

Engineering Manager
Annual fee: \$3.
Engineering management and organization as applied to technical and educational activities.

Information Theory
Annual fee: \$4.
Information theory and its application in radio circuitry and systems.

Nuclear Science
Annual fee: \$3.
Application of electronic techniques and devices to the nuclear field.

Automatic Control
Annual fee: \$6.
The theory and application of automatic control techniques including feedback control systems.

Military Electronics
Annual fee: \$4.
Electronic sciences, systems, activities and services germane to the requirements of the Military.

Reliability
Annual fee: \$3.
Principles and practices used in the design and development of electronic equipment.

Sonics and Ultrasonics
Annual fee: \$3.
Sonics include: acoustics, ultrasonics, and related activities.

Industrial Electronics and Control Instrumentation
Annual fee: \$3.
Electronics and electronic processes.

Engineering Writing and Speech
Annual fee: \$3.
The study, development, improvement and promotion of the techniques for preparing, organizing for use, processing, editing, selecting, conserving and disseminating information in the form of information.

Human Factors in Electronics
Annual fee: \$3.
Development and application of human factors knowledge germane to the design and development of electronic equipment.

Instrumentation and Measurements
Annual fee: \$3.
Measurements and instrumentation in electronics.

Product Engineering & Production
Annual fee: \$3.
Advances in methods, processes, materials and components in design and manufacture of electronic equipment.

Computers
Annual fee: \$4.
Application of electronic computers.

Component Parts
Annual fee: \$3.
Characteristics, limitation, application, development, performance and development of component parts.

Space and Navigation Electronics
Annual fee: \$4.
Application of electronics in navigation and traffic control.

Electromagnetic Compatibility
Annual fee: \$2.
Origin, effect, control and measurement of radio frequency interference.

Bio-Medical Engineering
Annual fee: \$4.
The application of electronics in biology and medicine.

Low Wave Theory and Techniques
Annual fee: \$4.
Wave theory, microwave techniques, microwave and the generation of microwaves.

Electron Devices
Annual fee: \$5.
Electron devices including solid state devices and vacuum tube devices.

Geoscience Electronics
Annual fee: \$4.
Applications in electronic systems and geophysics, measurements, and exploration.

Circuit Theory
Annual fee: \$4.
Theory and application of operation of circuits and theory of radio and electronic circuits.

Broadcast & Television Receivers
Annual fee: \$4.
Design and manufacture of broadcast and television receivers and related activities.

Technology of communication systems and of the audio-frequency systems, including acoustic terminations and room acoustics, such systems, and the recording and reproduction from recordings.
Annual fee: \$3.
Transactions, Vol. AU-2, No. 4; Vol. AU-3, No. 1, 3, 5; Vol. AU-4, No. 1, 2, 3, 4, 5, 6; Vol. AU-5, No. 1, 2, 3, 4, 5, 6; Vol. AU-6, No. 1, 2, 3, 4, 5, 6; Vol. AU-7, No. 1, 2, 3, 4, 5, 6; Vol. AU-8, No. 1, 2, 3, 4, 5, 6; Vol. AU-9, No. 1, 2, 3, 4, 5, 6; Vol. AU-10, No. 1, 2, 3, 4, 5, 6; Vol. AU-11, No. 1, 2, 3, 4, 5, 6.

Geoscience Electronics
Annual fee: \$4.
Applications in electronic systems and geophysics, measurements, and exploration.

Low Wave Theory and Techniques
Annual fee: \$4.
Wave theory, microwave techniques, microwave and the generation of microwaves.

Electron Devices
Annual fee: \$5.
Electron devices including solid state devices and vacuum tube devices.

Geoscience Electronics
Annual fee: \$4.
Applications in electronic systems and geophysics, measurements, and exploration.

Circuit Theory
Annual fee: \$4.
Theory and application of operation of circuits and theory of radio and electronic circuits.

Broadcast & Television Receivers
Annual fee: \$4.
Design and manufacture of broadcast and television receivers and related activities.

Technology of communication systems and of the audio-frequency systems, including acoustic terminations and room acoustics, such systems, and the recording and reproduction from recordings.
Annual fee: \$3.
Transactions, Vol. AU-2, No. 4; Vol. AU-3, No. 1, 3, 5; Vol. AU-4, No. 1, 2, 3, 4, 5, 6; Vol. AU-5, No. 1, 2, 3, 4, 5, 6; Vol. AU-6, No. 1, 2, 3, 4, 5, 6; Vol. AU-7, No. 1, 2, 3, 4, 5, 6; Vol. AU-8, No. 1, 2, 3, 4, 5, 6; Vol. AU-9, No. 1, 2, 3, 4, 5, 6; Vol. AU-10, No. 1, 2, 3, 4, 5, 6; Vol. AU-11, No. 1, 2, 3, 4, 5, 6.



