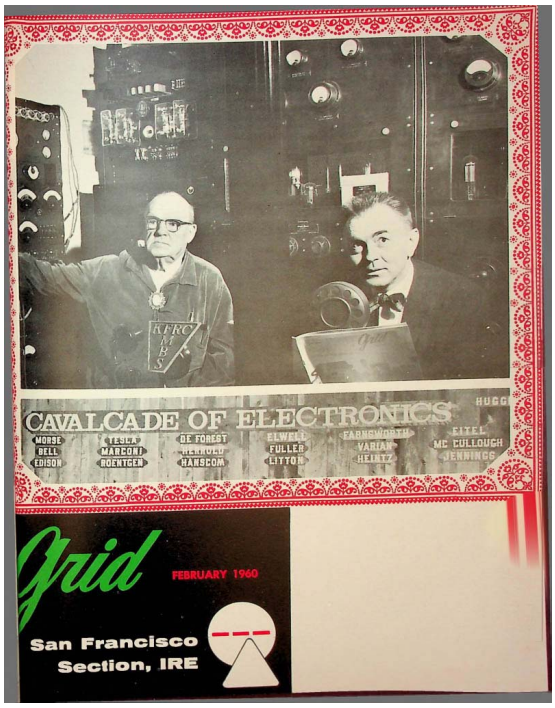
EDITOR'S PROFILE of this issue

from a historical perspective …

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



February, 1960:

Cover: Douglas Perham and Earl Goddard appear as old-time broadcasters on the restored 1,000-watt KFRC station at the New Almaden Museum, reading from a current issue of the GRID. Among the names listed are locals de Forest (for 2 years), Charles "Doc" Herrold (first regular broadcast in USA, in San Jose in 1912, with his wife as the first DJ), Cyril Elwell (founder of Federal Telegraph in 1909), Leonard Fuller (Stanford's first EE PhD, Chief Engineer of Federal, head of UC-Berkeley engineering), Charles Litton (inventor from the '30's and '40's, including the glass lathe), Philo Farnsworth (first electronic video display tube in 1927), Russell and Sigurd Varian (inventors of the klystron), Ralph Heintz (founder of Heintz & Kaufman in 1920's), and Bill Eitel W6UF and Jack McCullough W6CHE (founded Eimac).

Page 6: The very first issue of the GRID was 2 pages, issued in 1955. A photo shows the pre-GRID organizing meeting and its participants, with that issue on the table. "Grid" refers to the control element in an electron tube (the three dashes in a circle on the cover). With but a small signal, it can control considerable power in the tube's output circuit. Similarly, the GRID consolidates important information, which is the key ingredient in developing knowledge and career paths for IRE members and their companies/institutions, creating the dynamism and wealth of our communities and industries.

Page 8: The Medical Electronics group has a meeting on "Linear Electron Accelerator and Cancer Therapy". The linear accelerator was initially developed by Bill Hansen of Stanford during the 1940's, using the Varian brothers' newly invented klystron to accelerate electrons down an evacuated tube. We drive across the largest of them today – the 2-mile-long Stanford Linear Accelerator, under Fwy 280 behind the campus. Even today, there's a Varian klystron used in every treatment involving radiation therapy.

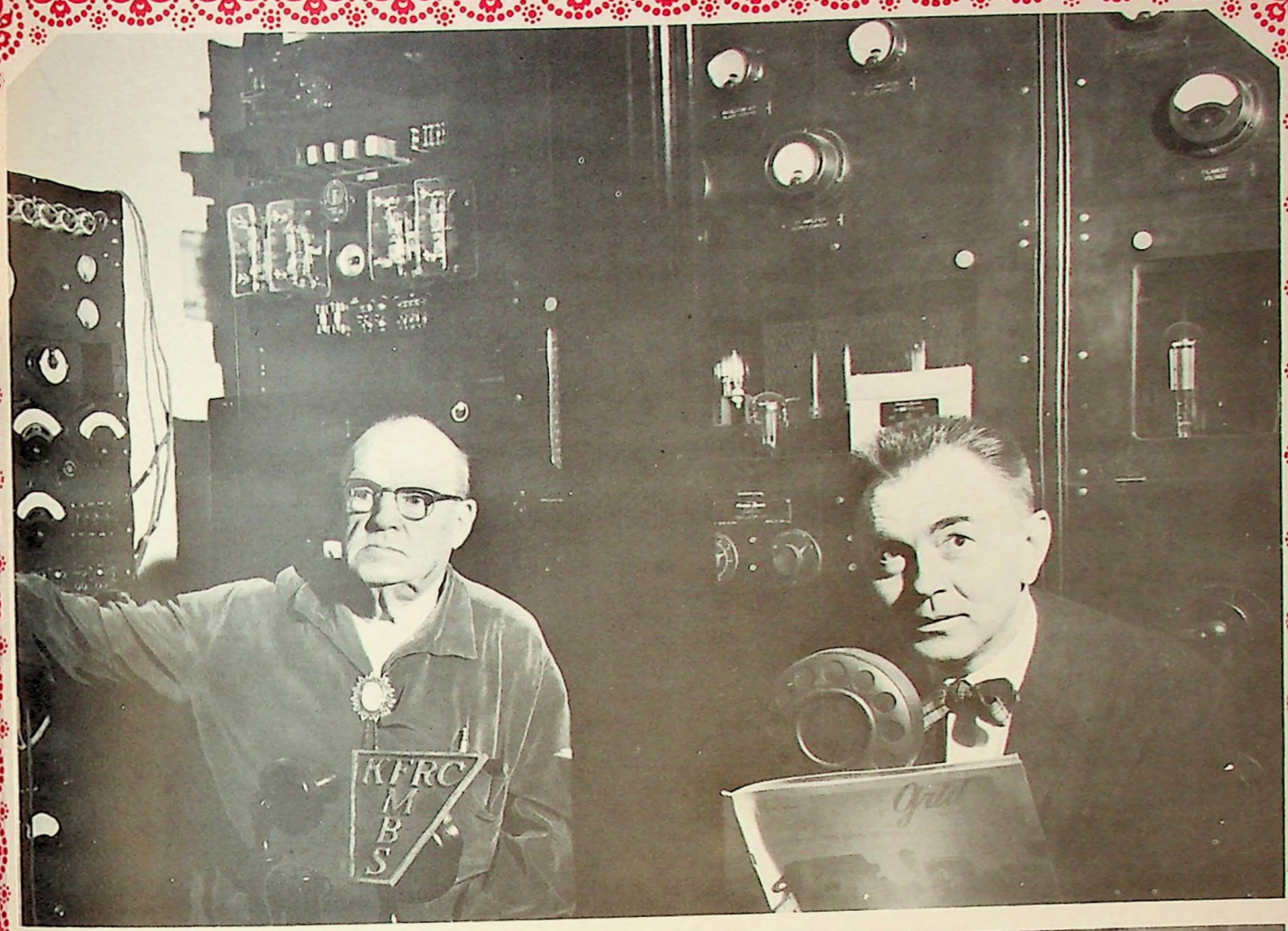
Page 18: Amateur radio operators (Hams) got together to honor John Reinartz as he retires from Eimac. Present (in the photo) are Hams Herbert Hoover Jr W6EV (who, with Fred Terman, was one of the Stanford "faculty brats" in 1915 who experimented with early radio and set the Valley on its road to prominence), and Bill Eitel W6UF and Jack McCullough W6CHE (founders of Eimac). Many of the developments in modern radio came from Hams experimenting with equipment and propagation. Eimac's klystron accomplishments are shown in the adjoining full-page ad.

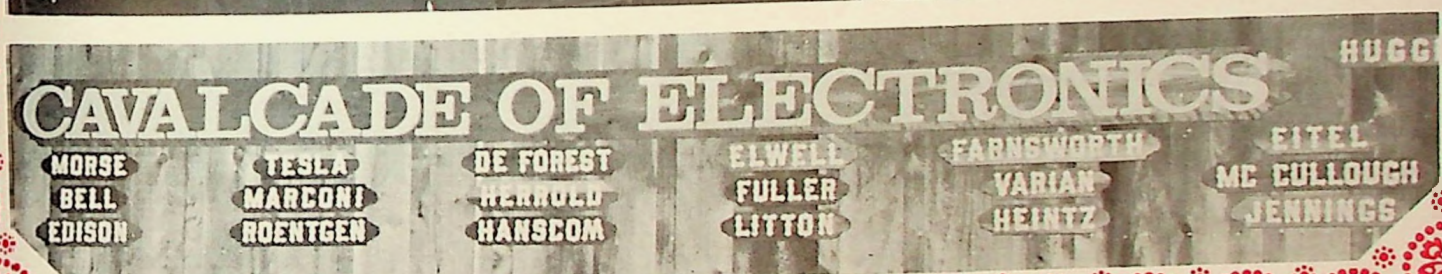
Page 29: Varian Associates will double its floorspace in the Stanford Industrial Park from 500,000 square feet to 1,000,000 sq ft.

