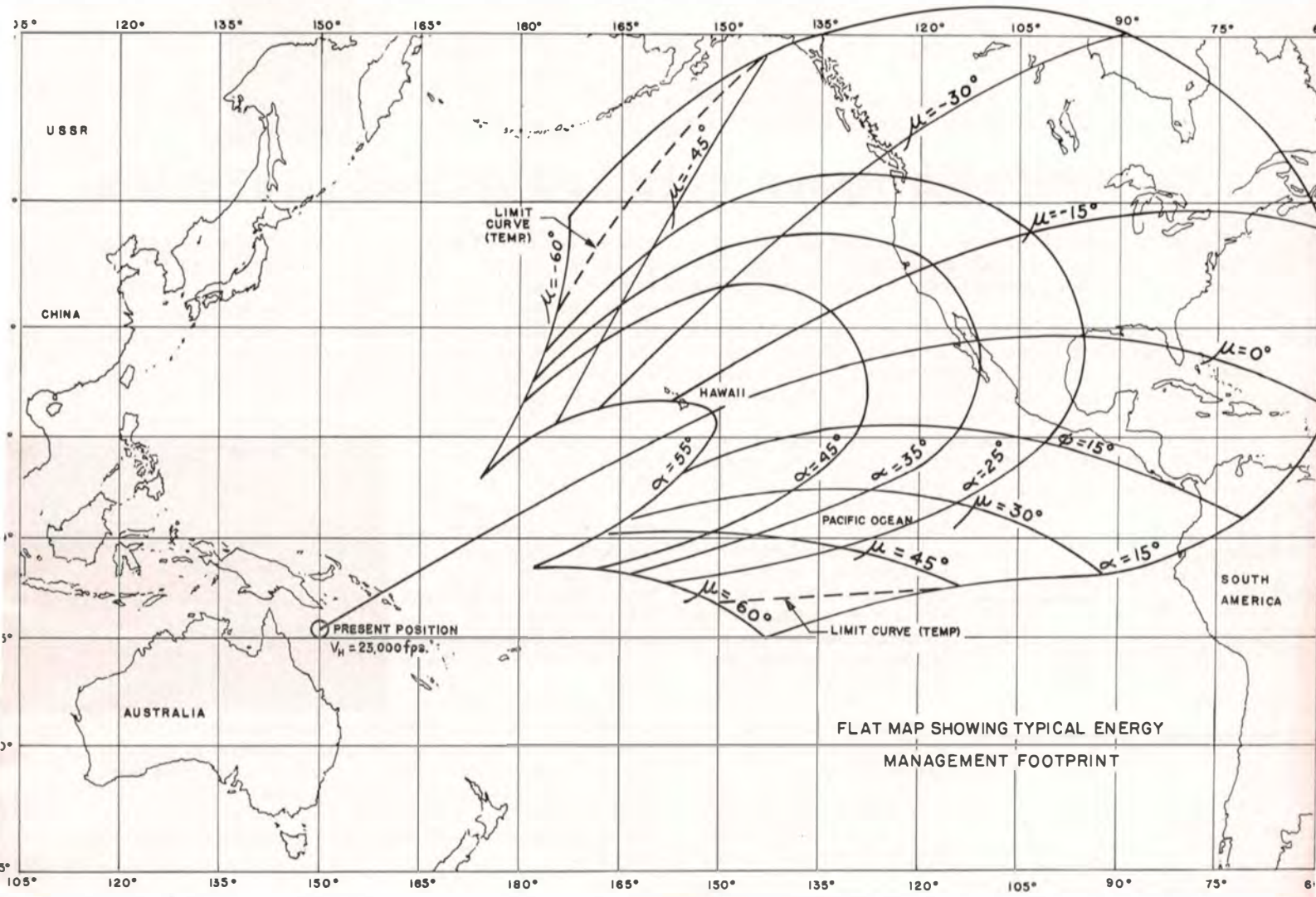


FLAT MAP SHOWING TYPICAL ENERGY MANAGEMENT FOOTPRINT

The IEEE
Newsletter
The Magazine of the North Jersey Section

CALENDAR

Wednesday, September 22

Computer

See p. 5

"Hybrid Computing Systems"
Dr. E. E. Mitchell, Electronic Assoc., Inc., Princeton.

8:00 P.M.—ITTFL Auditorium, Nutley, N. J.
7:30 P.M.—Plotlines, Pre-meeting film
6:00 P.M.—Copperhood Restaurant, Pre-meeting dinner

Thursday, September 23

N. Y. Electron Devices

See p. 6

"Operating Principles and Construction of MOS Transistors"
Dr. F. P. Heiman, RCA Labs, Princeton

8:00 P.M.—ITTFL Auditorium, Nutley, N. J.
6:00 P.M.—Copperhood Restaurant, Pre-meeting dinner

