division Wire and Cable, New York City New York.

December 12 — Relaying Coordination. Factors to be considered in coordination studies — Use of time-current curves — Protective device characteristics — Examples of coordination — Inherent protection of motors — Code and standards consideration.

F. A. Leinberger, Appl. Engr., General Electric Co., Phila., Pa.

December 19 — Industrial Relaying. Problems associated with parallel operation of utility and industrial systems reclosing on systems with synchronous motors, differential protection ground sensors.

E. M. Smith, App. Engr. General Electric Co., Phila., Pa.

For further information call — Pete Drobach — 376-9000.

TIME 7:00 — 9:30 PM Tuesday evenings — beginning September 26, 1972.

PLACE Main Auditorium, Automatic Switch Co., 50-56 Hanover Rd., Florham Park, N. J.

FEE \$75.00 to members of IEEE, ASME, AIME, ASCE, etc. \$85.00 to non-members.

SPECIAL OFFER — A \$5.00 savings for advance registrants whose mail registrations are received prior to September 8, 1972.

REGISTRATION FORM — ELECTRICAL POWER DISTRIBUTION FOR BUILDINGS

Mail to: Peter A. Drobach, General Electric Company, 25 E. Willow Street, Millburn, New Jersey 07041

Phone: (201) 376-9000

Name _____ Tech Society _____

Firm _____ Position _____

Business Address _____ Phone _____

Home Address _____ Phone _____

Check or Money Order Enclosed: _____ Member \$70 (after Sept 8, \$75) _____ Non-Member \$80 (after Sept. 8, \$85)

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

APPLIED SOLID STATE PROTECTIVE RELAYING

This 8 session course will provide a good working understanding of protective relay application techniques. Strong emphasis will be given to solid state relays, where they have been developed. The course will also include an introduction to solid state devices and basic relay circuits.

The instructors will include: J. Lewis Blackburn, Consulting Engineer, Westinghouse Relay & Instrument Division; Walter A. Elmore, Fellow Engineer, Westinghouse RID; Roger E. Ray, Senior Engineer, Westinghouse RID.

GENERAL PROTECTIVE RELAYING CONCEPTS

- A. Phasors
- B. Polarity
- C. Symmetrical components
- D. Instrument transformers

II SOLID STATE DEVICES AND RELAY CIRCUITS

- A. Diodes
- B. Transistors
- C. Thyristors
- D. Amplifiers
- E. Buffers

III. SOLID STATE RELAY CIRCUITS (cont'd)

- A. Flip flops
- B. Gates
- C. Ring Modulators
- D. Phase comparitors
- E. Protection from transients

IV. TRANSMISSION LINE RELAYING

- A. Line and Feeder Protection Principles
- B. Pilot Relaying Systems
 - Blocking
 - Directional Comparison
 - Phase Comparison
 - Transfer Trip
 - Under reach, Permissive, Non-Permissive
 - Overreach

V. COMMUNICATION, CARRIER AND TONE RELAYING

- A. Carrier Channel
 - Coupling Techniques
 - Attenuation considerations
- B. Microwave Channel
- C. Wire Pair
 - Audio Tones
- D. System Stability and Relaying

VI. OUT OF STEP RELAYING AND RECLOSING

- A. Stability from the Relay Engineers Viewpoint
- B. Out of Step Relaying
- C. Reclosing

VII. MOTOR AND GENERATOR PROTECTION

- A. Fault Protection
 - Phase
 - Ground
- B. Negative Sequence Protection
- C. Phase Unbalance Protection
- D. Thermal Protection

VIII. TRANSFORMER PROTECTION (AUTO, 2 WINDING, 3 WINDING) LOAD SAVING AND COURSE REVIEW

TIME: 7:00-9:00 P.M.; Thursday evenings starting September 28, 1972 and ending November 16, 1972.

PLACE: Automatic Switch Co., 50-56 Hanover Road, Florham Park, N. J. 07932.

INFORMATION . For additional information contact: Fred Hazard, Westinghouse Electric Corporation, 67 Evergreen Place, East Orange, New Jersey 07019. Phone: 465-2364.

REGISTRATION FORM - SOLID STATE PROTECTIVE RELAYING

Send to: Mr. F. Hazard, Westinghouse Electric Corporation
67 Evergreen Place, East Orange, New Jersey 07019

Name _____ Tech. Society _____

Firm _____ Position _____

Business Address _____ Phone _____

Home Address _____ Phone _____

Check or Money Order Enclosed: — Member-\$45.00; Registration Prior to Nov. 6 - \$40.00
— Non-Member - \$55.00; Registration Prior to Nov. 6 \$50.00
Please make check or money order payable to: North Jersey Section IEEE.

