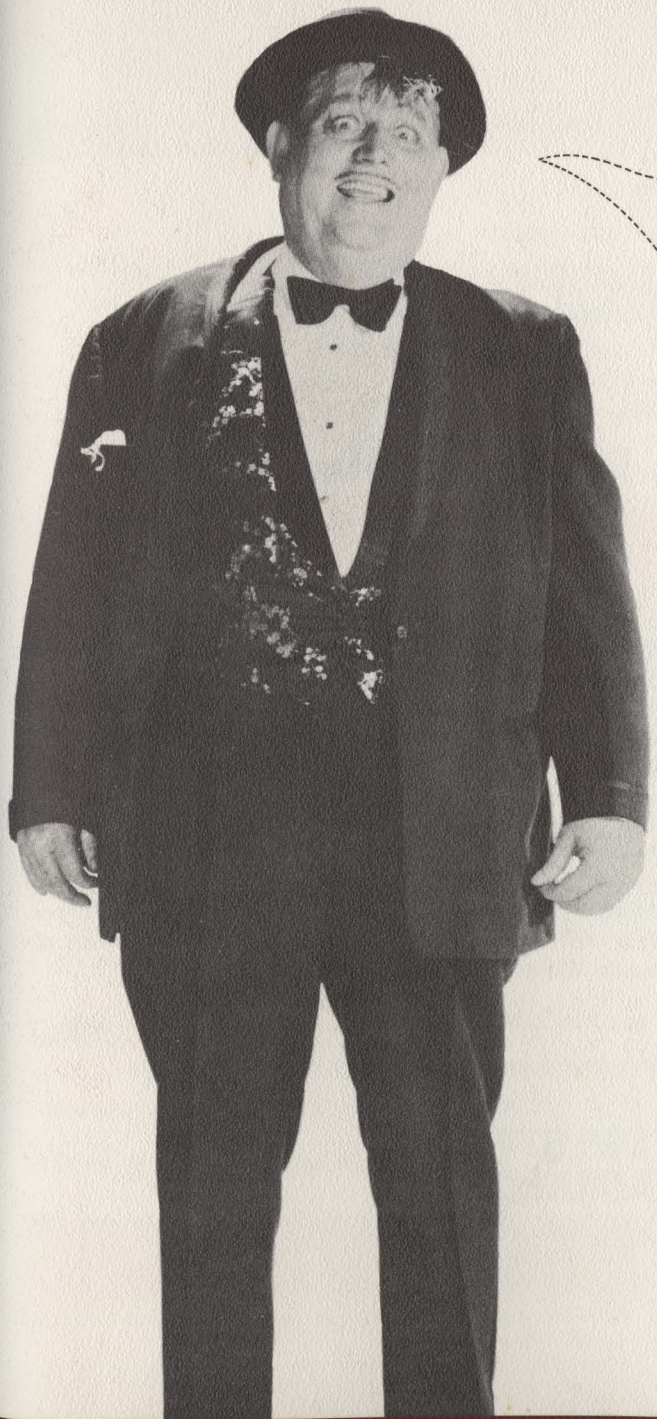


MAY 1964, Vol. 12, No. 9

The
Reflector

PUBLISHED BY THE BOSTON SECTION OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

Details on
Center Spread
JAMBORUPTION
Tuesday
May 19

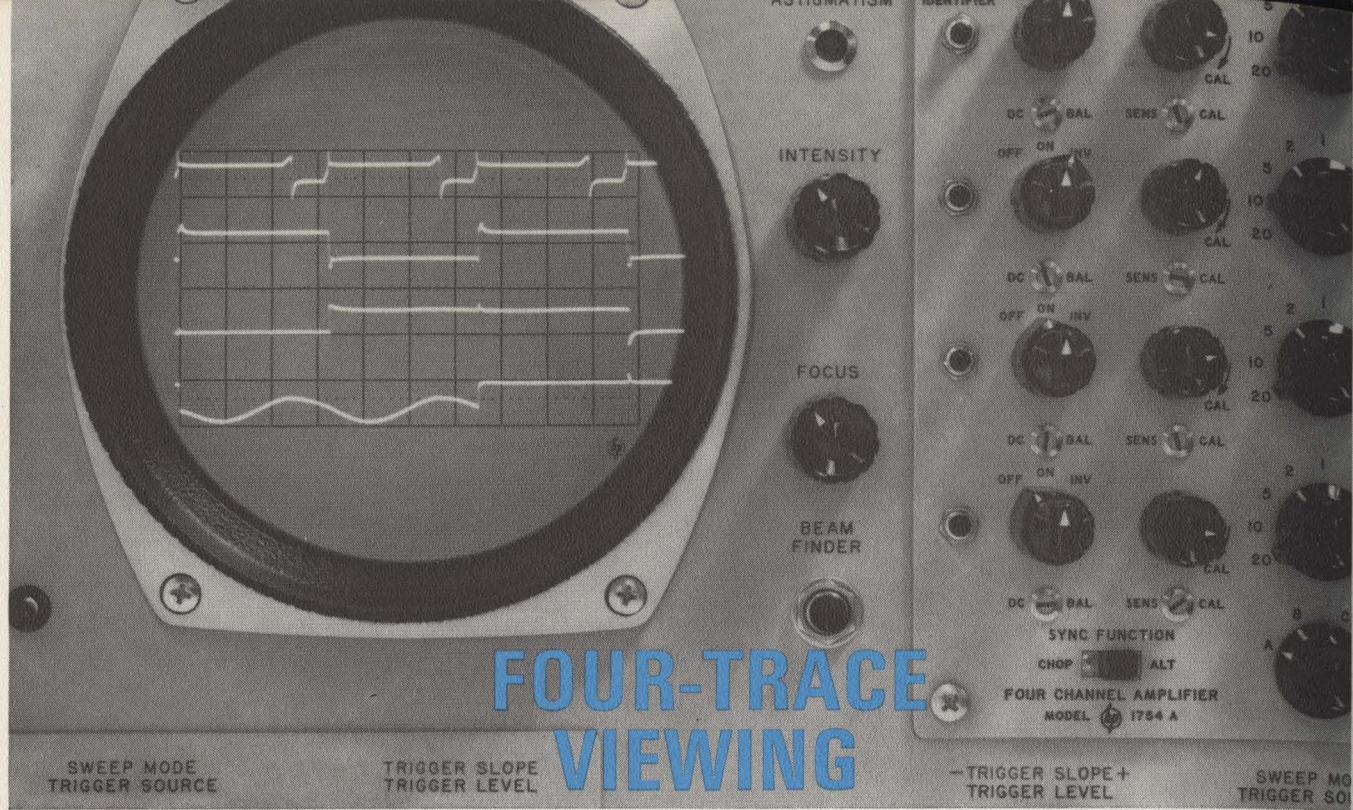


WOW!

I just saw the

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Rehearsal!



