



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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FEBRUARY 1964

Volume 10 / Number 6



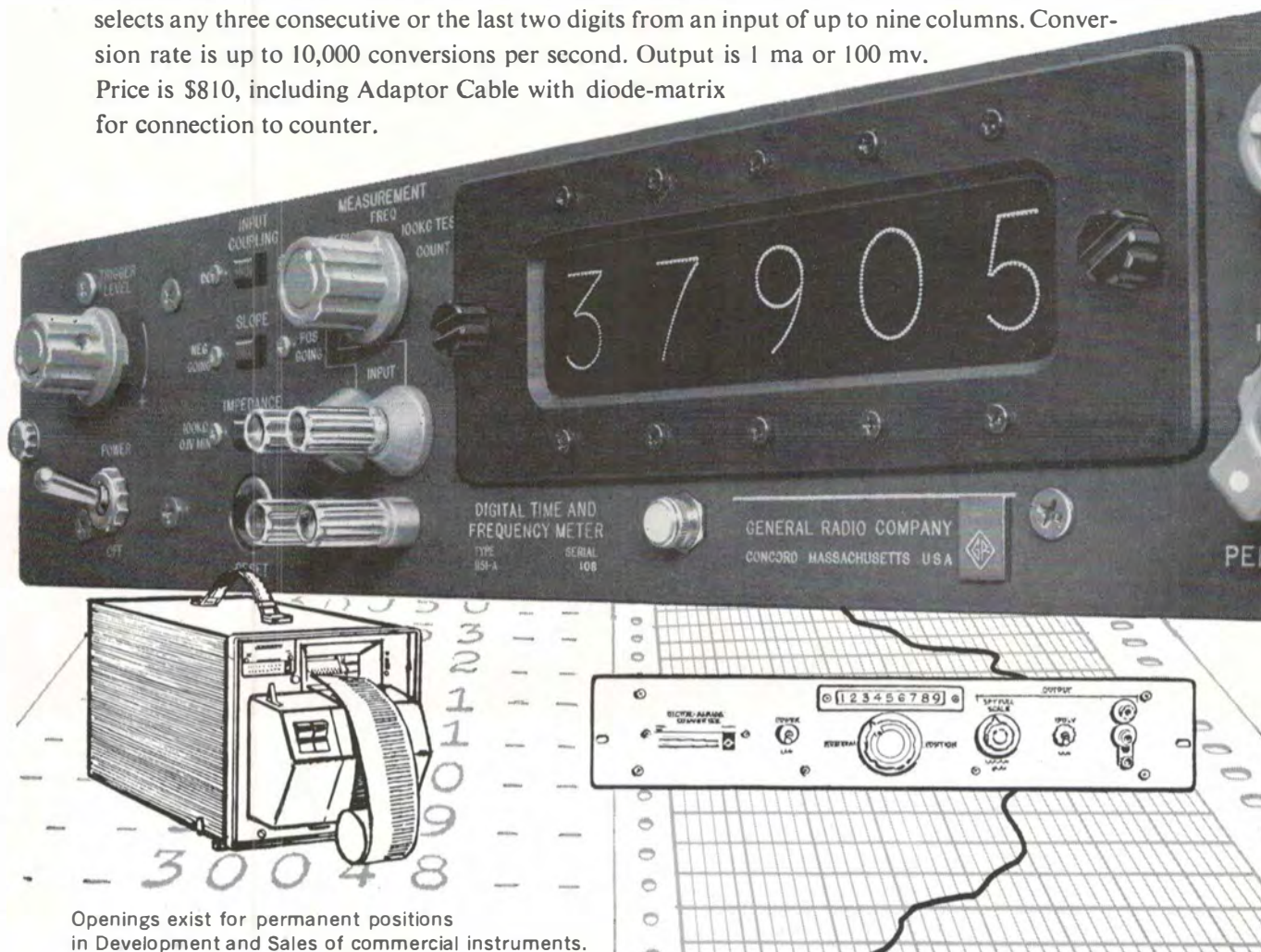
**The 1151-A Digital Time and Frequency Meter** uses reliable all-solid-state ring-counting decades. No feedback is required, and consequently, voltage levels are not critical. Since the decade transistors operate simply as switches, full advantage is taken of their inherent reliability.



The 1151-A has a full complement of input controls permitting selection of trigger level, ac or dc coupling, and sensitivities of 1 volt at 1 megohm or 0.1 volt at 100 kilohms. In addition to frequency measurements and counting over a range of dc to 300 kc, the 1151-A will also measure periods to 20 kc and frequency ratios. Accuracy is  $\pm 1$  count  $\pm$  crystal oscillator stability. Short-term oscillator stability is better than  $\frac{1}{2}$  ppm. Readout is provided by easy-to-read, bright, in-line Numerik indicators. Two models are available: the Type 1151-A, \$1195, and the Type 1151-AP which has outputs to drive an auxiliary Data Printer or a Digital-to-Analog Converter, \$1250. Also available is the 1150-A at \$995, to measure frequency only.

