

NORTH JERSEY SECTION MEETING

effect of computers on electronic design

by George L. Baldwin



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The Newsletter, September 1966

The IEEE Newsletter

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ABOUT ADDRESS CHANGES

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.

NEWSLETTER STAFF

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Executive Committee Meeting

at Verona Public Library - Sept. 7th

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Student Affairs Prof. J. W. Earle

Monday, September 26

CALENDAR

NORTH JERSEY SECTION MEETING (FOR SEPTEMBER)

6:00 P.M.-Pre-meeting Dinner - Wally's Tavern-on-the-Hill, Watchung, N. J.

8:00 P.M.—"Effect of Computers on Electronic Design"

Dr. George L. Baldwin, Bell Telephone Labs.

At-Arnold Auditorium, Bell Telephone Labs., Murray Hill, N. J.

Thursday, September 29

N. Y. ELECTRON DEVICES GROUP

8:00 P.M.—"Bulk GaAs Oscillators and Amplifiers" Dr. Mark R. Barber, Bell Telephone Labs.

At-General Telephone and Electronic Labs., 208-20 Willets Pt. Blvd., Bayside, L. I., N. Y.

Tuesday, October 18

N. Y. PMP/PGR GROUPS

6:00 P.M.—Dinner/Meeting — Cocktail Hour and Tour of LEM Mockup "Panel—Advanced Multilayer Board Applications and Design"

At-Grumman Aircraft Co., Bethpage, L. I., N. Y.

Wednesday, October 19

NORTH JERSEY SECTION MEETING (FOR OCTOBER) 6:00 P.M.—Dinner/Meeting

"Air-Control Circuits" - Mr. Norman Roden

At-Robin Hood Inn, Clifton, N. J.

NORTH JERSEY SECTION MEETING EFFECT OF COMPUTERS ON ELECTRONIC DESIGN

Speaker:	George L. Baldwin
Date:	Monday, Sept. 26, 1966
Time:	8:00 P.M.
Place:	Arnold Auditorium Bell Telephone Laboratories Murray Hill, New Jersey
Pre-Meeting Dinner:	Wally's Tavern on the Hill Bonnie Burn Road Watchung, New Jersey
Time :	6:00 P.M.

THE EFFECT OF COMPUTERS ON ELECTRONIC DESIGN

G. L. BALDWIN

Bell Telephone Laboratories, Inc.

The communications business has problems of design over an extremely wide area, ranging from simple components to extremely large and complex systems. In nearly all of these activities the computer is playing an increasingly significant role in the way in which we do our work. Furthermore, the general manner in which we use the computer varies from calculation of "one-shot" designs by custom-built programs all the way to the use of a highly integrated set of general purpose programs available to the designer through directly interacting graphical consoles, on-line typewriters, batch processing runs and some others. Two examples are described — one of transformer design and one of the design of a large digital system. These descriptions cover, by way of historical illustration, the various methods of computer usage which have been introduced into the design process. Finally, from this, some predictions are made as to what further extensions of computer usage in the design process may be expected over the next few vears.



BIOGRAPHICAL SKETCH G. L. BALDWIN

Mr. Baldwin received his BS and MS in 1949 and his DSc in 1952, all in Electrical Engineering from Carnegie Institute of Techoology. Since 1952 he has been employed by the Bell Telephone Laboratories at Murray Hill, New Jersey. From 1952 to 1957, as a member of the Mathematical Research Department, he worked on control systems and contributed to various air defense studies. From 1957 to 1963 as supervisor in charge of computer operations, he developed system programs, operational procedures and auxiliary hardware for the IBM 650, 704 and 7090 computers. From 1963 to the present he has been Head of the Machine Aids Development Department, working on programming systems to be applied to the generation, processing and storage of design and manufacturing information for large electronic systems.

RADAR PULSE GOMPRESSION



TRANSVERSAL EQUALIZER BY HAZELTINE

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Radar and IFF • Digital Logic • Imaging and Display Devices • Mechanical Design

OPPORTUNITIES IN RESEARCH: Radar Systems • Advanced Communications • Signal Processing • Advanced Circuit Techniques

OTHER OPPORTUNITIES: RFI Engineering • Field Engineering • Reliability

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N. Y. ELECTRON DEVICES GROUP

Bulk GaAs Oscillators and Amplifiers

Presented by: Dr. Mark R. Barber Bell Telephone Laboratories Murray Hill, New Jersey Date and Time: September 29, 1966 at 8:00 P.M. Place: General Telephone and Electronics Labs 208-20 Willets Point Boulevard Bayside, Long Island, N. Y. Pre-Meeting Dinner: Kam Fong Restaurant (6:00 P.M.) 19-11 Francis Lewis Boulevard (near Willets Point Boulevard) Whitestone, Long Island, N. Y.

A simple model has been developed to describe Gunn-effect oscillations and negative-resistance amplification. The power output and noise spectra of Gunn oscillators will be compared with other well known devices such as avalanche diodes, klystrons and microwave transistors.

BIOGRAPHY

Mark R. Barber (M'62) was born in Wellington, New Zealand. He received the Ph.D. degree in EE from the University of Cambridge, England in 1959.

From 1959 to 1961 he was at the Naval Research Laboratory in Auckland, New Zealand. Since 1962 he has been with Bell Telephone Labs., Murray Hill, N. J., working on solid-state microwave devices.

N. Y. COMTEC GROUP COMMUNICATIONS TRANSMISSION MEDIA

The Study Group Committee of the Communications Technology Group of the New York Section, IEEE, is sponsoring a six-part lecture series on "Communications Transmission Media." The six lectures will be held on Monday evenings at the Western Union Auditorium, 160 West Broadway, New York City, with the starting time at 7:00 P.M. The lectures are scheduled as follows:

- 1. October 17, 1966 Communication Explosion Domestic and Global
- October 24, 1966—Cable—Land and Sea
 October 31, 1966 Microwave Ground Path Systems
- 4. November 14, 1966 Satellites
- 5. November 21, 1966 Lasers
- November 28, 1966 Systems Comparison

Send check, payable to "Communications Technology Group, New York Section, IEEE," c/o Mr. F. Hill, A.D.T. Company, Inc., 155 Sixth Avenue, New York, N. Y. 10013. Please include a stamped, self-addressed envelope.