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VIEWING**

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**with your hp 175A Oscilloscope
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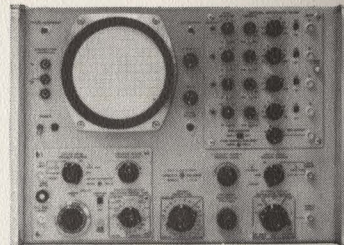
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Gentlemen: Please reserve _____ seats for the following qualified personnel to attend the seminar on June 3:

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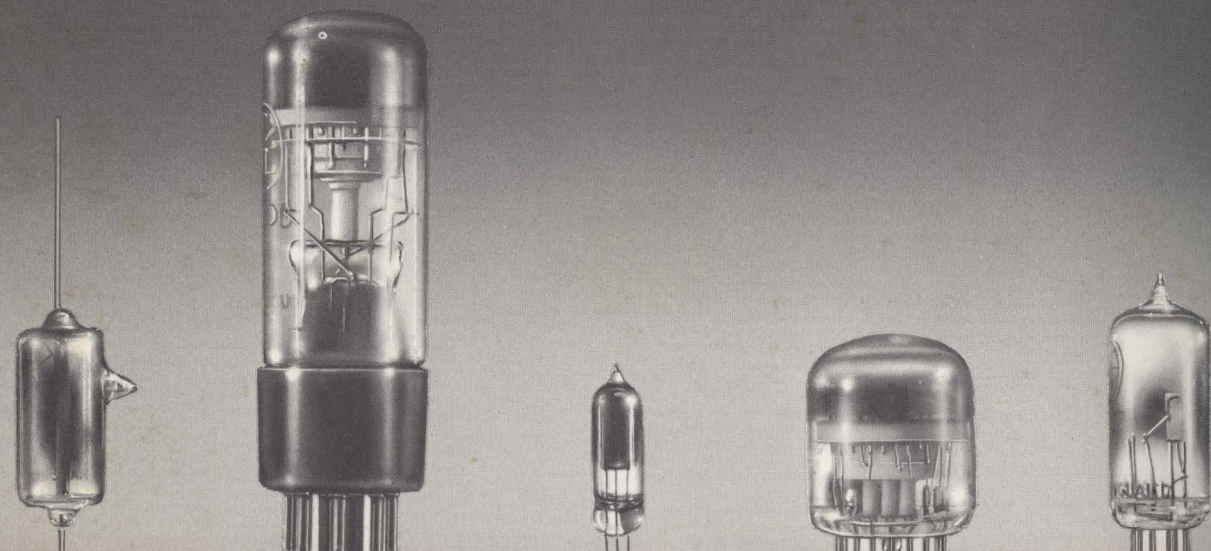
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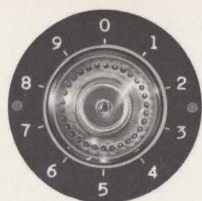
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Modulating
Multiplying
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Subtracting
Switching
Timing



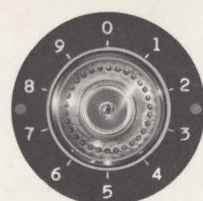
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The Reflector

MAY 1964

Volume XII, No. 9

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Newton, Mass. 02158
Telephone LAsell 7-5151

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Two Cultures Revisited

RONALD E. SCOTT
Chairman — Boston Section

THE *Two Cultures and the Scientific Revolution*, by C. P. Snow, stirred up a controversy which is not yet ended. Snow pointed out a real schism existing between our literary culture and our scientific culture and suggested that literature no longer had much influence on our technological society.

His principal critic has been F. R. Leavis, the erstwhile editor of a journal of literary criticism called *Scrutiny*. Leavis is a disciple of T. S. Eliot of *The Waste Land*. For Leavis literary insight is synonymous with a consciousness of the decay of civilization, of the inhumanness of the city, of the emptiness of human relations, and of the futility of modern work. Furthermore, Leavis contends that the literary critic, as the arbiter of our intellectual tastes, is the real ruler of our society.

Snow has pricked the balloon of Leavis's pretensions. According to Snow the literary people have lost touch with the real world and no longer have a serious influence upon it. Science and technology have opened up magnificent new vistas of wealth and beauty, and human relations are entering an era of vastly expanded possibilities.

The Leavis attack on Snow was intensely bitter and intensely personal. Using his method of literary criticism, he relegated Snow to the status of a minor author. He argued that a country has only one "culture," the sum total of its heritage from the past; and that if it is to be subdivided at all, it must be subdivided into more than two segments.

To these arguments Snow has replied that the use of the word "culture" was "something a little more than a dashing metaphor, but a good deal less than a cultural map." He also rejects the idea of a common culture for Western society. Persons educated with the greatest intensity in various branches of it cannot communicate with each other. (Have you ever tried to explain thermodynamics to a preacher?) The literary intellectuals were singled out to represent the nonscientific elements in our culture because they vocalize and to some extent shape and predict the mood of the nonscientific elements of society.

Central to Snow's argument has always been a distinction between man as an individual and man as a part of society. For individual man the solitariness, and the ultimate tragedy, death, will remain. But for social man conditions are vastly improved by modern science; and poverty, hunger and disease can be eliminated.

The critics will undoubtedly continue to snipe at Snow, but he has voiced the unstated thoughts of many and he remains a lonely voice trying to bridge the two cultures.

Reminder! General Section Meeting Promoted by PTG MIL/EMC

THURSDAY, APRIL 30

8:00pm

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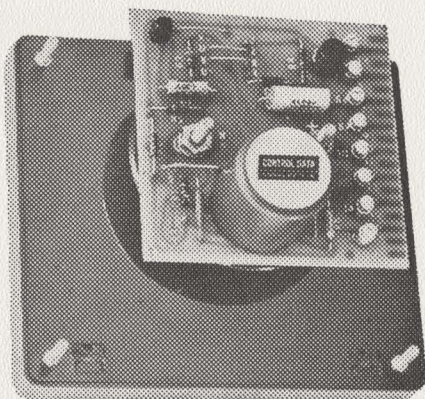
Putting the 70 MAGSENSE® Meter Monitor into operation is as easy as mounting it to rear meter terminals which connects its input in series with the meter . . . connecting input, output and 12 VDC using the 70's edge connector or studs . . . and turning the set point screw to the desired upper or lower limit setting. When current exceeds the set limit, the 70 statically applies control action to the external load.

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Set Point Resolution:	1.0 μ a	10 μ a	.10 ma	1.0 ma
Hysteresis:	3 μ a max.	30 μ a max.	.3 ma max.	3 ma max.

Response Time: 100 ms max. 50 ms typical.

Power Required: 10 to 14 VDC at approx. 30 ma exclusive of load current.

Output Load: Up to 50 ma standard. 500 ma optional.

Size: 3" x 3.35" x 1.25".

Weight: Approx. 3 ounces.

Mounting: On meter terminal studs up to 1/4-28 with 7/8" to 1 1/2"

centers. Chassis mounted, edge mounted, or card rack mounted.

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FROM

PTG

INSTRUMENTATION
AND MEASUREMENTS

Analog to Digital Conversion Techniques

MUCH of the information generated by the universe of interest to science and industry is analog in character and hence will not fit into the commonly available digital computers. Analog-to-digital converters exist for the purpose of transforming measured quantities into readily computable form.

This presentation will discuss the various techniques of digitizing voltages and the relative speeds and accuracies of each method. Related processes, such as limit testing and simple mathematical operations upon the data, will also be explained.



S. RIGBY
EDC

Problems of integrating analog-to-digital converters into a system will be examined. Sampling-rate requirements as a function of the original data spectrum will be given.

Sherman Rigby is chief engineer of the Electronic Development Corporation. His present interest is industrial data gathering and precision dc instrumentation. He received a BEE from the Polytechnic Institute of Brooklyn in 1949 and an MSEE from Columbia University in 1951. He is a registered professional engineer in Massachusetts.

TUESDAY, MAY 5
Meeting — 8:00pm — General Radio Co.
West Concord

JOINT MEETING

PTG's PRODUCT ENGINEERING & PRODUCTION AND ELECTRON DEVICES

Integrating Integrated Circuits

THE meeting will discuss today's and tomorrow's approaches to mounting, cooling, and interconnecting microcircuits. Within a very short period, the majority of military and much of the commercial electronics equipment will utilize solid-state integrated circuits. Are you ready to use them? Then meet us at the joint meeting of PTGPEP and PTGED on May 12.

1. J. A. Rothman (Chairman)—Engineering Systems, Inc.—Introduction and Review of the Microcircuit Packaging Problem.
2. Richard Steigerwald—Sippican—Interconnection of Integrated Circuits.

3. William T. McMorran and Don Grassi—Raytheon—Inter-Unit Wiring Technique Core Rope Application.
4. E. A. Guditz—Lincoln Lab., MIT—Deposited Connections and Wiring Techniques.
5. J. Staller—Sylvania—Physical Standardization of Integrated Circuits Packages and Some Comments on the Application of High-Density Integrated Circuit Packaging.

Following a short formal presentation by the speakers, separate round-table discussion groups on specific micro-miniature interconnection problems (and solutions) will be held.