Page 36: Frank Sordello joins the local IRE. He is the chief servo engineer at the startup Information Storage Systems (ISS), founded by the "dirty dozen" who left IBM to found a disk drive company that used an electronic voice-coil head positioner, rather then the hydraulics used in the IBM 2314 units. The drives were as large as a dishwasher and stored 30 megabytes (!) on an 11-high stack of 14-inch disks. I worked at ISS for four years (1970-1974); we were making so much money that our VP let us fly first class for any flight over 2 hours. Several of us went back to Bell Labs in New Jersey to cross-license Bubble Memories (invented by Andy Bobeck), since it was predicted that this type of magnetic/electronic memory would soon replace mechanical disk drives (but it never happened). I was in charge of epitaxy on gadolinium-gallium-garnet wafers and electronic evaluation. We developed our own version, then put it on the shelf in case disk drives were to become obsolete.

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





Grid

FEBRUARY 1960

San Francisco Section, IRE

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MTR28-5	24-32	5
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MTR28-30	24-32	30
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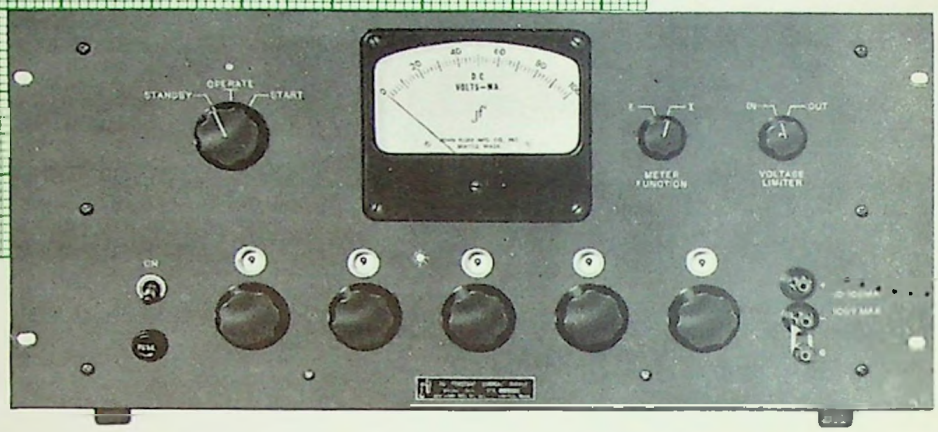

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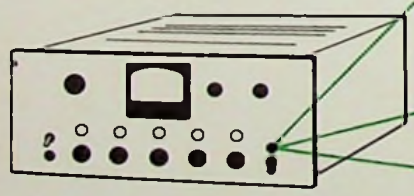

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Rockville, Md.

SAN FRANCISCO SECTION

Grid

VOLUME 6 FEBRUARY 1960 NUMBER 6

(Continued on page 8)

IN THIS ISSUE

ABOUT THE COVER

Electronic History a la Carte

Big news in the electronic history field is that the New Almaden Museum operated by Douglas Perham has opened its doors for routine business. This event was commemorated on January 15 by a special meeting of the Section Historical Committee held at the Museum.

Out of this came the impromptu broadcasting scene on the cover. One of the features of the Museum is a full restoration of the 1000-watt Western Electric transmitter installed by KFRC in 1927. In the picture Douglas Perham and Earl Goddard simulate an early-day broadcast using a copy of your favorite publication as a script.

(Continued on page 10)

The GRID is published by the San Francisco Section of the Institute of Radio Engineers monthly except for July and August.

Please send Form 3579 to:
Editorial and circulation office: P.O. Box 966, San Mateo, California
Subscription: $1.00 (members); $2.00 (non-members) per annum.
Office of publication: 394 Pacific Ave., Fifth Floor, San Francisco, Calif.
Second-class postage paid at San Francisco, California.

Robert Rector

Howard M. Zeidler

FROM THE SWIVEL CHAIR

Aged in the Wood

This issue marks the fifth, or wooden anniversary of the **Grid.** Don't be confused by the "Volume 6, Number 6." This numbering system was adopted to coordinate with the Section Year. The first **Grid** was issued in February 1955 following the concerted efforts of the earnest group of Section, Publications Board, and Staff members illustrated here.

During these years, something in the order of 100 individuals have rendered service to the Section through this activity. Certificates of appreciation are presently being completed and will soon be in the hands of these people, acknowledging their contributions. A sample of this new form is also shown.

This is also the time of the year when elections in the Publications Board can be reported. This year the event marks the retirement from the Board of Robert Rector of Sylvania Electronic Defense Laboratory. Bob has served the Section well in the capacity of Board Chairman throughout the last year and presided over the deliberations of a period marked chiefly by important steps in organizational procedures for the **Grid.**

Just as the physical format of the **Grid** has grown from a two-page leaflet to a substantial publication of more than 40-page average, so have the operational problems become more complex. During the past year these have been, under Bob's leadership, codified into well-considered routines.

As indicated on the masthead of this issue, Bob is succeeded in the chairmanship by Howard Zeidler of Stanford Research Institute. Howard has been serving the Board as treasurer. Milt Seymour of Lenkurt has been elected to the twin posts of vice chairman and recording secretary, while Peter Sherrill of Hewlett-Packard has been elected treasurer.

Frank Haylock

—Frank Haylock, Editor

Pre-Grid organization meeting, from 12:00 clockwise, Spangenberg, board chairman; Morris, Section chairman; Peterson, Lusted, board members; Haylock, editor; Ogilvie, board member. Layout of initial 2-page issue is in foreground

another top man on the totem pole

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Staff (cont.)—Reporters

SAN FRANCISCO SECTION

Steve Duer, Hewlett-Packard Co.

Dexter Hartke, (Photography), Hewlett-Packard Co.

EAST BAY SUBSECTION

Eugene Aas, Sandia Corporation, Livermore

Hugh Gray (Photography) Hugh Gray Co., San Francisco

PROFESSIONAL GROUPS

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Von R. Eshleman, Stanford University

AUDIO

BROADCASTING
Richard Newman, RCA, San Francisco

COMMUNICATIONS SYSTEMS
Kenneth P. Patterson, Sperry Gyroscope Co.
Lee Stephens (Photography) Lenkurt Electric Co.

ELECTRON DEVICES
Eugene W. Kinaman, Watkins-Johnson Co., Palo Alto

ELECTRONIC COMPUTERS
John Boysen, Lockheed Missiles and Space Division, Sunnyvale

ENGINEERING MANAGEMENT
Charles Meyer, Sylvania Electronic Defense Lab
Leonard M. Jeffers (Photography) Sylvania Electronic Defense Lab

ENGINEERING WRITING & SPEECH
Harry Lewenstein, Eldorado Electronics, Berkeley

MEDICAL ELECTRONICS
Noel Thompson, M.D., Palo Alto Medical Research Foundation

MICROWAVE THEORY & TECHNIQUES
Frank Barnett, Hewlett-Packard Co.

MILITARY ELECTRONICS
Jerome J. Dover, Ampex Military Products Co.

PRODUCTION TECHNIQUES
Olof Landeck, Electro Engineering Works
George F. Reyling, Varian Associates

RELIABILITY AND QUALITY CONTROL
John W. Hall, Dalmo Victor Co., Belmont
Julian Hilman, Fairchild Semiconductor, Palo Alto

SPACE ELECTRONICS & TELEMETRY
Robert B. Morgan, Lockheed Missiles and Space Division, Sunnyvale

INSTITUTIONS

D. J. Angelakos, Cory Hall, University of California, Berkeley 4

MEETING CALENDAR

SAN FRANCISCO SECTION
8:00 P.M. • Monday, Feb. 29

(Joint meeting with PGED, see below)

SAN FRANCISCO SECTION
• Tuesday, Mar. 29

Field Trip to New Almaden Museum and Perham Electronic Foundation
(Further details to be announced)

EAST BAY SUBSECTION
7:30 P.M. • Monday, Feb. 15

"Recent Electronic Experience with the Commissariat a l'Energie Atomique at Saclay, France"
"Recent Work in Photomultipliers"
Speaker: Quentin A. Kerns, group leader, Livermore Radiation Laboratory, Berkeley
Place: Livermore Radiation Laboratory, Livermore
Dinner: 6:00 P.M., Livermore Bowl, Livermore
Reservations: Marge Bennette, HIlltop 7-1100, Ext. 84203

PROFESSIONAL GROUPS

Antennas & Propagation
8:00 P.M. • Wednesday, Feb. 24

(Joint meeting with PGCS and PGMIL, see below)