Registration fees for the full series are: \$5.00 for IEEE members (and other pro-

- fessional societies) \$8.00 for non-members
- \$1.00 for full-time students

NORTH JERSEY SECTION ANNUAL BANQUET AND DANCE

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JOINT ASME-IEEE FALL STUDY COURSE

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A comprehensive series of notes will be provided with this course which will be a convenient reference for the engineer in his future work. PLACE: N. J. Telephone Company — Vait Hall, Broad St., Newark (see map).

- TIME: 7:00 P.M. Thursday evenings, Oct. 13, 20, 27; Nov. 3, 10, 17; Dec. 1, 8, 15. There will be no lecture Thanksgiving Day.
- FEE: ASME or IEEE Members \$25. Non Members — \$35. There will be a \$5 discount for paid registration postmarked no later than Oct. 10, 1966.

LIMITATIONS: Registration limited to the first 130 registrants.

- REFUND: Non Members may receive refund of \$10 premium fee if membership application for either ASME or IEEE is filed at course registration desk during duration of the series.
- ATTENDANCE: Attendance rolls will be kept and satisfactory completion certificate issued if at least 7 lectures are attended.

All lectures will be held on Thursday evenings.

DATE LECTURE

TOPIC

- Oct. 13 1. "Structure; Origin of Properties," by Dr. J. H. Wernick, Head, Physical Metallurgical Research Dept., Bell Telephone Laboratories, Inc.
- Oct. 20 2. "Alloys, Solid State Reactions, and Magnetism," by Dr. J. H. Wernick.
- Oct. 27 3. "Mechanical Properties of Metals," by Mr. P. R. White, Supervisor, Metallurgical Engineering Dept., Bell Telephone Laboratories, Inc.
- Nov. 3 4. "Ceramics and Glasses," by Dr. C. R. Kurkjian, Member, Technical Staff, Inorganic Chemical Research and Development Dept., Bell Telephone Laboratories, Inc.
- Nov. 10 5. "Electrochemistry and Protection of Surfaces," by Mr. R. G. Baker, Member, Technical Staff, Electrochemical Research and Development Dept., Bell Telephone Laboratories, Inc.
- Nov. 17 6. "Polymer Chemistry," by Dr. W. L. Hawkins, Supervisor, Plastics Development and Applied Research Dept., Bell Telephone Laboratories, Inc.
- Dec. 1 7. "Mechanical Properties of Polymers," by Dr. T. W. Huseby, Member, Technical Staff, Plastics Development and Applied Research Dept., Bell Telephone Laboratories, Inc.
- Dec. 8 8. "Adhesion, Composites, and Laminates," by Mr. D. K. Rider, Head, Organic Materials Research and Development Dept., Bell Telephone Laboratories, Inc.
- Dec. 15 9. "Dielectric Properties of Materials," by Mr. D. B. Herrmann, Member, Technical Staff, Physical Chemical Research and Development Dept., Bell Telephone Laboratories, Inc.

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- 1. Make checks payable to North Jersey Section of IEEE, regardless of affiliation.
- 2. Send to E. K. Van Tassel, Bell Telephone Labs, Whippany, N. J.
- 3. For information call 386-2414.
- 4. Please fill out completely. It will be a great help to the lecturers.

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N. Y. Section, IEEE



EDUCATIONAL PROGRAM-FALL 1966

Power and Industrial Div.

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STRUCTURAL PLANNING AND DESIGN (IEEE-ASME)

Review for Part I, N. Y. Exam., Part II, N. J. Exam. Planning, design, construction of buildings and similar structures in timber, steel and concrete, including beams, columns, foundations, piles, girders, riveted and welded sections. Intensive work in problem solving techniques with emphasis on the AISC and ICI codes. Printed notes available. MONDAYS, Starting Sept. 12, 1966, 6:15-8:30 P.M., 18 Sessions North Cafeteria, 19th fl., Con Edison Co., 4 Irving Place, N. Y. C.

BASIC ENGINEERING SCIENCES (ASME-IEEE)

Review for Part II, N. Y. Exam., Part I, N. J. Exam. Practical applications of hydraulics, thermo-dynamics, mechanics, and electrical principles.

WEDNESDAYS, Starting Sept. 14, 1966, 6:30-8:30 P.M., 19 Sessions North Cafeteria, 19th fl., Con Edison Co., 4 Irving Place, N. Y. C.

MECHANICAL ENGINEERING (ASME)

ciples to modern practice, shafts, flywheels, springs, gears and other machine elements, steel and heat treatment, internal combustion engines, air compressors, gas turbines, steam power plant cycles and equipment, refrigeration, heat transfer, air conditioning and other special subjects.

WEDNESDAYS, Starting Sept. 14, 1966, 6:30-8:30 P.M., 18 Sessions Rm. 240, Ebasco Bldg., 2 Rector St., N. Y. C

ELECTRICAL ENGINEERING AND APPLICATIONS (IEEE)

cations of: transformers, a-c and d-c machines, transmission lines, filters, networks, impedance matching, bridges, coupled circuits, resonance, harmonics, transients, three phase power, amplifiers, and electronic circuits. Features methods of problem solution based on examinations of past 7 years. Printed notes and past examinations available. WEDNESDAYS, Starting Sept. 14, 1966, 6:30-8:45 P.M., 18 Sessions Rm. 1427, Con Edison Co., 4 Irving Place, N. Y. C

ENGINEERING ECONOMICS AND PRACTICE (IEEE-ASME)

Review for Engineering Economics Section of Part III, N. Y. Exam. Economic comparisons, fixed and operating costs, accounting and cost analysis, valuations, contracts, etc. THURSDAYS, Starting Sept. 15, 1966, 6:30-8:30 P.M., 18 Sessions Auditorium, 19th fl., Con Edison Co., 4 Irving Place, N. Y. C. Instructor: S. DUBLIN, Director of Research &

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COURSE NO. 7

Review for Mechanical Engineering Section of Part III, N. Y. Exam. Application of mechanical engineering prin-

Instructor: H. MANUEL, Lummus Co.

