

EDITOR'S PROFILE of this issue

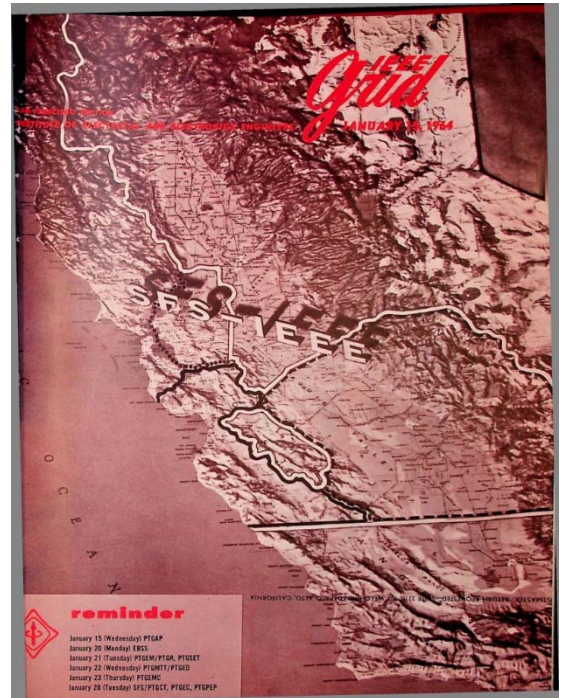
from a historical perspective ...

with Paul Wesling, SF Bay Area Council GRID editor (2004-2014)

January, 1964 (mid-month):

Cover: This Northern California relief map shows the IEEE's SF Section, with the three Subsections as outlined: Oakland (dotted black line), Santa Clara Valley (solid black line), and Fresno (dashed black line). The horizontal black line separates the Los Angeles District. and the Sacramento Section is shown to the upper-right.

Page 6: Bill Hewlett and David Packard are awarded honorary lifetime memberships in the Instrument Society of America for their technical contributions to that field. Stanford's provost Fred Terman is elected to the board of directors of Granger Associates; he already serves on the boards of HP, Ampex, SRI, and Watkins-Johnson.



Archive of available SF Bay Area GRID Magazines is at this location:

https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History

At time of scanning, the bound volumes are held by Paul Wesling.

July, 2021

Contact p.wesling@ieee.org

IEEE Guid

SAN FRANCISCO SECTION
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

JANUARY 15, 1964

SFS I E E E

POSTMASTER: RETURN REQUESTED—SUITE 2210, 701 WELCH ROAD, PALO ALTO, CALIFORNIA

reminder



- January 15 (Wednesday) PTGAP
- January 20 (Monday) EBSS
- January 21 (Tuesday) PTGEM/PTGR, PTGSET
- January 22 (Wednesday) PTGMTT/PTGED
- January 23 (Thursday) PTGEMC
- January 28 (Tuesday) SFS/PTGCT, PTGEC, PTGPEP

ENGINEERING AND SCIENCES EXTENSION • UNIVERSITY OF CALIFORNIA
EVENING CLASSES *Beginning in February* **SPRING 1964**

Electrical Engineering

- X 403B. Microwave Antenna Design—Array Design Theory. (2)
 REDWOOD CITY Mr. Damonte
 Mon. Feb. 10; 7-9 p.m.; room 112, Sequoia High School;
 15 meetings; \$35.
- X 418. Magnetic Memory and Logic Circuits. (2)
 PALO ALTO Mr. Stucki
 Tues. Feb. 18; 7-9 p.m.; room 21, Wilbur Junior High
 School; 15 meetings; \$36.
- X 422. Advanced Feedback Control Systems. (2)
 REDWOOD CITY Mr. Notthoff
 Tues. Feb. 18; 7-9 p.m.; room 108, Sequoia High School;
 15 meetings; \$38.
- X 424. Basic Transistor Analysis and Circuitry. (3)
 BERKELEY Mr. Smith
 Mon. Feb. 3; 7:30-10 p.m.; 289 Cory Hall; 18 meetings;
 \$45.
 LOS ALTOS Mr. Fitzgerald
 Tues. Feb. 4; 7-9:30 p.m.; room 304, Los Altos High
 School; 18 meetings; \$45.
- X 436. Space Radio Propagation Phenomena, Part II—
 Applied Space Electromagnetics. (2)
 MENLO PARK Mr. Kownacki
 Tues. Feb. 4; 7-9 A.M.; room B, Bldg. 312, Stanford Re-
 search Institute; 18 meetings; \$55.
- X 450. Principles of Digital Data Communications. (2)
 PALO ALTO Mr. Lender
 Wed. Feb. 19; 7-9 p.m.; room 25, Wilbur Junior High
 School; 15 meetings; \$42.
823. Introduction to Microwave Technology.
 PALO ALTO Mr. Wadhwa
 Wed. Feb. 19; 7-9:30 p.m.; room 36, Wilbur Junior High
 School; 16 meetings; \$45.

