EDITOR'S PROFILE of this issue

from a historical perspective …

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

December, 1964:

Cover: The IEEE Fellows elected from the SF Bay Area. Ampex Corporation seems to garner the most exposure: Alex M Poniatoff (founder of AMPEX) and Charles Ginsburg (Ampex VP). My wife worked at Ampex for several years. Profiles of the new Fellows begins on page 8.

Archive of available SF Bay Area GRID Magazines is at this location:
https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History

IEEE Grid
DEC. 1964
SAN FRANCISCO SECTION
INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

WILLIAM CULSHAW
microwave optics, interferometers, gas lasers

CHARLES P. GINSBURG
video recording techniques, equipment

WILLIS W. HARMAN
engineering education in electron dynamics, linear systems, communication theory

G. LESLIE HILL
power circuit [illegible], testing of [illegible] insulation

1965 Fellows

SAN FRANCISCO SECTION

ERNEST S. KUH
active and passive circuit theory, engineering education

DONALD H. PREIST
extending the limits on power and frequency in communications; radar

GEORGE L. MATTHAEI
theory and design of microwave networks, parametric amplifiers

CALVIN F. QUATE
theory and design of low noise amplifiers

ALEXANDER M. PONIATOFF
leadership in the magnetic recording industry

meeting reminder

December 9 (Wednesday) Instrumentation and Measurement, Microwave Theory and Techniques

December 10 (Thursday) Circuit Theory

December 15 (Tuesday) Biomedical Engineering

December 16 (Wednesday) Military Electronics

December 17 (Thursday) Information Theory, Reliability

January 18 (Monday) Biomedical Engineering, Engineering Management/Engineering Writing and Speech

January 26 (Tuesday) Space Electronics and Telemetry/Automatic Control

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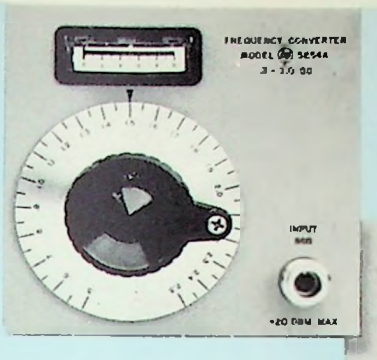
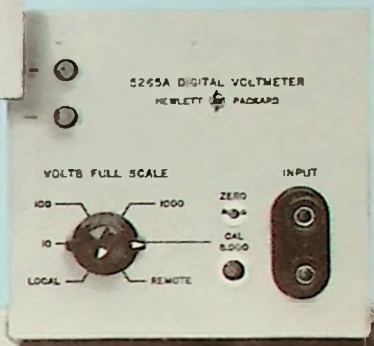
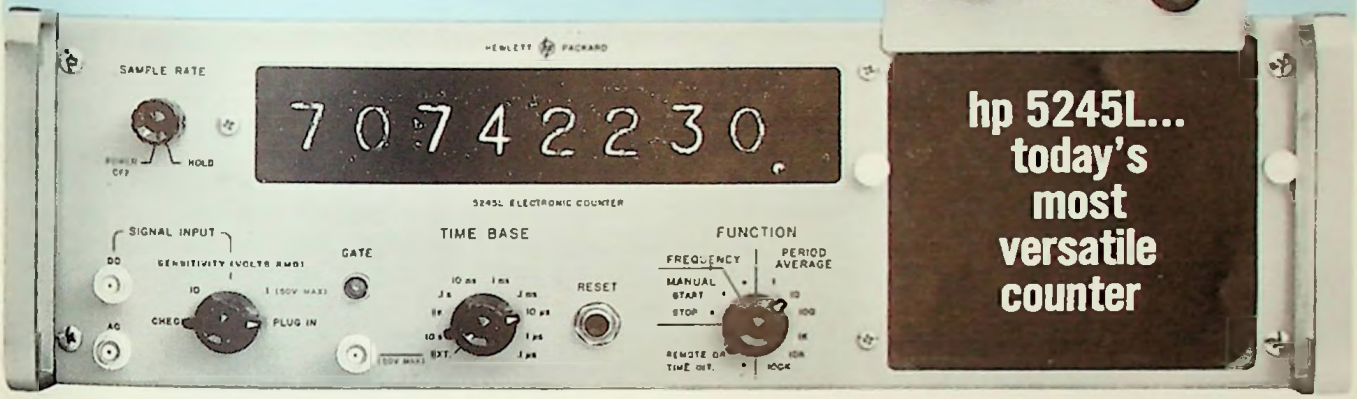