The IEEE

Newsletter

The Magazine of the North Jersey Section

IEEE INTERNATIONAL CONVENTION

THE IEEE SHOW

March 22-26, 1965

NEW YORK HILTON AND NEW YORK COLISEUM

NEW

Megohmmeter

2,000,000-Megohm Direct-Reading

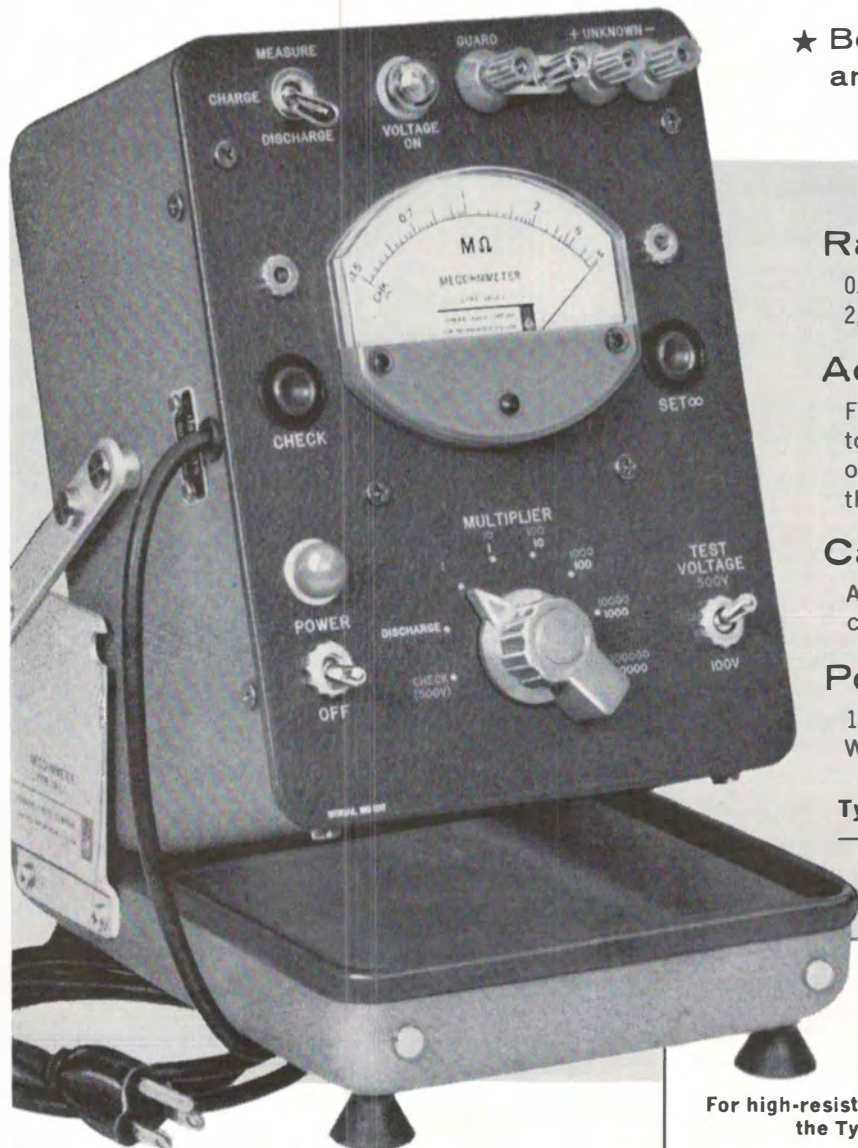


TWO TEST VOLTAGES 100v — EIA standard voltage for measurements of resistors above 100 kilohms

500v — For the measurement of insulation resistance

SAFE . . . Toggle switch on top of instrument lets you remove voltage without disturbing range-switch setting. In addition, a warning light indicates when voltage is on the terminals

★ Both Guard and Ground Terminals are Provided



Range:

0.5 to 200,000 megohms at 100 volts and to 2,000,000 megohms at 500 volts.

Accuracy:

From $\pm 3\%$ at low-resistance end of each decade to $\pm 12\%$ at high resistance end, up to 50,000 megohms. There can be an additional $\pm 2\%$ error at the top decade.

Calibration:

Adjustment is provided for standardizing the calibration at 500 volts.

Power Requirements:

105-125 (or 210-250) volts, 40-60 cycles, 25 watts. Will operate on frequencies up to 400 cycles.

Type 1862-C Megohmmeter, \$310 (in U.S.A.)

— rack model also available at same price.

This instrument is useful for the measurement of insulation resistance of rotating machinery, transformers, cables, capacitors, appliances, and other electrical equipment.

For high-resistance measurements to 10^{13} ohms at lower voltages, the Type 1230-A Electrometer is available at \$460.

Write for Complete Information

GENERAL RADIO COMPANY

WEST CONCORD, MASSACHUSETTS

Sales Engineering Office in NEW YORK: Broad Avenue at Linden, Ridgfield, New Jersey

George G. Ross • J. P. Eadie • Peter Bishop • Richard K. Eskeland

Tel: N. Y. 212 964-2722 • N. J. 201 943-3140 • TWX: 201 943-8249

LOCAL SERVICE AND REPAIR

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

Published monthly except July & August by the North Jersey Section of the Institute of Electrical & Electronics Engineers, Inc. Office of Publication: 9 Little John Road, Morris Plains, N. J.

Volume 11 March, 1965 No. 7

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

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

THE NEWSLETTER
c/o Staff Associates

P.O. Box 275 — Morris Plains, N. J.
Telephone: FOxcroft 6-1580

Subscription: 75¢ per year through dues for members; \$1.50 per year for non-members.
Second Class Postage Paid
at Morris Plains, N. J.

ABOUT ADDRESS CHANGES

It is not necessary to inform the North Jersey Section when you change your mailing address. The NEWSLETTER and other section mailings use a list provided by IEEE's national headquarters in New York. This means the Section has no need to maintain a mailing list or addressing plates. Section membership records are changed when Headquarters notifies us.

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

NEWSLETTER STAFF

Editor: Marcel Kozuch
Associate Editor: Howard L. Cook
Associate Editor: Paul Schwanenflugel
Associate Editor: Dr. Irving F. Stacy
Associate Editor: Sam Petrokofsky
IEEE Group Editor: A. R. D'heedene
School Affairs Editor: Gene R. O'Brien
Advertising Manager: M. M. Perugini
Office Manager: A. J. LaRouche

North Jersey Section IEEE Executive Committee

Section Officers

Chairman John K. Redmon
Vice Chairman Walter L. Glomb
Treasurer Stephen A. Mallard
Secretary James W. Gordon
Member-at-Large John P. Van Duyne
Member-at-Large Roger McSweeney
Past Chairman Charles W. Vadersen

Standing Committee Chairmen

Awards S. Fishman
Education C. G. Gorss, Jr.
History and Procedures F. Polkinghorn
Membership A. Paparozzi
Nominations A. W. Parkes
Program J. O'Grady
Publications Bernard Meyer
Publicity J. Fitzpatrick
Student Affairs J. W. Earle

Editorial Notes

This month will be an active one, what with the interesting North Jersey meetings and the International Convention and IEEE Show. As for the latter, we had better save up our energy. There will be several miles of floor to cover in the Coliseum and the Hilton Hotel. Four days will hardly be enough to see everything.

But most important, we should try to catch one or two technical sessions. These provide a good opportunity to meet with experts in our field of work or to attend a discussion between experts.

Finally, we won't forget the enjoyable aspects of the Convention, i.e., the Banquet, Cocktail Party and Fashion Show for the Ladies.

See further details in this issue.

M. K.

CALENDAR

Monday, March 22
through Friday, March 26

International Convention
Hilton Hotel and Coliseum
New York City

Thursday, March 11

N. Y. Computer

8:00 P.M.—"The IBM Computer Line"
590 Madison Ave.
New York City

Pre-meeting Dinner

Call Alan Corneretto

Thursday, March 18

Joint: N. J. Section—
Automatic Control

8:00 P.M.—"The Ubiquity of
Control Theory in
Biological Processes"
Prof. Richard W. Jones,
Northwestern University
Arnold Auditorium,
Bell Labs.
Murray Hill, N. J.

6:00 P.M.—Pre-meeting Dinner

Wally's Tavern
Reservations: J. G. O'Grady

Thursday, March 18

Power

7:00 P.M.—"Grounded Wye
Power Systems"
Messrs. C. W. Leber,
G. H. Langhor,
A. H. Moore
Punch Bowl Room
Jersey Central - N. J.
Power & Light Co.
Madison Ave. and
Punch Bowl Rd.
Morristown, N. J.

IEEE Group Chairmen

Group Coordinator Raymond Kudisch
Group Automatic Control
(AC) Dr. Andrew Meyer
Group Communications
Technology (CT) R. D. Chipp
Group Engineering Writing
& Speech (EWS) L. G. Lee
Group Electronic
Computers (EC) D. Perry
Group Microwave Theory &
Techniques (MTT) B. Mindes
Group Power (P) Herbert Blaicher

Wednesday, March 24

N. Y. Power

6:30 P.M.—Ravenswood Tour
Vernon Blvd. and
40th Ave., L. I. C.