**Digital Recording** — The 1137-A Data Printer provides the means for recording decimal coded information from the 1151-AP. The Printer has a 5- to 12-digit capacity and operates at printing rates up to 3 prints per second. Price, bench model, \$1350; rack model, \$1400.

**Analog Recording** — The Type 1136-A Digital-to-Analog Converter translates the counter's digital output into a dc voltage or current for analog recording with 1-ma recorders. The converter selects any three consecutive or the last two digits from an input of up to nine columns. Conversion rate is up to 10,000 conversions per second. Output is 1 ma or 100 mv. Price is \$810, including Adaptor Cable with diode-matrix for connection to counter.



Openings exist for permanent positions in Development and Sales of commercial instruments. If interested, write M. A. Nacey.

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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.

## EDITORIAL NOTES

### A QUESTION

The hunting season is on. We are not talking about the hunter with a gun, we are concerned with the engineer and his traditional slide-rule hunting for a job. Not too long ago, the hunter was the hunted. This transformation in role can be explained politically, economically, sociologically, etc.

On February 19th, the North Jersey Section of the IEEE will hold its Annual Students' Night at the Teaneck Campus of Fairleigh Dickinson University. When these students decided to become engineers were they told during their "High School Career Days" that there might be a surfeit of engineers and a dearth of jobs? Or were they led to believe that there would be no place to hide from the endless stream of recruiters with their siren songs of innumerable lucrative executive engineering positions?

The engineer with his degree does not face as harrowing a situation as the individual who is employed as a technician during the day and is pursuing an engineering curriculum at night. For the evening student may have already achieved senior status academically. He can not move geographically because this would retard him academically and put the crucial degree that much further off.

What shall we tell the students during career or guidance days?

The PTG on Power has been approved by Headquarters. H. Blaicher is the interim chairman. The first organization meeting will be held February 13 at Jersey Central Power & Light located at Madison Avenue and Punch Bowl Road, Morristown, N. J.

We thank Dr. Stacy for his offer in his column about the availability of PTG Engineering Writing and Speech members. We welcome these members to the staff.

As you read this February issue, the March issue is practically off the press. Prompt and efficient publication is impossible without the informed cooperation of the members and advertisers. Please note that **the deadline for material is the 25th of the second month preceding the month of publication.** In other words, this means that the deadline for the April 1964 issue is February 25, 1964. B.M.

**Remember: March 15, 1964, 4:00 P.M. Annual Section Banquet at Robin Hood Inn. See coupon P. 7.**

### THE COVER

The cover photograph shows Mr. Robert W. Nealey, blind checkers champion of the United States, playing checkers with a computer at the IBM Laboratories at Yorktown Heights. Although Mr. Nealey had not lost a match in eight years of tournament playing with human opponents, he lost to the machine. The impact of such developments as these on the future of engineering practice will be discussed by General Manager Fink at the Students Night meeting.

The

# Newsletter

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

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FEBRUARY, 1964

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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

P.O. Box 275 — Morris Plains, N. J.

Telephone: FOxcroft 6-1580

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Published monthly, except July and August by the North Jersey Section of the Institute of Electrical and Electronics Engineers, Inc. Subscription: 75¢ per year through dues for members; \$1.50 per year for non-members.

### 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.**



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The accuracy of the Model 365 is supported by a high order of stability gained by both ac and dc feedback techniques and conservative operation of all components. For further assurance of accuracy, a simple and reliable internal standard is available to check calibration accuracy and panel controls can correct the calibration, if necessary, in seconds.

Signal-ground isolation allows floating measurements to 500 volts above panel ground, and ac rejection is provided to reduce the effects of common-mode signals.

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## PARTIAL SPECIFICATIONS

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Accuracy .... 1% of indication above 1 mV	Accuracy .... 2% of indication above 0.1 $\mu$ A
Impedance ..... 1 M $\Omega$ above 1 $\mu$ V; 5 M $\Omega$ above 0.1 mV; 10 M $\Omega$ above 0.1 V	Impedance ..... < 10 k $\Omega$ above 1 nA; < 100 $\Omega$ above 10 $\mu$ A; < 1 $\Omega$ above 10 mA

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PTG  
Reliability

## NEW OPTICAL INSTRUMENTATION

The meeting of the Metropolitan Chapter of the PTG on Reliability will be held on February 18, 1964. Mr. Howard F. Gordon of the EdnaLite Research Corporation will speak on "New Optical Instrumentation for Miniaturized Assembly and Inspection". This meeting will be held at the United Engineering Center, Room 125B, 345 East 47th Street, New York City, beginning at 7:45 P.M.

In assessing the reliability of minuscule parts and microelectronic assemblies, visual examination of their structure is of greatest importance. Mr. Gordon will discuss the means for conducting critical examination of structural details of very small devices through the use of specially designed high resolution viewing systems with wide fields and extended working distances as a practical approach in production and inspection processes. The type of optical instruments which embody distortionless and color corrected magnification and make possible fatigue-free viewing during prolonged periods of visual observation will be described. Mr. Gordon's presentation will also include a short discourse on a new kind of training device to assist unskilled workers in rapidly acquiring the skills necessary in producing and inspecting miniaturized assemblies.