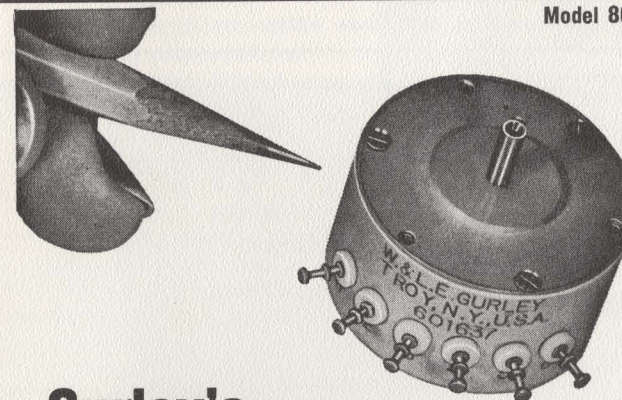
TUESDAY, MAY 12

Sylvania Electronic Systems — 40 Sylvan Rd., Waltham

Dinner — 6:30pm Meeting — 8:00pm

Reservations for dinner must be made with Miss Whitcher, 527-5151.

Cost of the dinner is \$3.00.



Model 8602

Change the bulb after every seven years of continuous use and this sturdy, compact, shaft-driven pulse generator will count at whatever speed you desire indefinitely. (We've never heard of any wearing out.) The secret of its long life: no contact of moving parts—nothing to wear out. All bearings are permanently lubricated and no field maintenance is necessary no matter what the extremes of operating conditions are.

The Gurley Photoelectric Incremental Encoder has three basic uses:

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3. As a distance measuring device, by converting linear motion to shaft motion.

The output frequency is directly proportional to rotational speed. The number of pulses per revolution, however, is a function of the number of segments on the glass disc which carries a highly-precise circular pattern of alternately clear and opaque sectors. The disc pattern can be made to meet special requirements. Standard discs are available with up to 1,024 pulses a revolution in Models 8601 and 8602, and up to 5,000 in Model 8603. The housing of Model 8602 (shown) is 1.375 in. by .844 in.; overall length including shaft is 1.188 in.

Gurley's Photoelectric Incremental Encoders KEEP COUNTING AND COUNTING AND COUNTING



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Low Noise Solid-State Microwave Signal Sources

D. A. CALDER — Raytheon Company

THE increasing use of solid-state microwave sources as local oscillators and transmitter chain exciters in Doppler radars and in high quality microwave communication links has produced considerable interest in the residual amplitude and frequency modulation of these sources. In Doppler radars the area of interest has been in that portion of the noise spectrum from close to carrier on out to 100 to 200 kc/s. For microwave links the area of interest has centered on the region between approximately 300 kc/s. and 10 Mc/s.

A study of the residual AM and FM has been made for a class of microwave sources consisting of a VHF crystal-controlled transistor oscillator, which is followed by a VHF transistor power amplifier and a varactor frequency-multiplier chain of high overall order of multiplication. The relationship between such factors as the basic oscillator frequency, oscillator power level, crystal Q, amplifier noise figure, and residual AM and FM has been investigated, and the major sources of residual AM and FM have been pinpointed. The results of this study have been used as a guide in the design of a 75-milliwatt X-band and a

S. L. JOHNSON — Raytheon Company

150-milliwatt C-band solid-state source with low residual AM and FM.

David A. Calder received an Associate Degree in EE in 1956 from the RCA Institute in New York City. Currently he is a Receiver Design Group Leader in the Ordnance Radar Department at the Raytheon Wayland Laboratory. He has had extensive experience in the design of pulse Doppler radar and communication receivers, IF data processors, and MTI cancelers. During the past two years he has been actively engaged in the design of highly stable crystal-controlled VHF transistor oscillators, VHF transistor power amplifiers, and UHF frequency multipliers.

Stanley L. Johnson received an AB degree in 1948, a BS in electrical engineering in 1949, and an MA in physics in 1953, all from Columbia University. He is currently employed as a Principal Engineer in the Ordnance Radar Department of the Raytheon Wayland Laboratory. He has had over eleven years experience in the design of microwave components including the design of low noise UHF and C-band parametric amplifiers. Recently, he has been actively engaged in the design of highly efficient microwave frequency multipliers for low-noise stable master oscillators.

TUESDAY, MAY 12
Dinner — 6:30pm — Coach Grille, Harvard Sq. Meeting — 8:00pm — MIT, Room 4-370

new
compact
Tektronix
oscilloscope

easily adapted to particular needs

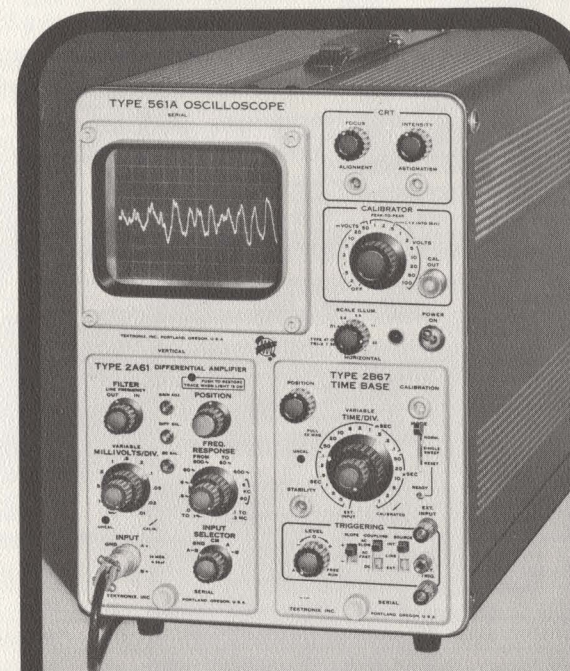


Here's a high-performance oscilloscope featuring operational simplicity and versatility through a new series of plug-in units. Presently, you can select from 10 amplifier units and 4 time-base units.

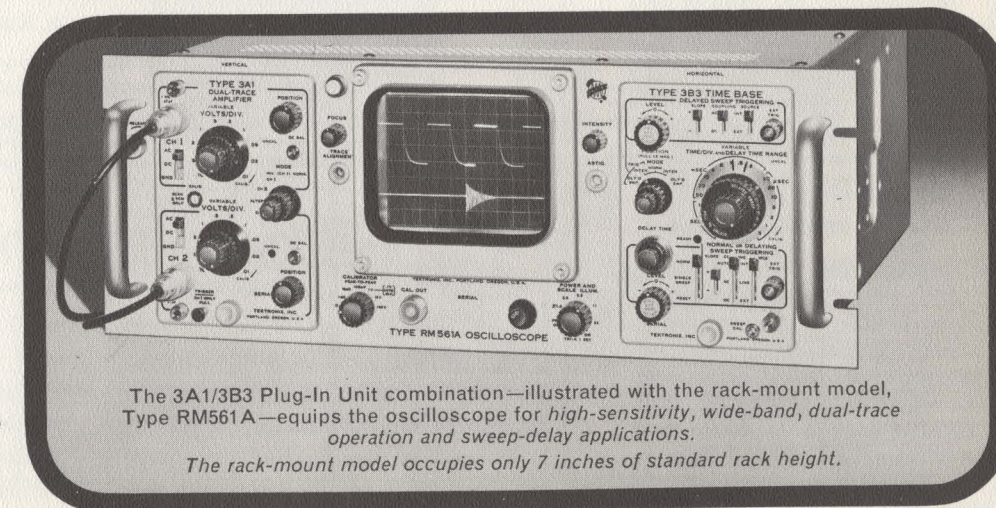
Knowing your application area, you select those units that fit your needs. Some of the general-purpose plug-in unit combinations available include those for low-level applications, differential applications, multi-trace applications, wide-band applications, sweep-delay applications, among other presentations. A special-purpose plug-in combination equips the oscilloscope for sampling applications, in which the instrument becomes a low-drift sampling system as easy to operate as a conventional oscilloscope, but with sensitivity and bandwidth possible only through sampling.