Audio
8:00 P.M. • Tuesday, Mar. 1

(Joint meeting with Audio Engineering Society)
"Why Stereo? The Philosophy of Multi-Channel Recording of Music" and tour of KGO studios
Speaker: John (Jay) G. McKnight, manager, advanced audio section, Ampex Professional Products Co.
Place: Studio A, KGO, 277 Golden Gate Ave., San Francisco
Dinner: 6:30 P.M. (Social Hour 6:00) Rathskeller, Polk and Turk Streets
Reservations: Mrs. Richardson, EMerson 9-7111, Ext. 203, before Feb. 29

Communications Systems
8:00 P.M. • Wednesday, Feb. 24

(Joint meeting with PGAP and PGMIL)
"Department of Defense: Problems, Policies, and Objectives in Worldwide Communications"
Speaker: Ralph Clark, assistant director for communications, office of the Department of Defense Research and Engineering
Place: Physics Lecture Hall, Stanford University
Dinner: 6:00 P.M. "Meet-the-Speaker" at Hal's Restaurant, 4085 El Camino Way, Palo Alto
Reservations: Mrs. Wada, DAvenport 1-3300, Ext 318

Electron Devices
8:00 P.M. • Monday, Feb. 29

(Joint meeting with the San Francisco Section)
"The Crossed Field vs the Linear Beam in Microwave Super-Power Generation"
Speakers: W. C. Brown, assistant vice president, Raytheon; and Dr. M. Chodorow, professor of applied physics, Stanford University
Place: Room 100, Physics Lecture Hall, Stanford University
Dinner: 6:00 P.M., Hal's Restaurant, 4085 El Camino Way, Palo Alto
Reservations: Miss Grace Pacak, IRE Office, FIreside 1-3471; or Evelyn Wenig, DAvenport 3-2441, by Friday, Feb. 26

Electronic Computers
8:00 P.M. • Tuesday, Feb. 23

(Joint meeting with the Association for Computing Machinery and the Society of Industrial and Applied Mathematics)
"The Role of the University and the Computer in Closely Allied Fields"
Speaker: Dr. Louis Fein, consultant
Place: Auditorium, Bldg. 202, Lockheed Missiles and Space Division, 3251 Hanover Street, Palo Alto
Dinner: 6:00 P.M., Hal's Restaurant, 4085 El Camino Way, Palo Alto
Reservations: None necessary

MEETING CALENDAR

Medical Electronics 8:00 P.M. • Wednesday, Feb. 24

"Linear Electron Accelerator and Cancer Therapy"
Speakers: Malcolm A. Bagshaw, M.D., assistant professor, Stanford Medical School; and Mitchell Weissbluth, Ph.D., assistant professor, Stanford Medical School
Place: Room M112, Stanford Medical Center, Palo Alto
Dinner: 6:00 P.M., Red Cottage, Menlo Park
Reservations: George Turner, DAvenport 5-8332

Military Electronics 8:00 P.M. • Tuesday, Feb. 23; Mar. 1

(Joint series with PGPT and PGRQC—see Production Techniques)

Military Electronics 8:00P.M. • Wednesday, Feb. 24

(Joint meeting with PGAP and PGCS, see above)

Production Techniques 8:00 P.M. • Tuesday, Feb. 23

February 16 meeting cancelled
(Joint series with PGMIL and PGRQC)
"Review of the State of the Art of Microminiaturization for Electronics"
Speaker: W. Dale Fuller, manager, microsystems electronics program, Lockheed Missiles and Space Division, Sunnyvale
Place: Room 100, Physics Lecture Hall, Stanford University

Production Techniques 8:00 P.M. • Tuesday, Mar. 1

(Final session in a series of four lectures, presented jointly with PGMIL and PGRQC)
"Future Possibilities of Microminiaturization"—panel discussion
Panel participants: Dr. Charles Rosen, head of applied physics group, Stanford Research Institute; Major Otis R. Hill, Air Research and Development Command, Los Altos; and Dr. James R. Nall, member of technical staff, Fairchild Semiconductor Corp., Palo Alto
Place: Room 100, Physics Lecture Hall, Stanford University
Dinner: 6:00 P.M., Hal's Restaurant, 4085 El Camino Way, Palo Alto
Reservations: Mrs. Jennings, WHitecliff 8-1434

Reliability & Quality Control 8:00 P.M. • Tuesday, Feb. 23; Mar. 1

(Joint series with PGMIL and PGPT—see Production Techniques)

Space Electronics & Telemetry 8:00 P.M. • Tuesday, Feb. 16

"Design Considerations for a PAM-FM Telemetry System"
Speaker: Thomas D. Lusk, associate research scientist, communications & control dept., Lockheed MSD, Palo Alto
Place: Auditorium, Bldg. 202, Lockheed Missiles and Space Division, 3251 Hanover Street, Palo Alto, Calif.
Dinner: "Meet-the-Speaker" dinner, 6:30 P.M., Hal's Restaurant, 4085 El Camino Way, Palo Alto
Reservations: Lois Reed, REgent 9-4321, Ext. 2-8150, before 12:00 noon February 16

Space Electronics & Telemetry 8:00 P.M. • Tuesday, Mar. 15

"The Courier Satellite Communications System"
Speaker: Donald Marx, project manager, U. S. Army Signal Research & Development Laboratories, Ft. Monmouth, N. J.
Place: Auditorium, Bldg. 202, Lockheed Missiles and Space Division, 3251 Hanover Street, Palo Alto, Calif.
Dinner: "Meet-the-Speaker" dinner, 6:30 P.M., Hal's Restaurant, 4085 El Camino Way, Palo Alto, Calif.
Reservations: Lois Reed, REgent 9-4321, Ext. 2-8150 before noon, Mar. 15

MEETING AHEAD

Microminification

For the February 23 session of the current series of four lectures presented jointly by PGMIL, PGPT, and PGRQC, W. Dale Fuller of Lockheed will review the state of the art of microminiturization for electronics.

Comparisons will be made of the reliability, producibility, and miniaturization aspects of the many new electronic technologies proposed in the industry today. Illustrations of these technologies will be used in the comparison.

This will be Lecture No. 3 in the series. The fourth and final meeting will be a panel discussion.

Fuller is manager of the microsystems electronic program in the Lockheed Missiles and Space Division where he performs research and application of research for system microminiaturization by the integration of materials.

Prior to joining Lockheed in 1959, he was director of research at Varo Manufacturing Co., Garland, Texas. He has also been a consulting engineer in Tulsa, Okla. and chief engineer of the Engineering Laboratories, Inc., of Tulsa, Oklahoma, and Garland, Texas; an instructor in electrical engineering at Iowa State College; and an engineer with General Electric Co. in Schenectady and Syracuse.

He holds a BS in electrical engineering from Michigan College of Mining and Technology, and an MS in electrical engineering from Iowa State College. He has also performed graduate study at Southern Methodist University and Oklahoma State College, as well as ad-

(Continued on page 10)

CHRONOLOGICAL RECAP

February 15—East Bay Subsection

February 16—Space Electronics & Telemetry

February 23—Military Electronics/Production Techniques/Reliability & Quality Control, Electronic Computers

February 24—Antennas & Propagation/Communications Systems/Military Electronics, Medical Electronics

February 29—Electron Devices/San Francisco Section

March 1—Audio, Military Electronics/Production Techniques/Reliability & Quality Control

March 15—Space Electronics & Telemetry

March 29—San Francisco Section

W. Dale Fuller

MORE MICROMINIFICATION

vanced engineering studies in the General Electric advanced engineering course in Schenectady.

He holds memberships in the American Society for Engineering Education, the American Astronautical Society, the Acoustical Society of America, and Pi Mu Epsilon.

MEETING AHEAD

For Two Ears

The dormancy of professional-society activities on audio in this area, which has been practically the birthplace of the contemporary art, is about to be corrected. A joint meeting of PGA with the Audio Engineering Society is scheduled for March 1. See the Calendar, page 8.

Probably you know or can deduce the meaning of the word, "Stereophony." But how about "Ambiophony"? According to Jay McKnight, these two words represent leading factors in the satisfaction engendered by reproduced music. McKnight is to present, at the joint meeting, a paper he gave at the 1959 AES convention in New York. Covering philosophical aspects of the stereo art and supported by demonstrations, the presentation is expected to have unusually high interest and merit.