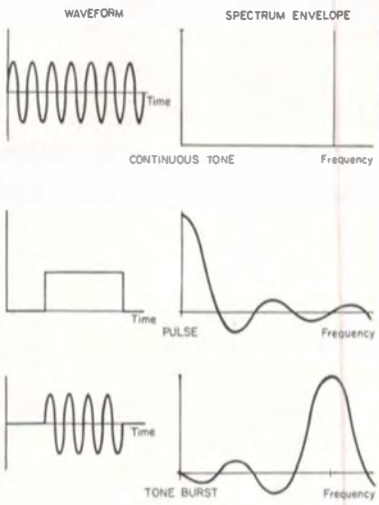
SEPTEMBER 1965 Volume 12 / Number 1

The Coherent Tone Burst

. . . Has the Bandwidth Properties of a Pulse and the Tunability of a Pure Tone

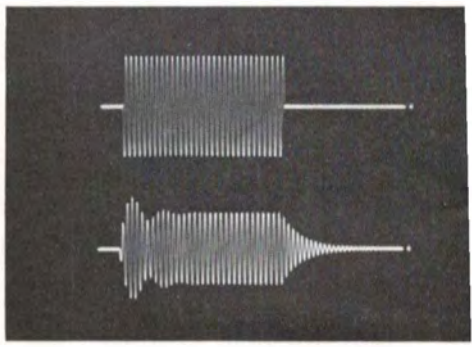
The interrupted periodic wave produced by the GR Tone-Burst Generator is a most useful signal. Its measured, repeated ac transients can do what continuous waves and pulses cannot do.

The tone-burst signal is made up of a series of equally spaced energy bursts of equal duration, created by alternate passing and blocking of an external periodic signal — sine wave or otherwise. Each burst contains a precisely selected number of cycles of the periodic wave. Moreover, since the signal within one burst is coherent (phase-stable) with that in another burst, energy distribution within the frequency spectrum is precisely defined; thus, the tone-burst signal becomes an extremely useful test signal.



The frequency spectrum of a coherent tone-burst signal clearly shows how useful a signal it is, particularly for bandpass measurements. Unlike the single-line spectrum of the plain sine wave and the spectrum of the repetitive pulse (whose energy is tied to the origin and cannot be concentrated where you want it), the symmetrical spectrum of the coherent tone-burst signal can be shaped and placed where it is needed. The tone burst's center frequency is simply that of the periodic wave from which the tone-burst signal is derived; consequently, the center frequency can be shifted easily. The tone burst's bandwidth can also be varied over an extremely wide range by adjustment of the number of cycles in the burst and the number of cycles between bursts. Thus, the test signal can be "tailored" and located in the frequency spectrum to fit your measurement needs exactly.

In a test, 31-cycle bursts of a 10-kc sine wave were used to measure the transient response of a circuit resonant above 10 kc/s. The upper trace of the oscillogram is that of the tone-burst signal; the lower trace shows the signal after it has passed through the circuit. Rise and fall times are easily measured on this trace, and overshoot and ringing are clearly visible.



The tone-burst generator is useful in many other applications including telemetry-signal simulation, sonar testing, and amplifier recovery-time measurements. For more information about this versatile instrument, write for the preprint "A Generator of AC Transients." Instrument Note IN-105, a detailed analysis of the Fourier frequency spectrum of tone-burst signals, is also available on request.

Type 1396-A Tone-Burst Generator . . .
a coherent gate for any waveform . . . produces tone-burst signals with the coherence necessary for accurate, reproducible measurements.

CONDENSED SPECIFICATIONS

Signal Input (to be supplied by an external generator or oscillator);
Frequency Range: DC to 500 kc/s.
Maximum Voltage Level: ±7 volts (5 volts, rms).

Gate Timing: Gate-open and -closed intervals can be independently set to 2, 4, 8, 16, 32, 64, or 128 cycles (periods) of timing signal. By means of a MINUS ONE switch, intervals can be set to 1, 3, 7, 15, 31, 63, or 127 cycles. The gate-closed intervals can also be timed in increments of one period of timing signal from 1 ms to 10 s.

Gate-Open Output: Maximum signal level is ±7 volts (5 volts, rms).

Gate-Closed Output: Less than 140 millivolts, peak-to-peak (—40 dB), with maximum signal input.

Switching Transients: Less than 140 millivolts, peak-to-peak (—40 dB compared to maximum signal input).

Size: 8 by 5⅞ by 7½ inches, over-all.

Price: $490 in U.S.A.

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Sales Engineering Office in NEW YORK: Broad Avenue at Linden, Ridgefield, New Jersey
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LOCAL SERVICE AND REPAIR

For your convenience, the New York Office has a Service Department, manned by factory-trained service engineers. This Department can supply prompt and efficient repairs or recalibration of any G-R equipment. Considerable time can be saved by taking advantage of these facilities

The IEEE **Newsletter**

Published monthly except July & 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 12 **September, 1965** **No. 1**

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

All communications concerning The Newsletter, including editorial matter, advertising, and mailing, should be addressed to:

THE NEWSLETTER
c/o Staff Associates
P.O. Box 275 — Morris Plains, N. J.
Telephone: FOxcroft 6-1580

Subscription: 75¢ per year through dues for members; $1.50 per year for non-members.
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ABOUT ADDRESS CHANGES

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.

REPORT ALL ADDRESS CHANGES TO:
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS INC., 345 EAST 47th STREET NEW YORK, N. Y. 10017

About The Cover

Simulation is used to compute possible bounds of a lifting vehicle during re-entry. This particular display — the footprint — is used to aid the pilot in the energy management task so that he can control angles of attack and bank to minimize the heating load. During abort situation all possible landing points are immediately displayed. See Computer Group meeting notice on page 5.

