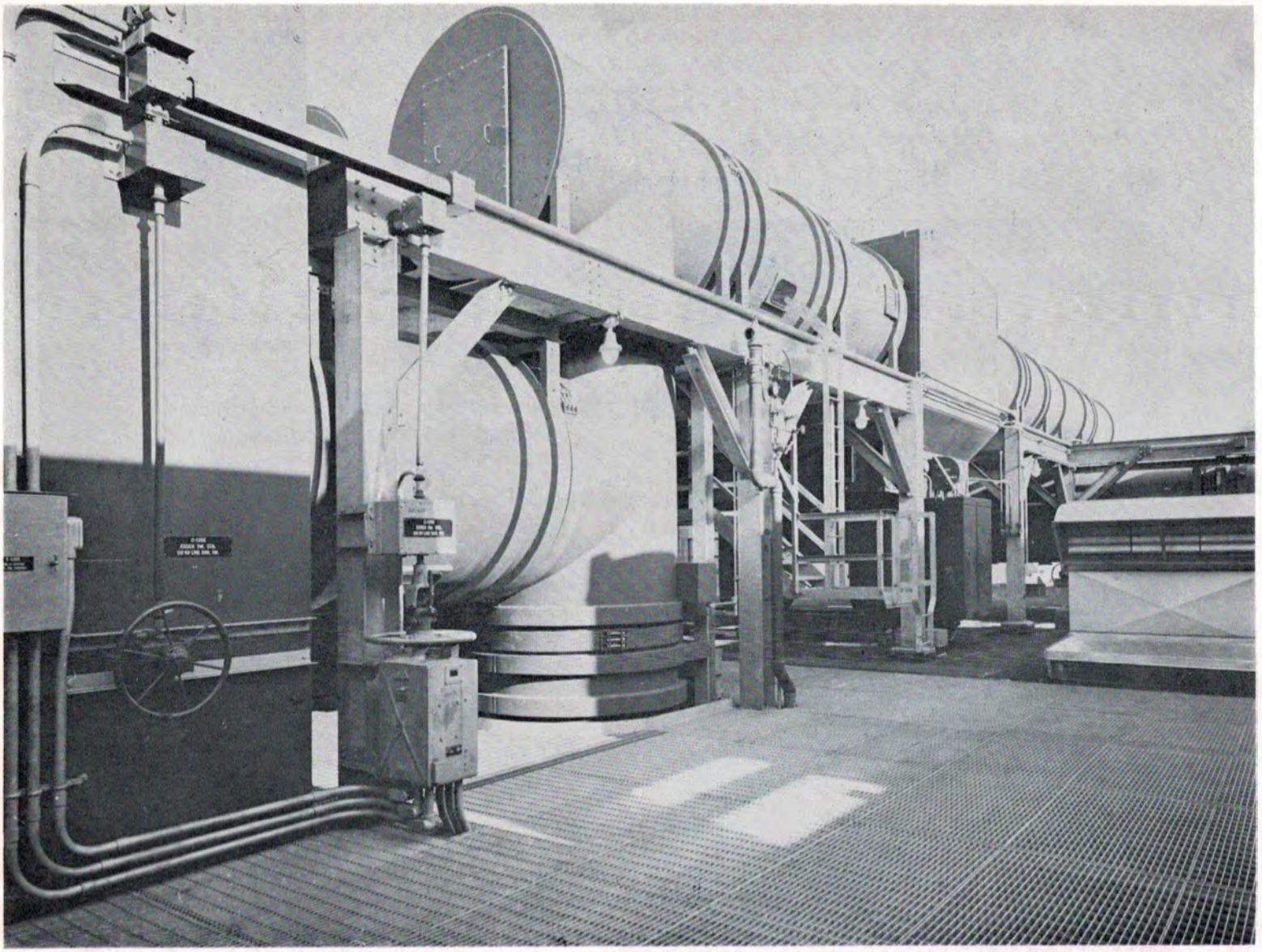

The Newsletter

The Magazine of the North Jersey Section of the IEEE

IEEE NEWSLETTER
North Jersey Section
P. O. Box 275, Morris Plains, N. J.

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JANUARY 1964

Volume 10 / Number 5

New DC to 1500 Mc Voltmeter

Voltage Accuracy: ±2% of reading above one-tenth of full scale. 0.005v minimum dc reading

Only one scale for all voltage measurements. Prevents reading wrong scale. Expanded scale for measurements below 1.5v ac.

Measures up to 1500 volts directly, ac or dc; no external multipliers required.

Wide-range ohmmeter — 0.2 ohm to 1000 megohms in four ranges.

Input Impedance: AC, 25 megohms, DC, 100 megohms or "open grid" (on all but 1500v range). Grid current is less than 10^{-10} ampere.

Built-in storage socket and reel for probe and its cable.

Handy storage compartment for accessories.

Calibration Stability is Excellent. The heart of the Voltmeter is a stable tube-and-transistor amplifier. There is so much feedback that changes in tube transconductance or transistor current gain have practically no effect.

Wide Frequency Range — within ±3 db up to 1500 Mc; resonant frequency of probe is above 3000 Mc.

Input Impedance: 25 megohms in parallel with 2 pf.

Wide variety of probe tips supplied.

Accessory Tee Connector available for uhf measurements in coaxial systems (Type 1806-P1, $35.00).

Type 1806-A Electronic Voltmeter . . . in convenient flip-tilt case for portability, doubles as an adjustable stand — also available in rack model. Price either model **$490** (in U.S.A.)

GENERAL RADIO COMPANY

WEST CONCORD, MASSACHUSETTS

Sales Engineering Office in NEW YORK: Broad Avenue at Linden, Ridgefield, New Jersey
George G. Ross • J. P. Eadie • Peter Bishop • Richard K. Eskeland
Tel: N. Y. 212 964-2722 • N. J. 201 943-3140 • TWX: 201 943-8249

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.

EDITORIAL NOTES

OPUS OR OOPS !

Editorials, especially first editorials, are not easy to write. When we first joined the staff, not as editor of course, there was no difficulty in thinking of what ought to go into an editorial. But now the aspect has taken a different coloration. Similarly, it is easy for a non-participant to criticize the organization's activities.

Let's ask some questions: Why did you join the IEEE? Was it to keep informed of the progress in your field? Was it to meet with people in your field and allied fields? Or did you join in order to be able to complete a space on an application form or on your resumé? These questions are prompted by noting that attendance at all section meetings is small.

Information about meetings is disseminated by "The Newsletter" and bulletin board announcements. Individual postal cards would not be economically feasible within the section's budget.

So we come to the crux of the question — with approximately 5,500 members in the North Jersey Section, why are less than 1% (one percent) attracted to the meetings? Are the subjects too simple? Do you, the members want more complex subjects? Is the place inconvenient? Would you prefer a location just around the corner from you home? Are the meeting times too late? Do the meeting days conflict with other activities?

The only way the Program Committee can make effective plans for meetings is, for you, the membership to tell them what you want. Are you afraid to voice your wishes because you might find yourself nominated to plan a meeting? The only way to make any improvements is to get off your assignment of inactivity.

Our section has a program for the current year only because there are active members engaged in planning meetings, selecting speakers and setting up educational seminars. This is the backbone of the organization. The only way to strengthen the backbone is to become active. Attend meetings, and make your wishes and interests known.