PROFIT PLANNING FOR ENGINEERS IN MANAGEMENT

The Northern New Jersey Education Committee is again presenting a seminar type program relating marketing, finance and general business economics to the decision-making procedure in technical enterprises. The course is directed to higher echelon managers who have advanced through engineering and technical lines, but whose scope now encompasses profit planning for comprehensive operations.

A particular objective of the course is the exploration of vital elements affecting profitable business decisions—so that managers with primarily technical backgrounds can communicate effectively with marketing and financial experts. This can lead to better preparation of comprehensive programs, improved defense of points which might be questioned, and more authoritative leadership in developing and managing broad-based business endeavors.

Due to the nature of the subject matter, the course will be restricted to persons with backgrounds in accounting, statistics and engineering economics, and whose positions indicate likely benefit from the course content. Class size will be limited, and the committee will exercise judgment in selecting applicants. A textbook and notes are included with the program.

The lecturer will be Murray Menkis, president of Menkis Engineering Associates. Mr. Menkis holds a B. E. E. from Newark College of Engineering, and an M.B.A. from Baruch School of Business Administration. He is licensed as a professional engineer in New York, New Jersey and Connecticut. His experience includes over twenty years in the development of electrical control devices, and consulting practice in profitable exploitation of technical innovations.

October 17-Introduction

- A. Characteristics of a free enterprise system; profit as a consequence of "beneficial innovation," "beneficial innovation" as an improvement in the "cost-benefit" matrix for goods and services.
- B. Role of the engineer in economic progress
- C. Planning for Product Improvement and New Product Design
 - 1. Objectives of the firm
 - 2. Evaluation of present and potentially available resources
 - 3. Requirements in markets for firm's product capacity

October 24-Data Required for a Decision (1)

- A. Broadview of market economics
- B. Supply segment of markets; technological trends in supply

October 31-Data Required for a Decision (2)

- A. Demand segment of market
- B. Technological changes in market requirements

November 7-Data Required for a Decision (3)

- A. Optimizing firm resources to meet market requirements more satisfactorily than alternate suppliers
- B. Cost considerations

November 14-Data Required for a Decision (4)

- A. Intangible factors
- B. Cash flow and return-on-investment calculations

November 21-Pricing and Strategy in Technical Markets

- A. Theoretical pricing methods (marginal cost equals marginal revenue)
- B. Long term considerations-maintenance of "technical primacy," avoidance of excessive competition, stability
- C. Strategic technical marketing

November 28-Analyzing the Supply Segment of the Market

- A. Recent trends of sales and costs in the product line
- B. General directions of technical developments, and market objectives sought
- C. Price and profit trends
- D. Statistical appraisal and projection

December 5-Analyzing the Demand Segment of the Market

- A. Recent trends of purchases and prices in the product line
- B. Determination of areas of possible dissatisfaction, and probing of "need" from a cost-benefit viewpoint
- C. Future implications of technological trends
- D. Econometric and statistical projection of future purchases

December 12-Evaluation of Intangibles

- A. Quantification of intangibles (equivalent benefit method)
- B. Political, sociological, psychological and irrational considerations

TIME 7:00 P. M. to 9:00 P. M. Tuesday Evening.

LOCATION . . . Automatic Switch Co., Hanover Rd., Florham Park, N. J.

FEE \$90.00 to members (IEEE, EMG, ASME, etc.) \$100.00 non-members

REGISTRATION FORM — PROFIT PLANNING FOR ENGINEERS IN MANAGEMENT

Send to: Mr. F. B. Gialanella, Automatic Switch Co.
6 Watsessing Ave., Bloomfield, N. J. 07003

Phone: 966-2459

Name _____ Tech. Society _____

Firm _____ Position _____

Business Address _____ Phone _____

Home Address _____ Phone _____

Check or Money Order Enclosed: _____ Member \$90.00 _____ Non-member \$100.00

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

COSMOS Topic Of Circuit Theory Meeting

On Wednesday evening, September 27, 1972 the Metropolitan New York Chapter on Circuit Theory will hold its first meeting of the fall season. The topic for the opening meeting is COSMOS, Complementary Symmetry Metal Oxide Semiconductor integrated circuits, a family of ultra-low power, small area integrated circuits.

In the talk the basic COSMOS circuit operation and fabrication will be described. Applications of COSMOS circuits, ranging from wrist watches and automotive electronics to satellites, will be discussed. The talk concludes with a discussion of the status of COSMOS today and an indication of future trends.

The speaker is Mr. Vernon E. Hills of the Solid State Division of RCA in Somerville, New Jersey. Mr. Hills is in the COSMOS product group where he is responsible for analysis of customer systems and requirements. He has been involved with COSMOS development for the past three years.

Time: Wednesday, September 27, 8:00 PM.