McKnight, a 1952 Stanford graduate, joined Ampex in 1953 to work on Cinemascope and returned to the company

(Continued on page 12)

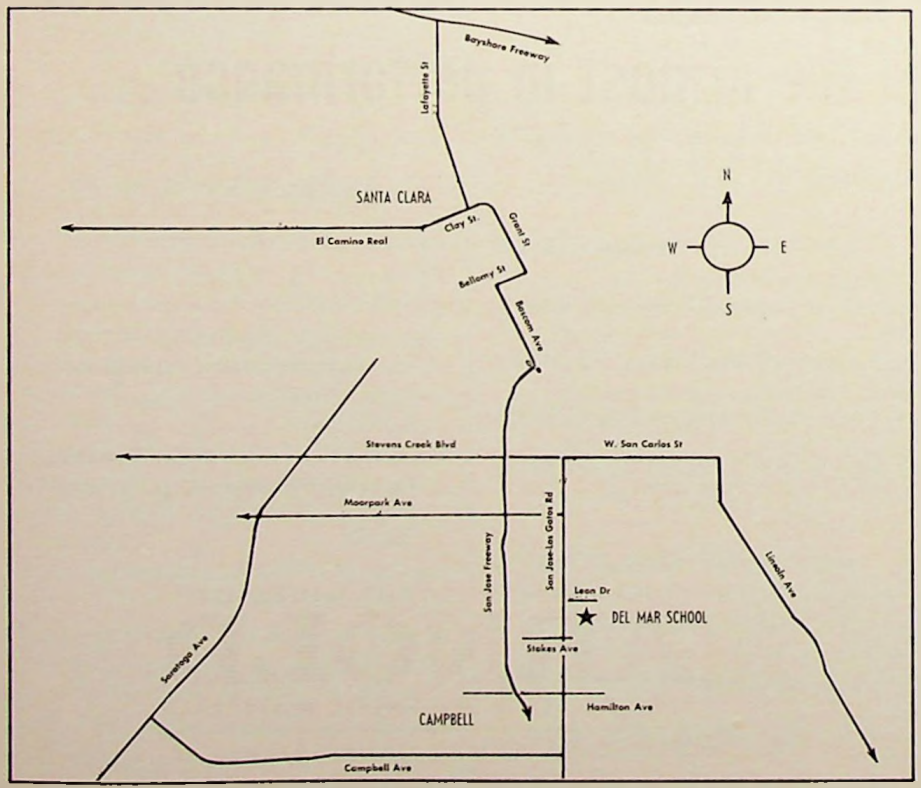
MORE ELECTRONIC HISTORY

Museum hours, so that you can plan your own visit, are every day except Monday from 10:00 a.m. until dark. Admission fees are 50 cents for adults, 15 cents for children six to twelve, and no charge for children under six. For substantial groups, appointments should be made.

Incidentally, the Perham Foundation is open for acceptance of memberships in the following categories:

1. Honorary—Those people who have produced or aided in producing outstanding works in their fields which correlate with the purposes of this foundation.
2. Life—A person or organization donoting $500 cash or cash and artifacts, or artifacts of equivalent value.
3. Sustaining—Persons donating $50 in cash per year.
4. Contributing—Persons contributing $10 per year as regular dues.
5. Junior—From age 1 to 18 years, contributing $2.00 cash per year as dues.

A special opportunity is at hand to witness an organized review of local electronic history. Perham is presenting a lecture series at Del Mar High School, 1224 Del Mar Avenue, San Jose. First meeting will be February 11 and meetings will be held regularly for the ten succeeding weeks. There is a small registration fee since this is an Adult Education activity of the Campbell Public Schools. Note that since a previous announcement of the series, the meeting nights have been changed to Thursday.



Radio lecturing in the 1920's was promoted with this poster used by the father of Earl Goddard, present historical committee co-chairman. Note attractive price schedule

RADIO

Concert and Lecture

HIGH SCHOOL AUDITORIUM

R. W. Goddard, Dean of the College of Agriculture and Mechanical Arts, and Professor of Electrical Engineering, State College, with two assistants and two complete sets of instruments, receiving and transmitting Radio, will be here Monday, May 8th, and will conduct a demonstration and deliver a lecture at the high School Auditorium, commencing at 8:00 P. M.

TEACHERS AND PUPILS OF THE SCHOOL WILL BE ADMITTED FOR 10 CENTS

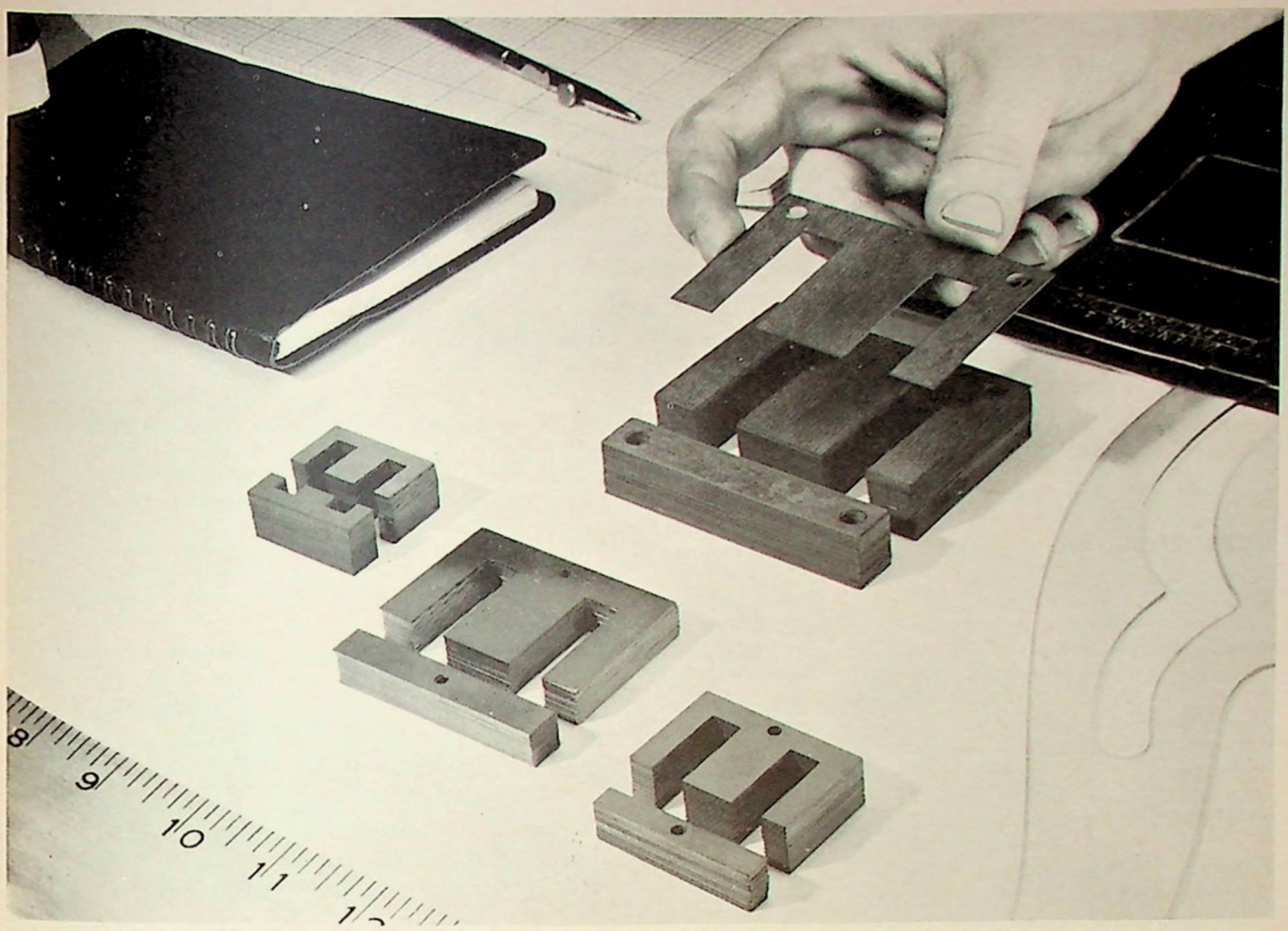
THE GENERAL PUBLIC WILL BE ADMITTED FOR 15 CENTS

Professor Goddard is a student of Radio and has been identified with Radio development for a number of years. His lecture will be in such language that any one, no matter what their knowledge of Electrics may be, can easily understand him. If you desire to know something of how conversation and music may be enjoyed from the air currents passing over us every hour of the day and night from everywhere, avail yourselves of this opportunity. Aside from the information and enjoyment you will get from the concert and lecture, you will be aiding a good cause.

The funds derived from the entertainment and lecture will be turned over to the Athletic Department of the Schools and will come right back to you in increased school facilities.

High School Auditorium, 8 P. M.

Monday, May 8th



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MORE EARS

in 1956 following a tour of duty with the Army and some development engineering with Gotham Audio Development Corp. He has published a number of serious works in the audio field and has the distinction of being an accomplished musician as well.

In addition to the technical program, the meeting will also include a business session in which both groups will establish active rosters of officers to replace those lost by transfers to the East and the requirements of business travel.

MEETING AHEAD

The Super-Power Bout

February 29, at 8:00 p.m. is the time for the big bout. That's when Dr. Marvin Chodorow and William Brown will verbally fight for the crown in the Super Power Generation Division.

The crossed field device, which will be backed by Brown, (Raytheon, associate director of engineering), has been active in the fight racket since the war in the form of a magnetron oscillator. Now, in the Amplitron form, as an amplifier, it has been accomplished because his trainer knows just exactly how to keep his boy cool even at high dissipation rates. He's built quite compactly for a fellow of his power level, hits the tape at 6 to 12 per cent bandwidth. He keeps it clean, very little phase pushing even with no fancy x-rays.