CONGRATULATIONS MIKE

With this issue, Mike shifts from his role of Editor to that of Business Manager. We wish him luck, and take this opportunity to thank him for all his help in the past. We know that his work in the future will be of the same high caliber. B.M.

THE COVER

138-kv pothead cubicles and 132-kv bus structure located on the roof of the Newark Switching Station.

The

Newsletter

Published monthly by the North Jersey Section of the Institute of Electrical & Electronics Engineers, Inc.

Volume 10 **JANUARY, 1964** **No. 5**

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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 records of membership are changed when Headquarters notifies us of any change.

REPORT ALL ADDRESS CHANGES TO: INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, BOX A, LENOX HILL STATION, NEW YORK 21, N. Y.

PTG RELIABILITY

RELAY I COMMUNICATION SATELLITE

A presentation on "The Relay I Communication Satellite" will be given by Mr. Richard P. Dunphy of RCA at the meeting of the Metropolitan Chapter of the Professional Technical Group on Reliability on January 14, 1964. This meeting will be held at the United Engineering Center, Room 125B, 345 East 47th Street (First Avenue at 47th) New York City, beginning at 7:45 P.M.

In his talk Mr. Dunphy will stress the great importance of reliability engineering considerations in relation to the continued successful operation of the Relay I Satellite for a period in excess of 300 days in orbit. The overall system concept and operating parameters will be described, and the various factors pertaining to the achieved operating reliability will be emphasized. The application of redundancy techniques to accomplish reliability objectives and the part control program will be discussed in some detail. In addition, Mr. Dunphy will speak about some of the space simulation environmental testing required for evaluation of satellite models.

Biography

Mr. Dunphy joined the Radio Corporation of America in 1955, and is currently Project Manager for Project Relay. Prior to this assignment he was Manager of Central Engineering, Defense Electronic Products, RCA. He graduated from the Michigan College of Mining and Technology in 1941 with a BS degree in Physical Metallurgy. Mr. Dunphy has done extensive research in the field of metallurgy, and was associated with the United States Naval Research Laboratory, Washington, D. C. for approximately 12 years.

MEETING NOTICE

SUBJECT: THE RELAY I COMMUNICATION SATELLITE
SPEAKER: Mr. Richard P. Dunphy, Radio Corporation of America
PLACE: United Engineering Center, Room 125B, 345 East 47th Street (First Avenue and 47th) New York City
DATE: January 14, 1964 (Tuesday)
TIME: 7:45 P.M.

NEWARK SWITCHING STATION

SUBJECT FOR FIELD TRIP

The January meeting of the Northern New Jersey Section will be a combined talk and field trip to Newark Switching Station of Public Service Electric and Gas Company. Mr. R. N. Southgate, Assistant Electrical Engineer, Electric Engineering Department, will present a short talk describing the station and the features of its particular design.

Newark Switching Station is an indoor transforming and switching station with three 138-kv pipe type cable entrances, a roof mounted aluminum enclosed isolated phase 138-kv bus, three 135,000 kva 138/26/13 kv transformers, a 26-kv metal clad bus with 13 outgoing circuits. The 138-kv circuit breakers are compressed air dead-tank type. The station was originally placed in service in December 1959. The installation of the third 138-kv line, third transformer and associated extensions of the 26-kv and 13-kv busses has recently been completed.

The building employs an unusual structural arrangement in that most of its exterior walls are precast, pretensioned, double tee shaped slabs, 61' high by 4' wide installed vertically with the stems of the tees on the exterior. The walls in front of the transformer bays are flat, removable, precast slabs. There are extensive facilities for compressed air supply, gas supply for gas filled cables, emergency removal of smoke in case of fire, water spray fire protection for the transformers and air conditioning of the control room.

Mr. Southgate presented an AIEE Transaction Paper on this subject at the organizations' General Meeting in June 1960 Mr. C. G. Troxell, Division Substation Engineer, Essex Division, will discuss the operating procedure used by personnel operating this station. Mr. Troxell is in charge of maintenance and operation of substations and switching stations in Essex Division Electric Distribution Department.

The meeting will start promptly at 7:30 P.M. on January 15, 1964 in Conference Room 3171A at 80 Park Place, Newark, New Jersey. Please use the main entrance, the night elevator operators will direct you to the conference room. After the talks, the group will be transported by bus to Newark Switching Station, located at the corner of Willow and Plane Streets, Newark, New Jersey. Following the guided tour of the station, return transportation to 80 Park Place will be provided. If anyone arrives at the meeting later than 8:15 P.M. it is suggested that he join the group when they arrive at the Switching Station.

Public parking garages are available both at the Military Park Parking Garage, opposite 80 Park Place, and on the east side of Plane Street just north of the station.

PTG
Aerospace & Navigational Electronics

The January meeting of the New York Metropolitan Chapter of PTGANE will be as follows:

DATE: Thursday, January 9, 1964

TIME: 8:00 P.M.

PLACE: Willkie Memorial Auditorium
20 West 40th Street
New York City

SUBJECT: Panel discussion on "FUTURE OF INERTIAL GUIDANCE IN AVIATION, IN MISSILES, IN SPACE"

Moderator: The panel will be chaired by a distinguished member of the MIT Instrumentation Laboratory.

Panel Members: Mr. Charles Benfield, Inertial Guidance Designer, Minneapolis—Honeywell Corporation. Mr. Ben McCloud, Electronic Systems Engineer, Pan American Aviation. Dr. Paul H. Savet, Member of the Scientific Staff for Engineering Operations of Arma Division of American Bosch Arma Corporation. Mr. Willis G. Wing, Technical Planning Consultant, Research and Development Group, Sperry Gyroscope Company.

Topics: Use of Exotic Sensors such as Electrostatically Suspended Gyroscopes and Accelerometers — Nuclear Gyros — Cryogenic Gyros and Accelerometers — Strapped-Down Systems — Optically Aided Inertial Systems — Light Weight/Low Cost Gyros — Two Axes versus Three Axes Platforms — Inertial Systems for the Next Generation ICBM's — Inertial Guidance Systems for APOLLO and future Deep Space Vehicles — the Coming Shakeout in the Inertial Guidance Industry — What the Military and NASA will require in tomorrow's Inertial Guidance Systems and Components.

Pre-Meeting Dinner: 6:30 P.M.
Old Seidelburg Restaurant
626 Third Avenue
(between 40th and 41st Street on the West Side of Third Avenue)

EXECUTIVE COMMITTEE REPORT

C. W. VADERSEN, *Chairman*

The North Jersey Section has now completed its third month of operation on a fully merged basis. As reported in September, our major problems of consolidation have been solved, leaving us principally with current and anticipated operating problems.

One such problem, of long standing, has been the matter of attendance at meetings. Over the years, this has been subject to all kinds of analysis ranging from the intuitive to the analytical, resulting in a list of causes and effects longer than the proverbial arm of the law. Yet, no one thing (or even two or three) has been identifiable as a principal contributor to good or poor attendance. There are, of course, a number of factors of proven influence such as:

1. Subject matter
2. Reputation of the speaker
3. Timely and effective Publicity
4. Competitive attractions (other meetings, etc.)
5. Geographic location of meeting
6. Weather

which as an ensemble are known to be important.