## Biography

Mr. Gordon is Sales Manager, Prescription Engineering Division of the EdnaLite Research Corporation. Prior to this position he was associated with the Automation Division of U. S. Industries, Inc., where he was concerned with modern production methods for small component assemblies.

## MEETING NOTICE

**SUBJECT:** New Optical Instrumentation for Miniaturized Assembly and Inspection  
**SPEAKER:** Mr. Howard F. Gordon, EdnaLite Research Corporation  
**PLACE:** United Engineering Center, Room 125B, 345 East 47th Street, New York City  
**DATE:** February 18, 1964 (Tuesday)  
**TIME:** 7:45 P.M.

The Newsletter, February 1964

# THE FUTURE OF ELECTRONIC AND ELECTRICAL ENGINEERING

by Donald G. Fink

*General Manager IEEE*

The February 19 meeting of the NJ Section of the IEEE will be dedicated to the engineering students in our area. The guest speaker, Mr. Donald Fink, will discuss "The Future of Electronic and Electrical Engineering" with particular emphasis on the professional environment which the engineer can expect to find during the next twenty years. Mr. Fink's talk covers a diverse and significant subject which should be of interest to both practicing engineers and students.

The talk will discuss anticipated changes in emphasis and in the amount of future work in the various subdivisions of electronic and electrical engineering. The probable effects of these changes upon the economic outlook for engineers and upon engineering managerial positions will be touched on.

His talk will review the rapid obsolescence of scientific and technical methods, and the effect on the careers of IEEE members before and after graduation from engineering school. Some of the recent developments in Computer Science, which place heavy emphasis on creativity as against routine engineering, will be described. The probable impact on the post-graduate careers of engineering students will be estimated.

Having taken over most of the manual work of more advanced societies, machines are beginning to encroach upon mental work. Younger



engineers will do well to keep this tendency in mind and to direct their activities toward fields in which there seems little likelihood of successful competition by computers.

Mr. Fink's present position and his very broad experience uniquely qualify him to develop opinions which will be of interest and value to young men about to enter the electrical and electronic branches of the engineering profession and to students who are considering these branches for future careers. In addition, Mr. Fink is a fascinating speaker noted for his lively talks.

The meeting will take place at 8 P.M. in the gymnasium at the Fairleigh Dickinson University Teaneck campus (see map) and will be preceded by a pre-meeting dinner at 6 P.M. in the faculty dining room. (Those wishing to attend the dinner are requested to indicate their intentions to Mr. R. McSweeney prior to February 12.) Arrangements have been made to permit

parking by members and guests in the main parking area of the Teaneck campus. Look for the IEEE signs in the area.

## BIOGRAPHY

Mr. Donald G. Fink is General Manager of the IEEE.

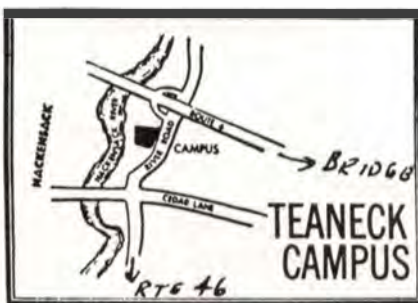
He received a BS in Electrical Communications from M.I.T. in 1933 and an MSEE from Columbia in 1942. From 1934 to 1941, Mr. Fink served on the staff of the journal *Electronics* and later was its editor-in-chief from 1946 to 1952.

In 1941 he became a member of the Radiation Laboratory at M.I.T. where, in 1943, he headed the Loran Division. As a consultant to the Office of the Secretary of War, Mr. Fink traveled over 80,000 miles during the war from Egypt to Australia arranging for use of Loran Systems by Allied Forces. In 1946 he participated in the atom bomb tests at Bikini.

In 1948, Mr. Fink was chairman of the IRE Television System Committee, and in 1950 he was a member of the Senate Advisory Committee on Color Television. In 1949, 1950, and 1951, he represented the United States at television conferences in Zurich, London, and Geneva.

In 1952, Mr. Fink joined the Philco Corporation. In 1956 and 1957 he was editor of the *Proceedings of the IRE*, and in 1958 he served as President of the IRE. In 1961 he was appointed Vice President, Research, of Philco Corp. Since 1957 he has been an active member of the Army Scientific Advisory Panel.

Mr. Fink is the author of numerous books on electronics, television, and radar.





## NOMINATIONS REQUESTED FOR FELLOW AWARD

Institute Headquarters has recently notified the Section of the opportunity to submit nominations for the Fellow Award. A separate form FC-1 (Fellow Grade Nomination Form) should be prepared for each nominee. Copies of the form may be obtained by addressing the Institute of Electrical and Electronics Engineers, Box A, Lenox Hill Station, New York 21, N. Y. The completed form must be returned to the Chairman, Fellow Committee, IEEE Headquarters at the above address. The form, together with the responses from the appropriate number of references, must be received at IEEE Headquarters on or before **April 30, 1964** in order that the candidate be considered by the 1964 Fellow Committee. An important consideration in the preparation of the nomination is completeness in the description of the professional accomplishments of the

nominee. Furthermore, the individual making the nomination has the obligation of insuring that the references selected complete and return the necessary recommendation forms prior to the April 30th date.