The linear-beam device, championed by Chodorow, (director of the microwave laboratory at Stanford University) has been particularly prominent in the high-power klystron form. Searching for a reason for the linear-beam success, you could point to the fact that he's sort of a sturdy, disjointed fellow. His brain controls the well-collimated "beam" power for the knockout punch. He loses very little of this energy to his interaction circuit. In recent fights he has shown that his body can utilize up to 60 per cent of this useful energy by

(Continued on page 14)

THE PEDAGOGIC GRID

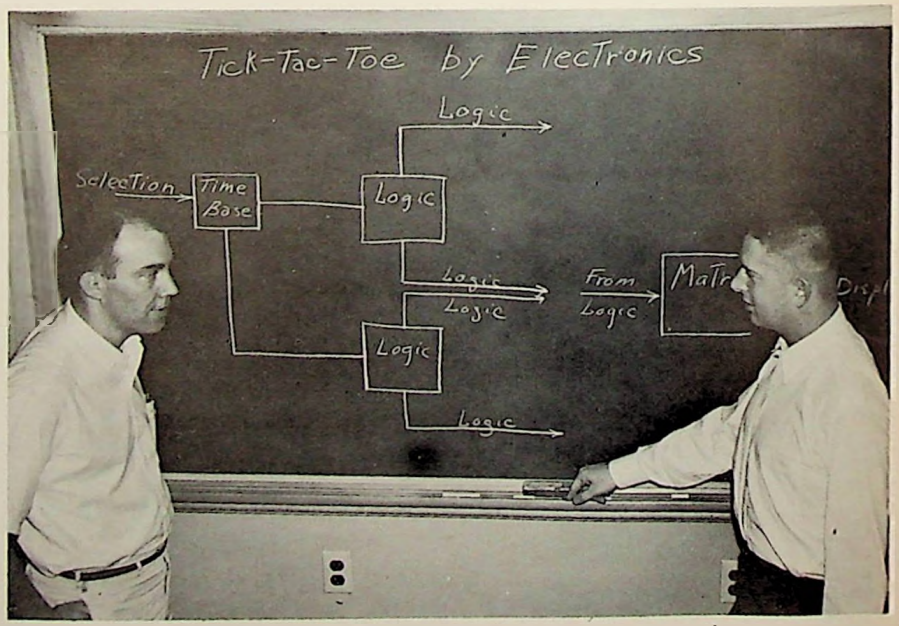
Students on Display

The two students shown are discussing the block diagram of an electronic tic-tac-toe computer game they are constructing as an exhibit for the coming San Jose State College Engineering Open House, Feb. 25, 26, and 27.

Of particular interest to employers and graduates of other engineering colleges will be a display of the curriculum materials used by a typical engineering student, and more specifically the demonstration of the use of test equipment for lab experiments of the electrical department, the largest within the College's division of engineering.

Displays of student projects based on induction heating, the evolution of miniaturization, radiation measurement, servomechanisms, and closed circuit television will also be among those on view in the electrical department.

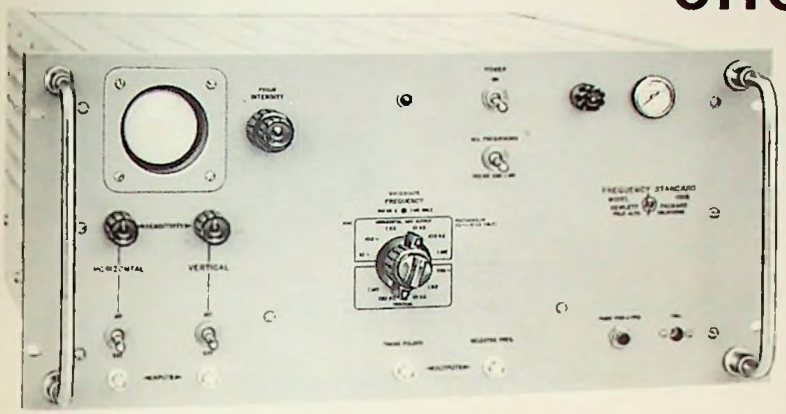
Since the foregoing exhibits are in addition to those of the other departments, the Open House promises to be quite interesting to all. The times: 6 to 10 p.m. Thursday, Feb. 25; 10 a.m. to 10 p.m. Friday, Feb. 26; and 8 a.m. to 3 p.m. Saturday, Feb. 27.



San Jose State College students prepare for open house

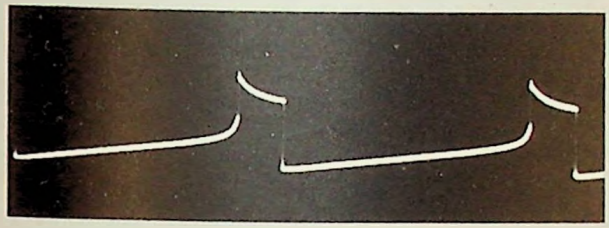
New, *compact* PRECISION FREQUENCY STANDARD

offers $5/10^8$ stability, just 8¾" high

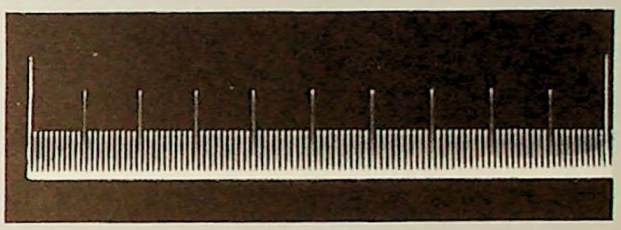


hp 100ER

FREQUENCY STANDARD



Model 100ER offers six standard sine and four rectangular frequencies in decade steps; available simultaneously and selected on front panel.



Timing comb output pips occur at 100, 1,000 and 10,000 microsecond intervals. Timing comb simplifies "fast" measurements and calibration.

Specifications

Stability:	$5/10^8$ parts per week, $3/10^8$ short term.
Outputs:	Sinusoidal 10 cps, 100 cps, 1 KC, 10 KC, 100 KC and 1 MC. Rectangular 10 cps, 100 cps, 1 KC and 10 KC.
Output Voltages:	Sinusoidal 5 v rms min.; rectangular approx. 15 v peak. Harmonics to 5 MC obtainable.
Rated Load:	1 MC and 100 KC, 50 ohms nominal; 10 KC, 1 KC, 100 cps, 10 cps, 5000 ohms nominal.
Distortion:	(Sinusoidal) Less than 4%.
Frequency Adjustment:	Screwdriver tune adjusts 1 ppm.
Size:	8¾" high, 19" wide, 18" deep behind panel. Weight 35 lbs.
Price:	$900.00.

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This compact, highly convenient new hp frequency standard not only provides stability equivalent to complex, expensive primary standards, but offers the versatility of a wide variety of outputs. Signals available include six standard sine frequencies and four rectangular signals which may be distributed by 50 ohm cables for use at many different stations on a production line or in the laboratory. A particularly useful feature is a timing comb for calibrating, and for measurement of sweeps and time intervals.

Stability of 5 parts in one hundred million per week is assured by careful aging and testing of the crystal controlled oscillator and oven.

Model 100E includes a built-in oscilloscope which may be used as a comparison device to calibrate external equipment such as oscillators through use of Lissajous figures. The scope may also be used to check internal frequency deviation of the instrument.

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6039

hp now offers 10 different precision oscilloscopes

Marvin Chodorow

William Brown

MORE SUPER-POWER

clever (collector depression) footwork. He thus puts to good advantage the effective separation of these major functions.

Interest and betting on the fight are unusually high. The crossed-field boy with the high conversion efficiency may end up with the same body loss shown by the linear-beam man because of his low interception. So, the fight will probably go the limit and be decided on the many side issues. (The Peninsula area will be blacked out for TV coverage.) Come and see for yourself this bout, sponsored jointly by the PGED and San Francisco Section of the IRE.

The speakers will hit their topic separately, then in rebuttal, and then be at the mercy of the audience in Physics 100 at Stanford University. Be sure to come to the weigh-in at Hal's Restaurant at 6:15 p.m., before you place your bet. For dinner reservations, call Evelyn Wenig at DA 3-2441, prior to February 25.

William C. Brown is associate director of engineering, crossed-field devices in the microwave and power-tube division of the Raytheon Company.

For the past 15 years Brown has been active in the area of microwave tube design and development and is responsible for a number of advances in the crossed-field device area, including the platinotron and its Amplitron and Stabilotron derivatives. During the past two years he has been active in the study of the generation and use of large amounts of microwave energy.

Brown received his BS degree in electrical engineering from Iowa State College and an MS degree in electrical engineering from the Massachusetts Institute of Technology. He is a Fellow of the IRE and a member of the honorary engineering societies, Tau Beta Pi and Eta Kappa Nu.