Make normalized measurements

Measure voltage with 6-digit resolution





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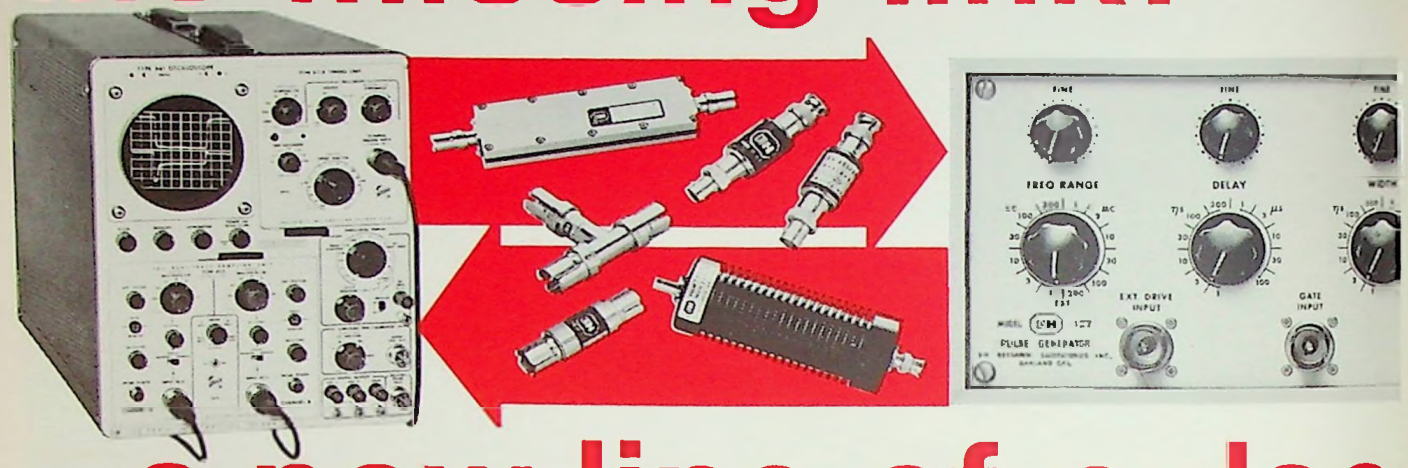

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Oscilloscope photograph courtesy of Tektronix, Inc.

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contents

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san francisco section officers

advertising

from the chairs

ENGINEERS' WEEK PREVIEW

The Bay Area Engineers' Week committee is sparked this year by General Chairman James F. Vivrette, who has been active on the committee for several years. Engineers' Week is a nationally proclaimed period, generally the week of Washington's birthday. There are many activities in the Bay Area keyed to Engineers' Week, but the scholarship program is the outstanding thing that sets apart BAEW from most other observances. Last year, $4,000 in scholarships and prizes were presented.

John T. Lavrischeff

Here is how the scholarship program works. Over 90 high schools in the area are solicited for senior math and science student entries. Zone chairmen will interview applicants and select ten zone winners to be further interviewed by a committee chaired this year by Dean of the College of Engineering, University of California, Berkeley. Four final winners share in scholarships ranging from $400 to $2,000. Recipients do not even have to be interested in engineering—the idea is to help top students with their college careers and, of course, help interest them in the engineering profession.

The climax of the week is a banquet at which the scholarships are awarded

(Continued on page 12)

cover

The nine distinguished members of the San Francisco Section on the cover were elected Fellows by the IEEE Board of Directors on October 21, effective January 1, 1965. They are the largest group from any section among the total 125 Fellows named from 50 of the total 182 sections of IEEE. In most recent years the San Francisco Section has led all others in the number of members honored with elevation to Fellow grade. For the biographies of the new Fellows, see page 8.