- 824B. Microwave Measurements—Techniques.
 REDWOOD CITY Mr. Hatfield
 Wed. Feb. 19; 7-9 p.m.; room 26, Sequoia High School;
 15 meetings; \$35.
- 838B. Industrial Power Systems.
 SAN FRANCISCO Mr. Crenshaw
 Mon. Feb. 17; 6-8 p.m.; 209 Richardson Hall; 15 meet-
 ings; \$35.

Mechanical Engineering

- X 471. Industrial Noise Evaluation and Control. (2)
 SAN FRANCISCO Mr. Salmon
 Tues. Feb. 11; 7:30-9:30 p.m.; 109 Woods Hall; 15 meet-
 ings; \$35.

Astronomy

810. Technical History of Astronomical Research.
 PALO ALTO Mr. Epstein
 Wed. Feb. 19; 7-9 p.m.; room 26, Wilbur Junior High
 School; 8 meetings; \$21.

Mathematics

- XB 185. Introduction to the Theory of Functions of a Com-
 plex Variable. (3)
 BERKELEY Mr. Killeen
 Tues. Feb. 4; 7-9:30 p.m.; 285 Cory Hall; 18 meetings;
 \$50.
 PALO ALTO Mr. Penico
 Tues. Feb. 4; 7-9:30 p.m.; room 36, Wilbur Junior High
 School; 18 meetings; \$50.

Statistics

- XB 12. Elements of Statistical Methods. (3)
 SAN FRANCISCO Mr. Eudey
 Tues. Feb. 4; 6:30-9 p.m.; 207 Richardson Hall; 18 meet-
 ings; \$45.

The courses listed above have been selected from the Spring 1964 Engineering and Sciences Evening Class Catalogue. To receive a catalogue with complete descriptions of all courses, write Dept. 7430, University Extension, University of California, Berkeley, California 94720, or telephone Engineering and Sciences Extension, TH 5-6000, extension 4154.

To enroll, send full name, home address and daytime telephone number, and course title, number and location, together with a check for the course fee payable to The Regents of the University of California, to: University Extension, University of California, Berkeley, California 94720.

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SECTION MEMBERS! To stay on mailing list when you move, send address change promptly to IEEE National Headquarters, Box A, Lenox Hill Station, New York 21, N.Y.

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cover

Outlined in white are the 22 counties which make up the San Francisco Section — the East Bay Subsection shown within the dotted line, the Santa Clara Valley Subsection in the solid line, and the Fresno Subsection

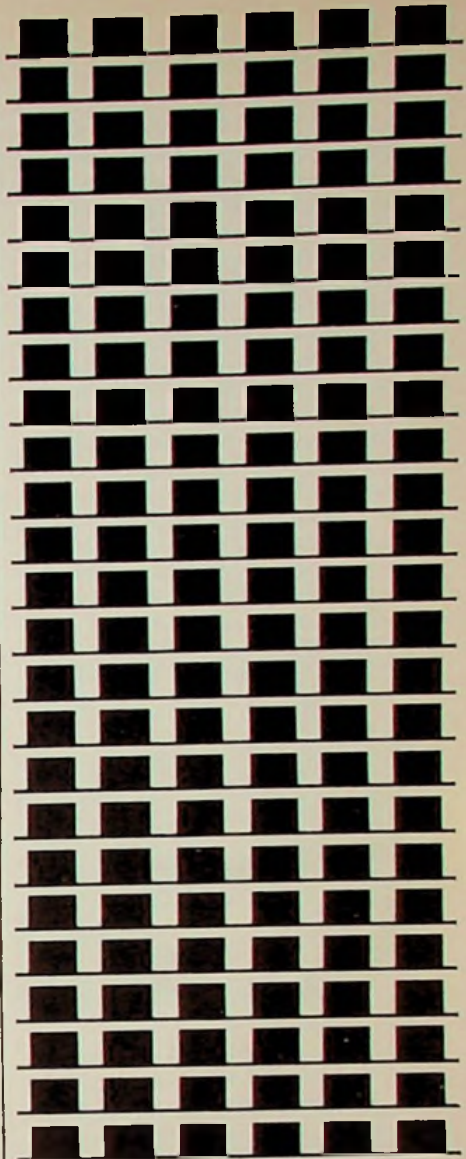
in the dash line. To the north lies the Sacramento Section and to the east and south the Los Angeles District. Aero relief map courtesy of Congdon & Crome, Inc., Palo Alto. Photograph courtesy of Henry Kappelhof.

