Annual Banquet-Dance!

(See details on Page 5)

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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MARCH 1964
Volume 10 / Number 7

To Measure Sound

No Frills or unnecessary extras clutter the functional design of this instrument. It has been developed for one purpose — to make sound-level measurements as accurate, convenient and complete as possible.

Microphone — Piezoelectric (PZT) ceramic type, developed expressly for sound-level-meter use

Essentially non-directional and unaffected by humidity variations (0-100%). Response is smooth from 20c to 8 kc (the range of most noise energy). Aging effects are too small to be measured. Completely self-contained; no polarizing voltages or humidity-sensitive preamplifiers. Ruggedly built to withstand rough treatment.

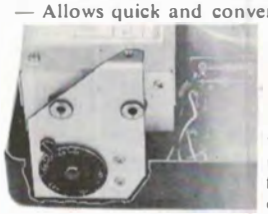
High Signal-to-Noise Ratio — Unique amplifier design makes possible analyses of noises with steep spectrum slope — microphonics caused by vibration and air-borne sounds have been reduced by use of low-noise cable and shock and vibration mountings.

Stability — insures accuracy with less frequent calibration adjustments. A voltage-reference diode maintains constant plate voltage on first two amplifier stages. Second stage is a pentode, permitting greater gain and allowing greater use of feedback around main amplifier. The output stage is a transistor emitter-follower. Readings are independent (within 1 db) of temperature and humidity over normal ranges of room conditions.

Excellent Frequency Response results from — (1) Smooth microphone frequency characteristic. (2) Attenuator with good high-frequency response. (3) Amplifier with full 20c-to-20 kc bandwidth. (4) Indicating meter with no observable frequency error.

Wide Sound-Level Range — Instrument is direct reading from 24 db to 150 db above standard sound-pressure level of 0.0002 μbar (dynes per sq. centimeter) at 1000 cycles.

Microphone Sensitivity Adjustment — Allows quick and convenient resetting of amplifier gain when using specialized microphones. Calibrated directly in terms of microphone sensitivity from −49 to −61 db (re: 1v/μbar).



Built-In Calibration Check — Reference circuit permits convenient standardization of sensitivity of electrical circuits at any time — after standardization, accuracy of sound-level measurements is within ±1 db for average machinery noise, specified by ASA standards.

Type 1551-C Sound Level Meter
$450. in U.S.A.

Weighting Networks — A, B, and C weighting fit design Center of ASA Characteristics. C weighting provides an approximately flat overall instrument response, within limits of the microphone's frequency range. The "20 kc" position provides a flat amplifier response from 20c to 20 kc for use with wide-range microphones.

RMS Waveform Response — Quasi-rms meter circuit approaches true rms response.

Two-Meter Damping Characteristics — In "FAST" position, ballistic characteristics of meter agree with ASA standards. In "SLOW" position, movement is heavily damped for easy reading and indicates the average level of rapidly fluctuating sounds.

Output Jack — Provides low distortion output for frequency analyzers, recorders, and oscillographs; connections to the jack do not affect panel-meter readings — output is one-volt across 20,000 ohms when panel meter is at full scale.

Convenient ON-OFF Switch — Swivel-mounted microphone folds against case and automatically turns instrument off.

Two Microphone Operating Positions — Horizontal position keeps microphone away from instrument cabinet and operator's body; minimizes disturbance of sound field. Vertical position is useful for measurements in confined areas.

Sturdy Aluminum Case — Light, durable aluminum case is unusually strong, neat, compact, and provides complete shielding. Complete instrument weighs only 7 lbs., 10 oz.; 9 lbs., 10 oz. with leather carrying case. Overall dimensions 6⅛ x 9¼ x 7¼ inches.

Simple to Operate — Sound level at microphone is conveniently indicated by sum of meter and attenuator readings. Meter has an easy-to-read, substantially linear 16-db scale — adjustable attenuator has range of 110 db in 10-db steps.

Accessory Leather Carrying Case — Instrument is easily carried, and can be operated without removal from case; makes field use convenient as possible — affords added protection in transit. Price . . . $25.

Batteries Readily Available — Two 1½-volt D flashlight cells and one 67½-volt battery (Burgess XX45 battery or equivalent) are used for easy replacement.

Tubes — Four Raytheon low-microphonic, low-noise CK-512-AX tubes and two CK-6418 tubes; one RCA 2N105 transistor.