Executive Committee Meeting

at Verona Public Library

SEPTEMBER 8

Elected Section Officers For The Year 1965-66

Left to Right: Joseph G. O'Grady, *Secretary;* Stephen A. Mallard, *Vice Chairman;* John K. Redmon, *Outgoing Chairman;* Walter L. Glomb, *Incoming Chairman;* Bernard Meyer, *Member-at-Large;* James W. Gordon, *Treasurer.* Not shown in photo: Herbert Blaicher, *Member-at-Large.*

professional notices

Automatic Control

New officers of the group have been elected. They are:

Chairman

Robert G. Sokalski

Mr. Sokalski received his BS degree from Stevens Institute of Technology where he majored in mathematics. He is currently employed by Kay Electric Co. as an Electronics Engineer. Mr. Sokalski has been active in helping form the North Jersey Chapter of the G-AC, serving as a member of the Executive Committee, as Head of the first Election Committee, as Head of the Workshop Committee, and as Secretary. Mr. Sokalski is a member of G-AC and G-IM.

Vice-Chairman

L. E. Sutton, III

Mr. Sutton received the ME degree from Stevens Institute of Technology in 1948, and has since taken graduate courses at Columbia University and Stevens as well as special courses given by Massachusetts Institute of Technology. He joined Gibbs and Cox, Inc. in 1948 where he has been engaged in research and development in connection with surface ships and hydrofoil research craft. Presently, he is Head of the Scientific Section of the Electrical Division of Gibbs & Cox. He is a member of both G-AC and G-EC since 1958 and Charter member of the North Jersey Chapter of G-AC serving on the Extcutive Committee and as Treasurer.

Secretary

Stanley A. Balter

Mr. Balter received his BS and MS degrees from Columbia University. Following service as a Radar Officer in the U.S. Army Signal Corps, he was employed by the Western Electric Co. and then taught courses in Electronics and Communications. He has been employed since 1956 by General Precision, Inc., first in the Electronics Department and then in the Inertial Guidance Department of the Systems Division. At present he is on the staff of the Director of Research and Engineering. He is a member of Tau Beta Pi. In 1964-1965 he served as publicity chairman for the North Jersey G-AC.

Anyone interestd in serving on the executive committee should contact Mr. Sokalski at (201) 226-4000 ext. 41 or Mr. Sutton at (212) DI 4-4366.

PLEASE POST ON BULLETIN BOARD—ALL COURSES ARE OPEN TO THE PUBLIC

N. Y. Section, IEEE — Metropolitan Section

EDUCATIONAL PROGRAM — FALL — 1965

Power and Industrial Div. — ASME

REVIEW STUDY GROUPS — FOR PROFESSIONAL ENGINEER EXAMINATIONS

This program is designed to prepare candidates for Professional Engineer License examinations in New York and New Jersey. The N. Y. State Board permits graduates of approved schools to take Parts I and II and qualify for "Engineer-in-Training".

ENDORSED BY NYSSPE

STRUCTURAL PLANNING AND DESIGN (IEEE-ASME) — **COURSE NO. 5**

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. 13, 1965*, 6:15-8:30 P.M., 18 Sessions
North Cafeteria, 19th fl., Con Edison Co., 4 Irving Place, N. Y. C.

Instructor: O. ONDRA, *Professor in Civil Engineering*
Manhattan College

BASIC ENGINEERING SCIENCES (ASME-IEEE) — **COURSE NO. 6**

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

TUESDAYS, *Starting Sept. 14, 1965*, 6:30-8:30 P.M., 19 Sessions
Auditorium, 19th fl., Con Edison Co., 4 Irving Place, N. Y. C.

Instructors: T. Eliades, Consolidated Edison Co., Inc.

MECHANICAL ENGINEERING (ASME) — **COURSE NO. 7**

Review for Mechanical Engineering Section of Part III, N. Y. Exam. Application of mechanical engineering principles 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. 15, 1965*, 6:30-8:30 P.M., 18 Sessions
Rm. 240, Ebasco Bldg., 2 Rector St., N. Y. C.

Instructor: E. STAMPER, *Assoc. Professor*
Newark College of Engineering

ELECTRICAL ENGINEERING AND APPLICATIONS (IEEE) — **COURSE NO. 8**

Review for Electrical Engineering Section of Part III, N. Y. Exam. Electrical Engineering Principles and Applications 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. *Only Review of Electrical Engineering for Part III available in Metropolitan area.*

WEDNESDAYS, *Starting Sept. 8, 1965*, 6:30-8:45 P.M., 18 Sessions
Rm. 1421, Con Edison Co., 4 Irving Place, N. Y. C.

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

ENGINEERING ECONOMICS AND PRACTICE (IEEE-ASME) — **COURSE NO. 9**

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. 9, 1965*, 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 & Asst. Prof. in Management*
Newark College of Engineering

REGISTRATION

FEES: For all courses except course No. 10 & 11
$20. — to members of I.E.E.E., A.S.M.E., A.S.C.E., A.I.Ch.E., A.I.I.E., N.Y.S.S.P.E.
$30 — to all others.