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SECTION/CT MEETING

Professor M. E. Van Valkenburg of the University of Illinois will discuss bridge structures in network synthesis at a joint meeting of the San Francisco Section and the PTC chapter on Circuit Theory on January 28. The meeting will launch the reorganized chapter with newly elected officers.

The paper will outline the applications a special bridge structure is finding in several aspects of network synthesis, including the search for the network with the minimum number of elements, driving-point synthesis, and transfer function synthesis including applications to filter design.

Van Valkenburg received degrees from the University of Utah, M.I.T., and Stanford University. He has served as editor of the Transactions on Circuit Theory, and is now vice-chairman of the PTC on Circuit Theory of the IEEE. He spent 1962-63 as visiting professor at the University of California.



Van Valkenburg

Wilson

meeting ahead

DEVELOPMENT CYCLE

Charles E. Wilson, manager, manufacturing engineering, video and instrumentation division, Ampex Corporation, is scheduled to speak on the subject "Breadboard to Breadwinner" to the Product Engineering and Production chapter at Ampex's Redwood City headquarters at 8:00 p.m. Tuesday, January 28.

In his presentation, he will describe the introduction of a new model tape recorder taken from the breadboard stage through the manufacturing cycle. A product will be selected which is typical of crash programs so common in the electronics field.

The meeting format is designed to provide information on the product development - manufacturing cycle rather than a technical discussion of the actual machine. The program will conclude with a tour of the video and instrumentation facilities.

Wilson, who joined Ampex in 1956, was formerly with Chrysler Corporation in San Leandro. He received his education at the University of California.

MEETING CALENDAR

SAN FRANCISCO SECTION

8:00 P.M. • Tuesday, January 28

(Special reorganization meeting of the PTC Chapter on Circuit Theory)

Bridge structures in network synthesis

M. E. Van Valkenburg, professor of electrical engineering, University of Illinois; vice-chairman, administrative committee, PTC on Circuit Theory

Place: Ampex Cafeteria, 401 Broadway, Redwood City

Dinner: 6:30 P.M., Algiers Restaurant, 2620 El Camino Real, Redwood City; \$3.75 incl. tax and tip

Reservations: Section Office, 321-1332, by January 27

EAST BAY SUBSECTION

7:30 P.M. • Monday, January 20

Closed circuit television developments in a nuclear research laboratory

Cecil H. Hayes, Lawrence Radiation Laboratory, Livermore

Place: Lucky Lanes, 1620 Railroad Avenue, Livermore

Dinner: Preliminary festivities at 6:00 P.M., dinner at 6:30 P.M. Steak \$3.25, Chicken \$2.75, both including tax and tip

Reservations: Winifred Veeder, 823-2740, Ext. 5434, in Berkeley
Pat Wilson, 447-5100, Ext. 2315, in Livermore

PROFESSIONAL TECHNICAL GROUP CHAPTERS

Antennas and Propagation

8:00 P.M. • Wednesday, January 15

Sparks in Nature

Dr. E. T. Pierce, Stanford Research Institute

Place: Stanford Research Institute, Building 1

No dinner

Circuit Theory

8:00 P.M. • Tuesday, January 28

(Special reorganization meeting of San Francisco Chapter. Joint with San Francisco Section. See above.)

Electronic Computers

8:00 P.M. • Tuesday, January 28

MIRF—A data retrieval machine using an associative memory

Jacob Goldberg and LeRoy Younker, senior research engineers, Stanford Research Institute

Place: General Electric Computer Laboratory, 310 DeGuigne Drive, Sunnyvale

Dinner: 6:30 P.M. at the Plantation, Bernardo and El Camino Real, Sunnyvale

Reservations not required

Electron Devices

7:30 P.M. • Wednesday, January 22

(Joint with Microwave Theory and Techniques, see below)

Engineering Management

8:00 P.M. • Tuesday, January 21

(Joint meeting with PTC Reliability)

Arms control and diversification

Dr. L. C. Van Atta, chief scientist, Lockheed Missiles & Space Co.