Review for Electrical Engineering Section of Part III, N. Y. Exam. Electrical Engineering Principles and Appli

Instructors: P. ZARAKAS, Engineer, Consolidated Edison Co., Inc. and J. F. BATES, Electrical Engineer, Gibbs & Hill, Inc.

COURSE NO. 9

Asst. Professor in Management, Newark College of Engineering

(REG. FORM ON BACK PAGE)

Instructor: O. ONDRA, Professor of Civil Engineering Manhattan College

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ASME

NEW YORK SECTION IEEE POWER & INDUSTRIAL DIV.

EDUCATIONAL PROGRA

COURSE NO. 1

ADVANCES IN CONTROL SYSTEMS

MONDAYS, 6:30 to 8:30 p.m. Starting Sept. 26, 1966 Ebasco Auditorium, 2 Rector Street, New York, N. Y. Course Coordinator: ROGER SULLIVAN, Consolidated Edison Co. Tel. (212) 460-4689

This course is designed to familiarize the engineer with industrial control systems and to help him keep pace with new developments. Fundamentals of basic control components are reviewed and consideration is then given to new components and equipment affecting the design and application of modern control systems.

- 1. Sept. 26 Control Introductory & Control Problems Space, history, terminology, systems, applications. Speaker: P. DORATO, Polytechnic Inst. of Brooklyn
- 2. Oct. 3 Application of Recent Advance in Control Technology Electronics in controls, solid state devices, computers, modern design philosophy.

Speaker: STERLING GORRELL, Data Master Corp.

3. Oct. 10 Solid State Analog Controls Developments in analog controllers including analog computer techniques — application of operational amplifiers and integrators.

Speaker: O. V. KUEHRMANN, Leeds & Northrup

4. Oct. 17 Application of SCR's in Control Systems Fundamentals of SCR's, advantages, capabilities and application.

Speaker: D. COLTERS, Westinghouse Elec. Corp.

5. Oct. 24 Detectors and Transducers in Control Systems

Properties and advantages of available detectors and transducers, advance in detectors and transducers.

Speaker: O. V. KUEHRMANN, Leeds & Northrup

6. Oct. 31 DDC-Direct Digital Control State of the art, considerations, equipment requirements, programming, cost.

Speaker: JOHN GREENWOOD, Foxboro Co.

7. Nov. 7 Modular Systems for Digital Control Advantages for system design, concept, basic modules, application:

Speaker: PAUL KINTNER, Airborne Instruments

- 8. Nov. 14 Set Point Controllers Junction, application, computer control. Speaker: R. E. PAULSON, General Electric Co.
- Nov. 21 Process Control System Design Basic considerations, model, cost/economy, data logging, monitoring, alarming. Speaker: P. S. RADCLIFFE, Westinghouse Elec. Corp.
- 10. Nov. 28 Electronic Control of Power Plant Advantages over pneumatic control, computing and data logging, presentation of trend information.

Speaker: R. May, Bailey Meter Co.

COURSE NO. 2

COMPUTERS FOR POWER ENGINEERING

TUESDAYS, 6:30 to 8:30 p.m. Starting Sept. 27, 1966 Brooklyn Union Gas Co. Auditorium, 195 Montaque St. Brooklyn, N. Y.

Course Coordinator: EDWARD ELDRIDGE, Thomas & Betts Co. Tel. (201) 354-4321

This course covers the basic computer hardware and language with emphasis on Fortran. Computers will then be treated as an engineering tool which may be tailored to do any big or small engineering computation.

1. Sept. 27 Computer Hardware

Components, and functions, numbering system, logic, scientific and commercial computers. Speaker: GARY MARTENS, RCA Electronic Data Processing

- Oct. 4 Computer Language Part I Computer instructions, block diagram, absolute language programming, symbolic programming, COBOL. Speaker: STEVE TRITTO, Honeywell Inc.
- 3. Oct. 11 Computer Language Part II Engineer's language – Fortran. Speaker: W. BRAUN, Univac Div. of Sperry Rand
- 4. Oct. 18 Computers are for Engineers Economic evaluations, design calculations, mathematical analysis, simulations, PERT. Speaker: J. PHILLIPS. Control Data Corp.

Speaker. J. PHILLIPS. Control Data Corp.

 Oct. 25 System Studies – Part I Total system planning – development and application of load forecast models; generation, transmission and distribution expansion programs.

Speaker: D. A. NORDMAN, Westinghouse Elec. Corp.

- 6. Nov. 1 System Studies Part II Methods of calculating system conditions from load flow and stability programs for planning and operation. Speaker: H. L. SMITH, Westinghouse Elec. Corp.
- Nov. 15 System Studies Part III Short circuit current calculation, relay settings and coordination.

Speaker: W. E. FEERO, Westinghouse Elec. Corp.

8. Nov. 22 Load Management

Economic design and operation of distribution systems. Speaker: MICHAEL ABIDI, IBM Corporation

9. Nov. 29 Digital Control

Event logging, load frequency control, load dispatch, time sharing, performance calculation. Speaker: D. W. MCCARTY, Leed & Northrup Co.

10. Dec. 6 New Development

Tele-processing, graphic data processing. Speaker: V. VITGLIANO, IBM Corporation

- Special Study Groups 🚸 FALL - 1966



WATER DESALINATION

WEDNESDAYS, 6:30 to 8:30 p.m. Starting Sept. 28, 1966 Consolidated Edison Co., Room 1701S, 4 Irving Place New York, N. Y.

Course Coordinator: DAVID HAWKINS, Consolidated Edison Co. Tel. (212) 460-6166

A course outlined to give a broad view of the various means for satisfying our increasing water needs. The course will provide a good review of the system, economic factors and design consideration. The possible role of the Electric Utility in this field will also be discussed.