For course No 10 & 11
$30. — to members (as above).
$40. — to all others.

FOR ADVANCE REGISTRATION (MAILED AT LEAST ONE WEEK BEFORE 1st SESSION) DEDUCT $5.00 FROM APPROP. FEE.

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(Continued on Last Page)

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Study Group .....

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for membership in.....

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Admission Card No. .....
Refund Certificate No. .....
Fee Paid $.....(Cash, Check, M.O.)
Date..... By.....

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NEW YORK SECTION IEEE
POWER & INDUSTRIAL DIV.

EDUCATIONAL PROGRA

COURSE NO. 1

PATENT LAW

MONDAYS, 6:30 to 8:30 P.M. **Starting Sept. 20, 1965**

Ebasco Auditorium, 2 Rector Street, New York, N. Y.

Course Coordinator: D. HAWKINS, *Consolidated Edison Co.*
Tel. 460-6019

This course has been set to provide the engineer with sufficient background with respect to matters relating to patent law. Mr. Hobart N. Durham and others of the law firm of Morgan, Finnegan, Durham & Pine will be the speakers.

1. **Sept. 20. Generalities**
   Patents, design patents, copyrights, trademarks, service marks, trade secrets and unfair competition. General principles and differentiation. Terms of protection.

2. **Sept. 27. What is patentable**
   Different types of subject matter, novelty and invention essential. Importance of detailed records. Invention—negative rules. Grounds of invalidity of a patent.

3. **Oct. 4. Searches & Ownership**
   Purpose of different types of searches. Role of Patent Agent or Attorney. Ownership and licensing of patent rights. Taxation of royalties.

4. **Oct. 11. Information for Attorney**
   Types of information attorney needs. Other data which may be needed. Joint and sole inventions. Who may apply for patent.

5. **Oct. 18. The Patent Application**
   Drawings, contents of specification. Purpose and importance of proper claims. Claim interpretation. Divisional, reissue and other types of applications.

6. **Oct. 25. Patent Office**
   Organization. Filing and examination of applications. Prosecution of applications, granting of patent, appeal and other special procedures.

7. **Nov. 1. Interference Procedure (Priority contests)**

8. **Nov. 8. Enforcement of patent rights**
   Types of suits, remedies and defenses.

9. **Nov. 15. Foreign patents, rights and problems**

10. **Nov. 22. Trade secrets and unfair competition**

COURSE NO. 2

JOINTS AND TERMINATIONS

TUESDAY, 6:30 to 8:30 p.m. **Starting Sept. 21, 1965**

Brooklyn Union Gas Co., Auditorium
195 Montague Street, Brooklyn, N. Y.

Course Coordinator: J. LADDEN, *L. V. Jochom Inc.*
Tel. 201 736-0440

A comprehensive review of all aspects of power cable connections and terminations from secondary through 345 kv voltages. Design, material selection, auxiliary systems and maintenance will be covered.

1. **Sept. 21. Design Theory of Joints and Terminals**
   Fields, shielding, insulating materials.
   Speaker: To be announced

2. **Sept. 28. Mechanical Consideration of Joints and Terminals**
   Mechanical connections, spiders, sleeves, wiping, welding, racking.
   Speaker: J. JEROME, *Jerome Hydraulics*

3. **Oct. 5. Secondary Systems (up to 600V)**
   Splicing, crab joints, moles, multitaps, joining aluminum to copper.
   Speaker: M. McCOY, *Burndy Corp.*

4. **Oct. 19. Splicing Low and High Voltage Cable Systems (600V to 69 kv)**
   Solid and low pressure gas filled type cables.
   Speaker: A. GRUENWALD, *Waterbury Cable Service*

5. **Oct. 26. Terminations for Low and High Voltage Cable Systems (600V to 69 kv)**
   Solid and Low pressure gas filled cables and plastic cables.
   Speaker: R. C. WATSON, R. M. DIXON } *H. K. Porter, Inc.*

6. **Nov. 9. 138 KV Low Pressure Oil Filled Cables Systems**
   Oil and system design, insulating and stop joints, bonding and cross bonding.
   Speaker: J. K. MATSUMOTO, *Consolidated Edison Co.*

7. **Nov. 16. Design of High Pressure Oil and Gas Filled Joints (69 kv, 138 kv, 345 kv)**
   Normal, reducing and semistop-joints. Use of air conditioning.
   Speaker: J. ZIMNOCH, *The Okonite Co.*

8. **Nov. 23. Installation of High Pressure Oil and Gas Filled Joints; Considerations of Design and Installation of Wye-Joints**
   Speaker: F. J. BENDER, *Long Island Lighting Co.*

9. **Nov. 30. High Pressure Oil and Gas Filled Terminals**
   Theory of capacitor pothead design, taping, piano rolls; aspects of electric fields and porcelain design.
   Speaker: R. B. GEAR, *G & W Electric Specialty Corp.*

10. **Dec. 7. Electrical and Mechanical Testing of Joints and Terminals**
    Grounding methods. Static electric test; impulse and switching testing.
    Speaker: T. A. BALASKA, *Phelps Dodge Copper Prod. Corp.*

The Institute of Electrical and Electronics Engineers, Inc.