Place: Rickeys Hyatt House, Stanford Room, El Camino Real, Palo Alto

Dinner: social hour 6:00 P.M., dinner 7:00 P.M., \$3.50 buffet

Reservations: Elizabeth Richards, 326-1755, Ext. 222, by 4:00 P.M. January 14

Electromagnetic Compatibility

8:00 P.M. • Thursday, January 23

Large weapon and space system electromagnetic compatibility

B. Weinbaum, electronics group engineer, general dynamics/astronautics

Place: Lockheed Missiles & Space Co., Bldg. 202, 3251 Hanover St., Palo Alto

Dinner: Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto

Reservations: Glenn D. Gillett, RE 9-4321, Ext. 24834 or 32368, by January 22

MEETING CALENDAR

Microwave Theory and Techniques

7:30 P.M. • Wednesday, January 22

(Joint with Electron Devices)

Automatic measurement of phase and impedance

Dr. Seymour Cohn, Rantec Corp.

Phase and delay measurement techniques for advanced microwave systems

Dr. Peter Lacy, Wiltron Co.

Place: Physics Hall, Room 100, Stanford University

Dinner: 6:00 P.M., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto

Reservations: Pat Peters, 326-6200, Ext. 2414, by January 17

Product Engineering and Production

8:00 P.M. • Tuesday, January 28

(Lecture plus tour of video and instrumentation manufacturing facilities)

Breadboard to breadwinner

Charles E. Wilson, Manager, Manufacturing Engineering, video and instrumentation division, Ampex Corp.

Place: 860 Charter Street, Redwood City, California

No dinner

Reliability

8:00 P.M. • Tuesday, January 21

(Joint meeting with PTG Engineering Management, see above)

Space Electronics and Telemetry

8:15 P.M. • Tuesday, January 21

Information theory and real information

Dr. Norman Abramson, Stanford University

Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover Street, Palo Alto

Dinner: 6:15 P.M., El Camino Bowl, 2025 El Camino Real, Mountain View

Reservations: Robert H. Light, 968-6211, Ext. 2024, by noon January 21

meeting ahead

PHASE MEASUREMENT

Two talks on microwave phase measurement, followed by a panel discussion, are scheduled for the Wednesday, January 22, chapter meeting of Microwave Theory and Techniques at 7:30 p.m. in Physics 100 at Stanford University. This meeting is co-sponsored by the PTG chapter on Electron Devices.

Dr. Peter Lacy, vice-president of Wiltron Company, Palo Alto, will present "Phase and Delay Measurement Techniques for Advanced Microwave Systems," including presentation of typical test arrangements and data from swept frequency measurements. Dr. Lacy received his Ph.D. from Stanford in 1952, and has been associated with Stanford Microwave Laboratory, Varian Associates, and Hewlett-Packard. He was chairman of the local chapter of PTG/MTT in 1958-59, and IRE chairman of the San Francisco Section in 1962-63.

Dr. Seymour Cohn, vice-president of Rantec Corporation, Calabasas, Calif., will discuss "Automatic Measurement of Phase and Impedance." His talk will cover recent improvements to a versatile phase measurement system. Dr. Cohn received his M.S. and Ph.D. from Harvard, and has been with the Harvard Radio Research Laboratory, Sperry Gyroscope Company, and Stanford Research Institute. He is an associate editor of *Microwave Journal* and author of numerous papers on microwave components and circuits, antennas, and microwave systems.

Discussion panel members are: Richard P. Borghi, Stanford Linear Accelerator Center; Philip Hand, Hewlett-Packard; Dr. Richard C. Honey, Stanford Research Institute; and Vernon G. Price, Stanford Linear Accelerator Center. Questions will be invited from the floor.

meeting ahead

BIG SYSTEM EMC

Ben Weinbaum, electronics group engineer, General Dynamics/Astronautics, will discuss large weapon and space system electromagnetic compatibility at the January 23 EMC chapter meeting.

The relationship between interference control and system engineering as a functional creative technology will be examined. New measurement techniques which address the objectives of electromagnetic compatibility and the requirements of system engineering will be discussed.