Accessories for the Type 1551-C are available which readily convert it for operation from an a-c power line, for high-level sound measurements, for analysis of the frequency spectrum, for vibration measurements, and for impact (short duration) noise analysis. You buy only what you need — no more, no less. General Radio manufactures a complete line of sound and vibration equipment for measurement, analysis, and calibration. *Write for Complete Information.*

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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

We have felt it is fortunate that this publication is called "The Newsletter," rather than "Amplifier" or "Oscillator," because up to now we have had no feedback. But, we are not a voice crying in an anechoic chamber. Happily, three people have answered. One provocative reply by Porter H. Evans to our question "Why did you join the IEEE?" might interest you: ". . . support the profession that supports you . . ."

The first Industrial Revolution replaced manpower with machine power. We are now engaged in the second Industrial Revolution which is replacing brainpower with a more sophisticated machine power. The engineer is creating, designing, and building his own replacement. To really explore this, the Program Committee should set up a forum wherein this could be discussed.

Even though it would mean breaking a tradition that seems to be followed by most organizations, we suggest that the meetings start at 5:30 or 6:00 P.M. and close at 7:30 or 8:00 P.M. At that time, the members may either adjourn to a nearby restaurant or head for home—early.

Ann Hathaway, Secretary of PTG Engineering Writing and Speech, and Howard L. Cook, Associate Editor of "The Newsletter," will marry in April. We'd like to think we are gaining an editor.

This is the time when we honor all the newly elected Fellows of the North Jersey Section at our Annual Banquet-Dance. As you can see by the details on page 5, this will be a real great affair. All the directions to insure your attendance are there. Follow them.

The Section Elections are coming up soon. We have a nominating committee headed by J. Schwanhausser who is working on the slate for the coming year. If you have any suggestions, be sure to let him know.

The

Newsletter

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

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c/o Staff Associates
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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.

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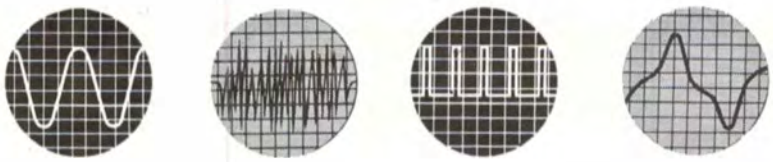

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Voltage Range.....10 μV to 300V (to 10,000 V with optional accessory)
Frequency Range.....5 cps to 4 Mc (3 db bandwidth is 2 cps to 7 Mc)
Measures signals with Crest Factor....5 full scale to 15 down scale
Accuracy above 300 μV, in % of READING AT ANY POINT ON SCALE, 2%, 20 cps to 400 kc; 3%, 10 cps to 2 Mc; 4%, 5 cps to 4 Mc
Input Impedance.....10 megohms in parallel with 11 or 27 pF
Amplifier..Choice of balanced or single ended, 5 cps to 4 Mc, up to 90 db gain, 50 V into 20K load
DC Output.....Proportional to mean square of ac input, for connection to recorder; output 1V; source resistance 1000 ohms
Power requirements.....115/230 V, 50-420 cps, 90W
Accessory (optional).....To measure up to 10,000 volts, use Model 1320 Multiplier (40 megohms, 3pF)

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PTG Reliability

RELAY I COMMUNICATION SATELLITE

"The Relay I Communication Satellite" will be the subject of a meeting on March 4, 1964 presented by the PTG on Reliability and co-sponsored by the New York Section IEEE. This subject was originally scheduled for presentation at the January 14 meeting of the PTGR, but because of the heavy snowfall at that time the meeting was canceled.

MEETING NOTICE

SPONSORS:	Presented by the PTG on Reliability and co-sponsored by the New York Section IEEE
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, New York City
DATE:	March 4, 1964 (Wednesday)
TIME:	7:45 P.M.

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.

SUNDAY,
March 15, 1964
4:00 P.M.–MIDNIGHT
ROBIN HOOD INN
Valley Road
Clifton,
New Jersey

North Jersey Section

Annual Banquet–Dance

Reception
4:00 P.M.
—Generous assortment of hot and cold hors d'oevres, and cocktails of your choice.

Banquet
5:15 P.M.
—Menu includes: appetizer, soup, Roast Prime Ribs of Beef, salad, vegetable, potatoes, dessert, and beverages.

Formal Program
7:00 P.M.
—Welcoming remarks by **C. W. Vadersen, Chairman,** North Jersey Section. "Report on the Organizational Activities and Growth of Professional Technical Groups" by **Richard Emberson, PTG Secretary,** IEEE Headquarters.

Introduction and Recognition of Newly Elected Fellows:

Ralph B. Blackman
Homer W. Dudley
Paul H. Jeynes
Bernard E. Lenehan
Kenneth G. McKay
Ernest C. Okress
Erling D. Sunde
Lucio M. Vallese

Edison Medal: John R. Pierce
W. R. G. Baker Prize: Donald L. White

Dancing
8:00 P.M. to Midnight
—to the melodious music of Matt Leyden.