GROUP CHAPTERS

Automatic Control

8:15 P.M. • Tuesday, January 26

(Joint with Space Electronics and Telemetry—see below)

Biomedical Engineering

8:00 P.M. • Tuesday, December 15

Nervous control of crustacean walking legs
Dr. William Evoy, research associate, Biological Sciences, Stanford University
Place: Stanford Medical School, Room 112
Dinner: 6:15 P.M., Red Cottage Restaurant, Menlo Park
Reservations: Dr. James Bliss, 326-6200, Ext. 3488, by December 15

Biomedical Engineering

8:00 P.M. • Monday, January 18

(Joint with Instrument Society of America [ISA]—Santa Clara Valley Section)
Blood pressure measurements
Dr. Al Sachs, Vidya Corp.
Place: Holiday Inn, Sunnyvale
Dinner: 7:00 P.M., Holiday Inn
Reservations: Dr. James Bliss, 326-6200, Ext. 3488, by January 15

Circuit Theory

8:00 P.M. • Thursday, December 10

Measurements on integrated circuits using a scanning electron beam
Prof. T. E. Everhart, University of California, Berkeley
Place: Ampex Cafeteria, 401 Broadway, Redwood City
Dinner: 6:00 P.M., Stone Cellar Restaurant, 1906 El Camino, Menlo Park
Reservations: Mrs. Kelley, 326-6200, Ext. 3285, by December 9

Engineering Management

8:00 P.M. • Monday, January 18

(Joint with Engineering Writing and Speech—see below)
Management ties with overseas electronics—one approach to corporate diversification
S. V. Hart, chief consultant, Electronics Engineers International
Place: to be announced in January Grid

Engineering Writing and Speech

8:00 P.M. • Monday, January 18

(Joint with Engineering Management—see above)

Information Theory

8:00 P.M. • Thursday, December 17

The nature of computability
Dr. C. Y. Lee, Bell Telephone Labs and University of California
Place: Philco Auditorium, 3825 Fabian Way, Palo Alto
Dinner: 6:15 P.M., L'Omelette, El Camino Real, Palo Alto
Reservations: Mrs. D. Saltzman, 326-4350, Ext. 4101, by December 16

Instrumentation and Measurement

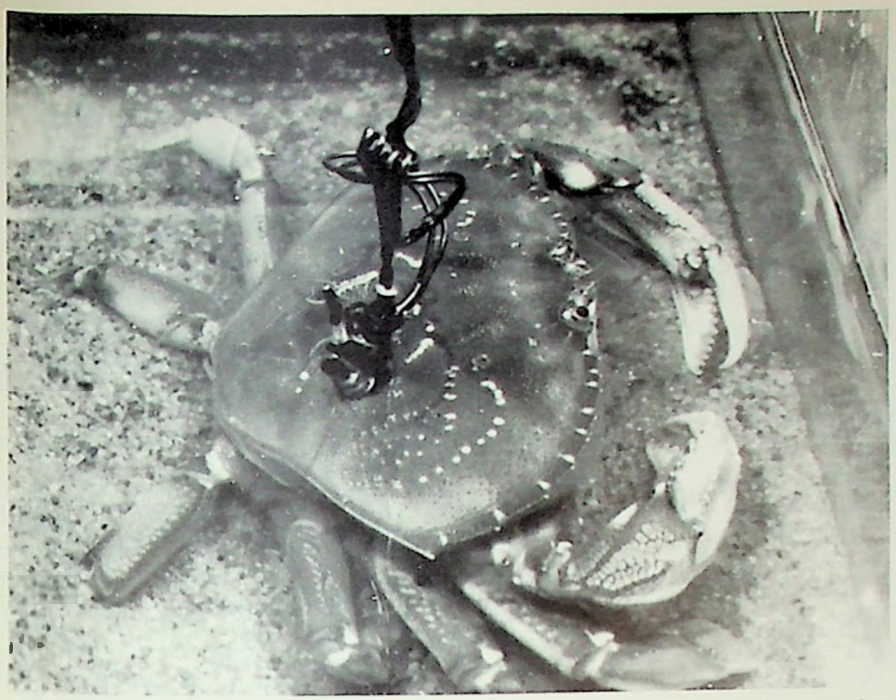
8:15 P.M. • Wednesday, December 9

Precision measurement of low-intensity magnetic fields
Lee Langan, manager of field engineering, Varian Associates
Place: Varian Cafeteria, Bldg. 4B, 611 Hansen Way, Palo Alto
Dinner: 6:15 P.M., L'Omelette, El Camino Real, Palo Alto
Reservations: none required