- 1. Sept. 28 The Water Desalting Market Pollution problem, utilization of existing supplies, increasing water demands, growth of desalting plants. Speaker: JOSEPH J. STROEBEL, Chief, Program Analysis Div., Office Saline Water
- Oct. 5 Freezing Process
 The solidification and separation of ice from saline water.
 Speaker: R. R. BRIDGE, Colt Industries, Fairbanks Morse Div.
- 3. Oct. 12 Reverse Osmosis Use of pressure to force water through a membrane capable of rejecting dissolved salts.

Speaker: GLEN A. NEWBY, General Atomic Div. of General Dynamics

4. Oct. 19 Long Tube Vertical Distillation Steam fills space around outside of water tube bundle causing part to boil off as it falls through the tubes in the second effect where fresh water is formed. Speaker: WILLIAM E. KATZ, Ionics, Inc.

5. Oct. 26 Forced Circulation Vapor Compression Saline water is pumped in tubes through evaporation chamber where steam around the outside causes part to boil. Vapor is collected, compressed, returned to evaporator tubes and becomes fresh water.

Speaker: PAUL L. GEIRINGER, American Hydrotherm

6. Nov. 2 Multi-Stage Flash Evaporation Sea water is passed into chamber of lower pressure producing steam. Remaining brine is passed through chambers of lower pressures.

Speaker: To be announced, Westinghouse Elec. Corp. 7. Nov. 9 Dual Plant Combinations

Feasible Plant combinations, Economic and Engineering Advantages, Disadvantages.

Speaker: MICHAEL ZIZZA, Burns & Roe, Inc.

8. Nov. 16 Desalination and the Electric Utility The Dual Purpose Plant, The Utility's Interest, The Electric Utility's Background in Water Technology. Speaker: WILLIAM J. BURNS, Long Island Lighting Co.

9. Nov. 23 Surfside

Lecture on Desalination Plant soon to be built at Riverhead, New York.

Speaker: WILLIAM I. WILLIAMSON, Cuno Eng. Corp.

10. Nov. 30 Future of Desalination Forecasted water requirements, possible technological innovations, use of nuclear energy. Speaker: JAMES G. CLINE, N. Y. State Atomic & Space Development Authority

COURSE NO. 4

SOUND CONTROL

THURSDAYS, 6:30 to 8:30 p.m. Starting Sept. 29, 1966 Consolidated Edison Co., Room 1101S, 4 Irving Place New York, N. Y.

Course Coordinator: HARRY JOHNSON, Automatic Switch Co. Tel: (201) DI 4-3765

This course provides a comprehensive review of the sound problem, its measurement and analysis, fundamentals of sound control, prime mover sound reductions, acoustical treatments in industry, and the medical, industrial and community relations aspects of sound.

1. Sept. 29 The Sound Problem

The definitions and basic concepts of sound, today's sound problems, the interrelations of sound and noise, and the fundamentals of sound control.

Speaker: LAYMAN MILLER, Bolt, Beranek and Newman, Inc.

2. Oct. 6 Measurement and Analysis

Application of instruments for measurement of sound and vibration and analysis of measured data.

Speaker: THOMAS H. MUJICA, General Radio Co.

3. Oct. 13 Prime Movers: Turbine-Generators Steam-turbine and gas-turbine generators sound control. Speaker: R. R. AUDETTE, General Electric Co.

4. Oct. 20 Electric Motors and Fans

Electric motor drive sound control.

Speaker: A. R. GILMOUR & C. WOOD Westinghouse Electric Corp.

- 5. Oct. 27 Prime Movers Diesel Engine Generators Sound control of diesel-engine generator plants. Speaker: R. G. PRIBRAMSKY, General Motors
- 6. Nov. 3 Prime Movers Jet Engines The aircraft type jet engine sound problem and its control.

Speaker: To be announced, Pratt-Whitney

7. Nov. 10 Acoustical Treatments Acoustical treatment of systems and structures for sound and vibration reduction.

Speaker: FRED JUDD, Silence Inc.

8. Nov. 17 Medical Aspects

The effects of sound and vibration on the human structure and the application of safeguards.

Speaker: DR. J. APPLEBAUM, New York Hospital, Cornell Medical Center

9. Dec. 1 Industrial Relations

Industrial codes and regulations, compensation for loss of hearing, and management-labor relations in sound control.

Speaker: TOM CONWAY, Counselor at Law

10. Dec. 8 Community Relations

Noise and community relations, noise control regulations and the airport problem.

Speaker: MAX LOME, Board of Directors, Central Queens Allied Civil Council PLEASE POST ON BULLETIN BOARD-ALL COURSES ARE OPEN TO THE PUBLIC

N. Y. Section, IEEE

Power and Industrial Div.

EDUCATIONA





EDUCATIONAL PROGRAM-FALL 1966

INDIVIDUAL IMPROVEMENT STUDY GROUP

COURSE NO. 10

PUBLIC SPEAKING FOR ENGINEERS

MONDAYS, 6:30-8:30 p.m.

Starting Sept. 12, 1966

Room 1427 Con Edison Co., 4 Irving Place, N. Y. C.

Instructor: Dr. H. R. GILLIS Professor of Speech L.I.U., C. W. Post Campus

Designed for Engineers who desire training in improving voice, articulation and pronunciation habits, oral reading, manuscript preparation and presentation, extempore speaking and psychology of persuasion.

Subjects to be covered in fourteen sessions:

- Study of the auditory and vocal mechanisms and their role in effective voice and speech.
- Study of the phonetic structure of American English, its dialect problems and determination of standards for speech.
- Improvement of articulation, pronunciation and vocabulary habits.
- Study and improvement of physical actions and platform behavior in speech.
- Study of effective techniques of selection, arrangement, interpretation and presentation of various topics and materials, including extempore presentation, briefings and reports, the precis and full manuscript presentation.
- Study of psychology of persuasion.