Tuesday, April 6

N. Y. Communications and
Electronics Div.

7:00 P.M.—"Special Engineering
Applications"
Lecture Series
Western Union Auditorium
160 W. Broadway, N. Y. C.

Advance Registration is Required.

Monday, April 12

Joint: N. Y. Communication Technology
and Engineering Management

7:00 P.M.—"Engineering Education
and Utilization"
Lecture Series
Western Union Auditorium
160 W. Broadway, N. Y. C.

Advance Registration is Required.

Executive Committee Meetings

at Verona Public Library

No meeting in March

April 7

May 5

June 2

Ballantine Sensitive R-A-P VTVM

(true-Rms) (AV.) (Peak)

Model 321

Price: \$560

Measures True-RMS,
Average, or Peak Voltage

Same Accuracy and
Resolution over entire
Five-Inch Log Scales

Accuracy of 2% of
Indication is far better
over the lower half of
the scale than for a
linear scale instrument
rated at 1% F.S.D.



THREE INSTRUMENTS
IN ONE

Measures Wide Range of Voltages, Frequencies, and Waveforms

Ballantine's Model 321 is an electronic voltmeter designed for accurate measurements of the true-rms, average, or peak values of a wide range of voltages and waveforms. It is *not* limited to measurement of pure sine waves to obtain the specified accuracy, but will measure sine, distorted sine, complex, pulse, or random signals whose frequency components lie within the designated frequency range.

The instrument's five-inch voltage scales make it possible for you to specify uniform resolution and accuracy in % of indication over the entire scale length. This feature is not possible with a linear scale meter.

PARTIAL SPECIFICATIONS

VOLTAGE RANGE

RMS 100 μ V — 330 V
Average & Peak 300 μ V — 330 V
As null detector to 10 μ V

WAVEFORMS

Sine, distorted sine, complex, pulse, random

Power Requirements: 115/230 V, 50 — 420 Hz,
90 W

FREQUENCY RANGE

RMS 5 Hz — 4 MHz
3 db bandwidth 2 Hz — 7 MHz

ACCURACY, ABOVE 300 μ V, MID-BAND

RMS & Average 2% of indication
Peak 3% f.s.

Amplifier: 90 db
Mean Square Output (dc): 1 V

Available in portable or rack versions

Write for brochure giving many more details

Member Scientific Apparatus Makers Association

— Since 1932 —



BALLANTINE LABORATORIES INC.

Boonton, New Jersey

CHECK WITH BALLANTINE FIRST FOR DC AND AC ELECTRONIC VOLTMETERS/AMMETERS/OHMMETERS, REGARDLESS OF YOUR REQUIREMENTS. WE HAVE A LARGE LINE, WITH ADDITIONS EACH YEAR. ALSO AC/DC LINEAR CONVERTERS, AC/DC CALIBRATORS, WIDE BAND AMPLIFIERS, DIRECT-READING CAPACITANCE METERS, AND A LINE OF LABORATORY VOLTAGE STANDARDS FOR 0 TO 1,000 MHZ.

Represented by GAWLER-KNOOP COMPANY 178 Eagle Rock Ave., Roseland, New Jersey

N. Y. COMMUNICATION TECHNOLOGY GROUP AND ENGINEERING MANAGEMENT GROUP

ENGINEERING EDUCATION LECTURE SERIES TO START APRIL 12

A spring lecture series entitled "Engineering Education and Utilization" will be given during April and May by the New York Section IEEE and its Communication Technology and Engineering Management Groups.

Courses will be held at the Western Union Auditorium, 160 West Broadway on six consecutive Mondays, 7:00 to 9:00 P.M. The area has adequate street parking after 6:00 P.M. and is easily reached by IRT (Seventh Ave.) or IND subways.

Lectures will be given on six consecutive Mondays commencing April 12. Registration fees for the lectures series are \$5.00 for members of the IEEE, \$8.00 for non-members, and \$1.00 for full-time students.

Registrations must be made in advance. To register, send check payable to "Communication Technology Group, New York Section, IEEE" to R. E. Sanner, GT & E, 730 Third Ave., New York, N. Y. 10017. A stamped, self-addressed envelope must be included.

LECTURE #1, APRIL 12, 1965

"Engineering Education
and Utilization
as Colleges View it"

Prof. Robert T. Weil
Dean, School of Engineering,
Manhattan College

LECTURE #2, APRIL 19, 1965

"Engineering Aspects
as Industry Views Them"

Speaker from General Telephone
and Electronics Corp. to be announced

LECTURE #3, APRIL 26, 1965

"Management Aspects
as Colleges View Them"

Dr. Samuel S. Stephenson
Rensselaer Polytechnic Institute

LECTURE #4, MAY 3, 1965

"Management Aspects
as Industry Views Them"

Mr. John Vaughn
Vice-President of Research
and Development
Maxson Electronics Corp.

LECTURE #5, MAY 10, 1965

"Updated Training—College and Industry"

Mr. Everett J. Thielen
Director of Continuing Professional Studies,
Brooklyn Polytechnic Institute

Mr. Arthur W. Gilmore
Chief Engineering
Professional Development,
Grumman Aircraft

LECTURE #6, MAY 17, 1965

Mr. William H. Larkin
Assistant Secretary, ASME

Joint Meeting:

North Jersey Section and
Automatic Control Group

THE UBIQUITY OF CONTROL THEORY IN BIOLOGICAL PROCESSES



On Thursday, March 18, 1965, at 8:00 P.M., the North Jersey Section will hold a joint meeting with the Group on Automatic Control, and it promises to be one of the most interesting meetings of the current program year. The meeting will be held at Arnold Auditorium in the Bell Telephone Laboratory facility at Murray Hill, New Jersey, and a pre-meeting dinner will take place at 6:00 P.M., in Wally's Tavern, Watchung, New Jersey.

The subject of the meeting is "The Ubiquity of Control Theory in Biological Processes" and the speaker will be Richard W. Jones, Professor of Electrical Engineering, Northwestern University. Professor Jones will develop, as the major theme of his presentation, how

current biological thinking shows widespread application of control theory and terminology to the study of life processes.

At the cellular level one is concerned with individual particles, diffusion processes, and chemical kinetics, which may or may not exhibit feedback relations. At the level of organization represented by neuro-muscular control, feedback is very much in evidence and is effective because of the coordinated action of a large number of cells. Temperature regulation of the whole organism employs a number of different feedback systems, each serving to counteract one type of thermal stress. Finally, at the level of organization represented by a population of similar units, one finds that the ideas of regulation and homeostasis have been applied to problems of genetics and ecology.

The application of control concepts at these several levels of organization raises questions as to the adequacy of such usage, the means of experimental verification, and the functional relations among the many systems making up this control hierarchy.