As in past years, the North Jersey Section will select a group of candidates for nomination for the Fellow Award through its Awards Committee, under the chairmanship of Dr. J. H. Mulligan, Jr. Individuals desiring consideration of their nominees for endorsement by the North Jersey Section should **submit** the original or a reproducible copy of the **completed FC-1 Fellow Grade Nomination Form** to the Vice Chairman and Secretary of the Awards Committee, Mr. Arnold M. Levine, ITT Federal Laboratories, 500 Washington Avenue, Nutley, New Jersey, **before February 20, 1964.**

## PTG Electronic Computers

### On Line Bank Automation at Howard Savings Institution

#### MEETING NOTICE

**SUBJECT:** Field Trip: — Lecture followed by tour of computer facilities

**PLACE:** Howard Savings  
251 Plane Street  
Newark, N. J.

**DATE:** Thursday,  
February 20, 1964

**TIME:** 8:00 P.M.

**Pre-meeting Dinner:** 6:00 P.M. at  
**BROTHER'S RESTAURANT**, 42  
Commerce Street, Newark.

The Howard Savings Institution of Newark has been operating an on-line computer to process savings accounts for over a year. During this period the bank's work force has been reduced. Customers are being handled in half the time. The equipment paid for itself in fourteen months.

Thirty two teller consoles distributed among seven banking locations are connected by voice grade, local cable and telegraph grade lines to the central processor. The system contains two stored program computers capable of operating either in the dual or duplex mode. Alternate communication lines are used between satellite banks and the central processor. A scrambled signature card identifies the customer who may deposit or withdraw at any branch.

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All modules available  
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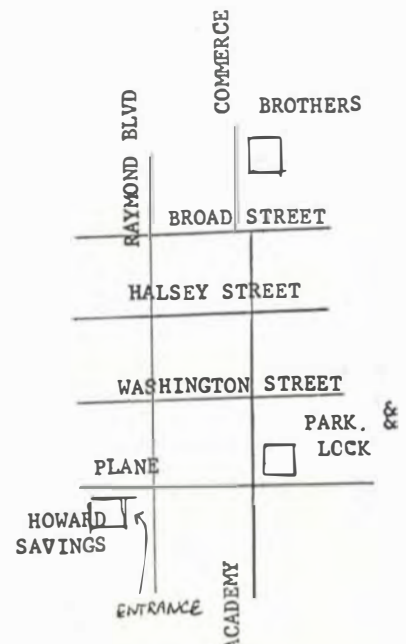


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# EXECUTIVE COMMITTEE REPORT

## Let's Write and Speak English

**Dr. I. F. Stacy**

*Chairman, North Jersey PTG  
on Engineering Writing and Speech*

Most of us have been speaking English since we were about eighteen months old. The only things we've been doing for a longer time are eating, drinking, and burping. Still, few of us write and speak English well. Even worse, few of us care.

The advertising men certainly don't help. One advertisement reads, "Us Carcino\* smokers would rather fight than switch." Of course us would! Was the ad written this way because the writer doesn't know the difference between "we" and "us"? Is he trying to appeal on their own level to those who don't speak English correctly? Or is he trying to change the English language single-handedly?

Many of us have attended technical meetings at which the speakers sounded disinterested in their own words. The audience was even less interested. By contrast, the quality of the writing in technical journals is high because most large companies and the journals have technical editors. If your company has no editorial group, PTGEWS will edit your paper for you. Members of the NJ PTGEWS also stand ready to evaluate and help prepare anyone who intends to present a paper orally.

Join the PTGEWS if you want to join the crusade to preserve some of the precision and beauty of the English language.

Some people say that the only purpose of language is communication. What difference does it make if we break the rules of grammar or use a word improperly as long as we make ourselves understood? There is some merit in that argument.

Me say what me want say. Me finish.

\* The name of the cigarette has been changed to preclude free advertising.

## ANNUAL SECTION BANQUET

Please reserve ..... tickets for The Annual Section Banquet to be held at the Robin Hood Inn, 1129 Valley Road, Clifton, N. J., on Sunday, March 15, 1964. Tickets are \$5.00 per person.

Enclosed is \$ .....

Name .....

Address .....

Reservations, checks and stamped self-addressed envelopes to be sent to:

PROF. JOHN REDMON

EE Dept., Newark College of Engineering — 323 High Street, Newark 2, N. J.