Each man will have an opportunity to speak at each session. Constructive criticism will be presented by the instructor. Those enrolled in the course will be encouraged to participate in the critique sessions, thus allowing each person to know the instructor's opinions as well as the reaction of his peers regarding his speech, his ideas and overall effectiveness. COURSE NO. 11 services and a service of the

THEORY AND MECHANICS OF TECHNICAL REPORTS

THURSDAYS, 6:30-8:30 p.m. Starting Sept. 22, 1966 Room 503, Con Edison Co., 4 Irving Place, N.Y.C. Instructor: E. ALCOSSER, Sperry Gyroscope Co. A Study Group designed to provide training in the preparation and presentation of technical reports. 1. Sept. 22 Introduction Course description, purpose, communication of ideas. Sept. 29 Written Communication 2. Types, purpose and for whom. Oct. 6 The Outline Purpose, value, mechanics — Use of Oct. 13 First Draft - Part I (General) — Style, grammar, effectiveness. 5. Oct. 20 First Draft - Part II (Specific) — Choosing the media, layout, illustrations. Oct. 27 Final Report 6. Draft review, production, final check. Nov. 3 Oral Reports 7. Principles of speaking, outline, presentation. Nov. 10 Preparation of Oral Reports 8. Use of index cards, timing, use of aids. Nov. 17 Delivery of Student Reports 9 Prepare short report (term project) for presentation and discussion. Dec. 1 Delivery of Student Reports 10. Prepare short report (term project) for presentation and discussion. _____ ADVANCE-REGISTRATION FORM Name (printed) Business Address Phone No. Home Address Course No. & Study Group Member of: (Do Not Write In This Space) IEEE AIME Admission Card No. ASME ASCE OTHER Refund Certificate No.

Fee Paid \$...... (Cash, Check, M.O.)

Date By

NON-MEMBER

I intend to apply

for membership in

NORTH JERSEY SECTION Elected Section Officers of the North Jersey Executive Committee



Left to right: Walter Glomb — Past Chairman Stephen Mallard — Chairman Bernard Meyer — Vice Chairman Joseph O'Grady — Treasurer Merle Irvine — Secretary

Two elected members-at-large not shown:

Herbert Blaicher, Jr. Barry Mindes

NORTH JERSEY SECTION FALL 1966 STUDY GROUP A 20-SESSION COURSE IN ENGINEERING ECONOMICS

A short but comprehensive course, at graduate level, in the profitable use of capital in a free-enterprise economy.

Devoted primarily to a presentation of the Revenue Requirements technique for measuring the profitability of ventures, and relative economy of alternative proposals.

Financial Mathematics, Depreciation, and Incomes Taxes are among the topics which will be considered.

This Study Group should be of particular interest to financial, accounting or engineering personnel in management.

The Instructors will be:

Mr. Paul H. Jeynes, Retired

Mr. Bert J. Blewitt, Engineering Economist

Mr. Leonard Van Nimwegen, Senior Staff Assistant

Mr. William G. Michaelson, Associate Engineer

All of the System Planning and Development Department, Public Service Electric and Gas Company, Newark, New Jersey.

TIME: 7:00-9:00 P.M., starting Tuesday, October 4, 1966 and ending Tuesday, March 7, 1967.

LOCATION: Public Service Electric and Gas Company, 80 Park Place, Newark, New Jersey.

REGISTRATION: \$60.00 to members of IEEE, ASME, ASCE, etc. \$75.00 to non-members. Limited to 30.

REGISTRATION FORM

Name	Tech. Society	
Firm	Position	
Address	Phone	
Check or Money Order Enclosed 🔲 Member \$60.00 🗌 Non-Member \$75.		
Send Registration Forms to: MR. J. ZEMKOSKI, Room 6315		
Public Service Electric and Gas Company		
80 Park Place, New	ark, New Jersey	

CHAIRMAN'S C<mark>ORNER</mark>

WHAT'S WRONG WITH IEEE?

"Plenty!" is the response from at least a few members.

"Nothing at all" is a response that I'm afraid far too few members would make. I feel that most members have specific criticisms of the Institute: the dues are too high; the publications are too technical in content; the publications are too general; Headquarters is making mailing and billing errors; there are too many technical groups; there should be additional technical groups; there should be additional technical groups to serve specialized interests; the North Jersey Section programs, study groups and inspection tours are not sufficiently interesting; this NEWS-LETTER is not satisfactory.

Perhaps you feel that "plenty" is wrong with IEEE. Perhaps you have one or two gripes: from among those listed above or maybe even other complaints that are more unique.

In any event, if you'd like to convert your discontent into action leading to improvement of the Institute, I have a wonderful suggestion for you. Make your voice heard through the North Jersey Section. The Section is the fundamental "grass root" element of the organization, and the Institute must be responsive to the needs of its sections. Our Section always has openings for dedicated members who are anxious to participate in the administration of the Section, to work, to contribute ideas and constructive criticism.

If you are a member who is tired of complaining about IEEE and would like to do something to improve the Institute, get in touch with me so that we can discuss where you can best expend your efforts within the Section in working toward the betterment of IEEE.

Call me at MArket 2-7000, Ext. 2117; or at home — NOrth 7-2350.

STEPHEN A. MALLARD Chairman North Jersey Section

NORTH JERSEY SECTION MEETING AIR-CONTROL CIRCUITS

On Wednesday, Oct. 19, 1966, Norman Roden will describe air-control circuits and how they compare with electronic-control circuits. The meeting will be held at 6:00 P.M. at the Robin Hood Inn, Clifton, New Jersey. Reserve Oct. 19 to hear about this new development. Watch for more detail in the October issue of Newsletter.

N. Y. PMP/PGR GROUPS PANEL: ADVANCED MULTILAYER BOARD APPLICATIONS AND DESIGN

TUESDAY, OCTOBER 18, 1966 6:00 P.M. — Dinner Meeting

at Grumman Aircraft Co. Bethpage, L. I.

Including a Cocktail hour and tour of the LEM mockup.

For information and reservations contact: MR. ALFRED E. MARTIN Grumman Aircraft Co. 516 LR 5-3651



NORTH JERSEY POWER GROUP

SUMMARY OF 1965 - 66

During the year 1965-66, 5 meetings were held as follows:

Date	Location	Subject	Attendance
October 7, 1965	Morristown	All Electric High Risc Apartments	s 44
November 18, 1965	Morristown	Industrial Ground Relaying Can b More Sensitive	
*January 19, 1966	Newark	Electrogasdynamic Power Genera	tion 54
March 15, 1966	Morristown	DC Transmission & Underground	Cable 84
April 21, 1966	Newark	Lightning Protection	30
*Section Meeting			

In our second year as a Power Chapter, there was an increase in membership from 260 to 304 as of April 30, 1966.