Marvin Chodorow was born on July 16, 1913, in Buffalo, New York. He received the BA degree in physics from the University of Buffalo in 1934, and the PhD degree from the Massachusetts Institute of Technology in 1939.

During 1940 he was a research associate at Pennsylvania State College. Chodorow was an instructor of physics at the College of the City of New York from 1941 to 1943, when he became associated with the Sperry Gyroscope Company as a senior project engineer. He remained at Sperry until 1947, when he joined the physics department of Stanford University, where he is now professor of applied physics and electrical engineering, as well as the director of the microwave laboratory.

Chodorow is a member of the American Physical Society, Sigma Xi, and was elected a Fellow of the IRE in 1954.

—Eugene W. Kinaman

ENGINEERS' WEEK

Commemorating the Profession

Over 50 high school students in science and mathematics have been nominated for selection of the top ten to receive awards during Engineers' Week. Three of the ten will share over $2,000 in scholarships—a $1,000 top award and two runners-up of $600—awards being made at the Engineers' Week banquet at the Sheraton-Palace Hotel on February 24.

Guest speaker at this banquet will be H. G. Vesper, president and director of Standard Oil Company of California's Western Operation Inc.

For complete details on all aspects of this annual commemoration of engineering, refer to the February issue of the San Francisco Engineer.

MEETING AHEAD

The Computer Goes to School

In February, PGEC will join forces with the Association for Computing Ma-

(Continued on page 16)

Louis Fein

MORE COMPUTER

chinery and the Society of Industrial & Applied Mathematics to present Dr. Louis Fein, consultant. His topic will be "The Role of the University & the Computer in Closely Allied Fields." See Calendar, page 8, for other details.

Since 1956, Fein has studied the genesis and operation of university programs in the field of computers, data processing, operation research, and other relatively new and apparently closely related fields. Fein is scheduled to expound on his ideas of this subject for the meeting.

Fein received the BS degree from Long Island University, the MS degree from the University of Colorado, and the PhD degree from Brown University —all in physics. In 1947 he joined the Submarine Signal Company. That company was purchased in 1948 by Raytheon Manufacturing Company, with whom he remained until 1952, when he founded and became the president of Computer Control Company of Boston and Los Angeles. Since 1955 he has practiced as a private consultant in the Bay Area.

—J. A. Boysen

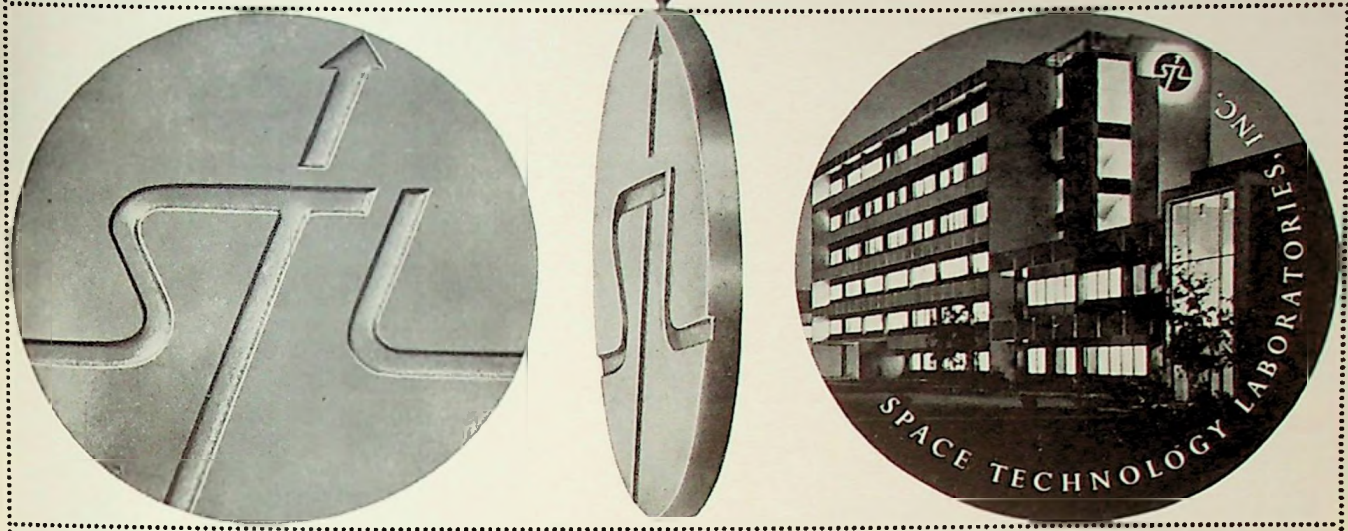
MEETING REVIEW

Nesting Time

The field of high-frequency antenna design has not changed over the years as much as many other areas of antenna design. Yet it is an area of great commercial as well as military importance, and an area in which great savings in real estate; increases in gain, bandwidth, and efficiency; and reductions in interference are potentially possible. These factors were described by Dr. Robert L. Tanner, head of the electromagnetics laboratory at Stanford Research Institute, at the meeting of the PGAP at Stanford on January 13, 1960.

(Continued on page 18)

SCIENTISTS AND ENGINEERS: There are two sides to the STL coin...



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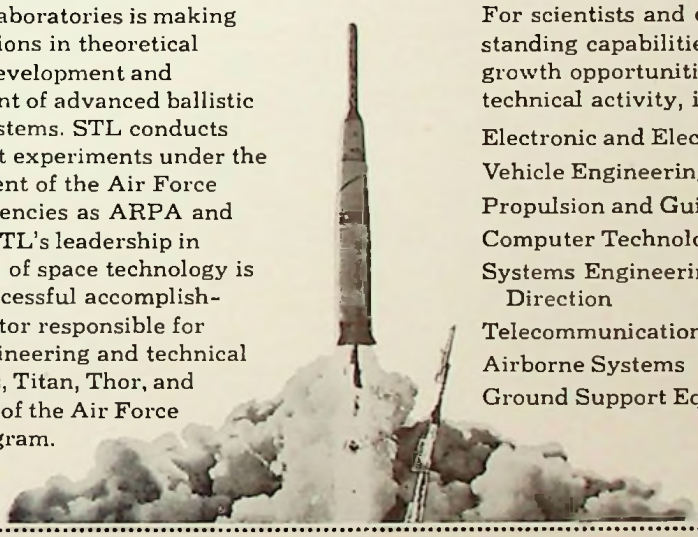

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Computer Technology
Systems Engineering and Technical Direction
Telecommunications
Airborne Systems
Ground Support Equipment

NEW YORK INTERVIEWS FOR MEMBERS OF IRE

For the convenience of those attending the Institute of Radio Engineers meeting, members of STL's Technical Staff will conduct personal interviews in New York, March 21-24. For an appointment, please telephone Mr. Robert Galbraith at STL's IRE suite, or send a complete resume to *Space Technology Laboratories, Inc., P.O. Box 95004, Los Angeles 45, California*

SPACE TECHNOLOGY LABORATORIES, INC.

MORE ANTENNAS

After presenting the historical background and describing the high-frequency antennas in common use at the present time, Tanner discussed in detail many of the newer proposals which have recently been made to improve the state of the art.

One of the more promising proposals that was treated in detail concerned improvements to standard rhombic antennas obtained by nesting smaller rhombics within the largest rhombic. By properly exciting these concentric rhombics, very significant improvements in the gain and the side-lobe levels of the radiation patterns can be realized over wide frequency bands. In addition, these smaller rhombics can be utilized to cover the higher frequency bands without appreciable interaction with the larger rhombic around it. These modifications have been analyzed and tested at model frequencies at SRI.

Another interesting proposal concerns the use of a two-dimensional Luneberg lens at high frequencies. This provides a very broad-band, steerable radiation pattern. The required variations in the velocity of propagation, or index of refraction, with radius can be obtained by varying the spacing between two square grids of conducting wires.

—R. C. Honey

MEETING REVIEW

The Latest Word

Norman Tipton, San Francisco bureau chief for Fairchild Publications, spoke at the January meeting of PGEWS. Fairchild, publishers of Electronic News, also have six other daily and weekly papers covering a wide range of commercial and industrial fields.

Since its inception three years ago, Electronic News has reached a total circulation of about 55,000. Material for this weekly paper comes from the entire Fairchild organization which has news bureaus in all major cities. Their news-gathering operation employs 800 people full time with 400 part time reporters or "stringers". The company is now trying to obtain permission to open a new bureau in Moscow.