Place: ITT Laboratories Auditorium, 500 Washington Avenue, Nutley, New Jersey.

IEEE Interprofessional Relations With NJSPE

Carmin J. DeVito, P. E., 1971-72 chairman of the New Jersey Society of Professional Engineers Interprofessional Relations Committee reports an accelerating interest and activity from many engineering disciplines in a coordinated effort to better the professional standing and the personal benefit of the engineer.

It is anticipated that this committee will meet on a monthly basis this coming year, and that activities will be reported to the full North Jersey I.E.E.E. membership by means of a flier appended to the North Jersey "Newsletter." Of course, as space permits, the Newsletter will print shorter news items.

In addition to the North Jersey IEEE section, this committee represents the IEEE Princeton section, IEEE New Jersey coast section and IEEE Southern

Jersey Section. Other engineering groups represented include ASCE (American Society of Civil Engineers), AIChE (American Institute of Chemical Engineers), AIPE (American Institute of Plant Engineers), ASHRAE (American Society of Heating, Refrigeration & Air Conditioning Engineers), AIMPE (American Institute of Mining, Metallurgical & Petroleum Engineers), ASM (American Society of Metals), ISA (Instrument Society of America), ASSE (American Society of Safety Engineers), AIIE (American Institute of Industrial Engineers), ASME (American Society of Mechanical Engineers) and, of course, the various county P. E. societies.

Principal action items include: Adopting a formal "charter" of action of this growing committee, protecting the "identity" of participating societies, specific legislative interests of the group, and other benefits for individuals.

For the engineer who wishes to participate more aggressively in P. E. activities, two membership grades are available to IEEE members without the P. E. license, the Associate Member and the Senior Associate Member. Both of these grades have voting rights, and may hold offices, local, state and national, except for the Presidency (or chairmanship) of each of these groups. The Senior Associate Member must have a degree from an ECPD accredited engineering curriculum plus twelve years of acceptable engineering experience. The associate member must have a degree from an accredited curriculum.

For further information, contact MAITLAND MC LARIN, 328-2351.

Editor's note: It is interesting to speculate on the possible metamorphosis of N.S.P.E. if a considerable fraction of I.E.E.E. members availed themselves of the Associate Membership opportunity. The current N.S.P.E. membership is approximately 70,000 of which 30,000 are from industry.

Transducer Study Group

A series of lectures sponsored by the New York-North Jersey and Long Island Joint Chapter IEEE - Instrumentation and Measurement has been planned for this fall. The series is devoted to the most up-to-date transducers and will be

presented by speakers who are well-known experts in their respective fields.

Lecture dates and topics are listed below:

OCTOBER 24 Pressure Transducers—*M. Green, Tyco Instruments.* A review of modern transducers: signal conditioning; applications; and economics.

OCTOBER 31 Temperature Transducers & Measurements—*Dr. C. Kemper, Kaye.* Fundamentals of thermocouples, RTD, and thermistors; data acquisition systems; precision references; calibration; and applications.

NOVEMBER 14 Non-contract Temperature Measurement—*H. Kaplan, Barnes Eng. Co.*

Theory of I. R. temperature measurement; detectors; calibration; instruments; thermography; infrared microscopes; applications; environmental measurements.

NOVEMBER 21 Strain Gages & Measurements—*T. Roach, — Picatinny Arsenal.* Theory of Operation, basic gages; data acquisition; limitations, and applications.

NOVEMBER 28 Shock & Vibration Transducers—*A. Orlicchio, Gulton Industries.*

Types of accelerometers; signal conditioning charge amplifiers, calibration; measurements and systems; and applications.

Time: Tuesdays, October 24, 31, November 14, 21, 28, 7:45 PM to 9:45 PM.

Place: N. J. Bell Telephone Co., 30 Evergreen Place, East Orange, N. J.

P & I Group To Discuss Insulator Engineering

The New York Section, Power and Industrial Division will hold a technical discussion meeting on Tuesday, October 17, 1972.

Substation Insulator Engineering, including construction, application, selection and maintenance will be the discussion. The moderator is Roland Dixon of the H. K. Porter Company. John Maney and George Warner, both of Lapp Insulator Division, are speakers.

Time: Tuesday, October 17, 6:30 PM

Place: Consolidated Edison Co., 4 Irving Place, New York, N. Y.

IEEE New York Communications Society
Lecture Series—Fall 1972
CUSTOMER TELECOMMUNICATIONS SYSTEMS

Place: Manero's Steak House, 126 W. 13th St., N.Y.C.
(Just East of 7th Ave., Convenient subway stop -
7th Ave., to 12th St.)

Time: 6:30 P.M. to 8:30 P.M.

The lectures will cover various aspects of customer equipment in terms of traffic, circuit and equipment design, and features.