Reservations are limited to **250,** so here is what you should do to insure your space for this gala event. Today: Complete the coupon below and follow the directions detailed.

Reservation Coupon:

To: Professor John K. Redmon,
Dinner Chairman
Department of
Electrical Engineering
Newark College of Engineering
323 High Street,
Newark 2, N. J.

Enclosed please find my check (or money order) made payable to the North Jersey Section IEEE in the amount of $ ..... ($5.00 each) for which please reserve in my name ..... ticket(s) for the North Jersey Section, Annual Section Dinner on March 15, 1964.

Enclosed also is a self-addressed, stamped envelope to return the tickets to me. (If received after **March 6th,** or without stamped self-addressed envelope, tickets will be held at the door).

Name **(Please Print)** .....

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ANDREW

Andrew

PTG Engineering Writing and Speech

APRIL MEETING TO HEAR ELECTRONICS EDITOR

Some of the mysteries surrounding electronics publishing will be cleared up at the April 16th meeting of the PTG on Engineering Writing and Speech. Mike Perugini, no stranger to NEWSLETTER readers, will discuss such questions as:

Why are some magazines free, others paid?
How are articles edited?
Why so many electronic publications?
How can you tell what type of articles a particular magazine is interested in?
Why should an engineer take time to write for a trade publication?
How can you improve your chances of getting an article accepted?

Most Section members know Perugini as a former Editor of "The NEWSLETTER." He is Editor of Mactier Publishing Company's EEP-Electronic EVALUATION & PROCUREMENT. His educational background includes a BSEE from Newark College of Engineering and a MBA from City College of New York.

Perugini will draw on five years of experience in electronic editing to give engineers insight into the publishing field.

Thursday, April 16th is the date. Full details will appear in the April issue of the NEWSLETTER.

PTG Vehicular Communication

ANNUAL DINNER MEETING NOTICE

DATE: Tuesday, March 24, 1964
PLACE: Skyline Roof
Shelburne Hotel,
Lexington Avenue
at 37th Street
TIME: Social Hour starts at 6:00 P.M.
Dinner will be served at 7:30 P.M.
PRICE: $6.50 per person payable at the door

Mail to:
Mr. John J. Algeo,
Sec-Treas. N. Y., PTGVC
New York Telephone Company
Room 1600
811 — 10th Avenue
New York 19, N. Y.

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Editor ..... B. Meyer

Executive Committee Meetings

at Verona Public Library

March 4
April 1
May 6
June 3

EXECUTIVE COMMITTEE REPORT

THE PUBLICATIONS COMMITTEE

Frederick I. Scott, Chairman

The Publications Chairman is broadly responsible for the operation of THE NEWSLETTER—the monthly magazine of the North Jersey Section. He is a member of the Executive Committee and is charged with the responsibility for developing and administering the editorial and advertising policies of the publication. In cooperation with the Section Treasurer and The Newsletter Business Manager, he prepares the annual budget for its operation.

So much for the (paraphrased) job description of the office of the Publications Chairman. What are some of the activities he performs? How does The Newsletter actually function? Who is paid? Does The Newsletter staff really swing? What are the major financial and editorial policies? Will the Newsletter circulation soon challenge Playboy's? Answers to these and other burning questions are more illuminating than any formal statement of duties and responsibilities.

Historically, the job of Publications Chairman has been in and out. That is, it has not always existed. This situation reflects more the variable availability of experienced people than any indecision of the Executive Committee. The activities the Chairman performs include attending the monthly staff meeting, attending the monthly Executive Committee meeting, discussing NL budget problems with the Section Treasurer, corresponding with the Chairman on policy matters and membership complaints, and writing a column at midnight on deadline date.

Despite the interference of the Publications Chairman, however, the Editor and the Business Manager succeed admirably in getting The Newsletter out on time. Seriously though, the NL really functions through their untiring efforts. The Editor is responsible for all of the editorial and layout functions, obtaining from each group a write-up of its future meetings and other material, because there is no rewrite staff. In addition, he decides on type size, writes headlines, gets the copy to the printer, sees that galleys are proof-read, lays out pages, pastes up the galleys and checks page proofs before notifying the Business Manager that the issue is ready to be printed. The Business Manager is responsible for producing the magazine from this point and also for contacting advertisers, maintaining a telephone during business hours, and several financial matters. He serves as liaison between editor and printer.

At this point, let me commend Mike Perugini for his herculean efforts when, as editor last year, he at times wore all three hats. We have made several changes, largely at his suggestion, to see that such a situation does not recur. Thanks Mike, and good luck in your new job.