With any combination of plug-in units in the oscilloscope—including the same type amplifier units in both channels for X-Y displays—this new value package provides you with "no-parallax" displays and sharp trace photography.

For more information on either model of this new Oscilloscope and any combination of Plug-in Units, please call your Tektronix Field Engineer.



The 2A61/2B67 Plug-In Unit combination—illustrated with Type 561A—equips the oscilloscope for low-level differential applications.



The 3A1/3B3 Plug-In Unit combination—illustrated with the rack-mount model, Type RM561A—equips the oscilloscope for high-sensitivity, wide-band, dual-trace operation and sweep-delay applications.

The rack-mount model occupies only 7 inches of standard rack height.

features

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Type 561A (shown in low level application) . . . \$470

Type RM561A (shown in sweep delay application) 525

Oscilloscope prices without plug-in units.

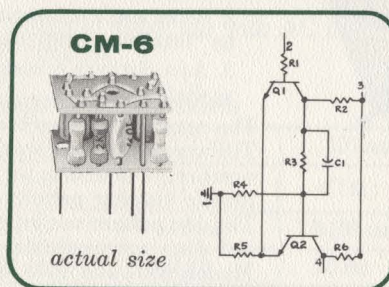
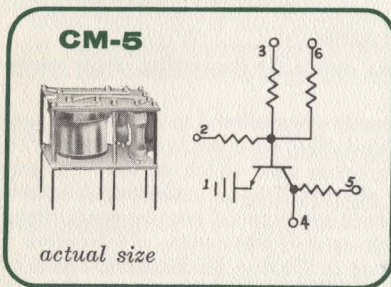
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The Coming Revolution in Information Transfer

TODAY emphasis must be placed on the need for rapid dissemination of accurate and clear engineering information. To accomplish this requires the introduction of new communication methods. This discussion will examine specific problems and the application of new techniques in solving these particular problems. The discussion and demonstration of new dynamic communication techniques will encompass the philosophy and application of these new systems. It will describe their advantages, disadvantages, operating costs, and resulting improvements in engineering communications to be expected through their use. Progress in engineering communication will ultimately be along the lines of the systems and techniques examined in this program.



A. LAHAISE
Raytheon Co.

Mr. LaHaise, who is a section manager at the Raytheon Wayland Laboratory, has for three years directed a group investigating new instructional and communications techniques. He is currently in charge of a project for a major textbook publisher investigating the teaching of modern mathematics using programmed instruction. His group is also examining the effectiveness of communication techniques in technical manuals. A modern approach to information retrieval will be covered by Mr. William Marsden, manager of the Information Retrieval Section at the Raytheon Wayland Laboratory. Mr. Marsden will exhibit a coordinate index system using noncomputer equipment for information retrieval. Audio-visual (AV) techniques will be covered by Mr. Arthur LaHaise, who has been active in technical publications work since 1946. He has also been consultant in AV to such firms as Western Electric, Westinghouse, Republic Aviation, and Sylvania, and is at present responsible for the design and application of AV in a Raytheon plant.



W. MARSDEN
Raytheon Co.

Mr. Marsden, who is a section manager at the Raytheon Wayland Laboratory, has for three years directed a group investigating new instructional and communications techniques. He is currently in charge of a project for a major textbook publisher investigating the teaching of modern mathematics using programmed instruction. His group is also examining the effectiveness of communication techniques in technical manuals. A modern approach to information retrieval will be covered by Mr. William Marsden, manager of the Information Retrieval Section at the Raytheon Wayland Laboratory. Mr. Marsden will exhibit a coordinate index system using noncomputer equipment for information retrieval. Audio-visual (AV) techniques will be covered by Mr. Arthur LaHaise, who has been active in technical publications work since 1946. He has also been consultant in AV to such firms as Western Electric, Westinghouse, Republic Aviation, and Sylvania, and is at present responsible for the design and application of AV in a Raytheon plant.

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C. SIMS
Raytheon Co.

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WEDNESDAY, MAY 13

Dinner — 6:00pm — Meeting — 8:00pm — Charterhouse Motor Hotel, Waltham

PTG

NUCLEAR SCIENCE

Nuclear Instrumentation

R. FESSEL — Harvard University

A DESCRIPTION will be given of the 6-billion-volt Cambridge Electronic Accelerator. Various components of the accelerator, its performance, and several high-energy physics experiments, currently being performed, will be described. Emphasis will be placed on the different types of instrumentation used by these experiments.

Dr. Rafael Fessel is currently associated with C.E.A., Harvard University. He assisted in the construction of the accelerator and has been both assisting and operating the accelerator in an experiment in meson photo production. Dr. Fessel's thesis was on pi-meson photo production.

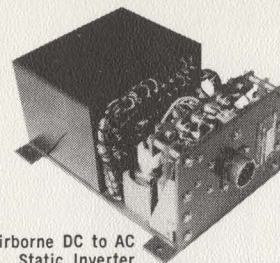
THURSDAY, MAY 14

Meeting — 8:00pm — MIT Room 4-231

Hyperion

INDUSTRIES, INC.

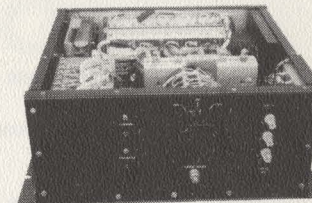
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Airborne DC to AC
Static Inverter
Military Specifications — MIL-E-5400

Hyperion's Power Equipment Division is actively engaged in the design, development, and fabrication of custom engineered power equipment. Our engineers have an intimate working knowledge of major military specifications and are able to implement military design requirements.

Hyperion's power supplies are found in many of the country's major weapons systems — Polaris, Hustler, 465L, BMEWS, Titan, Apogee, Sidewinder, etc.



Mobile Communications
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DESCRIPTION	"Flat Plate" Modules	Low Power Laboratory Supplies	Medium Power Laboratory Supplies	High Power Rack Mt'd Power Supplies
Regulation Worst Case Combined Line and Load	0.05% or 5 mv whichever is greater	0.05% or 5 mv whichever is greater	0.05% or 5 mv whichever is greater	0.025% or 5 mv whichever is greater
Ripple	350 μ v rms	350 μ v rms	1-2 mvrms	1 mvrms
Response Time	50 μ sec	50 μ sec	50 μ sec	50 μ sec
Constant Voltage	✓	✓	✓	✓
Constant Current	✓	✓		✓
Remote Sensing	✓	✓	✓	✓
Rack Mtg. Available	✓	✓	✓	✓
Overload Protection	✓	✓	✓	✓
Metered		✓	✓	✓
Remote Program	✓	✓	Optional	✓
Transient Free	✓	✓	✓	✓

MODEL	VOLTS	AMPS	PRICE	MODEL	VOLTS	AMPS	PRICE	MODEL	VOLTS	AMPS	PRICE	MODEL	VOLTS	AMPS	PRICE
HY-WM	0-7.5	3.0	\$149.00	HY-W1	0-7.5	3.0	\$159.00	HY-Z1	0-16	1.5	\$179.00	HY-T1	0-10	15	\$ 440.00
HY-WM	0-16	1.0	129.00	HY-W1	0-16	1.0	139.00	HY-Z1	0-16	4.5	219.00	HY-T1	0-10	40	695.00
HY-WM	0-20	1.5	149.00	HY-W1	0-20	1.5	159.00	HY-Z1	0-16	7.5	279.00	HY-T1	0-10	60	975.00
HY-WM	0-30	0.6	119.00	HY-W1	0-30	0.6	129.00	HY-Z1	0-32	1	189.00	HY-T1	0-20	10	440.00
HY-WM	0-40	0.8	149.00	HY-W1	0-40	0.8	159.00	HY-Z1	0-32	2.5	229.00	HY-T1	0-20	30	645.00
HY-WM	0-60	0.3	139.00	HY-W1	0-60	0.3	149.00	HY-Z1	0-32	5	289.00	HY-T1	0-20	45	1095.00
HY-WM	0-100	0.15	149.00	HY-W1	0-100	0.15	159.00	HY-Z1	0-50	1.5	225.00	HY-T1	0-40	7.5	430.00
								HY-Z1	0-60	0.5	199.00	HY-T1	0-40	15	625.00
								HY-Z1	0-60	1.0	239.00	HY-T1	0-40	30	845.00
								HY-Z1	0-60	2.0	299.00	HY-T1	0-60	5	519.00
								HY-Z1	0-160	1.0	319.00	HY-T1	0-60	10	655.00
								HY-Z1	0-330	0.35	319.00	HY-T1	0-60	20	945.00
												HY-T1	0-160	2	560.00
												HY-T1	0-160	5	845.00
												HY-T1	0-160	8	1195.00
												HY-T1	0-330	1	615.00
												HY-T1	0-330	2.5	895.00
												HY-T1	0-330	4	1795.00

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MAY 5
Tuesday, 8:00pm
General Radio Co.
West Concord

INSTRUMENTATION AND MEASUREMENTS - See page 2
ANALOG-TO-DIGITAL CONVERSION TECHNIQUES
Sherman Rigby, Electronic Development Corp.