The speaker has presented several papers on the subject, the most recent being "Modern Weapon and Space System Electromagnetic Compatibility Considerations," University of California Society of Electrical Engineers, November 1963.



Weinbaum



Van Atta

meeting ahead

CONTROL AND DIVERSIFICATION

Lester G. Van Atta, chief scientist, Lockheed Missiles and Space Company, will present to the joint meeting of the PTG chapters on Reliability and Engineering Management, to be held January 21, the subject of "Arms Control and Diversification."

Dr. Van Atta feels that arms control is already very much with us and that diversification is now the problem of the future; therefore, we (government and industry) must plan for it. He believes that the mechanism being developed for conversion will help us to greatly increase our national growth and will have great effect on the civilian economy. The Lockheed Aircraft Corporation is giving serious attention to a diversification effort, and Dr. Van

(Continued on page 4)



Lacy



Cohn

MIRF MODEL

The topic of the January 28 meeting of the PTG chapter on Electronic Computers will be "MIRF—a Data Retrieval Machine Using an Associative Memory." A recently developed experimental model of a document index retrieval file using a content-addressed memory and the research program that led to the hardware development will be described. The model has demonstrated the feasibility of constructing an associative parallel search memory with a useful capacity (approximately 300,000 bits) and has indicated the usefulness of a rapid feedback man-machine relationship in a data retrieval system.

The model is designed to store and search a file composed of indexes of 5,000 documents. The vocabulary required to describe the documents is held in a machine dictionary that has a capacity of 3,000 words. The heart of the retrieval is a memory made of specially designed fixed circuits consisting of wires interlacing magnetic cores in unique patterns. The information related to a given document index is stored in the detailed wiring pattern of a wire that is associated with an array of linear ferrite cores. The words that comprise the diction-

ary are stored in a similar way. One array of ferrite cores can accommodate up to 2,000 such wires.

Retrieval of document indexes is made in response to a search question consisting of a group of English word descriptors. The machine instantaneously determines if any documents in the file include the search question and indicates the number of responding indexes. It then types out the complete indexes of all responding documents. The model can also handle synonymous input descriptors and has the capability for automatically modifying the manually inserted search question.

The speakers will be Jacob Goldberg and LeRoy Younker, both senior research engineers with Stanford Research Institute. Goldberg will lead the discussion with a brief review of the information retrieval problem. He will also consider indexing, searching, data encoding methods, and the resolution of multiple responses.

Younker will describe the salient features of the MIRF (Multiple Instantaneous Retrieval File) experimental model. He will discuss the general operation, logic design, and design and fabrication of the magnetic memory system.

MORE CONTROL AND DIVERSIFICATION (PAGE 3)

Atta has a technical responsibility at LMSC for reconversion ideas.

The talk will develop the following points:

- The variety of reactions in the USA and elsewhere to the thermonuclear threat.
- Modification of the national consensus toward a broader concept of national security.
- Arms control as it has been effectively applied in Washington during the past two years.
- The effect of this arms control on the national budget.
- Planning at the federal and state levels, in industry and elsewhere, to realize growth to the civilian economy through the conversion effort.

A question period following the talk should lead to a lively discussion session.

Dr. Van Atta is extremely well qualified on the topic of his discussion, since he has had contact, at high levels, with basic science and military systems hardware. For the past 23 years he has worked for universities, the federal government, and industries on technico-military problems. This provides him with a well-rounded

background enabling him to view clearly the over-all picture. For 13 months he served as special assistant on arms control to the Director of Defense Research and Engineering (Department of Defense).

He received his B.A., physics, from Reed College in 1927; M.S., physics, from Washington University in 1929; and Ph.D., physics, from Washington University in 1931. He is a member of the IEEE (Fellow, IRE: Chairman of numerous IRE technical committees, 1945-) plus being a member of seven other professional and technical societies (including Society of the Sigma Xi). He holds 15 patents, primarily on microwave antennas and systems. He has published approximately 40 articles in professional and scientific journals; and numerous technical reports in the field of physics, particularly microwave electronics.

events of interest

IEEE PAPERS CALL

February 4 — Packaging Industry Conference, Nassau Inn, Princeton, N.J., May 4-6. E. W. Macoy, American Can Co., 100 Park Ave., New York 17, N.Y.