Both editorial and financial policies guide the NL operation. Fundamentally the NL is to serve as the meeting notice of the Section. In fact, it grew out of the original post card notices of the general Section meeting. Although the number of meetings has grown in these ten years of operation, this continues to be its main purpose. It has expanded to include an editorial and occasional feature articles as advertising revenues permit. It is the express desire of the Executive Committee that the NL remain an amateur publication, written and put together by volunteers from the Section itself though we welcome professionals on the staff. Only the business management function receives financial remuneration. All news gathering sources are volunteer and, while this can lead to communication problems, it is still the best way of operating. An aside to publicity and chapter officers should be mentioned here. It is the responsibility of each group to deliver meeting notices and other material for publication to the NL staff. We do not have the staff needed nor is it feasible to chase down the information from the various groups. Sure, sometimes we goof (who doesn't?) but often this results from the helter-skelter activity necessary in attempting to ascertain needed information. Incidentally, our deadline is the 25th of the 2nd month preceding publication, e.g., March 25 for the May issue.

As for whether the Newsletter staff really "swings"—we think it does though sometimes it is from a limb. I'm afraid though, we'll never approach Playboy's circulation without a centerfold.

Atmospheric Omelets & Electronic Specifications

There is a classic recipe — harking back to the days of the Great Depression — for an omelet serving eight people that calls for one egg . . . and a bicycle pump.

At first glance the resultant dish looked hearty and sumptuous. But it is difficult to live for any period of time on a diet consisting primarily of atmosphere.

The specifications published for some electronic equipment remind us somewhat of this pneumatic omelet . . . too little substance made momentarily presentable through inflation.

With this thought in mind, we would like to hold forth on our approach to specifying our equipment.

In all cases Boonton Electronics specifications represent the minimum performance you can expect over extended periods of time.

Our specifications are not "typical" figures; they are not "nominal" or "design-center" values. Nor are they best guesses or fond hopes. They are absolute limits which must be met (or exceeded) by each individual unit before it may be shipped. Each is backed by actual tests, performed where possible against standards whose accuracy is traceable to the NBS, and expressed in the clearest, least ambiguous terms we can devise.

An example of this philosophy at work may be seen in the published specification for the upper frequency limit of our Model 91D Sensitive RF Voltmeter. We know that the instrument provides useful readings to beyond 2500 Mc. But we would not presume to issue accuracy specifications for measurement in this region, since no appropriate primary standards exist for their validation.

It may well be that our insistance upon integrity of specification occasionally causes the loss of a sale to a less conservative competitor who is serving up an "atmospheric omelet." Our compensation for this is that we know the only surprises our customers get when they put one of our instruments into service are happy ones.

Our Sales engineer in your area will be happy to give you full details on our Sensitive RF Voltmeters and their applications, or to arrange a demonstration. Why not give him a call?

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AN OPEN LETTER TO

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- 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.

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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
Component Parts

MEETING NOTICE

DATE: April 14, 1964
TIME: 6:30 P.M.
PLACE: Barbizon Plaza, New York
SUBJECT: The Physics of Semiconductor Failures
SPEAKER: Dr. I. A. Lesk

6:30 P.M. to 7:45 P.M. — Motorola and Schweber Electronics invite 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".

Subject: 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.

Speaker: Prior to joining Motorola, Dr. Lesk held several positions with General Electric Co.

Sponsored by: This is part of a series on "Physics of Failure" of the Metropolitan New York Chapter of the Component Parts Group and PTGPEP.

Guests are Cordially Invited

REGISTRATION FORM

If you plan to attend, please return coupon before March 20, 1964 to Mr. E. F. Mallahan, Eclipse-Pioneer Div. — Bendix Corp., Dept. 7651, Teterboro, N. J.

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

FROM:
Name .....
Company
Affiliation .....
Address .....
.....

NEW FELLOWS OF THE IEEE

For contributions to circuit theory and data processing.

RALPH B. BLACKMAN

R. B. Blackman was born in 1904, in the Phillipines. He received his education through high school at De La Salle College in Manila. In 1921 he came to the United States where he received a BS degree in Physics and Engineering from the California Institute of Technology in 1926. He became a member of the technical staff of the newly organized Bell Telephone Laboratories in New York City, where he did research in acoustics, hearing, and electromechanical tranducers and filters until 1936. He was then transferred to a newly organized Mathematics Department under Dr. T.C. Fry, where, in association with Drs. H. W. Bode, R. L. Dietzold and S. Darlington, he was occupied mainly with the theoretical study of electrical filters, equalizers and feedback amplifiers, until 1940. Since then his work under Dr. S. Darlington has been largely on data-smoothing and prediction schemes with applications to weapons systems, satellite launching systems and satellite surveillance systems. He also did some work under Dr. J. W. Tukey on the statistical aspects of the measurement of power spectra and on the analysis of seismic data. (With Dr. Tukey he co-authored "The Measurement of Power Spectra", published by Dover.)