MAY 12
Tuesday, 8:00pm
Sylvania Electronic Systems
40 Sylvan Rd., Waltham

PRODUCT ENGINEERING & PRODUCTION AND ELECTRON DEVICES - See page 3
INTEGRATING INTEGRATED CIRCUITS
Roundtable Discussion
Dinner - Sylvania - 6:30pm - Reservations must be made with Miss Whitcher - cost of dinner \$3.00

MAY 12
Tuesday, 8:00pm
MIT, Room 4-370

MICROWAVE THEORY AND TECHNIQUES - See page 4
LOW NOISE SOLID-STATE MICROWAVE SIGNAL SOURCES
Dinner - Coach Grille, Harvard Sq. - 6:30pm

MAY 13
Wednesday, 8:00pm
Charterhouse Hotel
Waltham

ENGINEERING WRITING AND SPEECH - See page 5
THE COMING REVOLUTION IN INFORMATION TRANSFER
Christopher Sims, William Marsden, Arthur LaHaise, Raytheon Company
Dinner - Charterhouse Hotel - 6:00pm

MAY 14
Thursday, 8:00pm
MIT, Room 4-231

NUCLEAR SCIENCE - See page 6
NUCLEAR INSTRUMENTATION
Rafael Fessel, C.E.A. Harvard University

MAY 20
Wednesday, 8:00pm
Sylvania Electronic Systems
100 First Ave., Waltham

MILITARY ELECTRONICS AND ELECTROMAGNETIC COMPATIBILITY - See page 10
HALL-EFFECT DEVICES AS A TOOL IN MAGNETIC MEASUREMENTS
R. Wayne Crawford, Scientific Columbus, Inc.

MAY 27
Wednesday, 8:00pm
Route 9, Framingham

RELIABILITY - See page 11
ALL-DAY CASE STUDY CONFERENCE
Raytheon Co., Wayland: Area Code 617, 358-2721, ext. 2191, on or before May 18.
Total registration cost \$8.00

MAY 27
Wednesday, 8:00pm
Northeastern University
128 Burlington Campus

SPACE ELECTRONICS & TELEMETRY - See page 12
RESEARCH FOR ELECTRONICS IN SPACE
A. J. Kelley, NASA

NEREM Call for Student Papers

NEREM, the Northeast Electronics Research and Engineering Meeting, New England's annual electronics show and convention, is to be held in Boston, November 4-6, 1964.

Students are encouraged to participate in NEREM. Full-time students may attend the show and technical sessions free of charge. Graduate students should consider submitting a paper based on their thesis work, to be judged along with the other contributed papers.

Undergraduates (including seniors who will graduate before November) are invited to enter a special New England Undergraduate Papers Competition. Winning papers will be published in the NEREM Record, and the authors will be invited to give a ten-minute presentation of the paper at NEREM. In addition, a prize of \$100 for each winning paper will be awarded at the NEREM Banquet. Reasonable transportation expenses can be made available for out-of-town winners.

Papers should describe original work of the authors, and may be based on term papers, theses, special projects, etc. The papers will be judged by a group of Boston-area professors and by the NEREM Program Committee, on the basis of engineering and scientific merit.

To enter, send your paper* (typewritten, please) to Prof. Paul Penfield, Jr., 17 Bradford Road, Weston, Mass. 02193, before June 15, 1964. On it write (1) the phrase "NEREM Undergraduate Papers Competition," (2) your name, (3) your school, (4) your present address, and (5) your summer address. Winners will be expected to cooperate in making whatever changes are necessary in the written versions so that they can be published in the NEREM Record.

Winning papers will be selected by July 1, and final versions of winning papers will be due July 15. Students who submit papers must therefore be prepared to spend some time in early July revising their papers.

More information can be obtained from Professor Penfield at the address above.

*If your talk is based on a thesis or term paper, you may, if you wish, submit a copy of that document.

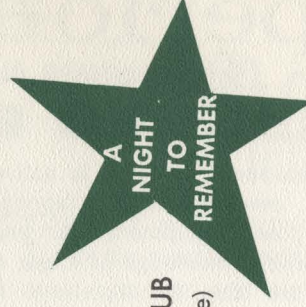
JAMBORUPTION ANNUAL STAG & SOCIAL MEETING

TUESDAY, MAY 19th

6:30pm

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Tickets may be obtained from the
Boston IEEE Office, 313 Washington
St., Newton, Mass. 02158
Member \$7.00
Non Member \$8.00

Make checks payable to Boston Section, IEEE

Name

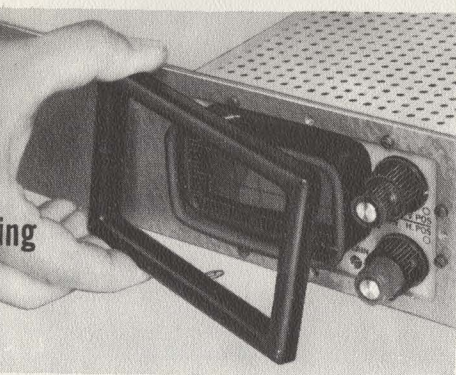
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Enclosed is my JAMBORUPTION check for

No tickets will be sold at the door. All tickets must be obtained by Friday, May 15.

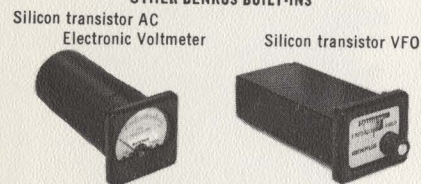
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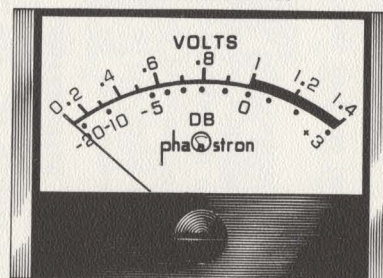
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PTG

MIL/EMC

Hall-Effect Devices as a Tool in Magnetic Measurements

HALL-EFFECT devices are finding increasing use in both industrial and military applications, not only as magnetic sensors but as basic multipliers in power transducers. Mr. Crawford will discuss the many uses of Hall-effect devices. Particular emphasis will be given to the use of these devices in measuring magnetic field intensities at both high and low levels. Some specific uses of low level magnetometers in military and industrial applications will be presented.

The use of a properly designed concentrator can greatly enhance the sensitivity of the sensor. Some of the considerations in concentrator design will be covered.



R. W. CRAWFORD
Scientific Columbus

Most materials used for Hall generators are temperature sensitive. Techniques for temperature stabilization over a wide range have been developed, however. A comparison of the advantages and disadvantages of measuring magnetic fields with Hall-effect devices over other techniques will also be given.

Mr. R. Wayne Crawford, President and Technical Director of Scientific Columbus, Inc., is an electrical engineering graduate of Ohio State University. Following his graduation he worked at the Ohio State University Research Foundation and took graduate work. He is a member of the IEEE.