DATA ACQUISITION

Donald Hamilton, supervisor of the ADA computer operation, LMSC, Sunnyvale, and Jim Liolios, RCA systems representative, San Francisco, presented a program at the November meeting of the PTG on Electronic Computers chapter. The program consisted of a talk on the automatic data acquisition and inquiry system (ADA) currently being used at Lockheed by Hamilton, the demonstration of two pieces of remote input equipment for the system, and an excellent question and answer period.

Time delay and massive bookkeeping involved with shop order handling, purchase order status determination, and material inventory and transfer are typical of the problems that preceded the large scale, real-time, data acquisition system at Lockheed. The system consists of two RCA 301 computers, approximately 250 remote input and output stations, and an 88 million character disc file. In addition, line concentrators are used to connect groups of remote stations to a smaller number of telephone lines to the central processors.

One of the computers is used for processing incoming data and the other is used for updating the various files and preparing the data for output. The computers are organized with some interchangeable roles to allow the overall system to achieve greater than 98 percent "on" time. Various precautions are taken to preserve data should a failure occur.

In order for the system to handle peak periods, the processors are operating at a 10 to 30 percent capacity during off periods. Error rates as high as .17 percent were mentioned in some applications requiring human detection. Three to four hours of IBM 7090 time are required per day in support of the system for preparing various administrative reports and other data handling.

WILLIAM R. SMITH

section notes

MEMBERSHIP KITS

Members are requested to call on their company representative on the membership committee for upgrading information or applications for colleagues who wish to join IEEE. The section office, 321-1332, can tell you his name, or send a membership kit if you do not have a company representative. IRE and AIEE application forms no longer being accepted by headquarters, members are requested to destroy obsolete forms and obtain new ones from the section office.

TRANSISTOR TESTING

The November meeting of the PTG on Instrument & Measurement concerned a subject of widespread interest—the testing of transistors. Charles Askanas, manager, instrumentation plant, Fairchild Semiconductor, was the speaker.

Present-day semiconductors have been developed to the point that effects formerly of little concern in their measurement have become important. Some of these are in regions of high current, some at very low current, and others at high frequency. If ignored, these effects can damage the device under test, or cause large errors in test results, or both. In addition to allowing for these factors, it is desirable that a testing system have the conventional features required for accuracy, speed, and ease of use. Automatic operation with flexibility in the setup is often desired.

Thermal dissipation in the device under test is an important factor at high currents. To avoid device damage and insure accurate results, the test conditions should be selected with allowance for device power rating, negative impedance characteristics, and thermal time constants. Pulse testing offers advantages in simulating large signal (switching) applications or steady state conditions, with control of thermal effects as desired by choice of pulse length and duty cycle.

Measurement of the very low leakage currents in present-day transistors is difficult. At higher currents an operational amplifier is used to null the transistor leakage current with the feedback current, but this is in error at very low leakage because of the DC grid current (usually ignored).

Often overlooked are switching transients in the test system which may damage the device when it is connected to the test circuit. High currents can be drawn momentarily as wiring and fixture capacitance discharges. Ideally the polarity and magnitude of the circuit voltage before the device is connected should be such as to minimize this problem.

A new digital transistor testing system was described which allows for all of these effects. It utilizes a self-balancing bridge circuit which provides pulses to the device under test and the balancing circuit until null is achieved. This inherently digital system counts pulses to null and provides a digital display. "GO-NO-GO" testing also is provided by application of a single pulse to determine if null is within preset limits.

Polarity and magnitude of test



Charles Askanas

biases are arranged to avoid connect and disconnect transients through the device. High null sensitivity is provided for leakage current measurements, and the stray wiring capacitance provides noise integration for this high impedance test. The pulse circuit detector is AC coupled so grid current problems are minimized.

Among problems which continue to require care in testing are oscillations at frequencies in the hundreds of megacycles. These may occur in the test setup and go undetected because they are beyond the response of most oscilloscopes. They usually make test results invalid and may damage the device. This is now becoming more of a problem because many devices provide gain at the equivalent tank frequency of the test circuit.

CAL WORLEY

events of interest

IEEE

April 13-15—Third Symposium on Micro-Electronics, Chase-Park Plaza, St. Louis, Mo., St. Louis Section. Program: T. F. Murtha, P.O. Box 4104, St. Louis, Mo. Proceedings at conference.