Those of us who manage the section are giving a great deal of attention to these factors. For instance, we have a rather large and energetic Program Committee that carefully considers items, 1, 2 and 4, not only on its own but with the cooperation of people from the New York and Long Island Sections as well as with the PTG Chapters. Similarly, the prime consideration of our Newsletter staff is item 3. As for item 5, we do our best to vary the locations of meetings, such that they should not discriminate against members from any one area in any consistent way. Perhaps some day the collective genius of IEEE will find an effective way to deal with item 6.

Although we feel we have made some progress in minimizing competitive attractions by turning over a number of monthly dates, formerly used by the Section, to the PTG Chapters; our sense of overall accomplishment is meager indeed. As a consequence, we are still asking ourselves the question: "Why can we not get larger audiences for our meetings?" If there are answers to this question, surely they must come from the membership. We therefore urge you, one and all, to let us have your comments and suggestions, by sending them to the Newsletter Editor.

On a more cheerful note, we can report that good progress is being made in the overall organization of the PTG setup within the Section. This activity is being handled by Vice Chairman John Redmon, who would be most happy to hear from members as to their wishes and viewpoints on PTG matters. He can be reached at Newark College of Engineering, EE Department.

Those members who are in the power industry will be pleased to hear that we have petitioned for the formation of a local chapter of the PTG Power. A reasonable expectation is that this will be a going concern by the time this column is read.

DIELECTRIC DILEMMA

"The Dielectric Dilemma with Electronic Devices" will be the subject of Mr. Robert Doran, CFI President at the February meeting of the Professional Technical Group of Product Engineering and Production of IEEE. Date — February 26, 7:30 P.M., at Willkie Memorial Building, 20 West 40th Street, New York City.

When a dielectric is required, the choice of material may be organic, glass, or ceramic; and this decision can be of considerable importance.

Discussion will cover the inherent properties and limitations of ceramic material as they control the design, fabrication and operational parameters of electronic devices. Specific consideration will be given to the problems relating to fabrication of precision ceramic shapes and production of vacuum-type ceramic and metal composites as used in microwave varactors, high temperature relays, power transistors, heat sinks, microwave windows, integrated circuit packages and ordinance mechanisms.

This talk will be illlustrated with slides.

SPEAKER

Mr. Doran received his BS degree from New York State College of Ceramics at Alfred University and MS from Penn. State. He was Section Head of the Ceramic and Glass Section of the Product Development Laboratories of Sylvania Electric from 1939-1958.

INSTRUMENTATION DIVISION N. Y. DIVISION IMPEDANCE MEASUREMENT

Basic to any problem of circuit analysis or system design is the measurement of impedance. However, many difficulties are encountered in making this measurement. Such factors as voltage and current levels, frequency ranges, leakage, and stray effects complicate test procedures and may introduce serious inaccuracies in the measurement. To review this subject, the Instrumentation Division of the IEEE New York Section is sponsoring a study group on Impedance Measurement Techniques, which will meet on consecutive Monday evenings from February 17 to April 13, 1964, at the Ebasco Auditorium, 2 Rector Street, New York City. For further information and advance registration, contact Professor R. R. Meola, Newark College of Engineering, Newark, N. J.

At the sessions, various speakers from industry, universities, and government will discuss standards, measurement techniques and special problems associated with different frequency ranges. The spectra to be covered include power frequencies, audio and carrier frequencies, rf, vhf, uhf, and microwave. Both lumped and distributed R, L, C parameters will be considered, and techniques for both active and passive two-port networks will be discussed. The final session will extend impedance measurement concepts to non-electrical problems.

PLAN VISIT TO KEARNY

The Communications and Electronics Division of the New York Section has arranged for a tour of the telephone cable manufacturing facilities at the Western Electric Company at Kearny, N. J. It is here that the supply unit of the Bell System produces cable to fulfill the exchange area cable needs of the various operating companies. The field trip has been set for Wednesday, January 29, 1964, starting at 1:30 P.M. and ending approximately 3:15 P.M. Bus transportation will be available for $1.50 round trip. Departure time will be 12:45 P.M. and will return to the same location at approximately 4:00 P.M.

The tour will start with a visit to the Wire Mill where 25 wire drawing machines, with a capacity of 30,000 tons of drawn copper per year, produce the various gauges of wire to be used in telephone cables.

Please send reservation form in this issue of Newsletter as soon as possible to insure transportation for all interested members. Contact Howard H. Richter, telephone number 212-394-6144 for any further information.

Please make a reservation for me to visit the Western Electric Company cable manufacturing facilities at Kearny, N J.

Name .....
Pos. .....
Firm .....
Bus. Tel. .....
Bus. Address .....
Member of .....
Enclosed $1.50 for bus transportation
U. S. Citizen ..... yes ..... no

Please make checks payable to C & E Division, New York Section, IEEE.

NORTH JERSEY SECTION IEEE EXECUTIVE COMMITTEE

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Vice Chairman ..... J. Redmon
Treasurer ..... J. P. Van Duyne
Secretary ..... S. A. Mallard
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Member at Large .... A. E. Hirsch, Jr.
Past Chairman ..... A. W. Parkes

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Electronic Computers ..... D. Perry
Engineering Writing and Speech ..... J. Stacy
Microwave Theory and Techniques ..... H. Engelman

NEWSLETTER STAFF

Business Manager ..... M. M. Perugini
Editor ..... B. Meyer

Executive Committee Meetings

January 8, 1964
February 5
March 4
April 1
May 6
June 3

PTG
ELECTRON DEVICES
LATEST ON LASERS

A talk on "Recent Advances in the He-Ne Gas Laser" will be presented by Dr. Eugene I. Gordon at the next meeting of the N. Y. Metropolitan Professional Technical Group on Electron Devices.

The meeting will be held on Thursday, January 16, 1964 at the International Telephone and Telegraph Laboratories, Nutley, N. J., at 8:00 P.M.

Abstract of Talk

The talk will consist of two major topics. The first concerns spectroscopic and microwave diagnostic techniques which have been applied to the He-Ne discharge in the geometry, pressure and current regime appropriate for obtaining population inversion in the 6328Å and 3.39μ transition. Considerable insight into the mechanisms responsible for the population inversion has been obtained.

The dependence of gain on geometry is considered. It is shown that the approximate proportionality between gain and the reciprocal of the discharge diameter arises from the geometry dependence of the average electron energy and not from the need to destroy metastables by wall collisions. Corollary relations between discharge current and voltage and discharge diameter are also shown.

The second topic concerns experiments with single frequency (single mode) optical oscillators. Constructional techniques and output properties will be detailed. A description will be given of optical heterodyning experiments with a swept frequency oscillator operating at 6328Å.

The Speaker

Gene Gordon was born in New York City and received a BS degree in physics from CCNY in 1952. In 1957 he was awarded a PhD degree in physics from MIT; his thesis subject was plasma physics. That same year he came to Bell Telephone Laboratories, Murray Hill, N. J. and has done work in plasma physics and microwave electron beam devices.