Microwave Theory and Techniques

8:00 P.M. • Wednesday, December 9

The microwave industry
William Bazzy, publisher, MICROWAVE JOURNAL; *Theodore Saad, editor-in-chief,* MICROWAVE JOURNAL
Place: Room 1A, Hewlett-Packard Co., 1501 Page Mill Road, Palo Alto
Dinner: 6:30 P.M., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
Reservations: Mrs. Gail Saxon, 326-7000, Ext. 2703, by December 7



Study of nervous control of crustacean walking legs was carried out to determine reception of signals and integration of information in posture and movement.

meeting ahead

GRAVITY GRADIANTS

Duane Scott, research specialist, Lockheed Missiles and Space Co., will discuss gravity gradiant stabilization before a joint meeting of the Space Electronics and Telemetry and Automatic Control chapters on January 26 in the Lockheed Auditorium.

meeting ahead

WHITHER D.O.D.?

General Victor Conrad, U.S.A., retired, will discuss future plans of the Department of Defense at the December 16 meeting of the Military Electronics chapter at Rick's Swiss Chalet, Palo Alto. Reservations may be made with Ralph Franks, 742-3894, by December 15.

Military Electronics

6:30 P.M. • Wednesday, December 16

Future plans of D.O.D.
Victor A. Conrad, General, USA, Retired
Place: Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
Dinner: 7:00 P.M., Rick's Swiss Chalet
Reservations: Ralph Franks, 742-3894, by December 15

Reliability

8:30 P.M. • Thursday, December 17

Ladies' night—an interesting nontechnical program is planned
The control of gambling in Nevada—protection of the public and the "house"
Edward A. Olsen, chairman, State Gaming Control Board, Nevada Gaming Commission
Place: Dinah's Shack
Cocktails: 6:30 P.M.
Dinner: 7:30 P.M., 4269 El Camino Real, Palo Alto
Reservations: Stuart Bessler, 327-4212, by December 14

Space Electronics and Telemetry

8:15 P.M. • Tuesday, January 26

(Joint with Automatic Control—see above)
Gravity gradiant stabilization
Duane Scott, Research specialist, LMSC
Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto
Dinner: 6:15 P.M., El Camino Bowl, 2025 El Camino Real, Mountain View
Reservations: Charles Jamgotchian, 697-7774, by January 26

meeting ahead

NERVOUS CRUSTACEANS

Dr. William Evoy, research associate, Biological Sciences Dept., Stanford University, will discuss the nervous control of crustacean walking legs at the December 15 meeting of the Biomedical Engineering chapter.

The engineering problems involved in locomotion are very different in man-made vehicles (which use wheels) and in animals (which use legs). Flexible struts, divided into sections which can move relatively independently of each other and activated in a specific sequential order, raise complex problems of their control. Specific kinds of information about the position and movement of the legs must be available and the transformation of this information must be adapted to the requirements of walking. Even the simpler problem of standing still requires the integration of information from all of these appendages to produce a fixed spatial arrangement.

Dr. Evoy will discuss the way in which posture and movement are controlled in crabs. Stretch sensitive receptors in the walking legs of crabs evoke reflexes to counteract length changes in the muscles and to make adjustments in posture such as in the vertebrates. Two sorts of receptors exist: one of these directly signals movement and position of the joints; another is associated with a small muscle, the length of which is independently adjusted by central nervous control. These two receptor systems interact to provide reflexes to counteract passive movements and to set and maintain posture by means of a biological servo-system.

It is curious that in the vertebrates there are also two receptor systems which act in an analogous fashion to those in crabs. In spite of the radical differences between arthropod and vertebrate, the basic solutions to the problems of walking and maintenance of posture appear to be quite similar.

meeting ahead

GAMBLING CONTROL

Edward A. Olsen, chairman of the State Gaming Control Board, Nevada Gaming Commission, Carson City, Nevada, will discuss the control of gambling in Nevada, the protection of the public and the house, at a meeting of the Reliability chapter on December 17 at Dinah's Shack, Palo Alto. The interesting non-technical evening will be a ladies' night. Reservations should be made with Stuart Bessler at 327-4212 by December 14.

events of interest

REGION 6 PAPERS CALL

The 1965 IEEE Region 6 annual conference will be held in Las Vegas, Nevada, next April 13, 14, and 15. The theme for the meeting will be "Power in the Space Age," with a broad coverage of technical disciplines ranging from commercial power through space power and advanced energy sources.