Richard W. Jones is professor of electrical engineering at Northwestern University. He is a graduate of the University of Minnesota in electrical engineering and for a number of years was a design and development engineer with the Westinghouse Electric Corporation. Upon his return to academic life he specialized in control system theory, and was instrumental in the development of courses and laboratories in motor control, and feedback systems. Professor Jones is the author of a textbook "Electrical Control Systems" and has served as consultant to Allis Chalmers and other industrial firms. He is past chairman of the Chicago Section,

AIEE, and a member of IEEE, the American Physical Society, and Optical Society of America. In the past few years he has devoted an increasing amount of his time to research on various physiological problems, and in the study of these systems with feedback control techniques. Professor Jones and his students are engaged in both experimental and theoretical studies in the Physiological Control Systems Laboratory on a number of problems related to the visual system, and homeostatic physiology. He was made a fellow of the IEEE in 1964.

Meeting Notice

Subject: THE UBIQUITY OF CONTROL THEORY IN BIOLOGICAL PROCESSES

Speaker: Professor Richard W. Jones, Northwestern University

Date: Thursday, March 18, 1965

Time: 8:00 P.M.

Place: Arnold Auditorium, Bell Laboratories, Murray Hill, New Jersey

Pre-meeting Dinner: Wally's Tavern, Watchung, New Jersey 6:00 P.M.

Dinner reservations — please notify:
Mr. J. G. O'Grady
Public Service Electric
and Gas Company
200 Boyden Avenue
Maplewood, New Jersey
Phone: 761-5111, Ext. 2

Dinner reservations accepted to March 16, 1965.

professional notices

Wheeler Laboratories, Inc.

Subsidiary of Hazeltine Corporation

Consultation — Research — Development
Radar and Communication Antennas
Microwave Assemblies and Components
Laser Devices and Applications
Harold A. Wheeler and Engineering Staff
Main office:

Great Neck, N. Y. HUnter 2-7876
Antenna Laboratory: Smithtown, N. Y.

PHASE METERS

Direct Reading in Degrees
0.001 cps to 18,000 mc
Accuracy 0.05° or 1%

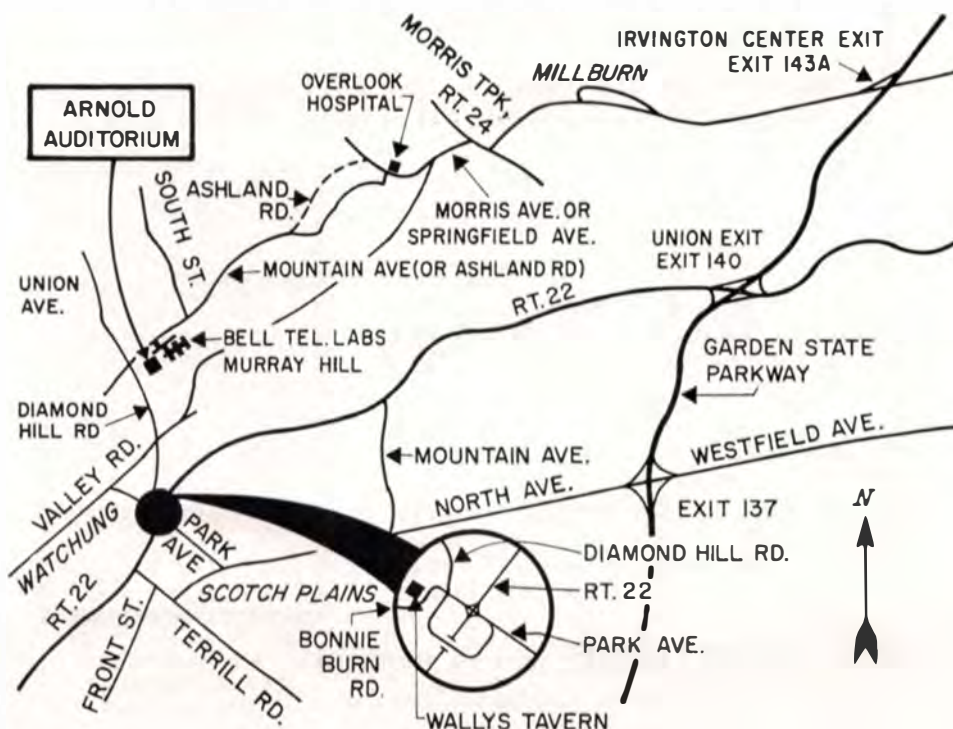
DELAY LINES

Microwave to Audio
0.01 us to 200 ms
Variable Tapped Fixed

AD-YU ELECTRONICS INC.

249 TERHUNE AVE., PASSAIC, N. J.

Sales Rep.: Gray & Reed Associates
9 Dunford Street, Huntington Station, N. Y.
(516) GE 3-3333



Newly-Elected IEEE Fellows

The listing of newly-elected IEEE Fellows in the North Jersey Section should include:

Dr. Jacob Earl Thomas, Jr.,
General Instrument, Newark, N. J.
John R. Hefe,
Bell Telephone Laboratories,
Murray Hill, N. J.



J. Earl Thomas, Jr. is Manager of New Product Development for General Instrument Corporation of Newark, New Jersey. He studied physics at John Hopkins (A.B. 1939) and Cal Tech (Ph.D. 1943). During World War II he was with the O.S.R.D. and the Manhattan Project. Following the War, he taught Electrical Engineering at M.I.T., with a year's leave devoted to transistor development at Bell Labs. In 1955 he became Professor of Physics and Department Chairman at Wayne State University in Detroit. In 1959 he entered industry to manage semiconductor development activities for Sylvania. He has served on several committees for the Government and the IEEE. His main research interest has been the relation between physical phenomena at the surface and the failure mechanisms of semiconductor devices.



John R. Hefe is a member of the Television Engineering Department of Bell Telephone Laboratories. He is concerned with problems relating to television transmission systems.

Since Mr. Hefe began his career in 1923, he has participated in all of Bell Laboratories' television developments and demonstrations. He took part in the first public demonstration of television from Washington to New York in 1927 and was responsible for the television transmission experiments via the Telstar experimental communications satellites.

He interrupted his television research during World War II to investigate and develop airplane detection and automatic following radar devices. Following the War he was concerned with special problems of visual transmission over restricted bandwidth channels for many years. He holds more than 12 patents on television systems and color television.

Mr. Hefe is a Fellow of the Institute of Electrical and Electronics Engineers, and a member of the Society of Motion Picture and Television Engineers and the Electronics Industries Association.

Mr. Hefe has also been interested in photography — black and white, color, moving and still pictures. He is past president, vice president and director of the

Metropolitan Motion Picture Club in New York City; past director of the 8mm Motion Picture Club; and a member of the Photographic Society of America. For many years he lectured and acted as technical advisor to motion picture groups.