1. **October 19 - Pulse PABX** - *Speaker from Northern Telecom, Boston, Mass.*
2. **October 26 - PABX Development in Japan** - *by Y. Arai Hitachi, Ltd., Tokyo, Japan*
3. **November 2 - Motorswitch PABX** - *by Speaker from Norelco Philips, Mahwah, N.J.*
4. **November 9 - Subject to be Announced** - *Speaker from Plessey Communications Systems, Hillside, N.J.*
5. **November 16 - Interconnection Management Installation & Maintenance** - *by C. Neenan, L.K. Comstock Co., New York, N.Y.*
6. **November 30 - Key Telephone Systems** - *by J. Quinn, Telephone Interconnect Equipment, Inc., Greenwich, Conn.*

STUDY GROUP LECTURE SERIES—REGISTRATION FORM

Send To: Mr. J. J. Doyle, N.Y. Telephone Co., 36th Floor
1411 Broadway, New York, N.Y. 10018

Fees: IEEE Members: \$20.00 Non-members: \$25.00*

Name _____ Position _____

Firm _____

Business address _____

Home address _____

Business Phone _____ Home Phone _____

Enclosed is a check for \$ _____. Please enroll me in the Study Group Lecture Series.

*Five dollars of the non-members fee will be applied toward an IEEE membership on request during the lecture series.

Make checks payable to "IEEE Comsoc, N.Y."

PLEASE POST ON BULLETIN BOARD

IEEE New York Communications Society
LECTURE SERIES—FALL 1972, WINTER & SPRING 1973
TELEPHONE SWITCHING SYSTEMS & COMPONENTS

This series of lectures will cover traffic theory computations necessary to engineer a telephone switching system. Discussion of functional characteristics such as signaling, numbering plans, transmission and alternate routing will be included.

Part I

Lectures 1 to 5— Traffic Theory— October 17, 24, 31, November 14, 21

by L. F. Beck, Traffic Engineering Supervisor, New York Telephone Co.

Nature of telephone traffic, occupancy, randomness. Review: Permutations, Combinations, Probability and Binomial Expansion.

Assumptions of Call Blocking Probability: Poisson, Erlang B, Erlang C. Delay Theory and Traffic Measurements

Lecture 6— Signaling Transmission and Applications— November 28

by H. Yamada, Development Engineer, Nippon Electric Co., Tokyo, Japan

Part II

Lecture 7— Engineering Crossbar Community Dial Offices End Office Features— January 16, 1973

by E. Finnerty, Sales Engineer, NEC America, New York, N. Y.

Lecture 8— Engineering a Crossreed CDO Tandem Switch and PBX Interface— January 23, 1973

by J. Tompkinson, Development Engineer, Stromberg Carlson Corp., Rochester, N. Y.

Lecture 9— Engineering a Large Central Office - Plus— January 30, 1973

Lecture 10— Centrex-CO and Centrex CU— February 6, 1973

11— Using Pentaconta A-1 Equipment— February 13, 1973

by ITT, New York, N. Y. and Milan, Tenn.

Lecture 12— Automatic Message Accounting— February 20, 1973

by D. Brewin, Stromberg Carlson Corp.

Part III

Lectures 13 & 14— Engineering Crossreed Central Offices— March 20, 27, 1973

by C. Egbert & S. L. Soni, Stromberg Carlson Corp.

Lecture 15— To be announced— April 3, 1973

Lecture 16— Principles of Pulse Code Modulation and Time Division Switching— April 10, 1973

by P. Kavanaugh, Stromberg Carlson Corp.

Lecture 17— Application of PCM to Integrated Systems— April 17, 1973

by W. Steward, Stromberg Carlson Corp.

Lecture 18— DATRAN System Engineering— April 24, 1973

by C. Fisher, DATRAN Corp., Vienna, Va.

Place: Little Theater, New York Telephone Co., 140 West Street, New York, N. Y. **Time:** 6:30 to 8:30 PM

TELEPHONE SWITCHING SYSTEMS & COMPONENTS LECTURE SERIES 1972-'73

SEND TO: *Mr. K. K. Clarke, Clarke-Hess Communication Corp.
43 West 16th Street, New York, New York 10011*

Fee: \$20 for Part I, II or III — Member IEEE

\$25 for Part I, II or III — Non-Member

\$45 for Complete Series — Member IEEE

\$60 for Complete Series — Non-Member

Note—Fifteen dollars of the non-member fee for complete series will be applied toward an IEEE membership on request during the lecture series.

Name _____ Position _____

Firm _____

Business Address _____ Business Telephone _____

Home Address _____ Home Telephone _____

Enclosed is a Check for \$ _____ Please enroll me for Parts I II III Complete Series.

PLEASE POST ON BULLETIN BOARD