Fifteen technical sessions, each with four papers, are planned. In addition, there are scheduled two panel sessions on future power, with invited speakers. Papers are invited in the following or related fields:

Commercial Electrical Power

Conventional generation systems (steam, diesel, hydroelectric), nuclear reactors, generators, geo-thermal systems, tidal systems, and transmission and distribution systems (extra high voltage-direct current, underground and highwire, wireless, etc.)

Packaged Power (Present and Future)

Terrestrial power sources (diesel, gas, battery, fuel cell, solar cell, radioactive isotopes), submarine power sources (battery, fuel cells, nuclear, reactor, radioactive isotopes), space-power sources (battery, fuel cell, solar cell, nuclear reactor, solid core, fluidized-bed, and gaseous core), radioactive isotopes, thermionic devices, thermoelectric devices, nuclear fusion reactors, M.H.D. devices.

Space Propulsion Power Equipment

Ion engines, plasma engines, arc-heated jets, and controls for conventional chemical and nuclear rockets.

Stanley V. Gunn, Rocketdyne Div. of NAA, Canoga Park, Calif., is papers chairman.

Two complete draft copies of each paper, on 8½ x 11-inch stationery, should be in the hands of the papers chairman no later than December 15, 1964. Those papers on commercial electrical power should be sent, one copy each, to the papers chairman and to the papers vice chairman, Albert E. Hamilton, L.A. Department of Water and Power, 600 Nevada Highway, Boulder City, Nevada.

Abstracts for those papers selected must be final and must be submitted before January 15, 1965. These abstracts will be published in the March issue of "Arizona Engineer and Scientist," together with the sessions schedule. All papers are to be unclassified.

Due to much inconvenience with the old telephone number, please note that, as of November 23, the new telephone number for the San Francisco Section office is 327-6622, code 415.

Prof. Everhart

meeting ahead

SCANNING BEAM

Prof. T. E. Everhart, University of California, will discuss measurements on integrated circuits using a scanning electron beam, at the December 10 meeting of the Circuit Theory chapter. The speaker spent the 1962-63 academic year at Westinghouse Research Laboratories, Pittsburgh, Pa., investigating the evaluation of semiconductor integrated circuits using scanning electron beam techniques. He is continuing this research at UC, where he is associate professor of electrical engineering. He has served as consultant to Watkins-Johnson Co. and Ampex Corp.

meeting ahead

COMPUTABILITY

Dr. C. Y. Lee, Bell Telephone Labs and University of California, will discuss the nature of computability at the December 17 meeting of the Information Theory chapter in Philco Auditorium, Palo Alto. The talk will cover Rado's approach to computability, the busy beaver problem, M. W. Green's remarkable machines, and the frustrations of computing $\sum(n)$ for even small values of n.

Mr. Lee received his education in EE and Mathematics from Cornell Universtiy and the University of Washington. Since leaving school in 1952 he has been with the Bell Telephone Laboratories working on switching and computer problems and on systems engineering. He is currently visiting the University of California at Berkeley as a Mackay Lecturer in the EE Department.

meeting ahead

OVERSEAS TIES

S. V. Hart, chief consultant, Electronics Engineers International, San Francisco, will discuss management ties with overseas electronics—one approach to corporate diversification—at the January 18 joint meeting of the Engineering Management and Engineering Writing and Speech chapters.

yours

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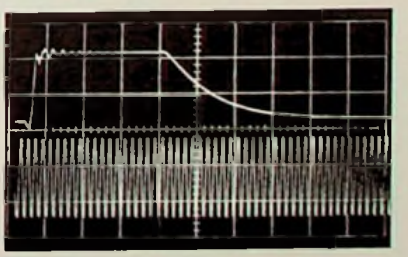

The single-beam oscilloscope display shows two different signals, each at a different vertical sensitivity and sweep speed. Single-exposure photograph.