Our primary purpose is to provide programs with subjects of vital interest to our members which will stimulate good attendance. It is felt that this was accomplished this past year and many thanks for a successful group of meetings goes to Jack Gill who served as Meetings and Program Secretary. The Chairman also extends his thanks to John Diercks as Vice Chairman and Joe Skroski as Financial Officer. It was unfortunate that soon after the officers were declared elected in July, Jim Jones, Correspondence and Membership Secretary, moved out of the area. We attempted to find a replacement from one of the local colleges, but were unsuccessful so we were without a secretary for the full year. This no doubt had some effect on the nominal increase in Power Chapter membership.

At the March 15 meeting, the Nominating Committee made its report and the slate was elected at the April 21 meeting. The new officers for the coming year are as follows:

Chairman: John C. Dicrcks General Electric Company 26 Washington Street, East Orange, New Jersey 07018

Vice Chairman: John G. Gill Public Service Electric & Gas Company 80 Park Place, Newark, New Jersey 07101

Meeting & Program Secretary: Joe C. Skroski Jersey Central/New Jersey Power & Light Company Madison Avenue at Punchbowl Road, Morristown, New Jersey 07960

Correspondence & Membership Secretary: Richard S. Smithley Federal Pacific Electric Company 50 Paris Street, Newark, New Jersey 07101 Financial Officer: Wally A. Hopkins

Westinghouse Electric Corporation 67 Evergreen Place, East Orange, New Jersey 07018

Starting with the second meeting, we had the New York Headquarters Membership Services send out a notice of each meeting to the Power Chapter members of the North Jersey Section. The time of mailing was such that the notice was received usually the Friday of the week before the meeting. It was our feeling that these mailings were well worth the cost and should become a standard practice. Many members commented that they appreciated receiving the separate mailings as a supplement to the Newsletter. The New York office requests 3 weeks advance notice for such mailings.

It is suggested that the new officers explore the possibility of a Joint Chapter with the I & G A group. The person to contact would be Mr. Willard Dickerson of Esso Research Company. Unfortunately, nothing was done toward this end during the past year although the membership previously indicated approval of such a joint chapter.

Respectfully submitted, CARL C. TORELL Chairman

INSULATED CONDUCTORS GROUP TO DISCUSS CORONA IN SOLID DIELECTRICS

The first meeting of the Insulated Conductors Technical Discussion Group which will be held on Monday, October 3, 1966 will be devoted to discussing "The Problem of Corona in Solid Dielectrics." Meetings of the Insulated Conductors Discussion Group are held in Room 1101-S of the Consolidated Edison Building, 4 Irving Place, New York City from 6:30 to 8:30 P.M.

POSITIONS AVAILABLE Good Opportunity for APPLICATIONS ENGINEER PRODUCTION ENGINEER **TECHNICAL WRITER** Apply AO-YU ELECTRONICS, INC. 249 Terhune Ave., Passaic, N. J.

Wheeler Laboratories, Inc. Subsidiary of Hazeltine Corporation Consultation — Research — Development

Radar and Communication Antennas Microwave Assemblies and Components Laser Devices and Applications Harold A. Wheeler and Engineering Staff Main office: Great Neck, N. Y. HUnter 2-7876

Antenna Laboratory: Smithtown, N. Y.

JOINT N. Y. ENGINEERING MANAGEMENT GROUP **EXCITING PROGRAM ANNOUNCED** BY MANAGEMENT GROUP

IEEE Vice-President W. K. MacAdam To Be A Speaker

Members of the Metropolitan Chapter of the Engineering Management Group are in for a treat this season. Seven monthly meetings are scheduled, two of them on a regional basis. A very timely educational series is planned for next Spring with the details to be announced shortly. The Chapter will arrange for a series of periodic luncheon forums at which experienced managers will have the opportunity to discuss pre-selected practical problems among themselves.

The program of monthly meetings gets off to a rousing start when members and guests will have the opportunity to hear W. K. MacAdam's views on management decisionmaking. To offer the most fruitful program, the Chapter's aim this season is to present experienced and successful practitioners of the art of engineering management. Mr. Mac-Adam is particularly well qualified in this regard as a Vice-President of the A.T.&T. Co. and the Vice-President of the IEEE. He will appear on October 13 at the United Engineering Center in New York City.

In addition, the Chapter is acting for the National Group as session organizers for the IEEE International Convention in March 1967. The Chapter has also asked for arrangements to be made at the Convention where all EMG members in town can become acquainted, possibly a "happy hour."

This energetic program is the outcome of a series of carly planning meetings in July and August by an enthusiastic group of members. The volunteers and the direction as to the type of activities desired for the coming season arc the result of a comprehensive questionnaire mailed to the membership. All the 40 volunteers who offered their services are becoming involved in implementing the season's activities, which are based on a consensus of the views in all the returned questionnaires. The membership apparently desires a program which will be educational and add concretely to their skills. The Chapter officers have this service foremost in their minds.

Meetings will be held on the second continued on page 14

Members, Prospective Members and other Engineers are invited to attend and participate in any of the Technical Discussion Groups. All meetings, except as noted, will be held in Room 1101-S, Consolidated Edison Building, 4 Irving Place, New York City.