WEDNESDAY, MAY 20
Meeting — Sylvania, 100 First Ave.,
Waltham — 8:00pm

THE REFLECTOR

PTG

RELIABILITY

Mechanisms, Modes, and Effects of Failure Phenomena

THE theme of this year's Boston Chapter PTGR all-day conference is Mechanisms, Modes, and Effects of Failure Phenomena and features an array of outstanding reliability specialists from major companies. A complete day of technical sessions will be presented in two separate parts that will run concurrently, starting at 9:00am. Part I is entitled The Component-Part Viewpoint, and the other is called The System Viewpoint. Each speaker will give a 30-minute talk which will be followed by a 15-minute discussion.

Papers of both sessions will be case and systems oriented rather than philosophical. For example, the paper by Mr. Kiethley, "System Reliability Considerations of an Electronically Steerable Array Radar," will explore the effects of various failure modes on performance, probability of detection, and system availability, using the AN/FPS-85 (SPADATS) as a model.

THE COMPONENT-PART VIEWPOINT

Chairman: E. J. Nucci, Office of Secretary of Defense, Washington, D. C.

Speakers: John Gaffney, Raytheon Co., Sudbury, Mass.
George Chernowitz, American Power Jet Spray Co.,
Ridgefield, N. J.
Ernest C. Ernst, General Electric Co., LMED, Syracuse, N. Y.
Jayne Partridge, MIT Instrumentation Lab., Cambridge
Ricardo Vanzetti, Raytheon Co., CADPO, Norwood
Donald J. Nicholson, RADC, Rome, N. Y.

THE SYSTEM VIEWPOINT

Chairman: Dr. Leslie Ball, Boeing Co., Seattle, Washington

Speakers: Alfred Lieberman, Norden Co., Norwalk, Conn.
Hudson Kiethley, Bendix Corp., Baltimore, Md.
Robert E. Killion, RCA, Moorestown, N. J.
Avery H. Hevesh, Raytheon Co., Wayland
Robert Ruth, Philco Corp., Philadelphia, Pa.
Igor Bazovsky, Litton Systems, Inc., Woodland Hills, Calif.
William Menges, Burroughs Corp., Paoli, Pa.

Total registration cost for the all-day conference is \$8.00. This includes a complete lunch (specialty of the house — roast sirloin of steer beef) and a copy of the *Proceedings*. Additional copies of the *Proceedings* are \$4.00 a copy.

THURSDAY, MAY 21

Maridor Restaurant — Route 9, Framingham

Technical Sessions 9:00am — 4:00pm

Lunch 12:00 — 1:30pm

Reservations must be made by calling Charles Saraglow, Raytheon Co., Wayland: Area Code 617, 358-2721, Ext. 2191. Reservations must be honored unless canceled on or before May 18.

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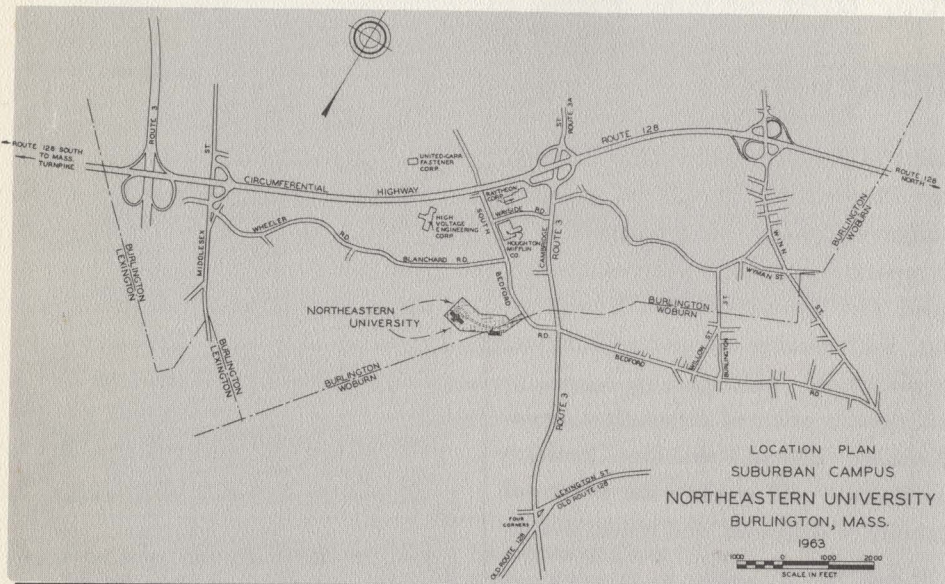
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STYLE 202 shown fully erected to its
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Research for Electronics in Space

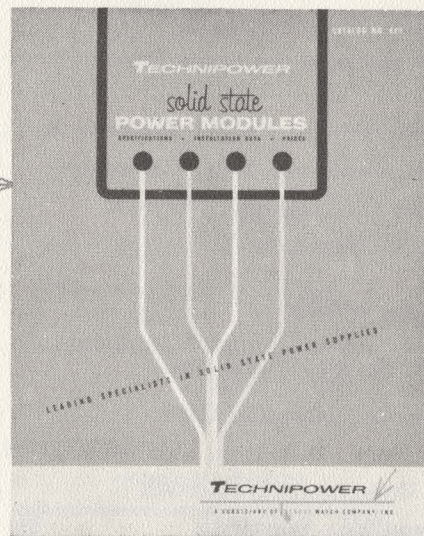


WEDNESDAY, MAY 27
Meeting — 8:00pm
AT NORTHEASTERN'S 128 BURLINGTON CAMPUS
(See Map)

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A. J. KELLEY
Director of Electronics and Control
NASA

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A Navy Commander on active detached duty with NASA, Dr. Kelley graduated from the U. S. Naval Academy in 1945. He has seen Navy operational duty as a shipboard officer in World War II, as a carrier pilot in Korean combat, and as an experimental test pilot.



A. J. KELLEY
NASA

He completed graduate studies in electronics engineering at MIT in 1948 and later returned there for graduate work in guidance and flight control, for which he was awarded the Doctor of Science degree by MIT in 1956.

Dr. Kelley is currently Director of Electronics and Control, NASA Office of Advanced Research and Technology, and is responsible for management and direction of NASA advanced research and development in the fields of guidance, flight control, communications, instrumentation, and data processing. He is also Manager of the NASA Electronics Research Task Group.

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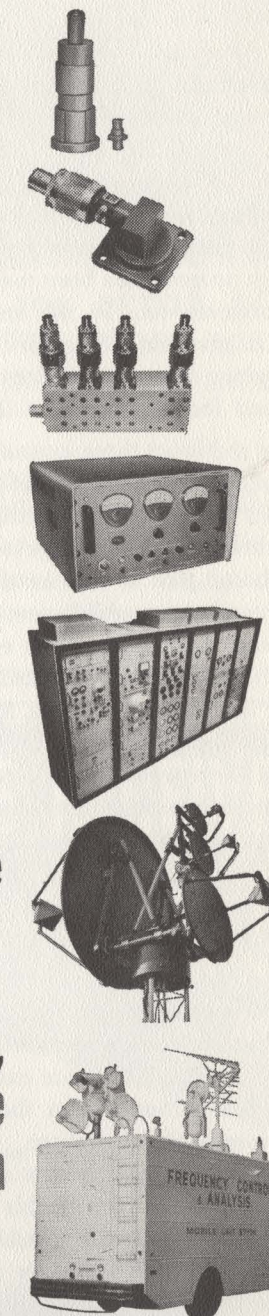
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Reflections

Editor

BRUCE B. BARROW

On IEEE Publications

THE most significant fruits of the merger of IRE and AIEE are the publications of the new organization, the IEEE. This must necessarily be true, whether for good or bad, since the IEEE is now publishing more technical material than all other electrical engineering societies in the world combined. There are several reasons for commenting on IEEE publications at the present time. In the first place, enough progress has been made to provide something new to comment on. In the second place, enough confusion exists to give something to clarify. In the third place, enough seeking for new solutions is going on to provide fertile ground for planting new ideas.