April 14-16—American Power Conference, Sherman Hotel, Chicago, Ill. IEEE, et al. Program: W. A. Lewis, Ill. Inst. of Tech., Chicago, Ill.

April 19-25—International Conference and Exhibit on Aerospace Electro-Technology, Westward-Ho Hotel, Phoenix, Ariz. IEEE, et al. Exhibits: R. D. Hulse, P.O. Box 2591, Phoenix 2, Ariz. Program: A. A. Sorenson, The Martin Co., J 359, Baltimore 3, Md. Bound volume of preprints.

April 21-23—Spring Joint Computer Conference, Sheraton-Park Hotel, Washington, D.C. AFIPS (IEEE/-ACM). Exhibits: Solomon Rosenthal, 5831 Quantrel, Alexandria, Va. Program: Jack Roseman, 2312 Coleridge Dr., Silver Spring, Md. Proceedings.

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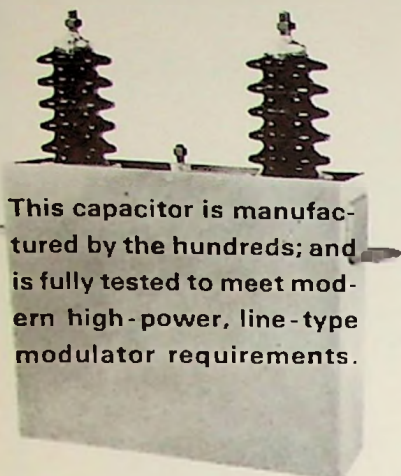
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IT IS REPORTED:

William R. Hewlett and David Packard, co-founders and chief executive officers of the Hewlett-Packard Company, Palo Alto, were recently presented honorary lifetime memberships in the Instrument Society of America "in recognition and appreciation of their technical contributions to the field of electronic measurement; their management skills in developing a successful international company in the electronics industry; and their invaluable professional participation in programs centered in universities, professional societies, industry organizations, and civic associations."



Bjerke

Grigsby

Arthur E. Bjerke, design engineer with the Berkeley division of Beckman Instruments, Inc., has joined E-H Research Laboratories, Inc., Oakland, as a project engineer in the pulse group.

Dr. John L. Grigsby has been elected to the position of vice president-engineering for Applied Technology, Inc., Palo Alto, having held the position of chief engineer since joining the company in 1960.

Earle M. Olsen has been appointed sales engineer for E-H Research Laboratories, Inc., Oakland.

Henry W. West, Jr., secretary and general counsel of the Ampex Corp., is a new director of MELABS, Palo Alto electronics firm.



Olsen

West

Dr. Frederick E. Terman, vice president and provost of Stanford University, has been elected to the board of directors of Granger Associates. He is also a director of Hewlett-Packard Co., Ampex Corp., Watkins-Johnson Co., and Stanford Research Institute.

Dr. Howard S. Seifert, Stanford University professor and internationally recognized authority on rocket propulsion, has been appointed manager of United Technology Center's physical sciences laboratory and will direct a staff of scientists in conducting basic long-range research into the fundamentals and advanced concepts of the sciences related to propulsion.

Richard L. Burkdall has been appointed assistant to marketing manager Michael Apar, Jr., of Dalmo Victor Co., Belmont, a division of Textron Inc.

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Write or call: Ernesto A. Montano or Rita Earnshaw, IEEE Grid, Suite 2210, 701 Welch Rd., Palo Alto, 321-1332.

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Dr. William A. Edson, president and director of research of Electromagnetic Technology Corp. (Emtech), has announced the award of a \$240,000 contract by the Department of the Navy's Bureau of Ships for the continued development, design, and fabrication of a series of broadband microwave frequency converters. The firm has moved from 1375 California Ave., Palo Alto, to 925 E. Meadow Drive, Palo Alto.

George Korpontinos, senior product marketing engineer, Fairchild Semiconductor, Mountain View, has been appointed manager of special products for product marketing.

Raymond D. Griffiths, manager of field marketing, Sylvania Electronic Systems, a division of Sylvania Electric Products, Inc., has been appointed marketing manager for the western operation with headquarters in Mountain View.

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HEWLETT - PACKARD COMPANY,
Operations Dept., Charles A. Eldon (left);
DALMO VICTOR CO., *Microwave Engineering Dept., John B. DaMonte.*

PAECO of Frequency and Time Div. of Hewlett-Packard, *Lloyd M. Burkhart (left);*
LENKURT ELECTRIC CO., INC., *Microwave Project, Maurice H. Kebby.*

the section

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Shown above are four of the nearly 90 section members serving on the membership committee located strategically in nearly 75 northern California firms to handle application and upgrading inquiries.