North Jersey Section

FALL 1965 — LECTURE SERIES

A SURVEY OF MODERN MAGNETICS

A SERIES OF NINE LECTURES

STARTING ON THURSDAY, OCTOBER 14 AND

ENDING ON THURSDAY, DECEMBER 23

TIME — 7:00 - 9:00 P.M.

LOCATION — PUBLIC SERVICE ELECTRIC AND GAS — RM: 3171A

80 PARK PLACE NEWARK, N. J.

PLEASE POST ON BULLETIN BOARD

ALL COURSES OPEN TO THE PUBLIC

The Institute of Electrical and Electronics Engineers — North Jersey Section

Fall 1965 Lecture Series

A SURVEY OF MODERN MAGNETICS

The use of the properties of magnetics has permeated practically all facets of our technical culture. The purpose of this Lecture Series is to present a clear statement of the basic principles involved in magnetics and to weave into a coherent series an understanding of this important part of our technology. This series will consist of nine lectures starting on October 14, 1965.

Lecture Number 1 **Thursday, October 14**
Professor R. C. Barker, Yale University

Lecture Number 2 **Thursday, October 21**
Professor R. C. Barker, Yale University

Two lectures on the basic principles, concepts and materials used in modern magnetics. They will include: definitions of the fundamentals of magnetics, the meanings of the different units used to measure and some ideas on how to measure magnetic quantities.

Lecture Number 3 **Thursday, October 28**
Mr. C. M. Bailey, Bell Telephone Laboratories

Lecture Number 4 **Thursday, November 4**
Mr. C. M. Bailey, Bell Telephone Laboratories

Two lectures built on the fundamentals of the first two lectures and presenting the principles of magnetics as used in transformers and inductors.

Lecture Number 5 **Thursday, November 18**
Mr. E. O. Schulz DuBois, Bell Telephone Laboratories

Masers, and its principles applied in the use of magnetics.

Lecture Number 6 **Thursday, December 2**
Mr. L. J. Varnerin, Bell Telephone Laboratories

Magnetic microwave devices including circulators, rotators, and phase shifters.

Lecture Number 7 **Thursday, December 9**
Mr. U. F. Gianola, Bell Telephone Laboratories

Magnetic memories and digital components.

Lecture Number 8 **Thursday, December 16**
Mr. Milan P. Getting, Allis Chalmers

A demonstration-lecture devoted to the use of magnetic materials in electro-magnetic energy converters. Electrical-to-mechanical, mechanical-to-electrical and, electrical-to-electrical converters will be covered.

Lecture Number 9 **Thursday, December 23**
Mr. Theodore R. Specht,
Westinghouse Electric Corp.

Basic considerations in the use of soft magnetic materials in power apparatus. Illustrations of the principles involved with non-sinusoidal fluxes in the core.

Place: Public Service Electric and Gas Company, Room 3171A

Time: 7:00 - 9:00 P.M.

Price: Members $20.00, Non-members $30.00, $5.00 discount for advance registration

Registration limited to 120 persons. See next page for information.

Registration Information For IEEE North Jersey Section
Fall 1965 Lecture Series "A Survey of Modern Magnetics".

Registration limited to 120 registrants.

Time: 7:00 - 9:00 P.M. starting Thursday, October 14, 1965.

No lecture will be held on Veterans Day, November 11, 1965 and Thanksgiving Day, November 25, 1965. Final Lecture on Thursday, December 23, 1965.

Location: Public Service Electric and Gas Company, Room 3171A.
80 Park Place, Newark, New Jersey.

Registration Fee: $20.00 to Members IEEE, ASME, ASCE, AIME, NJSSPE, etc.

$30.00 to Non-members. Non-members wishing to join IEEE may apply $10.00 of their registration fee if they join IEEE during the duration of the Lecture Series. Please apply at door for refund.

For advanced registrants (registration received at least one week before the first session) there will be a $5.00 discount, reducing the cost of the course to $15.00 for Members and to $25.00 for Non-members.

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Mr. E. K. Van Tassel
3E-131 Bell Telephone Laboratories
Whippany Road
Whippany, New Jersey
887-1000 Ext. 2414

Please make checks payable to: *North Jersey Section IEEE*

COURSES ARE OPEN TO THE PUBLIC

I – Special Study Groups FALL – 1965

COURSE NO. 3

POWER SYSTEMS AND INTERCONNECTIONS

WEDNESDAYS, 6:30 to 8:30 p.m. Starting Sept. 22, 1965

Con Edison Co., Room 1701, 4 Irving Place, New York, N. Y .

Course Coordinator: T. BALASKA, *Phelps Dodge Copper Products Corp.* Tel. 914 963-8200 Ext. 403

Course provides a review of power system design and operation, and includes aspects of interconnections, system relaying and system stability. The role of computer application in power systems will be discussed.