Mr. Hefe was born in the Bronx, and was graduated from Regis High School in New York City. He obtained his B.S. degree in electrical engineering and the E.E. degree from Cooper Union in 1929 and 1932, respectively. He did post-graduate work at Fordham and Columbia Universities.

N. Y. Computer Group

Thursday, March 11, 1965: "The IBM Computer Line." 8:00 P.M., IBM Building, 590 Madison Ave., New York City. For dinner details call Alan Corneretto, PL 1-5530.

1965 INTERNATIONAL ANTENNA AND PROPAGATION SYMPOSIUM

Sheraton Park Hotel
Washington, D.C.

August 30, 31
& September 1, 1965

CALL FOR PAPERS

Authors are invited to submit summaries and abstracts of papers for presentation at the 1965 International Symposium on Antennas and Propagation. Theoretical, experimental and developmental papers are solicited in all areas of the G-AP field of interest.

Summaries will be published in the Symposium Digest, and must be submitted in final form. They are to contain between 400 and 600 words and a maximum of six figures. Three copies of the summary are required, one with reproducible figures; i.e., glossy prints.

Three copies of a 50- to 100-word abstract are required.

Mail summaries and abstracts to: R. J. Adams, Chairman, Technical Program Committee, 1965 International Symposium on Antennas and Propagation, Code 5330, U. S. Naval Research Laboratory, Washington, D.C. 20390.

Deadline for receipt of summaries and abstracts is MAY 15, 1965.

Authors will be notified of acceptance or rejection by JUNE 7, 1965.

Unapproached in measuring
accuracy and display versatility . . .

AFTER 5 YEARS (10 years in 1970) STILL THE INDUSTRY'S FINEST SYSTEM OF DUAL-TRACE SCOPES

Designed to grow with your needs
with the addition of new Plug-ins.

analab 1120/700

The Analab Type 1120/700 has consistently proved itself for accurate *quantitative* measuring of signal amplitude, rise time, pulse duration, frequency and phase.

Now, the new Type 701 Sampling and Sweep Plug-in extends frequency measuring capabilities to 5000 MC. Permits more than 80% of all H-F scope measurements in a single instrument.



For Demonstration call
Q.E.D. ELECTRONICS, INC.
Phone: 914-968-2200



Analab DIVISION OF BENRUS
18 Marshall Street, South Norwalk, Connecticut

Student Affairs

Student Chapters Are Active

The student chapters of the three engineering schools in our section's area continue to perform a valuable service for our future electrical and electronics engineers. The speaking programs organized by the students and their advisors give insight to the student into possible applications of their academic training.

The recent December issue of The Newsletter contained a listing of some of the student officers. These people are quite active in formulating programs for their respective chapters.

Mr. James Earle and his Student Activities Committee reported that the one hundred and fourteen guests at the annual Students' Night surpassed any previous turnout. The speakers' ideas were well received, and the refreshments capped a very worthwhile evening.

Overall, the student aspect is important. Our chapters are active. In future issues we hope to report on their functions so that all may know what topics interest the young engineers so that all may appreciate the continuously improving quality of our engineering students, demonstrated by the maturity and refinement of their activities.

Speakers Needed

High school students want to know more about the profession of engineering. Engineers, concerned about the future of their profession, want to attract as many capable students to the profession as possible.

This dual goal is being partially met by the New Jersey Committee For Student Guidance. Members of this group have been visiting the high schools throughout our state upon invitation from the schools.

With the aid of an outline and a set of visual aids a speaker gives his audience a broad outlook of what engineering consists and how individuals comprise the profession. To sell the students on engineering as a career is not a speaker's motive. It is better that one should not become an engineer than to be a sub-standard member of our profession.

The program has been a success. And due to the favorable comments, more high schools seek the services of these speakers. This requires more speakers. At this time the N. J. Committee For Student Guidance is seeking volunteers to make one visit during a school year to a high school.

The assignment is by no means difficult. In fact, present members feel satisfaction in having provided such a service for the future of the engineering profession.

For additional information please send a card to The Newsletter at the address shown on the third page; or call Gene R. O'Brien in Elizabeth on 354-7244.

Executive Committee

For the season 1965-66

For Chairman

Walter L. Glomb

For Vice-Chairman

Stephen A. Mallard

For Treasurer

James W. Gordon

For Secretary

Joseph G. O'Grady

For Members-at-Large

Bernard Meyer and Herbert Blaicher

SPECIAL ENGINEERING APPLICATIONS LECTURE SERIES

The third and final part of the Communications and Electronics Division, Education Committee, lecture series on "Engineering Applications of Computer Programming" begins on April 6, 1965. Part III, entitled "Special Engineering Applications", consists of six lectures on the use of computers for fairly specialized applications whose impact on engineering is being felt widely. The exact sequence of the lectures will be announced in the future.

Dates: April 6, 20, 27;
May 4, 11, 18, 1965

Place: Western Union Auditorium
160 West Broadway
New York City

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

The lectures, topics and speakers are as follows:

Linear Programming—Abraham Shapiro, Supervisor of Mathematical Programming for UNIVAC's System Programming, New York.

Computer Uses in Production Engineering—Dr. Gastone Chingari, Manager of Applications Programming, Sperry Rand Corporation, UNIVAC Division.

Pert/Cost—Victor Erskine, Supervisor of Information Control Systems, UNIVAC Division of Sperry Rand Corporation, New York.

Report Program Generators and Sort-Merge Techniques—Harold Larin, Manager of Specifications, Systems Programming, UNIVAC.

Real Time/Time Sharing Systems—Their Functions and Design—R. B. Batman, UNIVAC Project Manager, Ohio Bell Telephone Company, Cleveland.

Traffic Control—Carl Hammer, Ph.D.; Director of Scientific Computer Marketing, Sperry Rand Corporation, UNIVAC Division, Washington, D.C.

Registration Information:

Registration must be made in advance. Fees are: IEEE members — \$10; non-members — \$12, full-time students — \$2.00. Send check or money order made payable to "Communications & Electronics Div., N. Y. Section IEEE" to J. L. Vossen, Chairman, Education Committee, RCA Communications Systems Division, 75 Varick St., New York, N. Y. 10013.



Walter Glomb received his BS degree in 1946 and his MS in 1948, both from Columbia University. In 1950, following a brief period at Paramount Pictures, Incorporated, where he was concerned with the development of theater television systems, he joined ITTFL. Since that time he has been concerned with communication systems design, integration, and analysis. Since 1959 Mr. Glomb has been directly concerned with integration and analysis of communication satellite system performance.

Mr. Glomb is a member of the Institute of Electrical and Electronics Engineers and of Tau Beta Pi.



Stephen A. Mallard received his ME in 1948 and his MS in 1951, both from Stevens Institute of Technology. He was an Instructor in Electrical Engineering at Stevens from 1948 to 1951. Mr. Mallard joined the Public Service Electric and Gas Co. in 1951, and has been serving in a number of positions in the Electric Distribution Department and System Planning Department. He is currently engaged in planning developments of future generation, transmission and interconnections.