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1965 FELLOWS

Biographies of the nine San Francisco Section members elevated to the grade of Fellow for 1965 follow:

William Culshaw, honored for contributions related to microwave optics, interferometers, and gas lasers, is a senior consulting scientist and senior member of the research laboratories of Lockheed Missiles and Space Co., Palo Alto, and directs and conducts research on gaseous and solid state lasers. He received the B.Sc. Honors degree in physics from the University of Sheffield, and the B.Sc. Honors degree in mathematics and the Ph.D. in physics from the University of London. He was awarded the Harry Diamond Memorial Prize Award of IEEE in 1962 for outstanding accomplishments in the field of microwave optics and interferometry.

Charles P. Ginsburg, honored for contributions to video recording techniques and equipment, is a vice president of Ampex Corp. and manager of the advanced wideband development section of the video and instrumentation division. At Ampex since 1952, his primary attention has been devoted to video recording and wideband instrumentation recording based on techniques initially embodied in the video tape recorders. He attended the University of California and San Jose State College, receiving a B.A. degree from the latter. He has been awarded the David Sarnoff Gold Medal of the Society of Motion Pictures and Television Engineers, the Vladimir K. Zworykin Television Prize of the IEEE, and the Valdemar Poulsen Gold Medal of the Danish Academy of Technical Sciences.

Willis W. Harman, honored for contributions to engineering education in the fields of electron dynamics, linear systems, and communication theory, has taught electrical engineering at Stanford University since 1948, except for two brief periods. From 1949 to 1952 he was an associate professor at the University of Florida, and during 1959, he was a visiting lecturer at the Royal Technical University, Copenhagen, Denmark. He received the B.S.E.E. degree from the University of Washington and the M.S. degree in physics and Ph.D. in electrical engineering from Stanford. His technical specialties have been microwave electronic devices and statistical communication theory; he is the author of three texts. He has been particularly interested in the liberal education of those studying for professional degrees. He received the George Westinghouse award of the American Society for Engineering Education for outstanding contribution to engineering teaching in 1958.

G. Leslie Hill, honored for contributions to power circuit protection and the testing of electrical insulation, is chief engineer of Hill Research Co., Oakland, doing consulting and research work and building specialty devices such as high voltage DC insulation testers. He was formerly supervisor of special engineering tests for Pacific Gas and Electric Co. He received the B.S. in electrical engineering from Polytechnic College of Engineering, Oakland. He has been granted 12 patents on electrical devices and test methods, and is the originator of the universal fuse link used throughout the industry and the de-ionizing and condensing chamber used on the present boric acid power fuses. He developed and received a patent on the nondestructive method of testing electrical insulation with high voltage direct current and pioneered the hot line insulation washing method.

Ernest S. Kuh, honored for contributions to active and passive circuit theory and engineering education, is professor of electrical engineering at the University of California. He received the B.S. from the University of Michigan, the M.S. from Massachusetts Institute of Technology, and the Ph.D. from Stanford University. A member of the technical staff of Bell Telephone Laboratories, Murray Hill, N.J., he was consultant to IBM research laboratory, San Jose, from 1957 to 1962. A former member of the administrative committee of the Circuit Theory Group, he is editorial reviewer for the Proceedings.

George L. Matthaei, honored for contributions to the theory and design of microwave networks and parametric amplifiers, joined the department of electrical engineering at the University of California at Santa Barbara, where he is a professor, in July. From 1958 to 1964 he was at Stanford Research Institute, where he did research on microwave devices and was named manager of the electromagnetic techniques laboratory in 1962. He received the B.S. in electrical engineering from the University of Washington and the Ph.D. from Stanford. He also served on the faculty at the University of California and the technical staff of Ramo-Wooldridge Corp., where he engaged in system analysis and research on microwave components.

Alexander M. Poniatoff, honored for outstanding leadership in the magnetic recording industry, is chairman of the board of Ampex Corp., having founded the corporation in 1944.

creating the company's name from his own initials and EX for excellence. He studied engineering at the University of Kazan, the Imperial College of Moscow, and at Karlsruhe, Germany, receiving a degree in mechanical engineering, then joining the Shanghai Electric Power Co. after the White Russian campaign against the Communists collapsed. He affiliated with General Electric Co. at Schenectady in 1927 and Dalmo Victor in 1930. Along with his other duties he now heads the Alexander M. Poniatoff Laboratory, which is devoted to investigation of advanced and experimental techniques in magnetic recording.