## NORTH JERSEY SECTION IEEE EXECUTIVE COMMITTEE

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Editor ..... B. Meyer

## Executive Committee Meetings

February 5

March 4

April 1

May 6

June 3

Banquet—March 15



# AN OPEN LETTER TO

## JUSTIFIABLY DISCONTENTED

### ELECTRONIC SYSTEMS ENGINEERS

- Are you sick and tired of having your best and most creative ideas shot down—or bogged down—by the massive mediocrity of “the Establishment”?
- Are you embarrassed to be associated with the “water-cooler gang” . . . the “coffee-machine philosophers” . . . the clock-watching hobbyists who **degrade a professional career into just another job?**
- Are you disturbed because your employer does not appreciate—or react to—the **basic and irreversible changes** that have occurred in government spending patterns?
- Are you discouraged because you have more ability than your assignment demands, more maturity than your responsibilities imply, **far more productive capacity than they let you use?**

#### ■ . . . Then **RADIOMETRICS** may be for you.

We invite you to find out. We have written a no-nonsense brochure, describing the **new kind of scientific and engineering organization** (called **RADIOMETRICS**) we have developed out of the old Defense Electronics Department of Polarad—an experienced, yet brand-new organization, designed to **achieve far more than mere survival** in the hardening defense/space market. You ought to read that brochure.



Interested? Call George Goich, Director of Industrial Relations, at EXport 2-4500, for a copy of the brochure and an appointment . . . or, if you're not sure yet (and we **respect** caution) write or call for a copy of the brochure.

#### By the way—

*we don't offer much in the way of scenery. We **did** just paint the plant, but otherwise, the “decor” is designed for dignified efficiency rather than pastoral beauty—blackboards, scope screens, an occasional lunch-time chess set—and the deeply-satisfying society of real professionals. Private offices? Yes. Palm trees? No.*

*All inquiries will be held confidential.*

*An equal-opportunity employer.*

**RADIOMETRICS**

*is a Division of Polarad Electronics Corporation—a Diversified Scientific, Engineering, and Manufacturing Organization Founded in 1945.*

43-20 34th Street, Long Island City 1, New York

#### 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. See coupon on P. 7.

Dinner Chairman .... John K. Redmon  
Asst. Chairman ..... Joseph O'Grady  
Publicity ..... Bernard Meyer  
Facilities ..... R. Winterstein  
Fellows List ..... G. Tanguay and  
Membership Committee

Talking-up

Committee ..... The membership  
Section Chairman ..... C. Vadersen



## 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 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.

Individual instructors for the series have not as yet been assigned. However for sessions 1 and 4, the instructor will be supplied by G.E.; for sessions 5 and 6 the instructor will be supplied by Bailey Instrument Co.

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, Strain 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 Rec-

tifiers, 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 \_\_\_\_\_

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500 mc to 18 Gc

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5-8752	1-2	1	33
502A	2-4	1	30
5-8868	2-4	10	33
5-542	4-8	1	30
529	4-8	10	30
529-S1	4.8-8.5	10	30
528	7-11	5	30
528A	7-11	10	30
527	8-12.4	2	30
527-S1	8-11	10	33
528	12.4-18	1	30



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adjustable overcurrent trip-out  
current range switching  
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provisions for system operation

Model	Voltage do	Current ma	Pk-to-Pk ripple	Regulation line	Regulation load
282	0 to 500	0 to 100	5 mv	.01%	.02%
283	0 to 1500	0 to 150	10 mv	.01%	.02%
287	0 to 3500	0 to 50	15 mv	.005%	.008%
270	0 to 5000	0 to 50	20 mv	.002%	.008%
271	0 to 5000	0 to 150	30 mv	.002%	.008%



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**PTG  
ELECTRON DEVICES**

**POWER SWITCHING  
WITH DIODES**

The NY Metropolitan Professional Technical Group on Electron Devices will present a talk on "Microwave Power Switching with Semiconductor Diodes" by Marion E. Hines of Microwave Associates. The meeting will be held on Thursday, February 27, 1964 at General Telephone & Electronics Labs., 208-20 Willets Point Blvd., Bayside, Long Island, New York, at 8:00 P.M.

**Abstract**

Semiconductor diodes have been used for many years as microwave switching elements. The impedance (for limited signal strength) may be switched from one value (usually small) in a forward-biased or conducting state to another (usually larger) in a reverse-biased or non-conducting state. In microwave switching networks, the diodes are incorporated into coaxial or

waveguide transmission paths in such a manner that a change in diode impedance causes a change in signal transmission. The impedance changes are brought about by changes in the dc bias.



Recent developments in p-i-n type diodes have permitted large increases in the power capacity of these switches and significant reduction in signal losses. In these diodes the conductivity of the intermediate i (intrinsic) region is modulated by the injection of carriers from the p- and n-type regions. These diodes have low capacitance and very high impedance when reverse-biased and can also withstand large high frequency voltages. In forward bias, the ac resistance is sufficiently low that many amperes can flow without excessive power dissipation. Because of these desirable characteristics, p-i-n diodes are greatly superior to varactor or other microwave diodes as switching elements. They can also be used at lower frequencies down to dc.

The paper describes the power and attenuation capabilities of several classes of microwave switches, including single pole, multiple pole, duplexer switches, and phase shifters. Basic figures of merit are presented which express these capabilities concisely. Methods of fabricating these diodes will be discussed, with emphasis on the factors which affect the figure of merit.