IEEE NORTH JERSEY SECTION
SPRING 1964 STUDY GROUP

Process Instrumentation and Control for Industrial Plants

The modern industrial plant today is relying to a far greater degree on automatic controls for production and quality control. New developments have revolutionized the control of many processes. In many plants there is a lack of complete understanding of the functional requirements for industrial process control.

This study group is intended to give a broad background on the fundamentals of measuring, recording and automatically controlling the variables encountered in most industrial plants.

As in our previous study groups, a minimum of control experience is necessary. In order to give the maximum benefit to all persons concerned, our discussions will not be of a a complex nature involving advanced physics or higher mathematics. The lectures will be in a general vein. We will dwell upon standard process equipment built by the leading manufacturers.

It is our intention that these sessions enable those attending to acquire a basic understanding of instrumentation so that they may recognize production opportunities, apply correct equipment and develop preventative maintenance programs.

The text material for this study group will be INDUSTRIAL INSTRUMENTATION FUNDAMENTALS, by Austin E. Fribance. This is an up-to-date text covering the majority of process variables found throughout the industry.

Your instructors will be experienced electrical engineers from the leading instrument manufacturers who have devoted the major part of their experience to the application, design or service of this type of equipment. Instructors for the course will be named later.

Starting Date — Thurs., Feb. 20, 1964

Time — 6:30 P.M. to 8:30 P.M.

Location:
Vail Hall, Bell Telephone Bldg., 540 Broad Street, Newark, N. J.

Registration Fee:
$15 to members of IEEE, ASME, ASCE — $25 to others.

Text Book:
Will be made available to those attending at a reduced price.

Session 1—Thursday, Feb. 20, 1964
Variables to be Measured and Basic Types of sensing Elements — Temperature Measuring Devices, Pressure Sensing Elements, Speed Measuring, Stain Indicators, Flow Meters, Electrical Quantities.

Session 2—Thursday, Feb. 27, 1964
Basic Types of Instruments — Measuring Small Signals, Recording Instruments, The Potentiometer — Theory and Utilization.

Session 3—Thursday, March 5, 1964
Basic Modes of Control — Simple On/Off Control, Time Proportioning, Rate, Reset, Proportional Band.

Session 4—Thursday, March 12, 1964
Final Control Elements — Motors, Valve Positioners, Saturable Reactors and Mag Amps, Ignitrons, Silicon Controlled Rectifiers, Positioners for Rheostats, Servo Valves.

Session 5—Thursday, March 19, 1964
Typical Examples of Control Systems — Utilization of Items Covered in Sessions 1 thru 4, Cascade Systems, Program Systems, Feedback Systems, Pitfalls in Designing Systems, Safety in Control Systems.

Session 6—Thursday, March 26, 1964
Future of Control Systems — What's Ahead — On-Line Process Computers, Analog and Digital Systems, Digital Sensing Elements, Digital Readout and Recorders.

NOTE: Advance registration is solicited to facilitate early acquisition and distribution of the Text Book.

Send Advance Registrations to:
Mr. R. Kudisch, ITT Communication Systems, Inc.
South 60, Route 17, Paramus, N. J.

Make checks payable to:
North Jersey Section IEEE.

Enclosed is a check for $ ..... for advance registration for the Process Instrumentation Control for Industrial Plants.

Name .....

Home Address .....

.....

Firm .....

Position ..... Member of .....

Business Address .....

Business Phone .....

PTG ENGINEERING WRITING & SPEECH SPEAK EFFECTIVELY

Mr. Vincent Vinci of General Precision Aerospace will give an audience participation talk and demonstrate some of the techniques of effective public speaking. Remember the date is Thursday,, February 13, 1964 at the Kearfott Auditorium in Little Falls.

The presentation is oriented toward the improvement of everyday speech, it is in three parts which cover voice, diction, and speech improvement. Mr. Vinci's talk is based upon his extensive communications experience in broadcasting and publishing. His approach is that of self-help.

WRITE FOR YOUR READER

Popular scientific articles combine the simplicity and the clarity of news writing with the personal appeal of magazine writing. The facts must not only be accurately and interestingly reported, but they must be free of classified or proprietary material. Exhaustive research, carefully planned interviews and painstaking writing are also essential.

In general, popular scientific articles serve one or more of four purposes:

1. They inform the reader of significant facts or events which he did not know.
2. They interpret for the reader the implications of a scientific development or invention.
3. They explain science and complex technology in simple language that the average reader can understand.
4. They apply the facts in scientific and technical subjects to the life of the reader.

Because science is such a complex subject, every word must be carefully weighed to make sure that it conveys the exact meaning you want it to convey. Understanding a technical subject yourself is one thing. Conveying it to the reader is another. Communicating the subject is analogous to teaching it. You must write with such exactness that the reader understands every fact or explanation.

But, understanding is not enough. You must anticipate every question the reader may ask — especially WHY and HOW. You may have to assume that he knows little or nothing about the subject. Yet you cannot afford to get too elementary. You must constantly strive to meet him on common ground and explain things in terms with which he is familiar.

(After Navy Training Course, NAVPERS 10295)

WRITING-IMPROVEMENT SEMINAR

Banquet speaker at the Seminar on Writing-Improvement Programs for Engineers being co-sponsored by PTG-EWS and PTG-E on February 24-25 will be Dr. James Hillier, Vice-President, RCA Laboratories, Radio Corporation of America, Princeton, New Jersey. Dr. Hillier's subject will be "Engineering Writing: The Larger View of Management".

Arrangements have been completed for the two-day seminar at the Hotel Delmonico, 59th Street and Park Avenue, New York City. The program will start on Monday, February 24th, at 9 A.M., with a welcome and keynote speech by the Seminar Chairman, C. A. Meyer (RCA). Four discussion periods will follow, led off by brief talks by panels of specialists in the particular fields.

The Monday morning session on "Specific Needs of Engineers for Writing Improvement" will include as panel members J. N. Shive (BTL), P. K. Furney (Ohio SPE), E. E. Grazda (Hayden Pub. Co.), and G. Kiessling (RCA); session moderator will be W. J. Underwood (RCA). The panel for the afternoon session on "Course Content of Writing-Improvement Programs" will include R. R. Rathbone (MIT), E. Ehrlich (Columbia University), A. Mansfield (Atomic Power Dev. Assoc.), and S. Wilcox (Arizona State University); moderator will be C. W. Sall (RCA). The afternoon session will be followed by a reception and banquet on Monday evening.

The program will continue on Tuesday morning with a session on "Program Administration". Panel members will include J. A. Miller (BTL), R. Gunning (Robert Gunning Assoc.), J. R. Gould (RPI), C. H. Stephans (NCE), and R. Rollf (MITRE); session moderator will be E. M. McElwee (RCA). The final session on Tuesday afternoon will consist of an "Evaluation" by H. Oreal (University of Kansas), followed by some "Recommendations for the Future" by T. Farrell (MSU) and W. C. Praeger (RCA). Moderator for the final session will be J. D. Chapline (Philco).

A registration fee of $30 will cover participation in the four discussion sessions and attendance at the banquet. Advance registrations may be sent to the Seminar Chairman, C. A. Meyer, RCA, Harrison, New Jersey.

PTG BIOMEDICAL-ELECTRONICS

DATE: February 20, 1964

PLACE: Rockefeller Institute
Welsh Hall
66th Street and
York Avenue
New York City, N. Y.