The IEEE now publishes three journals—the *Proceedings*, the *Spectrum*, and the *Student Journal*—that are intended to be wide, rather than selective, in their interest and appeal. Of these three the *Proceedings* is most vulnerable to the superficial charge that it serves no distinct need. The *Proceedings* is intended to publish new work of fundamental importance and is of most use to engineers and scientists who are actively engaged in research and development. Its vulnerability lies in the fact that almost any article it contains could also logically have been published in one of the many *IEEE Transactions*. When the Institute announced that members would have to pay \$6 to subscribe to the *Proceedings*, which until then had been sent free to members, it was widely predicted that the *Proceedings* would fail. Instead, more than 50 000 subscriptions came in, indicating a strong and broadly based need for the magazine.

We believe that it is axiomatic that a strong *Proceedings* must be maintained as the cornerstone publication of the IEEE. The prestige of the Institute cannot rest on several dozen different *Transactions*, even though some of them have achieved international stature. To strengthen the *Proceedings*, two steps are in order. First, more articles should be published in it, even if this means preempting some of the material submitted for publication in a *Transactions*. A goal of about 3000 pages per year seems not unreasonable for the *Proceedings*. The *Physical Review* publishes about 8000 pages of technical articles each year, and it is precisely because the American Physical Society keeps its best material in one central publication that it ensures that that publication will maintain its position as the preëminent physics journal in the world.

Second, the *Proceedings* should be available to IEEE members at no charge above the basic dues. This means that members should be given a choice between the *Spectrum* and the *Proceedings* as the journal to be paid for

from their dues, with the right to subscribe to the other as an extra publication. At present about one-third of the members of the IEEE find that they must subscribe to at least two wide-interest IEEE journals to meet their needs. Since this one-third have voted with their hard cash, it may be presumed that they earnestly feel that their needs are not met by the *Spectrum* (or by the *Student Journal*, as the case may be). Many members apparently belong to the Institute in order to receive the *Proceedings*, and to force them to accept another publication first is a little bit like forcing a staunch supporter of the Boston Symphony to take a Boston Pops subscription first, and then to buy a Symphony series at a surcharge.

The *Spectrum* is the new IEEE journal of togetherness, dedicated to the proposition that there must be some technical material worth publishing that will be of potential interest to nearly all the members of the Institute. We find little to criticize in the *Spectrum*. There is a clear need for a journal that will be of use to the majority of the members who do not wish anything as basic, and necessarily as difficult, in its approach as is the *Proceedings*. This need was already expressed before the merger. We believe, however, that the *Spectrum* cannot by itself serve the needs of all the members any better than can the *Proceedings*, and that it should not automatically be sent to everybody. Some twenty or thirty pages of material should go to all members and could easily be published in both the *Spectrum* and the *Proceedings*. (At present some basic research material such as the abstracts of *Transactions* papers appears only in the *Spectrum*. This material should certainly be carried in the *Proceedings* as well, since the *Proceedings* is the general research journal of the Institute and is the publication most likely to be kept in personal research libraries.)

The *Student Journal* is similar to the *Spectrum* but is intended for student members. It survives from a period in IRE history when it was acknowledged that most students had little current use for the *Proceedings*, and it was published to meet the need to provide them with something they could study and understand. We believe it is time now to discontinue publication of the *Student Journal*—to retire it with honor. Student members today can certainly read the *Spectrum* with profit, and therefore the Institute's need to communicate with its student members can be met with that publication. (The cartoons in the *Student Journal*, which have seemed to many to add a condescending and childish touch to an otherwise professional publication, will not be missed.)

To summarize: (a) Drop the *Student Journal*; (b) offer members of all grades, including students, the choice between the *Proceedings* and the *Spectrum* as the journal to be included in the basic dues; (c) strengthen the *Proceedings* by expanding it to include, in principle, the best technical work being published by the Institute, even though some of this work would be highly specialized.

On Lights at Night

THE most dismal news photograph we have recently seen appeared on the front page of the *New York*

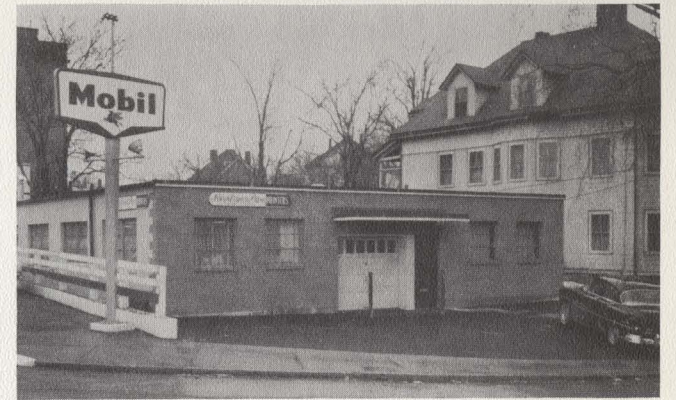
Times of April 2nd. It showed a nearly dark Pentagon building, and the accompanying news story told of government policy, promulgated at the very highest level, calling for turning off unused lights at night.

We have reluctantly become accustomed to government-induced fluctuations in the defense electronics industry. After all, somebody has to pay if there is to be a tax cut, and in defense the government giveth and the government taketh away. But a blow struck at Reddy Kilowatt is a kick at the foundations of our free-enterprise system. Is our consumption to be determined by our need? Then we may as well turn our backs on all our modern civilizing influences and emulate that nineteenth-century beatnik in his shack on the shores of Walden Pond.

Occasionally we pass the Pentagon at night, and we used to take comfort in the reassuring thought that all those colonels were on duty guarding the nation while it slept. Now it develops that the sentinels were unattended light bulbs, perhaps frightening to the enemy but in fact as inert and impotent as the corpses propped up at the crenels of the desert fort in *Beau Geste*. Our thoughts turn to the White House, and in our mind's eye we see the First Lady stumbling into the hall at night and skinning her shins on an unlit table. Not a reassuring thought at all.

We suggest that now is the time to revive a song from a more hopeful, and idealistic, period in our history. All together now: "When the lights go on again/All over the world . . ."

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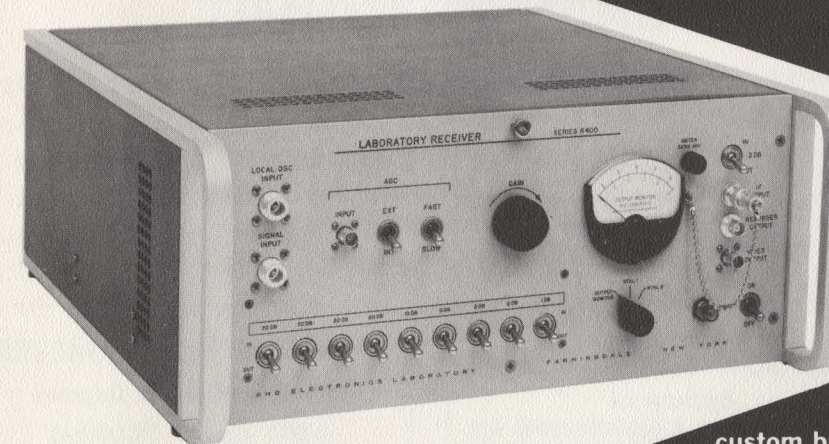
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There is a classic recipe — harking back to the days of the Great Depression — for an omelet serving eight people that calls for one egg . . . and a bicycle pump.

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 insistence 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?

BOONTON ELECTRONICS CORPORATION
PARSIPPANY, N. J.

Represented by:

GEORGE GREGORY ASSOCIATES
7 Erie Drive
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Call for Papers NEREM '64

TECHNICAL papers describing significant original advancements in research and development are invited for presentation at the 1964 Northeast Electronics Research and Engineering Meeting (NEREM). The meeting will be held in the Commonwealth Armory and the Somerset Hotel, Boston, Mass., on November 4, 5, 6, 1964 and will include both invited papers from recognized authorities and contributed papers on new developments.