He is a member of Tau Beta Pi and of the American Association for the Advancement of Science.

For contributions to the fields of speech theory, speech signal processing and speech synthesis.

HOMER W. DUDLEY

Homer Dudley, who received his IEEE Fellowship for "contributions to the fields of speech theory, speech signal processing, and speech synthesis," has been active in this area of research since 1921. He is presently serving as a consultant at ITT Communication Systems, Inc. (ICS), Paramus, N. J. subsidiary of International Telephone and Telegraph Corporation.

Before joining ICS in June 1962, Mr. Dudley served as a research engineer at Bell Telephone Laboratories, where, from 1921 to 1961, he was concerned with improving the transmission of speech sound by wire, cable and radiotelephone systems.

In the middle 30's, he turned to the analysis and synthesis of the spoken word as a function of inner speech. His work on the design and construction of speech analyzing and synthesizing circuits led to the development of the VODER, a manual speech synthesizer demonstrated at the 1939-40 New York and San Francisco World Fairs and to the Vocoder, a voice synthesizer which recreates spoken sounds electrically and combines them into human speech. The inventions formed the basis of many later developments in speech analysis, including a method for teaching the deaf to converse through the use of visual speech techniques.

Mr. Dudley is the holder of 35 patents in the United States and many more in other countries, covering negative impedances, submarine cable switching, negative resistance amplifier, coaxial conductor systems, television, frequency range reduction, multiplexing, terminal circuits, tactile perceptors, speech-controlled telegraph, voice printer, automatic "brain," formant analyzer-synthesizer, resonance Vocoder, miniature Vocoder, and speech synthesis from code signals.

He received his BS in electrical engineering from Pennsylvania State College and his MA in physics from Columbia University. He is a Fellow of the Acoustical Society of America and of the Audio Engineering Society, and a member of the American Association for the Advancement of Science. He is the author of 30 technical papers, including 15 of major significance in the fields of speech analysis and synthesis.

Continued on Page 11

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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.

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.

The North Jersey Section

Annual

Banquet-Dance

Sunday, March 15th, 4:00 P.M.

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page 5 for details

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For contributions to the economic analysis of power distribution.

PAUL H. JEYNES

Graduated from Shefficld Scientific School, Yale University, in 1918. PhB. Yale Graduate School, 1920. ME. Taught Power Engineering while in graduate school.

Public Service Electric and Gas Company, 1920 to 1963.

Distribution Engineer's Office, 1933-43. Became Distribution Planning Engineer in 1940. Published papers on applications of shunt capacitors, design of primary and secondary distribution systems, means for controlling voltage dips. Developed load-sampling procedures.

Accounting Department, as Depreciation Engineer, 1943-46. Originated methods for estimating service life, particularly the Half-Cycle Ratio and Indicated Renewal methods. Assisted in developing the Simulated-Plant-Record approach.

Distribution Plant Engineer, 1946-57. Problems in economic selection, evaluation, cost allocation, ratemaking, load sampling, electrical loss analysis, replacement economics, design of overhead and underground transmission, distribution, and street-lighting systems.

Engineering Economist, 1957-63. Economic studies and methods, operations research, and cost allocations in connection with system planning and development. Taught classes in engineering economy.

Author of two books, writing a third. "An Abbreviated Course in Engineering Economics" widely used, especially in the public utility industry. With Bert J. Blewitt (Member IEEE) presented the AIEE course in engineering economy, 1961-62, in Newark (24 classes).

Have published perhaps 50 technical papers, many in the AIEE Transactions. Innumerable discussions of AIEE and IEEE papers. Best known AIEE papers probably The Depreciation Annuity (1956) and The Criterion of Economic Choice (1958, with L. Van Nimwegen). AIEE prize paper in 1952 dealt with evaluation of electrical losses.

Thomas N. McCarter Medal in 1941, for contributions in the field of depreciation.

Elected to grade of Member, AIEE, in 1943.

Member Emeritus of the joint American Gas Association—Edison Electric Institute Depreciation Committees. Chairman of their Engineering Subcommittee for many years, and member of numerous other subcommittees. Member American Society for Engineering Education and Sigma Xi.

With partner Louis A. Winkelman, of Public Service, won the George Curtis cup, contract bridge, in 1934-35. Managed the Public Service Men's Glee Club in the 1930's. Pretty good on guitar, mandolin, and harmonica.