**The Speaker**

Marion Hines received both his BS in Applied Physics (1940) and the MSEE (1946) from the California Institute of Technology.

Mr. Hines was at Bell Telephone Laboratories from 1946 to 1960. He worked on the development of traveling-wave tubes, microwave triodes, storage tubes, pulse-code modulation transmission systems, and solid-state microwave devices.

Since 1960, he has been at Microwave Associates, Inc., Burlington, Mass.

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**PTG  
Engineering  
Writing and Speech**

**VOICE, DICTION, AND  
SPEECH IMPROVEMENT**

PTGEWS will hold its February meeting on the 13th at the General Precision Aerospace Auditorium after a pre-meeting dinner at the Robin Hood Inn.

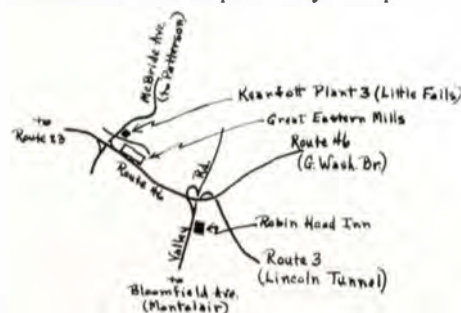
Mr. Vincent Vinci of General Precision Aerospace will give an audience participation talk. It will consist of a three-part speech analysis: 1) voice, 2) diction, and 3) speech improvement. The talk, designed around visual aids, is directed to everyday speech, not formal public speaking.

Mr. Vinci's talk will begin with a description of the voice, what it is, how it is generated and shaped. In addition to a discussion of voice as an instrument of speech, it will be considered as a tool of social adjustment. Following a summary description of the speech mechanism, its components and the nature of their contribution to the formation of articulate speech will be presented. Some commonly misused speech terms will be defined and examples given.

Familiar and common, but usually overlooked, speech problems and difficulties together with samples of each will be described. Methods of overcoming these difficulties and methods for general speech improvement will be introduced. These methods are primarily do-it-yourself or self-help means to speech betterment and are readily accessible to everyone.

The third and concluding portion of the presentation considers diction and how it can improve your speech. Uncommon material and audience participation, using seemingly obvious examples of diction, will highlight this part of the talk.

An over-all summary of the presentation will contain the relationships of voice, diction, and speech improvement with their impact on your speech.



**The Speaker**

Mr. Vincent Vinci, currently Proposal Manager in the Marketing Division of General Precision Aerospace, has been in the field of technical documentation and management since 1954. During this period, he has been responsible for the preparation of speeches, proposals, technical literature, and advertising.

At Stavid Engineering, Inc., he was a technical writer. With Vitro Laboratories he was a technical writer-editor. Mr. Vinci was a freelance consultant preparing public relations films and advertising copy. Prior to entering the technical field, Mr. Vinci was a radio announcer at WPGA, Bethlehem, Pa.

Mr. Vinci was a lecturer in speech at Seton Hall University from 1956 to 1962.

Mr. Vinci received a BA from Seton Hall University and received the school's Oratorical Medal.

**MEETING NOTICE**

**SUBJECT:** A Practical Talk on Voice, Diction, and Speech Improvement

**SPEAKER:** Mr. Vincent Vinci, General Precision Aerospace

**MEETING:** 8:00 P.M.  
General Precision Aerospace Auditorium  
1225 McBride Avenue  
Little Falls, New Jersey

**DINNER:** 6:00 P.M.  
Robin Hood Inn  
1129 Valley Road  
Clifton, New Jersey  
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## FUBINI TO CHAIR KEYNOTE PANEL AT PTGMIL CONVENTION

### Panel Includes Top Government, Military, and Industry Officials

Dr. Eugene G. Fubini, Assistant Secretary of Defense and Deputy Director for Research and Engineering, will moderate the keynote panel for the 1964 National Winter Convention on Military Electronics, to be held Feb. 5-7 at the Ambassador Hotel in Los Angeles.

Dr. Nicholas A. Begovich, chairman of the technical program committee and a vice president of Hughes Aircraft Company, said the panel will be made up of key government, military, and industrial leaders.

The panel discussion on "Weapons System Selection — 1964", will set the theme of the three-day convention, Dr. Begovich added.

More than 100 technical papers on systems requirements, technical feasibility, and cost effectiveness in the electronics field will be presented in sessions, which will include classified meetings. Classified sessions will be sponsored by the Air Force Systems Command, according to Dr. Begovich.

Members of the keynote panel which will be chaired by Dr. Fubini are Graeme C. Bannerman, Deputy Assistant Secretary of Defense (procurement); Lt. Gen. Dwight Beach, Commanding General, Army Combat Development Command; James N. Davis, Deputy Assistant Secretary of Defense (Weapons Acquisition and Industrial Readiness); Lt. Gen. Thomas Gerrity, Deputy Chief of Staff, Systems and Logistics, United States Air Force; and Richard E. Horner, senior vice president and general manager, Northrop Space Systems Laboratory.