TIME: 8:00 P.M.

Pre-meeting Dinner: 6:15 P.M. Sutton Restaurant, First Ave. at 58th St. N. Y., N. Y.

SPEAKER: Adrian Kantrowitz, M.D.
Director,
Cardiovascular Surgery
Maimonides Hospital of Brooklyn

SUBJECT: "Some Aspects of the Use of Electronic Devices as Therapeutic Modalities"

The Speaker: Dr. Kantrowitz, who is a pioneer in the application of electronic concepts and devices in the field of cardiovascular surgery has won several prizes for his work in this field. In his more than forty articles on surgical subjects he has written many pertaining to the use of electronics in surgery. His recent work on implantation cardiac pacemakers is most stimulating.

In addition to his numerous publications, Dr. Kantrowitz has made seven training films in his specialty and he has presented technical exhibits before varied professional groups.

ANNUAL SECTION BANQUET

Sunday, March 15, 1964 has been decided upon for the date of the Annual Section Banquet. The place is the Robin Hood Inn located on Valley Road in Clifton, N. J. This location is "close" to the intersection of Routes 3 and 46. There is room for 250 people.

The program includes an hour of cocktails and hors d'oeuvres starting at 4:00 P.M. Then a roast beef dinner, the presentation of the awards and dancing. Charges are expected to be set at $5 per person.

Dinner Chairman .... John K. Redmon
Asst. Chairman ..... Joseph O'Grady
Publicity ..... Bernard Meyer, Joseph Miller
Facilities ..... R. Winterstein
Fellows List ..... G. Tanguay and Membership Committee
Talking-up Committee ..... The membership
Section Chairman ..... C. Vadersen

PTG ELECTRONIC COMPUTER

Tell Us What You Think

The scope of PTG Electronic Computers includes: a) all aspects of design, theory, and practice relating to systems for digital and analog computation and information processing; b) components and circuits for digital and analog systems, including techniques for accomplishing the functions of logic, arithmetic, storage, control, mass data storage, input, output, and external communication in such systems; c) relevant portions of supporting disciplines, including switching theory, symbolic logic, numerical methods, codes and number representation systems, abstract machine or automation theory, bio-sciences, machine learning, pattern recognition, and other extension of logical machine capabilities; d) production, testing, operation, and reliability of digital and analog systems; and e) those aspects of application, use, and programming of digital and analog computing devices and information processing systems that relate to their design and operation.

Interest in specialized topics varies, depending on what is timely and on local interests. To find out what these topics are, we are conducting a survey. If you see an item of particular interest to you, check it off. If you have an idea of your own, write it out and mail it to the address given below. You need not be a member of the PTG to vote (more than half of our attendance comes from outside the Chapter). Results of the survey will be used in planning Chapter programs.

Indicate your interest with an "X".

1. I am interested in technical meetings on:
   - A. Total Systems .....
     - Government and Business Management .....
     - Military Applications .....
     - Space Projects .....
     - Industrial Processes .....
     - Real time Systems .....
     - Man-Machine Systems .....
     - Central/Satellite Computing Systems .....
     - Data Acquisition .....
     - Digital Data Communication .....
     - Data Processing and Display .....
     - Guidance and Control .....
     - Information Retrieval .....
     - Information Collection, Processing and Dissemination .....
     - Air Movement Control .....
     - Dispatching .....
     - Air Traffic Control .....
     - Simulation and Gaming .....
     - Numerical Analysis .....
     - Mathematical Programming .....
     - Computer Engineering .....
     - Digital—Analog Devices .....
     - Advanced Input/Output Devices .....
     - Pattern Analysis and Recognition .....
     - Computers for Communication Switching .....
     - Operating Systems .....
     - System Engineering .....
   - B. Unusual Applications
     - Computers as Teaching Machines .....
     - Frivolous Uses .....
     - Simulation of Biological Mechanisms .....
     - Digital/Analog Systems .....
   - C. Programs
     - Diagnostics .....
     - Multi-level Programs .....
     - Automatic Design .....
     - Compilers .....
     - Language Translation .....
     - Simulation .....
   - D. Inside the Computers
     - Reliability .....
     - Thin films .....
     - High Speed Logic .....
   - E. Theory
     - Turing Machines .....
     - Automata .....
     - System Engineering .....
2. The Chapter should sponsor lecture series on:
   Programming:
   - Fortran .....
   - Cobol .....
   - Symbolic Assembly .....
   - Simulation .....
3. The Chapter should hold discussions on:
   - Social Responsibilities of the Professional Group
   - Use of Computers in Social/Political/economic planning
   - Automated Medical Diagnosing
4. I am interested in:
   - Chapter activities management .....
   - Speakers Bureau .....
   - Joining PTG Electronic Computers .....
5. My Name and Address is:

.....

.....

.....

Please send your completed questionnaire to:

DAVID P. PERRY
PTGEC Chapter Chairman
57 Forest Hill Road
West Orange, New Jersey

SENIOR ELECTRICAL ENGINEER

Desires salaried position in sales or research and development of any area of profession, acoustic equipment preferred. At your convenience, for an appointment telephone kindly before 11 A.M. — 673-0283 (Orange, N. J.)

Power & Industrial Group N. Y. Section IEEE Spring 1964 Educational Program

Review Study Groups for Professional Engineering Exams

Structural Planning & Design, Mondays 6:15-8:30 P.M., 18 Sessions; 19th Floor Auditorium, Starting Feb. 3, 1964.

**Basic Engineering Sciences,* Tuesdays, 6:30-8:30 P.M., 19 Sessions; 19th Floor Auditorium, Starting Feb. 4, 1964.

**Mechanical Engineering,* Wednesdays, 6:30-8:30 P.M., 18 Sessions; Room 240, Ebasco Building, 2 Rector Street, Starting Feb. 5, 1964.

Electrical Engineering, Wednesdays, 6:30-8:45 P.M., 18 Sessions; Room 1101-S, Starting Feb. 5, 1964 .

Engineering Economics, Thursdays, 6:30-8:30 P.M., 18 Sessions; 19th Floor Auditorium, Starting Feb. 6, 1964.

Individual Improvement Study Groups

Efficient Reading For Engineers, Thursdays, 6:30-8:30 P.M., 10 Sessions; Room 1806-S, Starting Feb. 27, 1964.

Place: Con. Edison Bldg., 4 Irving Place, N. Y. 3, N. Y.

Fees: $15 For Members of Engineering Societies, $25 Non Members.

Send Advance Registration to:

N. M. Moreira, Con. Edison Co. of N. Y. 4 Irving Place, N. Y. 3, N. Y.

Make Checks Payable to:

"P & I Group, N. Y. Section IEEE"

*Run By ASME. Make Checks Payable to "ASME Metropolitan Section" and send to K. W. Geiser, Allis-Chalmers Mfg. Co. 100 Church Street, New York 10007

Special Study Groups

High Voltage & Extra High Voltage Cable Systems, Tuesdays, 6:30-8:30 P.M., 10 Sessions, Starting Feb. 25, 1964. G. E. Co. Auditorium (Subway Level), 570 Lexington Avenue (at 51st St.).