Industrial & Commercial Power Systems Wed., Oct. 5, 1966 Wed., Nov. 16, 1966 Wed., Mar. 1, 1967 Wed., May 3, 1967	Substation Tues., Oct. 18, 1966 Tues., Nov. 29, 1966 Tues., Mar. 28, 1967 Tues., May 2, 1967
Transmission & Distribution Wed., Oct. 19, 1966 *Wed., Nov. 30, 1966 Wed., Mar. 8, 1967 Wed., Apr. 26, 1967	Insulated Conductors Mon., Oct. 31, 1966 *Wed., Nov. 30, 1966 **Thurs., Mar. 30, 1967 **Thurs., May 4, 1967
Power Generation Wed., Oct. 26, 1966 Wed., Apr. 19, 1967	System Engineering Tues., Oct. 4, 1966 Tues., Nov. 15, 1966 Tues., Mar. 14, 1967 Tues., Apr. 25, 1967
Group Sponsors will be pleased to include meetings and discussion topics. Please indicate y	your name on their mailing lists for advice on your Group interest(s) and mail to:
	MR. JOHN F. SHIMSHOCK c/o Public Service Electric and Gas Co. 80 Park Place Newark, New Jersey 07102
() Industrial and Commercial Power System	ns () Substation

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MC-65 SERIES is a new line of all-silicon AC-DC power modules - specifically designed to give you more watts per dollar. A wide range of different voltage and current models is available. So, if you're interested in better power supplies at budget prices — and who isn't — write for information on these new Technipower modules today!

- 314 models, outputs 3 to 152VDC, up to 750 watts.
- Regulation $\pm 0.05\%$.
- Temperature coefficient 0.015%/ C typical.
- Ripple 2mV RMS.
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- Not damaged by output shorts or overloads.
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- Designed to meet MIL specifications.





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The Newsletter, September 1966

) Insulated Conductors

) System Engineering

(



JOINT N. Y. ENGINEERING MANAGEMENT GROUP

continued from page 13

Thursday of every month beginning at 7:30 P.M. to assist members from outlying locations to travel to the meetings. Pre-meeting dinners, to which all members are cordially invited, will begin at 6:00 P.M. Exact titles of the seven meetings and places will be announced prior to each meeting. A general list of monthly meeting subjects is given below:

Oct. 13, 1966 W. K. MacAdam: Management Decision Making Nov. 10, 1966 Panel: Executives Discuss Practical Problems Dec. 8, 1966 Talk by a Researcher into Management Jan. 12, 1967 Panel: Engineering and the Government (LI) Feb. 9, 1967 Papers: Three Variations on a Theme (NJ) April 13, 1967 Panel: International Approaches to Engineering Motivation May 11, 1967 Talk/Panel: Operations Research -**Risk Taking** Full details on the talk by Mr. MacAdam will appear in the October issue. Anyone desiring further information may call Mr. L. Katz (212) 394-2558. The new officers for the coming year (1966-67) are as follows: Chairman Mr. L. Katz New York Telephone Co. 140 West Street (Room 1300) New York, New York 10007 212 - 394-2558 Vice-Chairman Mr. H. F. Mullen Northern Radio Company 149 West 22nd Street New York, New York 10011 212 - 929-9117 Secretary Mr. J. E. Walsh Long Island Lighting Co. 175 E. Old Country Road Hicksville, New York 11801 516 - 931-6300 (680)

N. Y. COMTEC GROUP

SWITCHING SYSTEMS AND THEIR APPLICATIONS

"Switching Systems and Their Applications" is the subject of a series of 18 lectures being sponsored by the Education Committee of the Communication, Technology Group, New York Section, IEEE. The series is divided into three parts. Each part will be presented by a recognized authority in the field.

The Fall series, which will be conducted on Tuesday evenings, at 6:30 P.M., beginning October 11th, in the Little Theater, New York Telephone Company, 140 West Street, New York City, will have the following schedule:

October 11th - History of Switching

October 18th — Traffic Theory

October 25th and November 1st — Types of Electro-Mechanical Systems

November 15th — Introduction to Electronic Switching Systems (E.S.S.)

November 22nd — Coding

November 29th-Elementary Building Blocks

During the six-part winter series, which begins on January 18, 1967, the building blocks and the system design of Electronic PBXs and central offices will be discussed.

The six-part Spring series, which begins on April 11, 1967, will cover a Wire Center Study, Broadband Switching, Satellite Switching, Computer Switching, International System and Worldwide Dialing.

1225 McBride Avenue (Plant #3)

Little Falls, N. J. 07424

201 - 256-4000 (2081)

REGISTRATION INFORMATION Registration for the Series, which will be

limited to 63 person, must be made in advance. The fees are as follows:

For the	three-part,	18-lecture	series -	_
IFEE	Members .			\$30.00
Non-n	nembers			40.00
Full-ti	me students	s		10.00

or individual series parts (1, 2 or 3)	-
IEEE Members	\$15.00
Non-members	20.00
Full-time students	7.00

In addition to admission to the lecture series, the above-quoted fees also entitle attendees to a copy of the required text "Switching Systems," a publication of the American Telephone and Telegraph Company. Those participants who already have the text may deduct \$5.00 from the registration fee.

To register, please fill out the attached coupon and mail it with a check or money order made payable to Communications Technology Group, New York Section, IEEE, to Mr. J. C. Sieglinger, Secretary, Education Committee, New York Telephone Company, 140 West Street, New York, New York 10007. Further information can be obtained from Mr. Sieglinger at (212) 394-6721.

MR. J. C. SIEGLINGER Secretary, Education Committee New York Telephone Company Room 1369 140 West Street New York, N. Y. 10007 I wish to enroll in the following parts of the Communications Technology Group Lectures series on "Communications Transmission — A Changing Field." Three-Part Series Part I Part Berle Part II I am an IEEE Member Non-member Full-time Student is enclosed.		
Affiliation		
Mailing Address	Phone	
Treasurer Mr. R. Colen Hayden Publishing Company, Inc. 850 Third Avenue New York, New York 10022 212 - 751-5530 Publicity Committee Mr. N. B. Mills RCA Frequency Bureau 60 Broad Street (Room 730) New York, New York 10004 212 - 689-7200 (RJ 221) Program Committee Mr. H. F. Mullen Membership Committee	 L. I. Arrangements Committee Mr. W. D. Moyers Airborne Instruments Lab. Division of Cutler-Hammer, Inc. Comac Road Deer Park, N. Y. 11729 516 - 595-3061 Northern N. J. Arrangements Committee Mr. L. H. Hershenson RCA (Building 10-2) 415 South 5th Street Harrison, N. J. 07029 201 - 485-3900 Past Chairman 	
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New Tektronix Type 556 DC-to-50 MHz, dual-beam, sweep-delay oscilloscope

The Type 556 and rack-mount Type R556 use any combination of Tektronix letter or 1-series plug-ins

The UPPER BEAM can display a signal from either *left* or *right* plug-in; with either Time Base A, Time Base B, or external signals; triggered from a composite vertical signal, plug-in single channel signal (with 1A1 or 1A2), external, or line.