Tipton emphasized how Fairchild Publications and Electronic News place emphasis on fast reporting of facts. He pointed out that Fairchild reporters try to obtain a complete story with informa-

(Continued on page 20)

Griswold, Reinartz, Hoover, Eitel, Collins, and McCullough interview the press

TESTIMONIAL EVENT

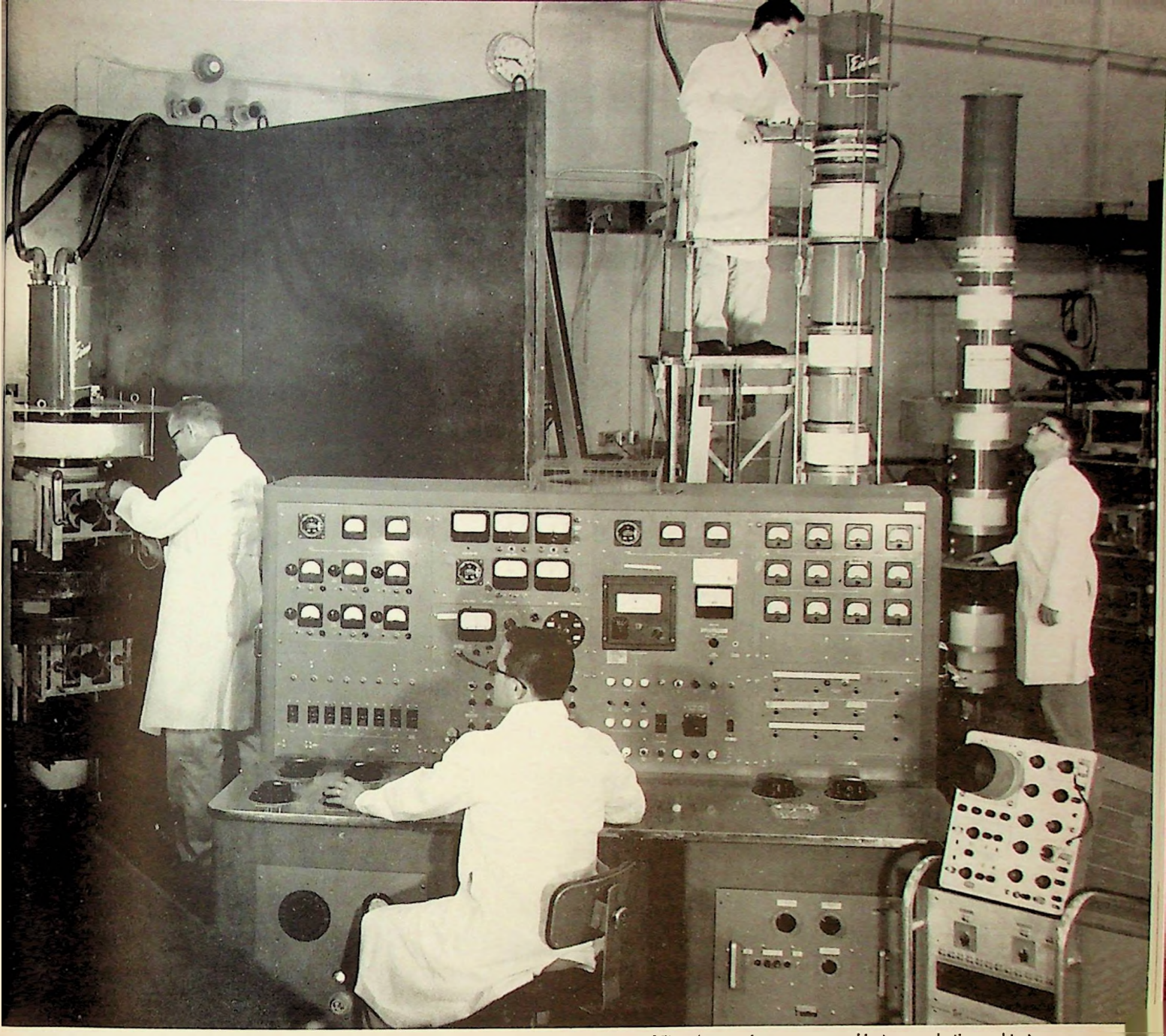
Don't Call Them Hams

Amateur radio operators from far and near congregated at the Villa Hotel in San Mateo on February 1 to attend a testimonial dinner for one of the great men of their field—John Reinartz, K6BJ and Fellow, IRE. Reinartz was retiring from active service with Eitel-McCullough, Inc., as he put it, "to spend more time on amateur radio."

On hand to wish him well were his wife, K6MJH; Herbert Hoover, Jr., W6ZH, W6EV; Lt. Gen. Francis H. (Butch) Griswold, K0DWC; Arthur A. Collins, W0CXX; Bill Eitel, W6UF; and Jack McCullough, W6CHE; some of whom are shown at the press conference which preceded the banquet.

In crediting Reinartz with pioneering work in the field, those who spoke of him seemed to feel that his readiness to help young people in getting started with amateur radio had been an outstanding characteristic. Collins suggested that his company had been founded on such inspiration and guidance, dating back to the times when he cut high-school classes to work schedules with Reinartz. Eitel and McCullough attributed their mutual acquaintance as well as their subsequent collaboration to the same stimulation. Gen. Griswold, who is vice commander of the Strategic Air Command and a Senior Member, IRE, credited the SAC single-sideband communications net to amateur origins, many traceable back to Reinartz.

Reinartz accomplishments included the first two-way transatlantic communication in 1923; publication of the "Reflection Theory of Short Waves" and its implementation with the first transcontinental daylight communication; and management of communications for the 1925 Byrd Arctic expedition.



Portion of Eimac's extensive super-power klystron production and test area

MORE EIMAC KLYSTRONS PRODUCED FOR UHF SUPER-POWER RADAR THAN ALL OTHER TUBES COMBINED

A decade ago Eimac decided that negative-grid tubes were impractical to generate high power at UHF. Instead, Eimac developed external cavity klystrons and opened the upper spectrum to high power propagation. With high power at UHF new applications and systems have been made possible.

Custom, laboratory-made tubes can't begin to meet the demands of systems such as UHF space radar. In keeping with its pioneering tradition, Eimac was a leader in developing super-power, long-pulse klystrons for this system—and followed through with quantity production.

This combination of development and production has placed Eimac klystrons in more tropospheric communications and UHF super-power radar transmitters than all other makes of final amplifier tubes combined. And Eimac will continue to convert its developments to production to meet the increasing demand.

For high power at ultra-high frequencies, investigate the many advantages of Eimac external cavity amplifier klystrons.

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MORE WORD

tion from all possible angles. They do not accept items on an off-the-record basis and diligently follow up leads on stories which come to them from their sources and contacts in various industries.

The editorial and business offices of Fairchild Publications are completely separated. Advertising pressure or the possibility of obtaining advertising is not a factor in determining the newsworthiness of a story.

Electronic News makes use of all of the facilities of the Fairchild organization. The various city bureaus are connected by private wire to New York so that stories breaking as late as an hour before press time on Friday can be in the paper which reaches eastern subscribers Monday morning.

Electronic News consists of several distinct sections. The most important of these are the general news section and the new product section. Since the paper is still relatively new, sections may change as experience shows the readers want emphasis on different items.

Electronic News prints news details rather than circuit details. According to Tipton, the paper is aimed at the reader who has a limited time to get an overall picture of the industry's news.