Dr. Fubini has been a member of the Air Force Scientific Advisory Board, the Advisory Group on Special Projects of the Department of Defense, chairman of the Electromagnetic Warfare Advisory Group of the Air Research and Development Command, and consultant to the President's Science Advisory Committee.

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Press Committee

## International Conference on Microwaves, Circuit Theory, and Information Theory September 7-11, 1964, Tokyo

Sponsored by: The Institute of Electrical Communication Engineers of Japan

Supported by: The International Scientific Radio Union, The Science Council of Japan

In cooperation with: Société Française des Electroniciers et des Radioelectriciens, Verband, Deutscher Electrotechniker, The Institution of Electrical Engineers (United Kingdom), The Institute of Electrical and Electronics Engineers (USA), The Academy of Sciences of the Union of Soviet Socialist Republics

The International Conference on Microwaves, Circuit Theory, and Information Theory, 1964, Japan (ICMCI) will be held at Akasaka Prince Hotel in Tokyo, Japan, from September 7th (Monday) to 11th (Friday), 1964.

The Conference will be open to any interested person in any country in the world and will be specialized in subjects of current importance in regard to Microwaves, Circuit Theory, and Information Theory. There will be several informative sessions on the following major topics:

- (I) Microwaves
  - 1) Microwave Theory and Techniques and Electron Devices
  - 2) Microwave Antennas and Propagation
  - 3) Microwave Communication Systems
- (II) Circuit Theory
- (III) Information Theory

### ABSTRACTS

The Abstracts of about 100 words must be typewritten, double spaced, in an area of about 15 cm X 21 cm on standard white bond paper (about 21 cm X 27 cm). The title, the name(s) of author(s) and the address of the institution should be typed at the top of the paper.

Summaries and Abstracts must be written in English.

The Summary and Abstract should be packed flat using the envelope provided, not folded, and arrive at the Chairman of the Papers Committee NOT LATER THAN MARCH 31st, 1964 to: Dr. Kiyoshi Morita c/o The Institute of Electrical Communication Engineers of Japan, 2-8, Fujimicho, Chiyoda-ku, Tokyo, Japan.

OFFICIAL REGISTRATION will take place at Akasaka Prince Hotel beginning Saturday, 5 September — 10:30 A.M. to 3:00 P.M.

### EXHIBITION

Various kinds of electronic equipment and apparatus will be exhibited at the show rooms of Tokyo Tower throughout the Conference period.

### HOUSING

Application for hotel reservations should be made by mail direct to the Japan Travel Bureau (Cable address "TOURIST TOKYO"), 1 Marunouchi-1, Tokyo, Japan. NOT LATER THAN JUNE 30, 1964.

## IMPEDANCE MEASUREMENT STUDY GROUP

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**.

**DATE:** Every Monday from  
February 17 to  
April 6, 1964  
(excluding March 23).

**TIME:** 6:30 to 8:30 P.M.

**PLACE:** Ebasco Auditorium,  
2 Rector Street,  
New York City.

**REGISTRATION:** \$15.00 for engineering society members, \$20.00 for non-members. For advance registration, make check payable to Instrumentation Division, New York Section, IEEE. Mail to M. D. Bowers, Thomas A. Edison Research Center, Watchung Avenue, West Orange, N. J.

Following is a summary of topics and speakers:

- Feb. 17 — NATIONAL STANDARDS  
C. Peterson, National Bureau of Standards
- Feb. 24 — POWER FREQUENCIES  
E. H. Salter, Electrical Testing Laboratories, Inc.
- Mar. 2 — AUDIO TO 300 KC RANGE  
R. B. Mather, New York Telephone Co.
- Mar. 9 — RF AND VHF RANGE  
J. H. Mennie & R. E. Lafferty, Boonton Electronics Corp.
- Mar. 16 — UHF AND MICROWAVE RANGE  
C. G. Gorss, Boonton Radio Co.
- Mar. 30 — FOUR-TERMINAL NETWORKS  
P. Bishop, General Radio Co.
- Apr. 6 — NON-ELECTRICAL IMPEDANCE  
N. C. Szuchy, Republic Aviation Corp.

At the sessions, various speakers from industry, universities, and government will discuss standards, measurement techniques, and special problems associated with different frequency ranges. The spectrum to be covered includes power frequencies, audio and carrier frequencies, rf, vhf, uhf, and microwave. Both lumped and distributed R, L, and 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.

The Newsletter, February 1964

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## 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:

N. J. Huth — IBM

H. E. Blaicher — Jersey Central —

N. J. Power and Light Co.

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.

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

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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, 1964

### 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.

## 1964 Reliability Training Course

A Reliability Training Course, another of the series sponsored by IEEE and ASQC, will be held at the Westbury Hotel, Toronto, from Monday, 20th April thru Friday, 24th April 1964.

The syllabus includes formal lectures on a wide variety of Reliability and Maintainability topics, supplemented by films, discussion groups, and presentations by well-known guest speakers. Management, theoretical and practical aspects, are covered to provide an overall appreciation of present-day Reliability technology.