Independent Vertical Systems use Type 1A1 or 1A2 Plug-In Units for 50 MHz operation; also accept any other 1-series or letter-series plug-ins.

Independent Sweep Systems provide 24 calibrated steps from 0.1 μ s/cm to 5 s/cm; the X10 Magnifier extends the fastest sweep rates to 10 ns/cm.

Calibrated Sweep Delay extends continuouslyfrom 0.1 microsecond to 50 seconds.

Single-Sweep Operation enables one-shot displays of normal or delayed sweeps.

Independent Triggering Systems provide stable displays to beyond 50 MHz. Either input signal can be used to trigger either or both time-bases. The LOWER BEAM can display a signal from the *right* plug-in; with either Time Base B or external signals; triggered from a composite vertical signal, plug-in single channel signal (with 1A1 or 1A2), external, or line.

New Dual-Beam CRT (with illuminated internal graticule) provides "zero-parallax" viewing of small spot size and uniform focus over the 8 cm by 10 cm display area. Each beam has 6 cm vertical scan, with overlap scan of 4 cm by 10 cm.

EMI (RFI) Suppression — meets interference specifications of MIL-I-6181D over these frequency ranges: 150 kHz to 1 GHz — Radiated (with CRT mesh filter installed), and 150 kHz to 25 MHz — Conducted (power line).

Size is 15" x 17" x 24".

Weight is \approx 80 pounds, without plug-ins.

Power Requirement is 100-130 V or 200-260 V, 50-60 Hz \approx 850 watts.





Simultaneous Single-Shot Displays. Current versus voltage display of a .75 ampere, fast-blow fuse during destructive overload. Both beams are driven by B Time-Base at $50 \ \mu s/cm$ which is delayed by pre-triggered A Time-Base to provide base reference lines before and after the event. The upper beam shows the current waveform at 30 A/cm while the lower beam shows the corresponding voltage across the fuse at 100 V/cm.



Single-Input Dual-Beam Displays. Upper beam shows bursts of 2.5 MHz pulses on Time Base A with time variation between bursts. This shows up as increasing time-jitterbetween thefirst and successive bursts. The lower beam shows B Sweep (0.1 μ s/cm) delayed by A Sweep and triggered on the second pulse of the last burst to provide a jitter-free expanded display of the A Sweep intensified zone. The use of only one probe and one plug-in input simplifies signal connection and provides minimum loading on the source.

Plug-ins illustrated

Type 1A1 Dual-Trace Unit . . \$600 (Dual-Trace—50 mV/cm at DC-to-50 MHz, 5 mV/cm at DC-to-28 MHz. Single-Trace—500 μ V/cm at 2 Hz-to-15 MHz. 5 Display Modes—Channel 1, Channel 2, Alternate, Chopped, Added Algebraically. Front - panel signal output.)

Type W Differential

Comparator Unit. \$575 (Conventional Preamplifier - 50 mV/cm at DC-to-23 MHz to 1 mV/cm at DC-to-8 MHz. Decade Input Attenuator to X1000. Differential Input Preamplifier - CMRR of 20,000 to 1, DC-to-20 kHz. Max. Peak Input of ± 15 V, XI Attenuation. Calibrated Differential Comparator - Vc Supply of 0 to ± 11 V. Accuracy of $\pm 0.15\%$ of output $\pm 0.05\%$ FS.)

Type 556 Dual-Beam Oscilloscope . . . \$3150 Rack Mount Type R556 Oscilloscope . . \$3250 U.S. Sales Prices, f.o.b. Beaverton, Oregon

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Measurements of C, R, L, D (dissipation factor of capacitors), and Q may be made by Hewlett-Packard's Model 4260A. The steps involved are simple: set the function knob for parameter to be measured, adjust the range switch for an on-scale indication, and obtain a null with only the CRL dial. Auto-balance is the key to simplified operation; its function is to eliminate control interactions.

The Model 4260A Bridge is balanced in the automatic mode by phase-controlling the balance leg so it is automatically slaved to that leg which is being adjusted for null. This is done with a voltage-tuned resistor controlled by a phase detector. The readout, for C, R, and L, is digital, with the decimal point automatically positioned. Units of measurement, e.g. pF and μ F, are automatically shown.

Model 4260A Universal Impedance Bridge is less than 71/4" high, 73/4" wide, and 11" deep. A tilt stand is provided to raise the viewing angle for bench use; the instrument may be rack-mounted with available accessory hardware. And the Model 4260A is priced at \$550.00.

MOSELEY ADDS AUTOMATIC SWEEP TO X-Y RECORDERS USING SELF-CONTAINED TIME BASE.

Generating a ramp voltage, linear to 0.5%, the Model 17108A External Time Base plugs directly into Model 7035A Recorders, and is readily adapted to other Hewlett-Packard Moseley Division models. Five calibrated sweep speeds are available from 0.5 to 50 seconds per inch. Model 17108A is completely self-contained, including the battery which provides a minimum of 100 hours operation.

The circuit is an integrating amplifier fed by constant current, the current being the time-determining variable. Unique to the 17108A is an integratedcircuit operational amplifier with a fieldeffect transistor for extremely low input current, and a low-leakage integrating capacitor.

The new Moseley Time Base will drive any number of X-Y recorders simultaneously, provided only that the combined impedance seen by the Time Base output is greater than 20,000 ohms. The linear ramp output of the Time Base ends at 1 volt minimum.

The Model 17108A Time Base measures $4\frac{3}{6}$ " x $2\frac{1}{2}$ " x $3\frac{3}{4}$ " and is priced at \$175.00. For complete information on all equipment – call or write your local HP Field Engineer.

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