Donald H. Preist, honored for contributions in extending the limits on power and frequency in communications and radar, is advanced development coordinator of Eitel-McCullough, Inc., and has concentrated on research on tubes leading to higher power levels. Under his direction, advances have been made in the understanding of window phenomena and improvements to windows, in extended interaction klystrons, in the evolution of new concepts for the design of negative grid tubes, and in the attainment of clean spectra from pulsed klystrons. He received the B.S. degree and diploma in engineering from King's College, London Univer-

(Continued on page 10)

PEP CHAPTER TOURS TOPOGRAPHIC FACILITY

The September 22 PEP chapter meeting started with Roy Thurston, assistant region engineer of the U.S. Geological Survey's topographical division, presenting a brief summary of topographical map making in the U.S. About 98 percent of the effort is expended on the development of 7½′ and 15′ quadrangle maps. These maps represent either 7½′ of latitude and longitude or 15′ of latitude and longitude. At the present time, some $25,000,000 per year is being expended. This permits completion of 3 to 4 percent of the country each year with 73 percent of the area currently being covered by either 7½′ or 15′ maps. The 7½′ maps are on the scale of 1:24,000, represent about 55 square miles, and cost $12,000 to prepare. The 15′ maps are to the scale of 1:62,500, represent 220 square miles, and cost $25,000 to prepare.

The four main phases in map making are initial field work, stereo model development, field completion, and cartography. During the initial field work, stereo serial photographs are made and tied in with reference points established by extending existing control points into the area being mapped. This takes about one year.

The next phase of developing the stereo models is done at Menlo Park, using Kelsh and other plotters. Contour lines and all other information is plotted to the final scale being used for the map. Information that cannot be determined from the photographs, such as name places, elevation under trees, and identification of small objects, is then completed in the field.

The final phase, which is also done at Menlo Park, is the preparation of color separation negatives. The contour lines, roads, water, woods, and other information are reverse engraved on their own negative, depending on the color in which each is to be printed. As many as nine negatives are required for a map. The negatives are sent to Washington, D.C., where printing plates are prepared and the maps printed.

A comprehensive tour of the work done at the Menlo Park facility followed Mr. Thurston's talk. The equipment used to develop the data from the stereo aerial photograph and the equipment used in making the separation negatives was described and demonstrated.

HARMON TRAVER

IEEE COMPUTER GROUP

According to the new listing of Group Chapters from headquarters, the name of the Electronic Computer Group has been changed to IEEE Computer Group.

MORE FELLOWS

sity, and subsequently entered government service as a member of the first radar team under Sir Robert Watson-Watt. From then until 1946, when he joined his present organization, he was associated with various aspects of radar development.

Calvin F. Quate, honored for contributions to the theory and design of low noise amplifiers, is professor of applied physics and electrical engineering at Stanford University and has been engaged in research in the field of wave propagation in solids. Of late, he has been primarily concerned with the interactions which can occur between electrons, electromagnetic waves, and acoustic waves. He received the B.S. degree in electrical engineering from the University of Utah and the Ph.D. from Stanford University. He was formerly a member of the technical staff of Bell Telephone Laboratories and Sandia Corp., where he became vice president and director of research.

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IT IS REPORTED:

George W. Deskin has been appointed to the new position of staff scientist for Applied Technology, Inc., Palo Alto, reporting directly to Dr. William E. Ayer, president and founder of the firm.

Odell R. Blair has been appointed manager of engineering for Western Switchboard Co., San Francisco, and will be responsible for the company's design and development program throughout the wide area it serves.

William C. Hennings has been promoted to manager of the military equipment engineering department of MELABS, Palo Alto, reporting directly to President Lloyd A. Addleman.

MORE REMARKS

in the presence of the students' parents, school advisers, and mayors. The banquet is well attended by engineers in the area and their guests because a speaker of national prominence is generally presented.

The scholarship program is supported by the Bay Area Engineering Societies, San Francisco Bay Area Engineering Council, consulting engineers, and many of the engineering industries.

The Engineers Speakers Club of San Francisco helps publicize BAEW in talks before service organizations, and this year a special appeal for publicity via magazine and newspaper articles was made. Any engineering activities written up for publication before the week of February 21-27, 1965, should have a few words about BAEW.