1. **Sept. 22. Transmission System Part I**
Historical development, Design criteria (generator sizing, substation design, transmission line voltage selection).
Speaker: S. A. MALLARD, *Public Service Elec. & Gas Co.*

2. **Sept. 29. Transmission System Part II**
Operation — normal, maintenance, emergency.
Speaker: S. A. MALLARD, *Public Service Elec. & Gas Co.*

3. **Oct. 6. System Relaying**
Protection of generators, transformers, transmission lines. Philosophy of backup protection. Effects on stability.
Speaker: W. A. ELMORE, *Westinghouse Relay Instrument Div.*

4. **Oct. 13. System Interconnections Part I**
Historical development, factors influencing interconnections, in phase and quadrature load flow control, potential of future interconnections.
Speaker: C. CONCORDIA, *General Electric Co.*

5. **Oct. 20. System Interconnections Part II**
Operation methods, metering, control, problems, role of computer.
Speaker: H. G. STEWART, *P. J. M. Interconnection Office*

6. **Oct. 27. Power System Stability Part I**
Design criteria — steady state and transient.
Speaker: L. BRIEGER, *Consolidated Edison Co.* (Retired)

7. **Nov. 3. Power System Stability Part II**
Design criteria — steady state and transient.
Speaker: L. BRIEGER, *Consolidated Edison Co.* (Retired)

8. **Nov. 10. Digital Computer Application I**
Electric Load flow analysis, stability studies, economic studies.
Speaker: To be announced, *I.B.M.*

9. **Nov. 17. Digital Computer Application II**
Load dispatch, data logging.
Speaker: H. G. STEWART, *P. J. M. Interconnection Office*

10. **Dec. 1. Power Systems of the Future**
EHV, potential role of DC, trends in design of substations and transmission lines, generator sizes and mixture of peaking and base load machines.
Speaker: J. W. SKOOGLUND, *Westinghouse Elec. Corp.*

COURSE NO. 4

COMMUNICATIONS AND DATA TRANSMISSION

THURSDAY, 6:30 to 8:30 p.m. Starting Sept. 16, 1965

New York Telephone Company
Little Theatre 140 West St., New York, N. Y.

Course Coordinator: L. AMENDA, *Robert Bosch Corp.* Tel. 786-1644

A course outlined to give a broad view of the various means of communication from underwater media to outer space. The course will provide a good review of the systems, economic factors and design considerations.

1. **Sept. 16. Moving Communication Information**
Increases in quantities of data transmitted—Media—antenna systems, receiver systems, economics, wave behavior.
Speaker: F. B. WOODWORTH, *Airborne Inst. Lab., Div. Cutler-Hammer Inc.*

2. **Sept. 23. Transmission Line Characteristics and Capabilities**
Environmental conditions, wave propagation of carrier, material properties, qualities and characteristics, open wire and coaxial cable behavior, phase changing, attenuation and time delay.
Speaker: To be announced, *Bell Telephone Laboratories*

3. **Sept. 30. Selecting Suitable Path — "How to Get There"**
Line requirements, carrier frequency, governmental frequency specifications, enemy surveillance, jamming or RFI considerations, system compatibility and economics.
Speaker: To be announced

4. **Oct. 7. Spectrum Search and Antenna Site Surveys Environmental Tests**
RFI effects, electromagnetic measuring and analysis.
Speaker: To be announced

5. **Oct. 14. VLF Communication Path**
Frequencies below 60kc—use, reliability, special requirements.
Speaker: To be announced

6. **Oct. 28. Intercontinental Communication by Submarine Cable**
Reliability, design, maintenance.
Speaker: To be announced, *Bell Telephone Laboratories*

7. **Nov. 4. Microwave Lines**
Centimeter and decimeter waves, design, RFI effects, antenna construction, impedance matching.
Speaker: P. V. CREPEAU, *Polytechnic Institute of Brooklyn*

8. **Nov. 18. Long Range Communication by Passive or Active Reflectors in Space**
Types of reflectors, communication satellites.
Speaker: To be announced

9. **Dec. 2. Space Communication**
Space or earth-to-space station, environmental factors such as cosmic noise, re-entry effects, ionospheric blocking and reflection etc., equipment specifications and choice, LASER use.
Speaker: PROF. R. L. PICKHOLTZ, *Polytechnic Institute of Brooklyn*

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N. Y. Section, IEEE

Power and Industrial Div.

EDUCATIONAL PROGRAM — FALL — 1965

Metropolitan Section

ASME

INDIVIDUAL IMPROVEMENT STUDY GROUP

COURSE NO. 10

Public Speaking for Engineers

WEDNESDAY, 6:30-8:30 p.m. **Starting Sept. 8, 1965**

Room 1806-S Con. Edison Co., 4 Irving Place, N. Y. C.

Instructor: PROF. WM. WALTER DUNCAN
Bronx Community College of the City University

A Study Group designed for engineers who desire training in the fundamentals of the art of addressing and influencing audiences.

1. Stage fright and how to control it; basic principles of effective speech. Each man will introduce himself.
2. How to use the voice to express thoughts and feelings in a dynamic, communicative manner. Drills with the use of a tape recorder.
3. Good articulation for effective speech. Drills with the use of a tape recorder.
4. Vocabulary and the use of words with precision. Reports on word study.
5. How to express ideas clearly and vividly. Reports.