Mr. Mallard has been active in the former New Jersey Division of AIEE, serving on its Executive Committee, Program Committee, Education Committee, and Student Guidance Committee. He is a licensed Professional Engineer in New Jersey, a member of the National Society of Professional Engineers, and a member of Tau Beta Pi.

Mr. Mallard is married, has three children, and lives in Nutley, New Jersey.



James Gordon was born in 1920 in Pine Island, Minnesota. In 1942 he received a BEE degree from the University of Minnesota. He joined the General Electric Test Program in 1942. He then had assignments in the Service Engineering, Control Engineering, and Application Engineering Divisions of the General Electric Company. He is presently employed in the East Orange Sales Office as an Application Engineer.

His work with the AIEE has been as member and Chairman of the Educational Committee, and he was Member-at-Large, Secretary, Treasurer, and Vice-Chairman of the New Jersey Division.



Joseph G. O'Grady was born in North Bergen, N. J., and saw service with the U. S. Navy during both World War II and the Korean War.

In 1948, he joined Public Service Electric and Gas Company as a Laboratory Apprentice at their Testing Laboratory in Maplewood, New Jersey. In 1961 he was named Assistant Chief of the Electrical Division and in 1963, was made Assistant to the Laboratory Engineer. In 1964, he was promoted to Assistant Laboratory Engineer, the position he now holds.

He is a graduate of the College of Engineering of New York University where he received a BEE degree in 1954, and is a former member of the instructing staff of the Special Courses Division of Newark College of Engineering.

A senior member of IEEE, he has been a member of various standing committees of the North Jersey Section. He is a former Chairman of the Publicity Committee and during the current year he is Chairman of the Program Committee. He is also a senior member of the Instrument Society of America.



Bernard Meyer received his BA and BEE from New York University in 1942 and 1950 respectively. He has been active in the North Jersey Section of the IRE and IEEE.

as Student Affairs Editor, Managing Editor, and Editor of "The Newsletter." He has also served as Chairman of the Publicity Committee and is now Chairman of the Publications Committee.

At present he is employed as an Electronics Engineer at Picatinny Arsenal in the Electrical Inspection Equipment Branch of the Quality Assurance Directorate. Prior to this, he was employed by the Service Division of Lockheed Electronics stationed at Bell Telephone Laboratories at Whippany, N. J.



H. E. Blaicher, Jr. was graduated from the Pennsylvania State University in 1949 with a degree of B.S. in Electrical Engineering. Following graduation he entered the

cadet engineer training course of Jersey Central Power & Light Company. Since then he has worked in various assignments in system planning and distribution engineering. He is presently in the System Planning group where he is in charge of engineering computer applications.

Mr. Blaicher served on active duty with the U. S. Armed Forces from 1943 to 1946.

Mr. Blaicher is a senior member in IEEE and has served as chairman of the Education Committee during the 1961-62 season, and as an IEEE representative on the New Jersey Engineer's Committee for student guidance. He is presently chairman of the Power Group Chapter in North Jersey Section, IEEE.

1965 IEEE INTERNATIONAL CONVENTION OPENS MARCH 22

Technical Program Expanded to Five Days

The 1965 IEEE International Convention will be held from March 22 through 26 at the New York Hilton Hotel and New York Coliseum in New York City. The Convention features a 25 per cent increase in number of technical papers compared to last year's program and, as a result, the technical meetings will be held on five days instead of just four as in the past. The exhibits will continue to be open for four days, from Monday, March 22 through Thursday, March 25.

The world's largest technical meeting and exhibition is expected to draw an attendance of about 70,000 engineers and scientists from 40 countries.

An increased technical program consisting of 400 papers covering breakthroughs in every area of electrical and electronics engineering, will be presented in 80 technical sessions. For the first time in the history of the annual convention, the CONVENTION RECORD — several volumes containing all of the papers presented at the meeting — will be available at the time of registration. Because of the availability of the CONVENTION RECORD, no other preprints will be permitted at the Technical Sessions or elsewhere at the Convention.

One high point of the program will be a special evening symposium on Tuesday, March 23 on a subject of major interest. Another will be a talk by Mr. Frederick R. Kappel, Chairman of the Board of American Telephone and Telegraph Company. He will be principal speaker at the Annual Banquet to be held on Wednesday, March 24 in the Grand Ballroom of the Hilton. At the banquet, the following major IEEE awards will also be presented: Edison Medal, Lamme Medal, and the Education Medal. In addition, the 125 recently-elected Fellows will be recognized.

Field awards and prize paper awards will be presented at special ceremonies on Tuesday, March 23.

More than 1000 exhibitors will display \$20 million worth of the latest electrical and electronic equipment, most of it for the first time. The Show will be in two locations: The New York Hilton and the New York Coliseum. This year, for the first time, the electrical and electronics exhibits will be fully integrated with no attempt made to separate them. For the convenience of visitors, the exhibits at the Coliseum will be grouped as follows: Floors 1 and 2 — Components and heavy machinery; Floor 3 — Systems and instruments; Floor 4 — Production. The Hilton will be used for new exhibitors. The Coliseum will be closed on Friday, March 26.

The exhibits will be open on Thursday afternoon to high school students at a fee of \$2 if the student is accompanied by an

adult. There will be a limit of three students per adult. Registration fees for the Convention and Show will be: \$2 for IEEE members; \$5 for non-members; and \$1 for women.

There will be a Hospitality Suite for IEEE Members' wives at the Hilton where coffee will be served each morning. The Women's Program includes a Welcome Tea on Monday afternoon and a Gala Luncheon and Fashion Show on Tuesday.

The Cocktail Party will be held on Monday evening from 5:30 to 7:30 in the Grand Ballroom of the Hilton.

Electron Devices

SYMBOLS

by

Howard L. Cook, *Secretary*
IEEE Symbols Committee

The following multiple and submultiple unit-symbol prefixes have been recommended by the International Electrotechnical Commission and the International Committee on Weights and Measures, and have been adopted by the U. S. National Bureau of Standards and the IEEE.

Typical Applications

Unit	Symbol
centimeter(s)	cm
cubic centimeter(s)	cm ³
decibel(s)	dB
gigacycle(s) per second	Gc/s
kilocycle(s) per second	kc/s
kilohm(s)	kΩ
megacycle(s) per second	Mc/s
megawatt(s)	MW
megohm(s)	MΩ
microampere(s)	μA
microfarad(s)	μF
microhenry(ies)	μH
micromho(s)	μmho
microsecond(s)	μs
millivolt(s)	mV
milliwatt(s)	mW
nanosecond(s)	ns
picofarad(s)	pF

Use of these unit-symbol prefixes permits a reduction in the number of zeros appearing in an expressed magnitude of a quantity, thereby reducing a possible source of writing or reading error. For example, use 10 kV instead of 10000 V and 1 mW instead of 0.001 W.