For contributions in the field of electrical instruments and measurements.

BERNARD E. LENEHAN

Bernard Edward Lenehan was born in 1901 in Deep Valley, Pennsylvania. He received his BS degree from Carnegie Institute of Technology in 1921. Upon graduation from college he joined the Westinghouse Electric and Manufacturing Company in East Pittsburgh, and shortly thereafter was selected for special advanced training in B. G. Lamme's design school, following which he was assigned to instrument development and design in the Supply Engineering Department.

In 1928, Mr. Lenehan joined the operations of the Westinghouse plant in Newark, N. J., where, in 1952, he was made advisory engineer of the Meter Division. In 1956 he was advanced to the position of consulting engineer, which is

Continued on Page 12

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NEW FELLOWS OF THE IEEE

his present position with the Relay-Instrument Division of the Westinghouse Electric Corporation in Newark.

During his early engineering years, Mr. Lenehan invented and developed a number of instruments which have had wide application. These inventions include: a narrow-range frequency meter with a four-cycle span; a repulsion vane a-c ammeter and voltmeter, having a superior scale linearity; a line of motor-operated servo-type electrical recording instruments; a current-balance type of telemetering system. Mr. Lenehan's later inventions and developments have been in the related field of measurement devices, including a slow-speed small synchronous motor; basic inventions in the field of power-line carrier-current relaying systems; and developments in the field of watthour meters.

His inventions resulted in 70 United States patents, and he has earned four Westinghouse special awards for outstanding patents and meritorious disclosures.

Professionally, Mr. Lenehan has been an active AIEE member, having served on instrumentation technical committees for over 25 years. He was formerly chairman of the AIEE Special Instruments and Auxiliary Apparatus Committee.

He is author or co-author of about twenty technical papers and articles, of which three were published in the AIEE Transactions. Mr. Lenehan represents the IEEE on the American Standards Association Sectional Committee on Electrical Instruments. In 1962 Mr. Lenehan received the Morris E. Leeds Award for his outstanding contributions to the field of electrical measurement.

For fundamental advances in the physics and engineering of solid-state devices.

KENNETH G. McKAY

Kenneth G. McKay of 100 Wildwood Lane, Summit, N. J., was named an Executive Vice President of Bell Telephone Laboratories effective May 1, 1962, with responsibility for all systems engineering and related activities of the Laboratories. A research physicist, Dr. McKay has been associated with electronic, semiconductor and solid-state research and development programs at Bell Laboratories since 1946.

Dr. McKay is a native of Montreal, Canada, and a graduate of McGill University, where he received his BS and MS degrees in 1938 and 1939, respectively. He was awarded the ScD degree by Massachusetts Institute of Technology in 1941 and worked with the National Research Council in Canada for the next five years.

Upon joining Bell Laboratories in 1946 he undertook fundamental research studies of the physics of solids, including studies of secondary electron emission and electron bombardment conductivity in insulators and semiconductors. Later his work related to the electrical and optical characteristics of electrical breakdown in germanium and silicon.

He was named Director of Development of Solid State Devices in 1957, promoted to Director of Development of Components and Solid-State Devices in 1958, and elected a Vice President in 1959.

Dr. McKay has been granted nine patents for his electronic inventions, and has written extensively on solid-state physics for scientific publications.

He is a Fellow of the American Physical Society and served on the Board of Editors of *The Physical Review* from 1955 to 1957. He is a senior member of the IEEE and a member of the Research Society of America.

For contributions to microwave magnetron design.

ERNEST C. OKRESS

Presently (i.e., since 1962) employed in research at American-Standard, Research Division, with respect to the non-equilibrium MHD generator and the non-equilibrium EHD accelerator, with some attention devoted to Electronic Power. Recently (i.e., 1959 to 1962) employed in research at Sperry-Rand Corp., with respect to millimeter waves. Previously (i.e., 1940 to 1959) employed in advanced development engineering at Westinghouse, with

respect to plasma physics, electrodynamics, electron physics, physical electronics, and microwave electronics. Device-oriented activities included: the gas discharge tube, the crossed field tube, microwave circuit components, the Klystron, the Resnatron and the grid control tube.

Original contributions related to the high power microwave Magnetron, the high power microwave window, the microwave gas switch, the microwave resonator, the grid control power tube, the high power cathode, electromagnetic levitation, pending non-equilibrium ionization for the MHD generator and the EHD compressor.