6.7.8. How to use visual aids effectively. Carefully prepared visual aid speeches.

9.10.11. The subtle art of persuasion: Selling ideas, products and services. Carefully prepared, persuasive speeches.

12. An introduction to General Semantics. The analysis of language and communication with applications from the engineer's professional environment. Guest lecturer: George M. Bernard, Past Chairman, Metropolitan Section.

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

Theory and Mechanics of Technical Reports

THURSDAYS, 6:30-8:30 p.m. **Starting September 9, 1965**

Room 1806-S 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. INTRODUCTION—Course description and purpose, communication of ideas.
2. WRITTEN COMMUNICATION—Types, purpose and for whom.
3. THE OUTLINE—Purpose, value, mechanics—Use of
4. FIRST DRAFT—Part I—Style, grammar, effectiveness (General)
5. FIRST DRAFT—Part II—(Specific) Choosing the media, layout, illustrations.
6. FINAL REPORT—Draft review, production, final check.
7. ORAL REPORTS—Principles of speaking, outline, presentation.
8. PREPARATION OF ORAL REPORT—Use of index cards, timing, use of aids.

9.10. DELIVERY OF STUDENT REPORTS—Prepare short report (term project) for presentation & discussion.

REGISTRATION (*Continued from First Page*)

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Computer

GROUP OFFICERS NOMINATIONS FOR 1965-66

For Chairman
Harry R. Clark

For Vice Chairman
Edward R. Byrne

For Treasurer
Louis M. Small

For Secretary
Oscar Shapiro

Harry Clark received his BSEE degree in 1951 from Newark College of Engineering. He has been with ITT Federal Laboratories since 1959 and is a Section Head in the Digital Communications Group of the Switching and Terminal Equipment Laboratory. He is currently supervising the design of a large digital and analog command and control system.

Mr. Clark is a member of the IEEE. He has been active in helping form the NJ Computer Group. He has served as Publicity Chairman, Treasurer and Secretary in the Metropolitan and NJ Chapters of the Computer Group.

Edward R. Byrne received his BS degree in 1954 and his MS degree in 1955, both from Notre Dame University. He has been with Bell Telephone Laboratories, Whippany, since 1957 and is now Supervisor of Military Data Systems Engineering. His activities cover a range of digital computer applications from the point of view of both hardware and software.

Mr. Byrne is a PhD candidate in Systems Engineering at Brooklyn Polytechnic Institute, majoring in Systems Science. He has served as Vice-Chairman of the NJ Computer Group during 1964-65.

Louis Small received his BSEE in 1954 from Columbia University and his MSEE in 1956 from Newark College of Engineering. He participated in the development of magnetic core memory systems for commercial use with General Ceramics Co. and helped develop the input-output sub-system for the 465L Command and Control System while at ITTFL. He has been with Communication Systems Inc. since 1963, where he is working on various terminal equipments.

Mr. Small is a member of the IEEE and served as Secretary of the NNJ Computer Group during 1964-65.

Oscar Shapiro received his BS degree in 1943 from the University of California and his MSEE in 1957 from Stevens Institute of Technology. He joined ITT Federal Laboratories in 1943 and is presently a Section Head in the Digital Systems Laboratory. Since 1960, he has contributed to the 465L command and control system, the UNICOM stored program message-switching system, and several smaller systems. He is presently Supervisor in charge of the DATA/DISPLAY/CONTROL System for the Pacific Fleet Tactical Range.

Mr. Shapiro is a member of the IEEE.

HYBRID COMPUTING SYSTEMS

A presentation on *Hybrid Computing Systems* will be given by Dr. E. E. Mitchell at the first meeting of the NJ Computer Group. Election of officers for the 1965-66 year will also be conducted.

The meeting will be held on *Wednesday, September 15, 1965 at 8:00 P.M.* at ITT Federal Laboratories, Nutley, New Jersey. A pre-meeting dinner will take place *at 6:00 P.M.* in the Copperhood Restaurant, Lyndhurst, New Jersey.

A general presentation will be given on the development of hybrid computing systems as dictated by the demands of modern simulation laboratories. This will be followed by a description of the specific application of hybrid computers to the simulation of a temperature-rate flight control system for re-entry vehicles. It is also tentatively planned to present a video tape-television display of this specific application.

Although the simulation could, in theory, have been performed on an analog or digital machine alone, the capabilities of either would have been severely limited, or lacking, in meeting the rigid computational requirements necessary to attain the problem objectives.

These requirements dictated the need for a computing system incorporating stored-program digital accuracy and analog speed plus high-speed programmed communication between these domains, concurrent 2-variable function generation, and logical control.

Dr. Mitchell received his Ph.D. from the University of Liverpool, England in 1959, having conducted successful research in electrical discharge phenomena. His undergraduate work in Physics was completed at Cambridge University in 1956.

Since joining Electronic Associates, Inc., in 1962, he has worked in process control systems design, developing several multivariable computer control schemes for cement kilns and paper machines. He has also developed a hybrid computer program of value in the simulation of nuclear reactor heat transfer studies. Dr. Mitchell has also made valuable contributions to the analysis and programming of aerospace vehicle trajectories for hybrid computer simulation.

Pre-Meeting Film
PLOTLINES
Electronic Associates, Inc.

In addition to the main meeting, a pre-meeting film will be shown *at 7:30 P.M.* This film describes the significance of data-plotter analysis of data processing information. Included are applications making weather maps, oil exploration maps and U. S. Government market sheets.