New Fields For Electrical Engineers, Wednesdays, 6:30-8:30 P.M., 10 Sessions; Starting Feb. 26, 1964. Con. Edison, 4 Irving Place (at 14th Street), Room 1701.

Methods Improvement, Thursdays, 6:30-8:30 P.M., 10 Sessions; Starting Feb. 27, 1964. Con. Edison, 4 Irving Place, Room 503.

Fees: $15 For Members of Engineering Societies, $25 Non Members.

Send Advance Registration to:

W. Laudan, Public Service Elec. & Gas Co. 80 Park Place, Newark 1, N. J.

Make Check Payable to:

"P & I. Group, N. Y. Section IEEE"

PTG COMPONENT PARTS MEETING NOTICE

DATE: January 14, 1964

TIME: 6:30 P.M.

PLACE: Barbizon Plaza, New York

SUBJECT: The Physics of Semiconductor Failures

A failure in a semiconductor component ranges from characteristics that have changed so that they are outside a predetermined specification limit, all the way to catastrophic events, such as melting together several components of the system. Catastrophic failures occurring at high powers are becoming better controlled as their mechanisms are better understood. Slow changes (which can eventually lead to catastrophe) occur due to bulk semiconductor, surface, and metallurgical effects, often in combination. A better understanding and control of the bulk and metallurgical factors now permits study of the surface factors at the high stress levels necessary for their acceleration. Surface failure modes are often reversible. Different problems and solutions have arisen concerning failures in devices fabricated, passivated, and packaged in different ways, and in integrated circuits.

6:30 P.M. to 7:45 P.M. — Motorola and Schweber Electronics invites you to attend a pre-meeting buffet, at the Barbizon Plaza, Central Park South, New York City.

8:00 P.M. — A talk and question period on "The Physics of Semiconductor Failures".

Speaker: Prior to joining Motorola, Dr. Lesk held several positions with General Electric Co. He received the BSc degree in Engineering Physics from the University of Alberta in 1948. He pursued graduate work in Electrical Engineering at the University of Illinois, and was awarded the MS degree in 1949 and the PhD degree in 1951.

Dr. Lesk has served as general chairman, session chairman, organizer, papers chairman for various IRE, AIEE and Electrochemical Society conferences, and is currently Chairman of the IEEE PTGED Integrated Devices Committee. He is also a member of the American Physical Society, Sigma Xi, Eta Kappa Nu, Pi Mu Epsilon, and Phi Kappa Phi.

Sponsored By: This is the second meeting of the five part series on "Physics of Failure" of the Metropolitan New York Chapter of the Component Parts Group.

REGISTRATION FORM

If you plan to attend, please return coupon before January 3, 1964, to Miss Rose C. Cambria, The Bendix Corporation, Eclipse-Pioneer Division, Teterboro, New Jersey.

I will attend the Metropolitan New York Chapter Meeting of the Professional Group on Component Parts on January 14, 1964 on "The Physics of Semiconductor Failures".

FROM: Name .....

Company Affiliation .....

Address .....

.....

TV'S FUTURE IN EDUCATION AND INDUSTRY

A joint meeting of the New York Section of IEEE and its Communications and Electronics Division will be held at 7:00 P.M. Wednesday, January 15, in Room 125B of the United Engineering Center, 345 47th Street.

Wallace W. Wall, of the New York Telephone Company will speak on "The Future of Television in Education and Industry".

Educators and businessmen alike have long been aware of the many important advantages that television offers. Tests performed during the last few years have proved beyond any reasonable doubt that TV can be an effective tool for improving overall efficiency.

Today there is little question that television will play an increasingly important role in the day-to-day activities of educational and industrial organizations. To meet tomorrow's demands however, a considerable effort in the development of new techniques and equipment will be required.

Mr. Wall will discuss recent developments and trends which lead to the belief that a number of the major obstacles which have prevented the greater use of television may soon be overcome.

IEEE NORTH JERSEY SECTION SPRING 1964 STUDY GROUP
DIGITAL COMPUTER PROGRAMMING

Wednesday, 7-9 P.M.
Jersey Central—New Jersey
Power & Light Companies
Madison Avenue at Punch Bowl Road
Morristown, New Jersey
START: February 19, 1964

Computers are being used in ever-increasing numbers in all fields. This study group will discuss the general principles, basic methods and application of computers in the engineering field. The material to be presented will be basic to enable persons with little knowledge of computers to learn and apply basic concepts.

Included will be two visits to the IBM 1620 computer at Jersey Central-New Jersey Power & Light. During these visits simple problems prepared by the group will be solved by the computer.

Instructors for the course will be named later.

February 19, 1964
Computer Concepts
Computer hardware — stored program concepts introduction to programming — description of a 1620 system.

February 26, 1964
Machine Language Programming
Instructions — Operation Types — Arithmetic, looping, I/O, and etc.

March 4, 1964
Machine Language Programming (Cont'd)
Operation Types — address modification, and etc. — sample program.

March 11, 1964
Artificial Language Programming
Symbolic Programming System

March 18,1 964
Artificial Language Programming (Cont'd)

March 25, 1964
Visit to a Computer
Visit to a 1620 computer at Jersey Central-New Jersey Power & Light Companies.

April 1, 1964
Compiler Programming
FORTRAN and GOTRAN — Concepts — arithmetic and I/O, statements, problems.

April 8, 1964
Compiler Programming (Cont'd)
Logic, do and if statements, subscripting, and etc.

April 15, 1964
Compiler Programming (Cont'd)
Use of the compiler program — other language.

April 22, 1964
Visit to a Computer
Visit to the 1620 computer at Jersey Central-New Jersey Power & Light. Groups will use the computer to solve sample problems.

FEE: $25.00 to members of IEEE, AIME, ASCE, ACME, AIChE, AIIE, PE, $30.00 to others. A discount of $5.00 will be extended to those registering early by mail.

Send Advance Registration to:
H. E. Blaicher, Jr.
Jersey Central Power & Light Co.
Madison Avenue at Punch Bowl Road,
Morristown, N. J.
JEfferson 9-6111

Make Checks Payable to:
North Jersey Section IEEE.

Enclosed is check for $ ..... for advance registration in "Digital Computer Programming".

Name .....

Home Address .....

Firm .....

Position .....

Membership .....

Business Address .....

Business Phone .....

FIRST ANNUAL CONFERENCE FEBRUARY 2 - 7, 1964

An annual conference on power apparatus and systems will be inaugurated next year by the Power Division of the Institute of Electrical and Electronics Engineers (IEEE). The initial conference will be held in New York City at the Statler Hilton Hotel, February 2 through 7, 1964. It will bring together over 2,000 engineers interested in all phases of the design, manufacture and applications of electrical apparatus as well as power system engineers concerned with design and operation of electric utility systems around the world.

The new conference will be known as the Power Division First Winter Power Meeting and it will take over the 1964 dates of the Former Winter General Meeting of the American Institute of Electrical Engineers. The AIEE was merged January 1, 1963, with the Institute of Radio Engineers to create the IEEE, the largest engineering society in the world.

In announcing the inauguration of the new forum on power system subjects, C. A. Woodrow, chairman of the Power Division of IEEE, explained that such an annual conference will provide a needed annual forum for the presentation and discussion of technological advances in the electrical engineering of bulk power generation, transmission, distribution systems.