Granted over 30 U. S. patents in vacuum and gas discharge devices, microwave electronics, and electrodynamics. Granted several Special ($500) and Meritorious ($200) Westinghouse patent awards for outstanding inventions. Granted several Westinghouse paper Honorariums ($50). Granted Certificate of Commendation, OSRD, 1945. Granted National Registered Professional Engineer Certificate No. 925 and a State (N. J.) Registered Professional Engineer License No. 5625. Contributed over ten papers to professional journals and professional books relating to electronics, electrodynamics, thermionic and microwave devices. Editor-in-chief (Cross Field Microwave Devices). Previously papers examiner for J. Appl. Phys. and IEEE—PGED. Previously member JETEC. Fellow of IEEE, Fellow of Am. Phys. Soc., and Member of Soc. of Sigma Xi. BEE, Electrophysics, U. of Detroit; MSc, Electrophysics, U. of Michigan; PhD Thesis incomplete, Electrophysics-Mathematics, Polytechnic Institute of Brooklyn and N.Y.U. Academic status: Undergraduate—cum laude. Graduate—summa cum laude.

For contributions to knowledge of earth conduction effects.

ERLING D. SUNDE

Erling D. Sunde came here from Norway in 1927, after graduating in 1926 as Dipl. Ing. from Technische Hochschule, Darmstadt, Germany. From 1927 to 1934 he was with the Development and Research Department of the AT&T Co., and transferred with this department to Bell Telephone Laboratories in 1934, where at present he is a consultant in the Transmission Systems Engineering Division.

Until 1949 he was concerned principally with theoretical and experimental studies related to the protection of communication circuits against inductive interference, lightning damage and corrosion. He published a number of theoretical papers in this field, together with a book entitled "Earth Conduction Effects in Transmission Systems".

Since 1949 much of his work in transmission systems engineering has been devoted to development of pulse transmission and modulation theory applicable to representative communication circuits with attenuation and phase distortion and he has published several articles in this field. Two recent papers deal with selective fading in troposcatter paths as a source of errors in digital pulse transmission and of intermodulation distortion in analog FM systems.

Mr. Sunde is a member of AAAS and American Mathematical Society.

For contributions to the theory and applications of solid-state electronic devices.

L. M. Vallese, Senior Scientist, Head Electrophysics Department, Physical Sciences Laboratory, ITT Federal Laboratories, Nutley, New Jersey. Dr. Vallese holds degrees from the University of Naples, Italy (1937) and from Carnegie Institute of Technology (Dr. Sc. EE 1948). He has been on the faculties of the University of Rome (1939-1947) of Duquesne University (1948-1951) of the University of Pittsburgh (1949-1951) and of the Polytechnic Institute of Brooklyn (1951-1959). He is currently an Adjunct Professor at the Polytechnic Institute of Brooklyn.

Since 1959 he has been associated with ITT Federal Laboratories, where he has organized the Electrophysics Department of the Physical Sciences Laboratory, developing research programs in Quantum Electronics, Networks and Radiation.

Dr. Vallese has written various technical papers and reports on the analysis and design of active networks, on the analysis of nonlinear networks, on the study of propagation and scattering of electromagnetic waves, on the design of ferrite antennas; also he holds several patents. He is a member of the Solid State Devices Committee, Fellow IEEE, member A.P.S., Sigma Xi, Tau Beta Pi, Eta Kappa Nu.

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OFFICERS NOMINATED FOR 1964-5


RODNEY D. CHIPP


ALFRED A. ROETKEN


JACK HARVEY


MANFRED WESTHEIMER

A nominating committee has selected the candidates whose biographies appear below to serve as officers of the North Jersey Chapter of PTGCS for the period June 1, 1964 to May 31, 1965.

Other candidates may be nominated by petition addressed to Mr. McSweeny. Each petition should be signed by not less than 10% of the membership of the North Jersey Chapter. Names of all Chapter members are listed in the December 1964 issue of the national PTGCS Newsletter.

Election of officers will take place at the joint PTGCS - Section technical meeting on **April 21, 1964** in the auditorium of the Garden State Plaza at 8:00 P.M.

Chairman—Rodney D. Chipp

Rodney D. Chipp was born in New Rochelle, New York, in 1910. He received his technical education at MIT and Naval schools, supplemented by professional and graduate courses. He has a BS in Physics, and is a licensed professional engineer in New York, New Jersey, Pennsylvania, and the District of Columbia.

Since 1933 Mr. Chipp's professional activity has been in broadcasting, television, radar, communications, and engineering management. In 1961 he entered private practice as a consulting engineer in those fields. Prior to that he was Director of Engineering Planning at ITT Federal Laboratories, and Director of Engineering at ITT Communications Systems, Inc., a wholly-owned division concerned with the planning and design of the worldwide communications system for the Air Force.