N. Y. Electron Devices

Operating Principles and Construction of MOS Transistors

Presented by: Dr. Fred P. Heiman
RCA Laboratories,
Princeton, New Jersey

Date and time: Thursday, September 23, 1965 at 8:00 P.M.

Place: ITT Federal Laboratories
Auditorium
Nutley, New Jersey

Pre-meeting Dinner: Copperhood Restaurant (6:00 P.M.) South of Route 3 at Park Ave. Exit

A brief history of field-effect devices will be given. Attention will be focussed on the single-crystal silicon MOS transistor. Current research investigating the drift observed in many devices performing under severe operating conditions will be described and special attention given to the application of the MOS transistor to integrated logic circuits.

Dr. Heiman was graduated from the City College of New York in 1960 with a BSEE degree. He continued his education at Princeton University under a David Sarnoff Fellowship and received his Ph.D. degree in June, 1964, from the Department of Electrical Engineering.

After completion of the Research Training Program, he worked on the development of the insulated-gate field-effect transistor and for this work was a co-recipient, with Steven R. Hofstein, of an RCA Laboratories Achievement Award in March 1963.

CHAIRMAN'S CORNER

WHERE TO NOW ?

A new chairman, upon inauguration, takes stock of his responsibilities. This is what this chairman sees.

The North Jersey IEEE, as a consequence of the dedication and perspiration of its past officers and committee members, has achieved a stature of substance among the sections of IEEE. It is the fifth largest, boasting 5,000 members; its publication, the Newsletter, is among the finest published among the sections; its program activity is of a level greater than most; and its membership includes a formidable roster of the leaders of our profession. Membership participation in its many activities is comparable to that of many other sections, however, it is not as dynamic as it might be.

During the past year, under the able guidance of John Redmon and Roger McSweeney, an extensive study was made of section activity as it relates to the needs and desires of the membership. This study and related discussions have resulted in the following proposed program for the year 1965-1966.

a. The group chapter meeting will continue as the principal vehicle for the dissemination of highly specialized information. Where specific group activities appear to have wide interest, the section will jointly sponsor the meeting, thereby providing broader publicity and recognition of the significance of the subject.
b. The section, in addition, will sponsor activities of more general interest, specifically the annual awards banquet, field trips, educational programs, technical sessions of widespread application.
c. The section will continue to encourage student participation and will sponsor meetings wherein the student can anticipate the professional environment regards publication of papers, industrial practice, professional growth, etc.
d. The section will attempt, in any way possible, to become the mechanism of continuing informal engineering education to keep its membership informed and interested, and combat middle-aged technical obsolescence.

The Section program is well along. It already includes many technical sessions, a students night, two field trips and of course the annual awards banquet. The educational program includes a series on magnetics and another is being planned in the computer application field.

But this is only part of the program. The executive committee has many other suggestions, however, we would like better to know the desires and needs of the membership. If, as an individual or a group, you have a subject which you would like to present or have presented, let us hear about it. Together we can create the kind of program you want, and become the kind of a section we all want.

Walter L. Glomb, Chairman — Phone 201 - 284-2931

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Performance features include:

Bandwidth (with new P6010 Probe)
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- 5 mv/div > 40 Mc
- 1 mv/div > 25 Mc (Channels cascaded)

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NEW INSTRUMENTS

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The 414A Autovoltmeter, a new 12-range all-solid-state dc voltohmmeter from Hewlett-Packard, gives accurate measurements immediately with automatic ranging. Operation is simply touch and read.

The Model 414A silently selects correct range and polarity in less than 300 milliseconds after contact is made. Both range and polarity appear on an illuminated display; the reading appears on a mirror-backed, individually calibrated taut-band meter.

DC voltages are measured at sensitivities from ±5 millivolts to 1500 volts full scale. Accuracy is ±0.5% of reading ±0.5% of full scale. Input resistance is 10 megohms on the two longest scales. 100 megohms on full-scale ranges from 50 millivolts up.

Resistance is presented on linear scales with full-scale ranges from 5 ohms to 1.5 megohms. Current through the unknown is 1 milliampere up to 5000 ohms, 1 microampere above 5000 ohms. Accuracy is ±1% of reading ±0.5% of full scale on all ranges.

The modular cabinet is less than 7" high, $7\frac{5}{8}$" wide and 12" deep. It is readily rack-mountable by means of available accessories. And the Model 414A is priced at only $650.

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Model 6920A is a versatile AC/DC METER CALIBRATOR, capable of constant voltage and constant current output. Its absolute accuracy of 0.2% on DC and 0.4% on AC makes it suitable for laboratory or production testing of panel meters, multimeters, and other meters having an accuracy of the order of 1.0% or higher.

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Model 6920A has been packaged in one of the new H-P cabinet modules suitable for bench or rack use; it occupies ½ rack width when placed in a 7" high standard relay rack mounting assembly.

H-Lab's 6920A is $6\frac{3}{4}$" high by $7\frac{13}{16}$" wide by 11" deep and its weight is 15 pounds. The price is only $695.00. For full information on the 6920A, call or write your RMC Field Engineer.

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