Among the subject categories recommended for contributed papers are the following:

- Antennas
- Automatic Controls
- Biomedical Electronics
- Coherent Propagation
- High Frequency Solid State Techniques
- High Power Solid State Techniques
- Microelectronics
- Microwave Techniques
- Microwave Links
- Plasma Electronics
- Quantum Electronics — Generation
- Quantum Electronics — Modulation
- Transistor Technology

Speakers are requested to furnish 600-1000 word condensed versions of their papers in triplicate, plus 35-40 word abstracts for an advanced program mailing. The condensed papers should be accompanied by finished inked drawings of all curves and artwork; this material will be used for the NEREM Record, a printed, 200-page conference report which is furnished, free of charge, to all IEEE members registering at the meeting.

In addition, both the abstract and summary should include the following information: Author(s) name(s), affiliation(s), business and home address, and telephone contact(s). Any necessary military or company clearance of papers must be obtained before submission of the paper. All material must be mailed on or before June 30, 1964 to the NEREM '64 program chairman:

Dr. James E. Storer
Boston Section, IEEE
313 Washington St.
Newton 58, Mass.

Complete, printed instructions for authors are also available, on request, from the program chairman.

Authors will be notified of paper acceptance or rejection by July 30, 1964.

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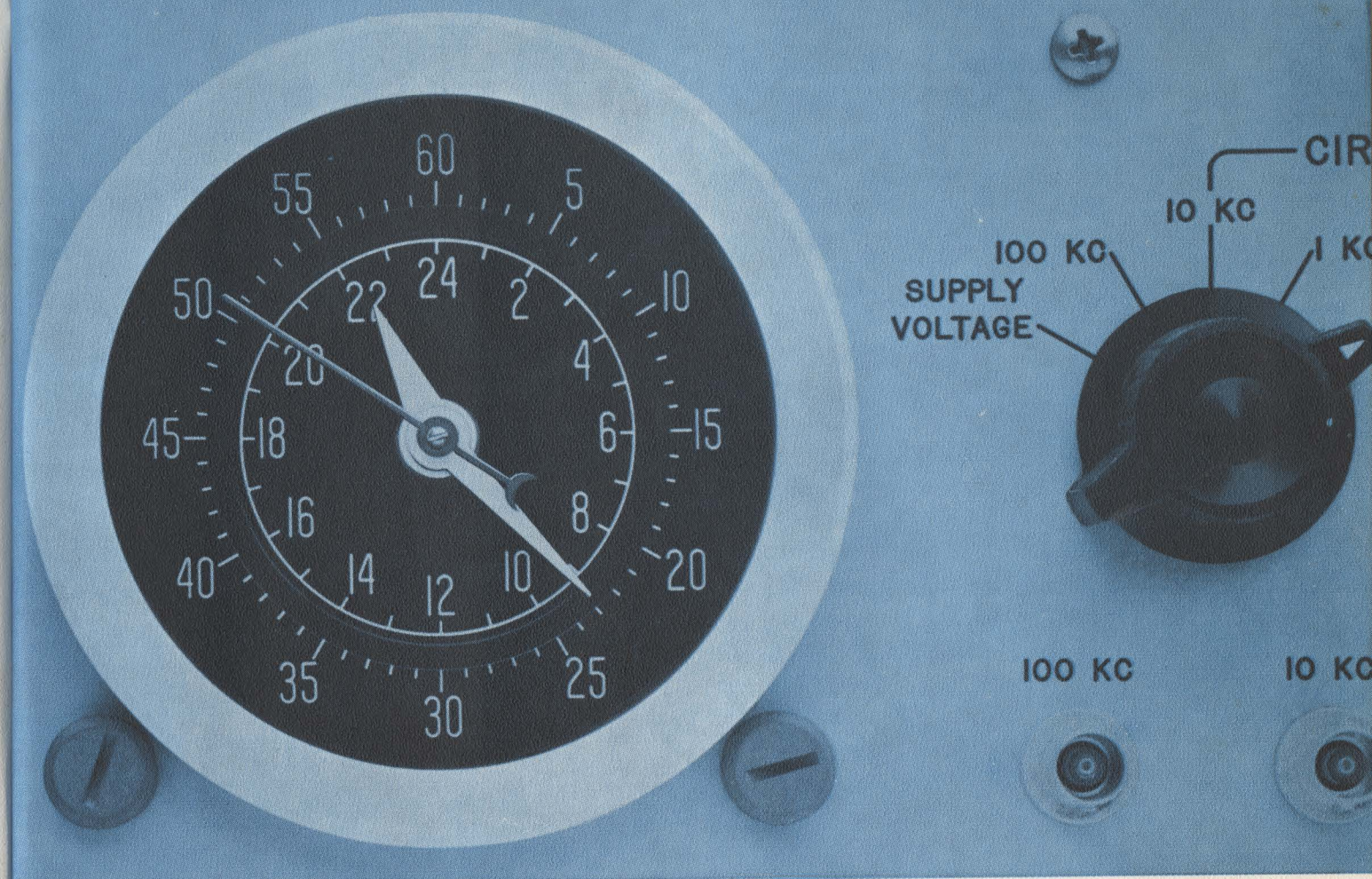
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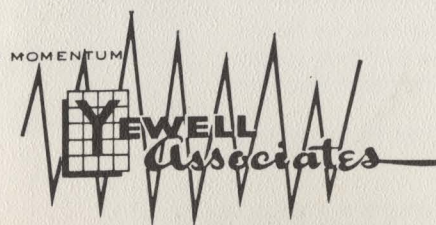
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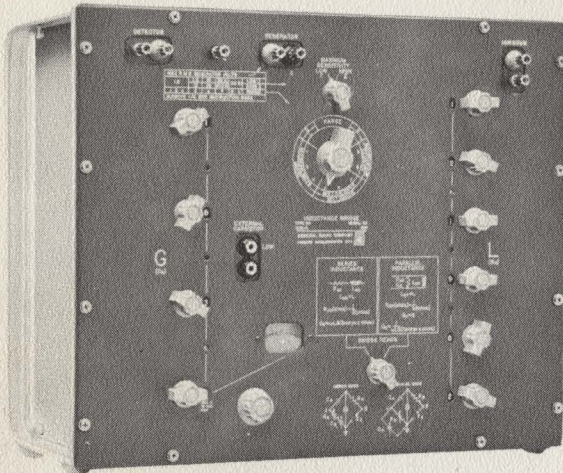
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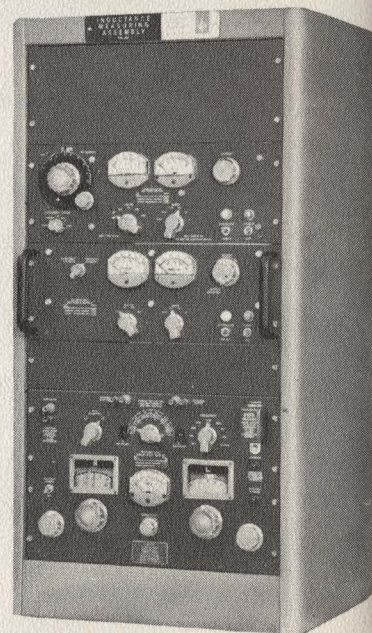
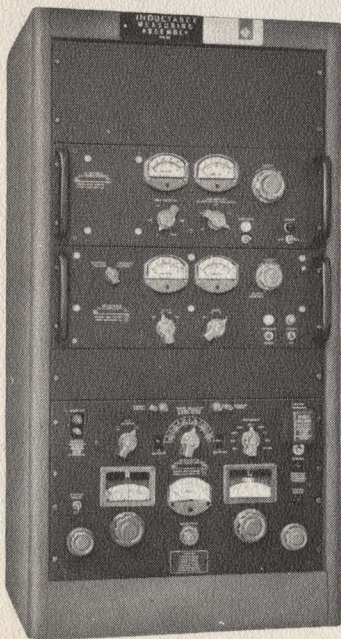
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