Here is the SIMPLEST CHART EVER

HOW TO USE

1. **If you are not responsible** for your company's advertising but think THE NEWSLETTER should be carrying your firm's ads, then show or send this page to your advertising manager.
2. **If you are responsible** for your company's advertising program, simply dial the number at the bottom of this page to find out why it pays to reach 6,000 members of the North Jersey Section. (Of course, there's nothing to stop you from using the chart to check our rates before you call)

ADVERTISING RATES FOR THE IEEE NEWSLETTER

	One Time	Five Times	Ten Times
Full Page	\$215.00	\$190.00	\$160.00
Two Thirds Page	180.00	160.00	135.00
One Half Page (horizontal)	145.00	130.00	110.00
One Third	120.00	110.00	90.00
Classified (per column inch)	15.00	15.00	12.00

(See Card No. 2A for details on classified)

Special Position Charges

Front Cover — not sold
Cover II — plus \$60.00
Cover III — plus \$50.00
Cover IV — plus \$70.00
(also color charge)

Opposite meeting page — plus \$40.00. Other positions quoted.

Standard AAAA color—\$60.00 per color

Bleed — Plus 15% of basic rate

Agency Commission — 15%

Cash Discount — 2% ten days

Terms — net 30 days

Specifications

Full Page — 7½" x 10" (45 picas wide by 60 high)
Two Thirds — 5" x 10" (29 picas wide by 60 high)
One Half (horizontal) — 7½" x 5" (45 picas wide by 30 high)
One Third — 2⅜" x 10" (14 picas wide by 60 high)
5" x 5" (29 picas wide by 30 high)

Inserts: Rates and quantity on request.

Printed by Letterpress

Halftones — 110 screen

Mounting: Cuts and halftones must be mounted type high on wood blocks to conform with dimensions.

Full size cuts must be mounted flush on block, top and bottom.

Full size reverse plates or half tones must be anchored to the block and trimmed flush.

Plates and copy are due the first of the month preceding publication.

Send to: **WOOD PRESS**, P. O. Box 2929, 515 East 41st St., Paterson, New Jersey — ZIP 07509

Send insertion orders and instructions to:

IEEE NEWSLETTER
Box 275, Morris Plains, N. J.
201 FOXcroft 6-1580

Power

GROUNDING WYE POWER SYSTEMS

Industrial power systems operating at 600 volts or less are undergoing a transition from ungrounded delta systems to solidly grounded wye systems. There are many reasons for this change, and there are also many problems connected with it. One of these problems, and an important one, is that of proper protection.

Mr. C. W. Leber of the Esso Research and Engineering Company will introduce the subject and Messrs. George H. Langhor of the Research and Engineering Center of the Johns Manville Products Corporation and Arthur H. Moore of the Industrial Sales Division of the General Electric Company will discuss typical installations, problems and solutions. In particular they will cover protection against low magnitude ground faults; single phasing due to the operation of only one fuse as a result of a ground fault; low impedance ground return paths; ground relaying on feeders and motor circuits; also many other facets of the industrial relaying and fuse co-ordination problem.

Date: Thursday, March 18, 1965

Time: 7:00 P.M.

Place: Punch Bowl Room
Jersey Central - N. J.
Power & Light Co.
Madison Ave. and
Punch Bowl Rd.
Morristown, N. J.

CALL FOR PAPERS

The 1965 IEEE Conference on Military Electronics (MIL-E-CON 9) will be held in Washington, D.C. at the Washington Hilton Hotel on September 22, 23 and 24. The President of MIL-E-CON 9 is Maj. Gen. H. L. Scofield, USA (Ret.). The general theme of the meeting will be, "ELECTRONICS AND TOMORROW." All papers will be UNCLASSIFIED. Clearance will not be required for attendance at any session. Authors will be responsible for all necessary approval by sponsoring agencies.

The technical presentations will be limited to 15 minutes with additional time for discussion. Selected papers will be divided into appropriate categories in accordance with technical content. Interested authors are invited to submit papers on new and unpublished designs, developments, research and concepts in the electronics field. Typical technical areas of interest are: communications, navigation, instrumentation, detection, location, microelectronics, integrated circuits, etc. To be considered for acceptance, three copies each of a 500 word abstract of the proposed paper, together with a biographical sketch of the author, must be submitted to the undersigned prior to April 15, 1965. The deadline for submission of papers for printing in the Proceedings is July 15, 1965. Instructions on preparation and submission of papers for the Proceedings will follow notification of acceptance of the papers selected for presentation.

Leon H. King, Chairman
Technical Program Committee
Atlantic Research Corporation
Shirley Highway at Edsall Road
Alexandria, Virginia

THE RETURN OF THE SQUARE

*Reprinted by permission, from "Scouting" Publication of
National Council Boy Scouts of America*

By CHARLES H. BROWER

President, Batten, Barton, Durstine & Osborn, Inc.

Continued from January 1965 Issue

Nathan Hale: Me spy on the British! Are you kidding? Do you know what they do with spies they catch? I'll give you a news flash, chum. They hang them.

Paul Revere: What do you mean ride through every Middlesex village? And in the middle of the night yet. Why me? Am I the only man in Boston with a horse?

Patrick Henry: Sure I'm for liberty—first, last and always. But we've got to be a little realistic. We're a pretty small outfit. If we start pushing the British around someone is going to get hurt.

George Washington: Gentlemen, I am honored. But try some one else—say General Gates. I'm just getting things organized at Mount Vernon. Also you might say I already served my time. Against the French, you know.

Benjamin Franklin: What we really need as Ambassador to France is a young man. I'm 70 years old! It's time a new generation took over.

Missing words

Perhaps it is significant that what such men actually did say has been quietly sneaked out of our school-books. This Week Magazine recently surveyed history books issued before 1920, compared with those issued since.

Nathan Hale said, "I regret that I have but one life to give for my country," in 11 of the old texts and in only one of the new texts. Patrick Henry said, "Give me liberty or give me death" in 12 out of 14 earlier texts and in only two of 45 recent ones. But John Paul Jones set the record. He said "I have not yet begun to fight," in nine of the old books and in none of the new ones.

When Dwight D. Eisenhower was President, he appointed a Committee on National Goals to decide where we were going. Perhaps a first step should be a commission on National Heritage to make sure we remember where we have been.

Arnold Toynbee, the historian, says that of 21 notable civilizations, 19 perished not from external conquest but from the evaporation of belief within. Today our country still has a choice. I believe it has already begun to make that choice. It is going back to its old beliefs in such things as ideas, pride, patriotism, loyalty, devotion, and even hard work.

The struggle is on

We are great believers in statistics and while the things that really count cannot be measured even by the most advanced computers, sheer head-counting indicates that people are beginning to struggle for better things.