PTG COMMUNICATION SYSTEMS

VOCODERS

Cecil H. Coker and Roger M. Golden will speak at the January, 1964 meeting of the North Jersey Chapter of the Professional Technical Group on Communication Systems on the subject of Vocoders. The meeting will be held at the Arnold Auditorium, Bell Telephone Laboratories, Incorporated, Murray Hill, New Jersey.

PTG COMMUNICATIONS SYSTEMS

ABSTRACT

Speech communication over a 4kc bandwidth channel requires bit rates of about 40 kbits/sec. However, statistical evidence indicates that human beings do not perceive speech information at rates much above 40 bits/sec. Vocoders are devices capable of extracting the information bearing parts of speech signals for transmission at greatly reduced bit rates.

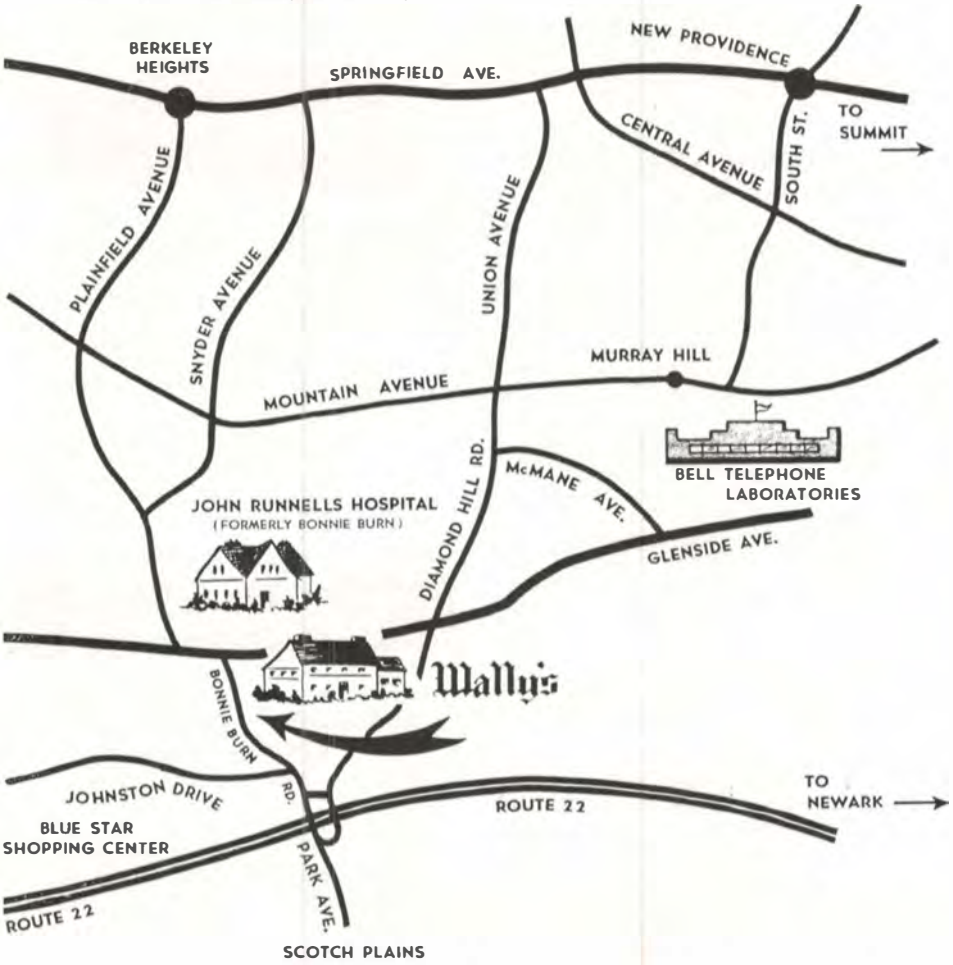
A brief review will be given of the special characteristics of the speech signal and the hearing mechanism which make vocoders possible. Several types of speech bandwidth compression devices will be described employing vocoders. The advantages of digital computer simulations in the testing of projected system designs will be discussed. Tape recordings of laboratory models and of digital computer simulations will be demonstrated.

ROGER M. GOLDEN

Roger M. Golden has been a member of the technical staff of the Acoustics Research Department at Bell Laboratories for the past three years. He is engaged in the study and computer simulation of speech bandwidth compression devices. He attended Northwestern University for two years and completed his studies at the California Institute of Technology where he received the degrees of BS, MSEE and PhD.

CECIL H. COKER

Cecil H. Coker received his BS and MS degrees from Mississippi State University and worked for two years in design of flight control systems and safety devices. He received his doctorate from the University of Wisconsin and taught there for one year as an Assistant Professor of Electrical Engineering. Dr. Coker is a member of the technical staff at Bell Telephone Laboratories.



GLOBECOM VI CALL FOR PAPERS

An International Symposium on Global Communications — GLOBECOM VI — will be held in Philadelphia on June 2, 3 and 4, 1964, at the University of Pennsylvania and the Sheraton Hotel.

GLOBECOM VI is jointly sponsored by the IEEE Professional Technical Groups on Communications Systems and Electronic Computers; the Communications Division Technical Operating Committee (formerly in AIEE); IEEE Philadelphia Section and the University of Pennsylvania.

The sixth of a series — GLOBECOM VI — the 1964 conference will accent the close ties of communications and data handling, particularly the interplay between computers and communication networks. The program is being fashioned to underscore international activities as reported by overseas authorities.

All IEEE registrants will receive a DIGEST OF TECHNICAL PAPERS with comprehensive illustrated condensations of all papers.

Original papers (not previously published or presented) on communications and computer research, development, application and operation — system-oriented — are invited. Suggested topics are:

- Traffic Analysis and Systems Simulation
- Terrestrial Radio Transmission
- Communication, Coding and Modulation Theory
- Economic Factors in Systems Design
- Data Transmission Systems
- Computer Control of Communications
- Commercial Satellite Communications
- Military Satellite Communications
- Input/Output Technology
- Deep Space Communications
- Communications Data Handling and Processing
- Military Command and Control Systems
- Cable Transmission
- Switching Systems
- Industrial Communication and Control

Prospective speakers should submit both a 35-word *abstract* and 300-500 word *summary* of the paper. The summary should define the nature of the effort's contribution to the art and include theoretical and experimental results, when available, as well as key illustrations.

The abstract, suitable for publication in an advance program, should be typed — in triplicate — on separate sheets and include title of paper, author's name, affiliation, return address and telephone contact.