In the past, public displays, such as company models, have helped publicize the week; these are again solicited from Bay Area engineering firms and schools. This year, Quantic Industries, San Carlos, specializing in electro-optical and electro-mechanical in-flight hardware for aerospace, was the first to volunteer a public display.

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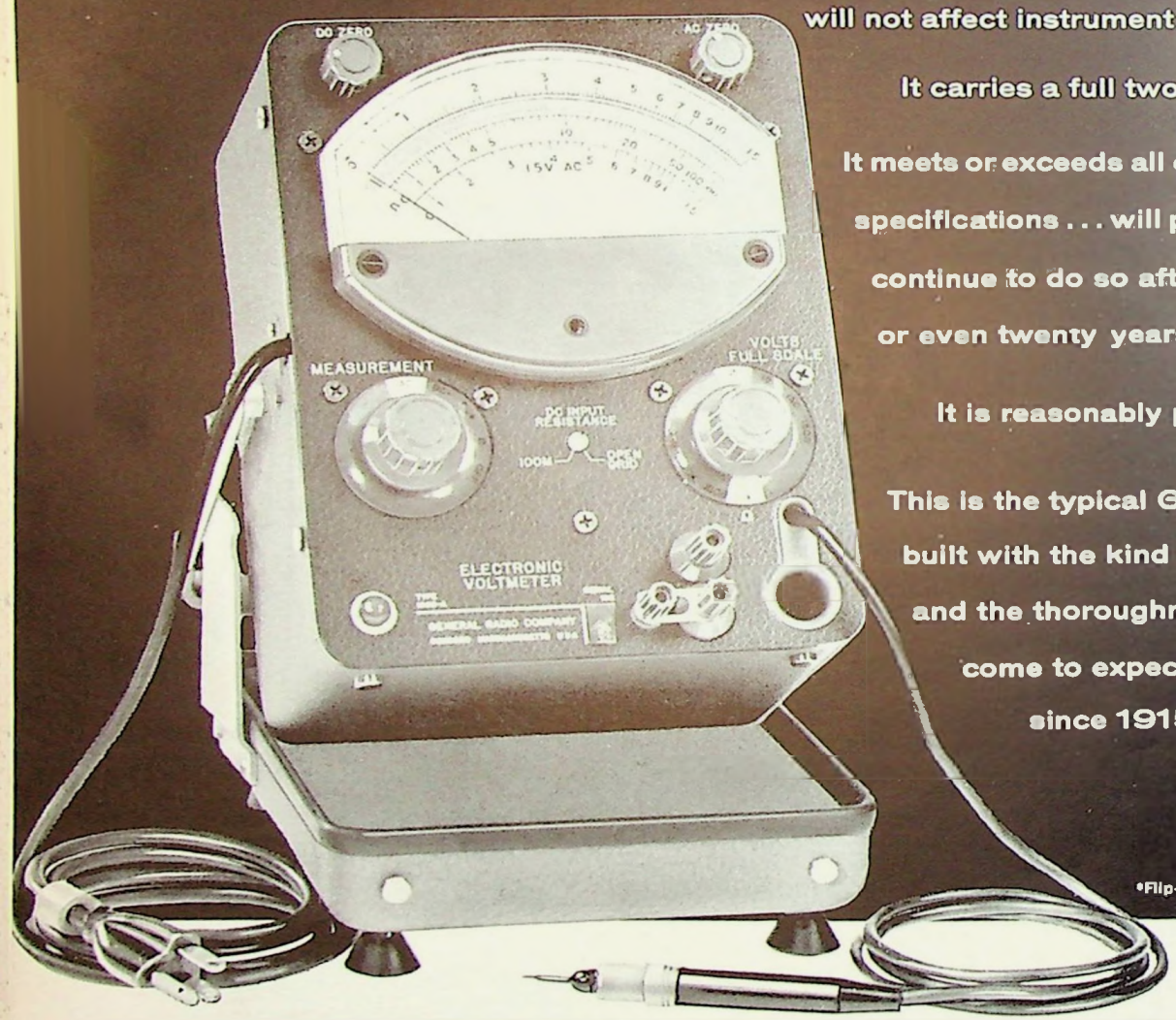

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