Vice Chairman—Alfred A. Roetken

A. A. Roetken has been a Radio Consultant in the Electronics and Systems Research Center of Bell Telephone Laboratories at Murray Hill, N. J. since 1961. He received the BSEE degree in 1927 and the MS degree in 1929, from Ohio State University. In 1929 he joined Bell Telephone Laboratories as a member of the Radio Research Department engaged in problems relating to radiotelephone applications within the Bell System including the development of precision frequency measuring equipment, SSB equipment for transoceanic telephone service and UHF circuits for domestic service.

Mr. Roetken is a Fellow of the IEEE (IRE), an associate of Sigma Xi and a member of the Research Society of America.

Secretary—Jack Harvey

Jack Harvey (S-'49, A-'52, M-'56, SM-'57), was born in Tarkio, Missouri, on July 26, 1929. He received the BSEE degree in 1951 from the University of Missouri.

In 1951 he joined ITT Federal Laboratories, from which he was on leave from 1952 to 1954 for duty in the U. S. Army Signal Corps. He is now a Member of the Technical Staff of Sichak Associates, Nutley, N. J.

Finance and Facilities Officer Manfred Westheimer

Manfred Westheimer was born in 1927 in Karlsruhe, Germany. He received his BEE degree from Pratt Institute, Brooklyn, N. Y. in 1951 and his MEE degree from the Polytechnic Institute of Brooklyn in 1955.

At present Mr. Westheimer is with ITT Communication Systems, Inc., Paramus, N. J. where he is task manager of a long haul communications project.

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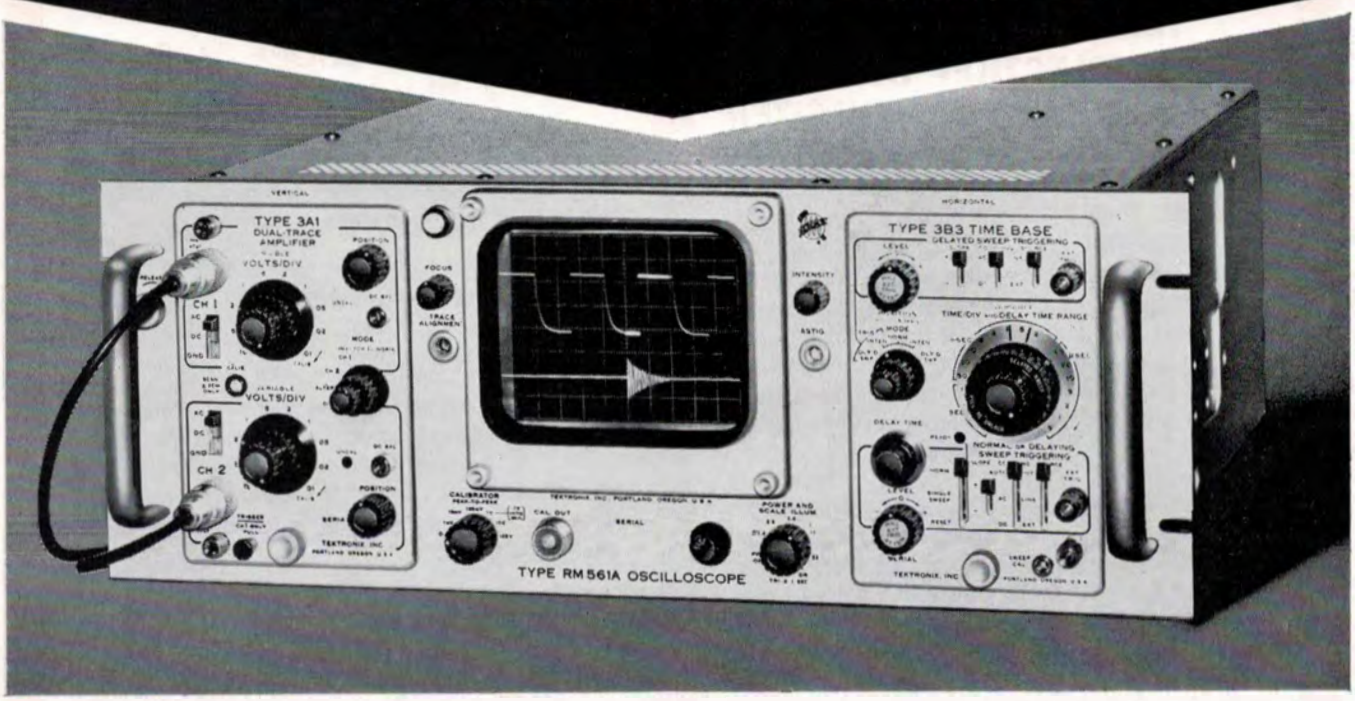

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