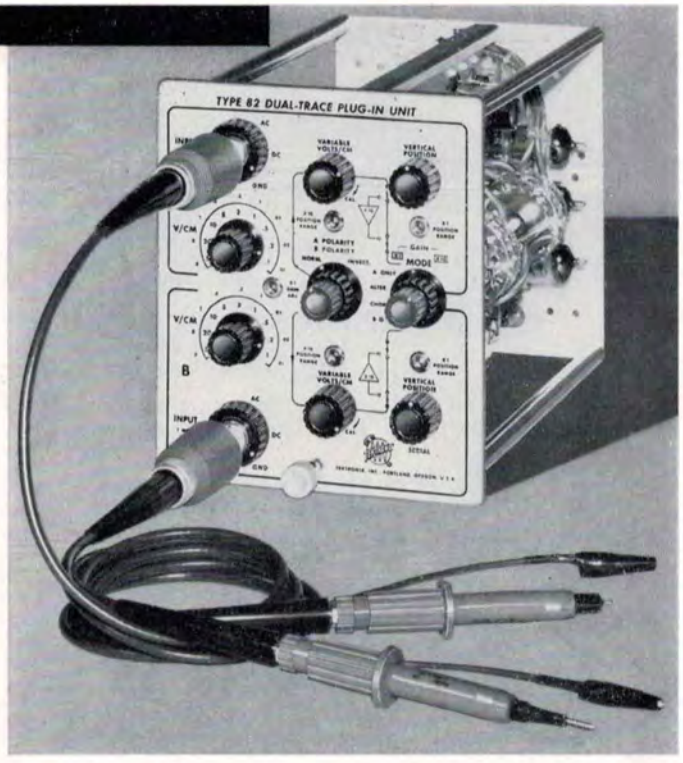
Summaries should also be submitted in triplicate and in single-side, black-on-white, double-spaced typewritten form, suitable for immediate reproduction and subsequent screening. The author's name, affiliation, address and telephone number must appear on the first page, and the author's name and abbreviated paper title on each subsequent page. On papers with multiple authorship, the name of the speaker who will deliver the paper should be noted.

Both abstract and summary should be forwarded — on or before February 28, 1964 to:

Richard Guenther — GLOBECOM VI Program Chairman, RCA Communications Systems Division — Bldg. 1-3-1 Camden, New Jersey 08102.

Here's a new Tektronix dual-trace unit... to update older Type 580-series oscilloscopes

DC-to-80 MC at 10 mv/cm
DC-to-85 MC at 100 mv/cm



Type 82 plug-in unit adds new convenience to display and measurement of high-sensitivity, wide-band, dual-trace presentations on the Type 580-Series Oscilloscopes.

Characteristics

■ DUAL-TRACE OPERATION with 4 operating modes and independent controls for each channel—for individual attenuation, positioning, inversion, and ac or dc coupling as desired.

■ PASSBAND typically DC-TO-85 MC (3-db down) at 100 mv/cm (12-db down at 150 Mc), and typically DC-TO-80 MC (3-db down) at 10 mv/cm.

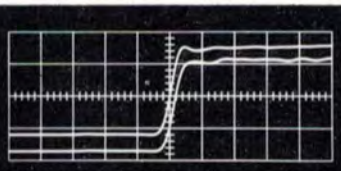
■ CALIBRATED SENSITIVITY in 9 steps from 100 mv/cm to 50 v/cm, and in 10X Amplifier Mode, from 10 mv/cm to 5 v/cm, variable between steps.

plus

■ SUPPLIED SMALL SIZE PASSIVE PROBES to simplify probe connection to signal-source points. Probes increase input R to 10 megohms and decrease input C to approximately 7 pf, with risetime (of probe, plug-in unit, oscilloscope) at over-all sensitivity of 100 mv/cm at approximately 4½ nsec.

Type 82 Dual-Trace Plug-In Unit $650

Risetime of 4.3 nsec



Dual-trace display of input and output pulses of a transistor amplifier at 10 nsec/cm—with lower trace delayed 1 nsec by amplifier under observation. Type 580-Series/82 combination can display time coincidence between input channels with no measurable difference at 10 nsec/cm.

Modification for Early Instruments

Some early Type 580-Series Oscilloscopes must be modified to accept the new Type 82 Dual-Trace Unit or the new Type 81 Single-Trace Unit. After modification, these oscilloscopes—with serial numbers below No. 970 for Type 581's and below No. 2585 for Type 585's—will have improved and standardized transient response (and improved performance with the Type 80/P80 combination).

To determine whether your particular instrument needs this modification, please call your Tektronix Field Engineer.

Modification Kit (Part Number 040-275) $25

U. S. Sales Prices f.o.b. Beaverton, Oregon

For a demonstration, please call your Tektronix Field Engineer.

Tektronix, Inc. *UNION FIELD OFFICE*

400 CHESTNUT STREET · UNION, N.J. · Phone 688-2222

NEW INSTRUMENTS

hp MODEL 214A
PULSE GENERATOR

hp PULSE GENERATOR OFFERS BIG, CLEAN PULSES

Here's Hewlett-Packard's versatile new Pulse Generator. Designated Model 214A, it offers high peak power pulses of known shape.

hp Model 214A can provide positive or negative 100-volt, 2-amp pulses into 50 ohms. Source impedance is 50 ohms on all but the highest output range to minimize errors caused by re-reflections when operating into unmatched loads—a feature which permits the output pulse characteristics to be accurately specified.

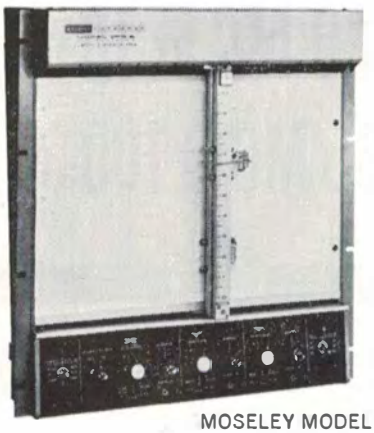
Some uses of Model 214A:

- Testing magnetic devices.
- Checking switching times of high power semiconductors.
- Testing amplifiers and modulators.
- Radar, nuclear, and TV tests.

At maximum output, pulse rise and fall times are typically 15 nsec; on all other ranges, less than 13 nsec.

Internal triggering extends to 1 Mc, and oscilloscope-type controls make it possible to trigger from the positive or negative slope of almost **any** dc to 1 Mc external signal from —40 to +40 volts!

A call to your RMC Field Engineer will give you a full spec fill-in on Model 214A priced at $875.



MOSELEY MODEL 2FRA
X-Y RECORDER

MOSELEY TWO PEN X-Y RECORDER

The Moseley Model 2FRA AUTOGRAF is a two-pen, three axis graphic recorder for applications requiring simultaneous plotting of two dependent variables against a single independent variable.

Model 2FRA accepts direct current signals representing the related functions and produces Cartesian coordinate curves on standard graph paper which has a writing area of 10″ x 15″.

An internal sweep generator provides a time base for driving the pen carriage at selected constant rates along the X-axis when it is desired to plot any two variable functions against time.

The pens are driven by three independent potentiometer servo mechanisms, isolated and free of ground. Balancing potential is obtained from a continuous electronic reference supply, zener diode controlled. 1 megohm input on 11 ranges.

Price of Model 2FRA is $3575. For more specs on this and other Moseley one megohm X-Y recorder Models—135A, 2D-2A, 136A and 6SA, dial your Field Engineer at RMC.

rmc

for more information phone or write

SALES DIVISION, HEWLETT · PACKARD COMPANY

FIELD ENGINEERS · ELECTRONIC INSTRUMENTATION

236 EAST 75th STREET, NEW YORK, NEW YORK · TRafalgar 9-2023
391 GRAND AVENUE, ENGLEWOOD, NEW JERSEY · LOwell 7-3933