The fee for the course is \$225 which includes tuition, text-books, other course materials, all noon meals and one evening meal. The attendance at the course is limited to 35 people to insure close liaison between students and instructor.

Applications for attendance or requests for further information should be addressed to:

Mr. Leonard C. Thomas  
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1001 Lenoir Street  
Montreal 30, Quebec

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## PROBABILISTIC CONTROL THEORY

### March 17 PTGAC Meeting

Professor Rudolph Drenick of the Polytechnic Institute of Brooklyn will discuss non-deterministic control theory. The meeting will be held at General Precision Auditorium, Little Falls, on Tuesday, March 17 at 7:45 P.M.

#### ABSTRACT

The basic purpose of a control system is presumably this: a device, usually called the "plant" or the "load", is to be driven in such a way that its output has certain desirable characteristics. In practice, the achievement of this objective is complicated by the fact that the plant is typically surrounded by some uncertainty. In other words, given the input that drives the plant, it is not in general possible to predict the precise nature of the output.

The origin of such uncertainties can be manifold. In some cases, a supposedly linear plant may in fact be nonlinear in some only poorly understood fashion. In other cases, it may be affected by aging in an unknown way. Or else, its output may be distorted by noise. Complications such as these underlie very much of the present theory and practice of control engineering, more than is sometimes realized. It is, for instance, basically responsible for the use of feedback in control systems.

A good deal of recent thinking about control theory, notably about optimal control theory, has centered on the question of how to incorporate the notion of uncertainty into the theory. One way of doing this is to equate uncertainty with probabilistic control theory.

The talk will discuss some of the main concepts that have become important in this theory and some of the problems that arise in it. It will sketch some possible areas of application. Some of the presumed advantages and disadvantages of the theory will be mentioned.

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## THE SPEAKER

Rudolph F. Drenick is a Professor of Electrical Engineering at Polytechnic Institute of Brooklyn. He graduated with a PhD in theoretical physics from the University of Vienna. In 1946 he joined General Electric as engineer engaged in the analytic treatment of guided missile problems.

He is a member of the IEEE, American Mathematical Society of Industrial and Applied Mathematics, Operations Research Society of America, Institute of Mathematical Statistics.

Dr. Drenick has held the following memberships: IEEE Cybernetics Committee, Administrative Committee, IEEE—PTGIT, URSI Committee VI.

#### MEETING NOTICE

**SUBJECT:** PROBABILISTIC  
CONTROL THEORY

**SPEAKER:** Rudolph F. Drenick  
Professor of  
Electrical Engineering  
Polytechnic Institute of  
Brooklyn

**PLACE:** General Precision,  
Incorporated  
Auditorium, Plant 3  
1225 McBride Avenue  
Little Falls, New Jersey

**DATE:** Tuesday,  
March 17, 1964  
7:45 P.M.

All PTGAC members are invited to monthly executive committee meetings. If interested, please contact Mr. Robert Sokalski at CA 6-4000.

## IEEE INTERNATIONAL CONVENTION TO DISCUSS INFORMATION RETRIEVAL

The benefits to be derived from increased information retrieval activity all the way from the individual IEEE member who wants to start his own personal system to the service centers at the national level will be discussed at a session "Information Retrieval, IEEE, and You" to be held Tuesday afternoon, March 24, in the Hilton Hotel, New York, as part of the 1964 IEEE Convention. Experts from industry, government, and the academic world will participate. An IEEE booklet, specially prepared for participants, will give not only specific implementation suggestions but also abstracts of good information retrieval papers, information retrieval terminology and definitions.

"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 illustrated 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.

Topics at this session will include:

- PUBLICATION OF INDEX TERMS  
AND ABSTRACTS WITH  
TECHNICAL ARTICLES
- THE EJC THESAURUS OF  
ENGINEERING TERMINOLOGY
- PREPARATION AND USE OF  
MICROTHESAURI IN  
SPECIALIZED FIELDS
- SELECTIVE DISSEMINATION TO  
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6-cm by 10-cm display area. Internal, no-parallax graticule. Controllable graticule illumination. 14-kv accelerating potential.

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2 time bases, independent triggering. Sweep rates to 0.1  $\mu$ sec/cm. 10X sweep magnifier.

Sweep delay 50 sec to 1  $\mu$ sec. Single-sweep operation. Wideband (>50 Mc) triggering. External horizontal input.

1-kc voltage calibrator, (crystal controlled). Push-button trace finder. Dc-coupled Z-axis amplifier. Current-probe calibrator.

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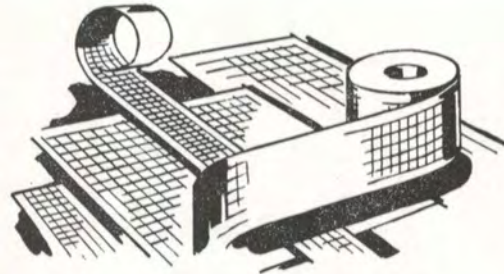
Besides measuring frequency and period and totalizing—as do most universal electronic counters—hp 5214L also:

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