Following are the names of IEEE members who have recently entered our area, thereby becoming members of the San Francisco Section:

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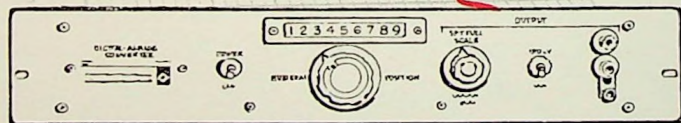
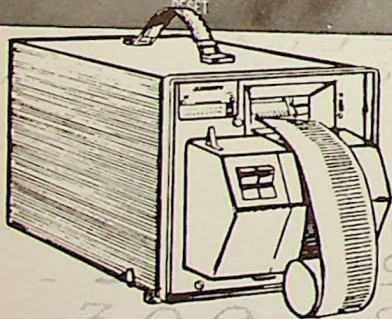
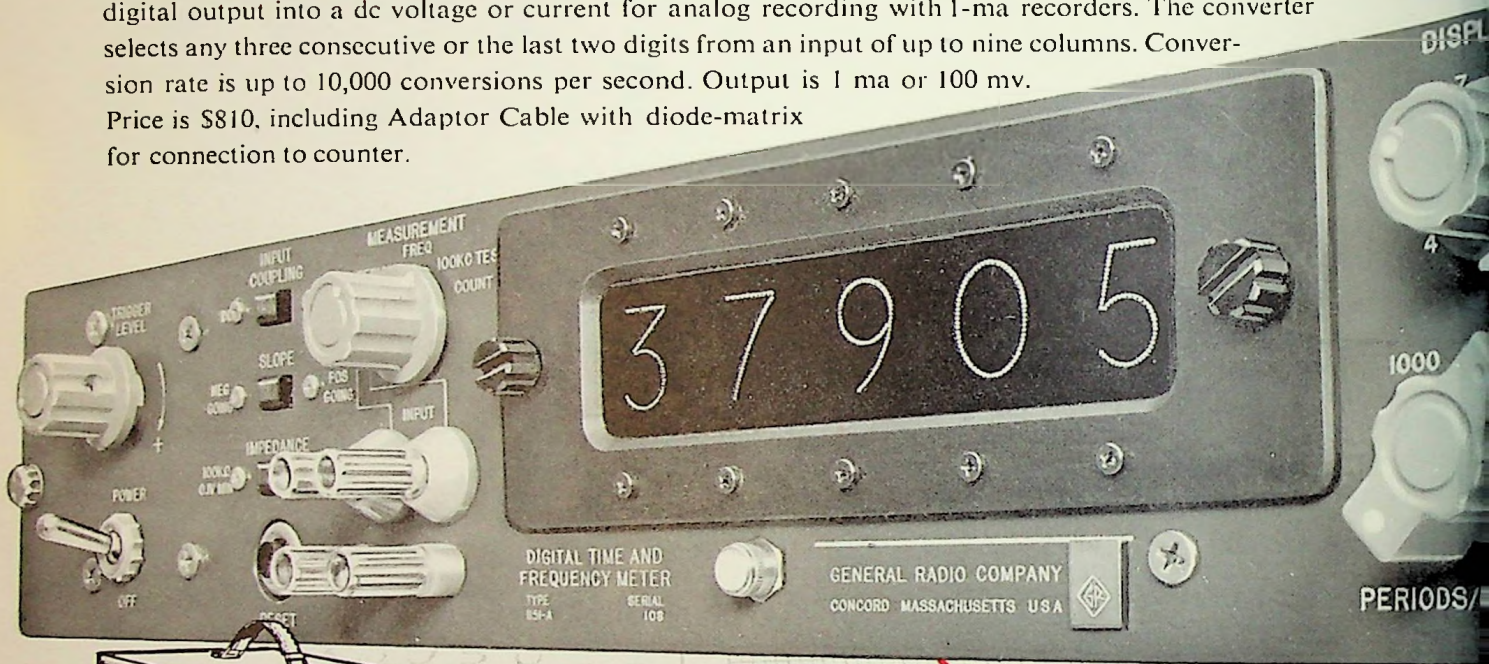


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