Twenty years ago, half of us belonged to churches. Today 64 per cent of us do. Sales of classical records have jumped 78 per cent in the last three years. Millions of people are visiting museums, millions more than a decade ago. We spent over a billion dollars on books last year, and people are taking 670 million volumes out of our public libraries each year.

There are 50 per cent more symphony orchestras than there were ten years ago. Expenditures on all cultural activities have increased 70 per cent in the past ten years — to a total of more than \$3 billion.

Since the turn of the century, the percentage of our population that has graduated from high school is up ten times, and the percentage that has gone to college is up seven times. Also, the percentage in higher education who are trying to get better marks is encouraging. Yes, there are indications that the day when it's smart to be smart is finally at hand.

But the greatest thing that has happened is that our nation has a whole new set of heroes. Their names are Carpenter, Cooper, Glenn, Grissom, Schirra, and Shepard.

These lads grew up to be squares, for who but a square would volunteer his life for his country. They are not even ashamed of their feelings. John

Glenn says he gets a funny feeling down inside when he sees the flag go by. Imagine that. He's proud of his small town, proud of his small college, proud that he belonged to the YMCA and is associated with Scouting.

The ruts remain

I hope that some of Glenn rubs off onto the next generation. The forces of conformity are still strong. Too many of us are still sitting it out instead of sweating it out. Too many haven't got the guts to stand up straight and dare to be square because the opposite of square is round, and being round is so much simpler. Responsibilities and problems slide off nice and easy, and we can just roll down the path, without any bumps, being careful to stay in the middle where the most comfortable ruts are.

Too few of us know or care where the ruts lead. Too few dare to leave the ruts. But there are no ruts to greatness, to progress, to outer space, or inner satisfaction.

How shall we avoid the group poop, the vortex of mediocrity, the great nothing of cynical sophistication and bored nonparticipation? How shall we fight for personal independence?

S.O.S.

May I suggest that we all join the S.O.S. — the Society of Squares. It doesn't exist, but it could. Not a left-wing organization. Not a right-wing organization. Just an organization with wings!

We might have a secret handshake consisting mainly of grabbing the other guy's hand as though we meant it and looking him square in the eye.

We would be for participation and against sitting life out; for simplicity and against sophistication; for laughter and against sniggering; for America and against her enemies; for the direct and against the devious; for the honest way against the easy short cut; for a well-done job and against the goof-off.

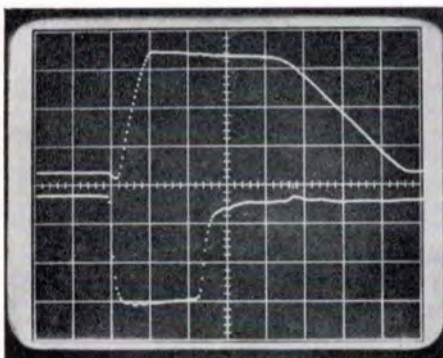
We have the satisfaction of knowing our problem is not new. When Benjamin Franklin was told that the war for independence was over, he said, "Say rather the war of the revolution is over — the war for independence has yet to be fought." Today, 180 years later, the war for independence has still to be fought.



**Your Tektronix
field engineer
invites you to
send for this
VALUABLE
BOOKLET
on Type
561A**



Multi-Purpose Oscilloscope



This oscilloscope display shows, within fractions of a billionth of a second, the time relationship between transistor turn-on and turn-off (upper trace) and driving pulse (lower trace).

It's yours for the asking — complete specifications on the extremely versatile Tektronix Type 561A Oscilloscope. Precise time an event happens is just one of many displays which can be observed and analyzed easily and accurately.

Possible Type 561A displays include: *Conventional*—single or multiple trace; *Sampling*—single or dual-trace; *X-Y*—with similar or different units for vertical and horizontal deflection; *Multiple X-Y*—from two to four independent displays; *Differential*—including low level with passband control; and others including *Transducer* and *Strain-Gage* operation.

Read how the compact Type 561A, using up to 17 different plug-in units for vertical and horizontal deflection can meet your requirements for dependable multi-purpose measurements. **For the booklet listing complete capabilities, call your field office.**

Tektronix, Inc. UNION FIELD OFFICE
400 CHESTNUT STREET • UNION, N.J. • Phone 688-2222

NEW INSTRUMENTS



MODELS DY-2800A & DY-2801A QUARTZ THERMOMETERS

The new DY-2800A/2801A Quartz Thermometers give direct digital readout with 0.0001° resolution from -40° to +230°C (-40° to +450°F). Two quartz sensors provide choice of two-point monitoring or temperature difference readings.

Fast, accurate, dependable readings are assured by time constant of less than one second, 0.01°/30 days stability, repeatability better than 0.02% of span.

Dymec quartz thermometers may be used independently or in complete temperature measurement systems. Sensors may be located up to 1000 feet from main chassis. Instrument is fully compatible with standard digital recording equipment, automatic scanners for sequential measurement of multiple probes.

FEATURES

- Complete measurement system—no other instrumentation required.
- Linear digital readout directly in °C or °F.
- Resolution to .0001°C or °F.
- Outputs for recording on digital recorder or strip-chart recorder.

Two quartz thermometers are available. DY-2801A with 2 sensor probes for 2-point monitoring or difference readings, 0.0001° resolution \$2450; and economical DY-2800A with 0.1° resolution, one probe, \$1750. And contact your RMC Field Engineer for more information.



NEW 216A PULSE GENERATOR

The Model 216A Pulse Generator provides fast rise time pulses with repetition rates up to 100 mc. Pulse shape nearly ideal—rise and fall times less than 2.5 nanoseconds; preshoot, leading edge less than 3.0%; less than 5.0% on trailing edge; corner rounding no sooner than 96.0% maximum pulse amplitude; overshoot no greater than 4.0% of peak; ringing less than ±4.0% peak to peak of pulse amplitude; time to achieve flat top or settle within 20.0% of baseline approximately 20 nanoseconds—no

more than 3.0% amplitude perturbations on flat top.

Pulse width continuously variable 5 to 100 nanoseconds. Peak amplitude 15V maximum, continuously adjustable with step attenuator and vernier. Output decoupled; no baseline shift with changes in rep rate. 50-ohm output impedance insuring clean, easy-to-interpret waveform. Pulse bursts may be produced by internal or external grating—simulates pulse trains for logic circuit testing. Flexible triggering circuits with count-down trigger output.

'65 IEEE SHOW

We'll see you at the IEEE Show at the Coliseum, March 22-25, at all the Hewlett-Packard Companies' Booths, 3501-3518. There, you'll see the most complete line of high quality electronic measuring instruments. We are looking forward to seeing you at the Hewlett-Packard aisle at the Coliseum.

**HEWLETT
PACKARD**



R·M·C
SALES DIVISION

FIELD ENGINEERS-ELECTRONIC INSTRUMENTATION

236 East 75th Street, New York 21, N. Y., TR 9-2023 • 391 Grand Avenue, Englewood, N. J., LOwell 7-3933