—Harry J. Lewenstein

MEETING REVIEW

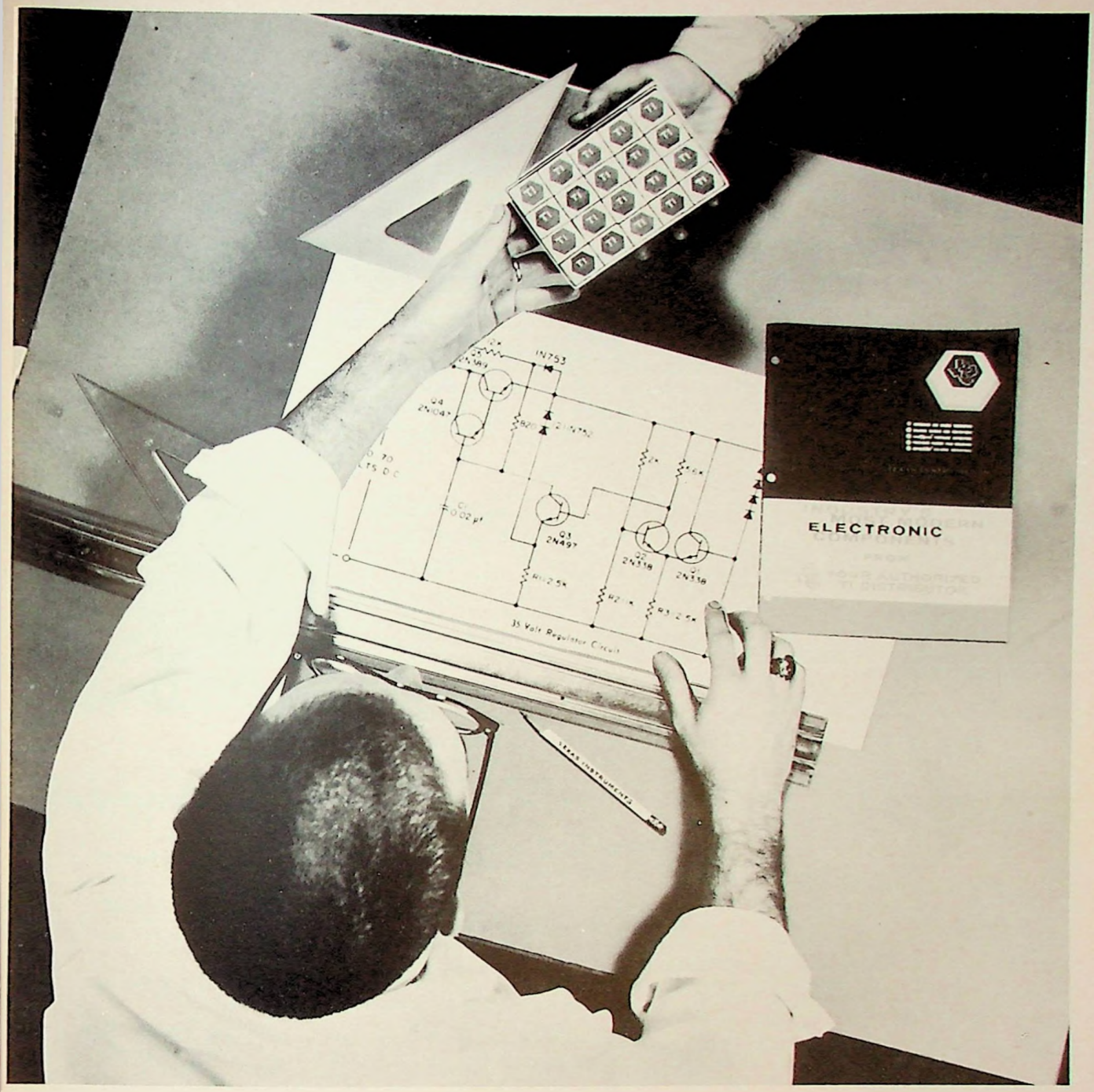
The Night Shift

The January 26 meeting of the PGEC was held at the Bank of America facilities in San Jose.

Jay Levinthal and Claude Tucker of the General Electric Computer Lab in Palo Alto gave talks accompanied with slides and movies on the ERMA computing system. ERMA (Electronic Recording Machine Accounting) was developed by GE for the Bank of America to handle the bank's checking accounts. The talks were followed by a tour of the ERMA computing center in operation. The San Jose installation is one of six that the bank has in California. The prototype is installed in San Jose and five manufactured models are in the Los Angeles area. The San Jose ERMA center is presently handling approximately 50,000 accounts and processing them between 6:00 p.m. and 5:00 a.m. the following morning.

ERMA is a transistorized general-purpose stored-program computer. It uses a 4,000-word magnetic-core memory, 13 magnetic-tape transports, a high-speed line printer, and several check reader-sorters. It is the check reader-sorters that make this system unique. They are the devices that serve as the input to the system. The reader-sorters

(Continued on page 22)



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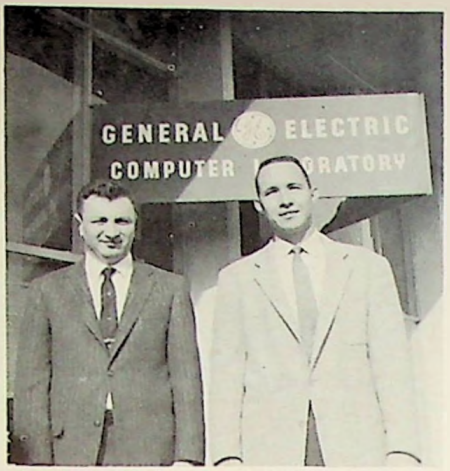


Jay Levinthal and Claude Tucker pose below a familiar sign. They both spoke at the January PGEC meeting

MORE NIGHT SHIFT

read the account number and dollar amount on the original document (check or credit slip) at a rate of 750 documents per minute. The numbers read from the document are printed in magnetic ink in a stylized form that can be read by human or machine.

The basic ERMA philosophy was conceived by Stanford Research Institute nearly nine years ago. SRI pioneered in the field of document handling, character reading, and banking systems. GE entered the field in 1956 picking up where SRI left off and developed the system as it is seen today.

—*J. A. Boysen*

MEETING REVIEW

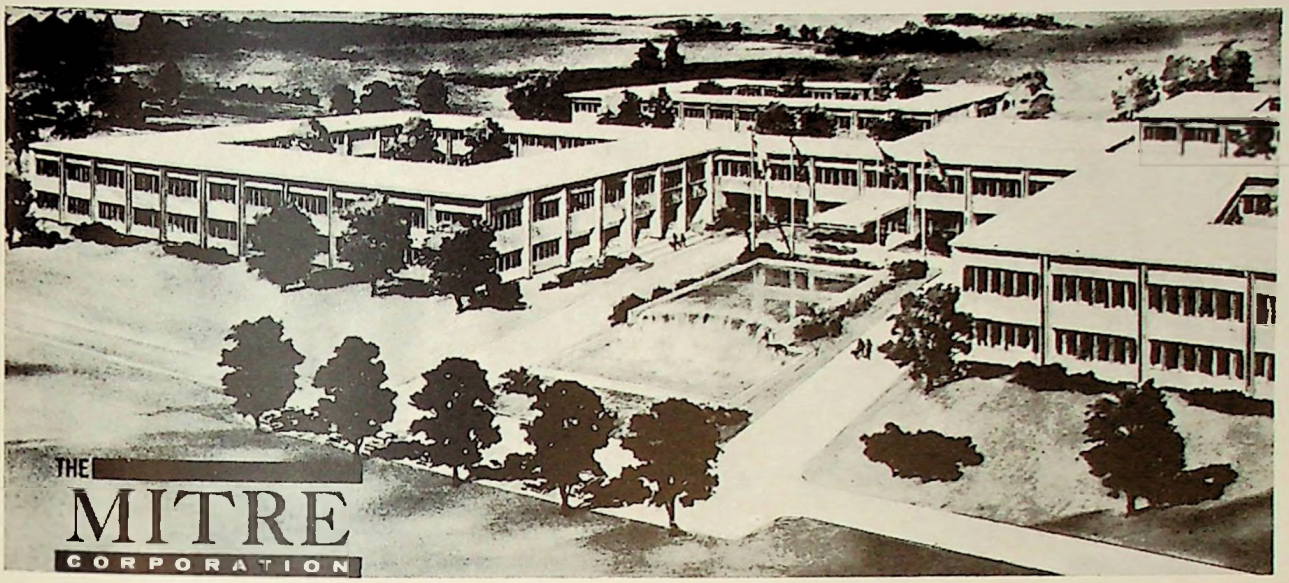
Shh!

A secret Air Research and Development Command presentation was made by Col. Carlos R. Tosti, on January 5, 1960, to Bay Area IRE members and guests. Col. Tosti's presentation on the present status of Air Force Development Programs and future research and development plans was easily the highlight of this year's PGMIL Program. Over

(Continued on page 24)

Carlo Tosti

ENGINEERS • SCIENTISTS



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Dana N. Burdette, Personnel Director, Dept. 16-MD

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MORE AIR FORCE

1,000 persons attended the classified session, and over 175 members of the IRE, student members, and guests attended a January 7th unclassified meeting at the Santa Clara University Auditorium. Col. Tosti's presentation consisted of a well detailed talk interspersed with many color slides and movie shorts, and was very well received by his audience. After the talk, numerous questions were directed to Col. Tosti, especially with regard to future weapons and research systems.

—Jerome J. Dover

EVENTS OF INTEREST

Meetings Summary

February 24-26 — **Fourth Annual Meeting, the Biophysical Society.** Sheraton Hotel, Philadelphia, Penna. H. P. Schwan, University of Pennsylvania, Philadelphia 4, Penna.

February 25-26 — **Seventh Scintillation Counter Symposium.** Hotel Shoreham, Washington, D. C. G. A. Morton, Chairman, Scintillation Counter Symposium Committee, RCA Laboratories, Princeton, N. J.

Belated view of the post-paper discussion at the October PGED meeting. Dr. Dietrich Jenny, left, speaker of the evening, answers questions

March 21-24—**1960 IRE International Convention.** Waldorf-Astoria Hotel and New York Coliseum, New York, N. Y. Gordon K. Teal, Chairman, 1960 Technical Program Committee, IRE Headquarters, 1 East 79 Street, New York 21, N. Y.

San Francisco Section members listed on the Technical Program include: P. S. Carter, Jr., Stanford Research Institute; T. A. Christie, Jr., Stanford University; D. F. Eldridge, Ampex Corp.; J. A. Jolly, Eitel-McCullough, Inc.; H. Kroemer, Varian Associates; E. S. Kuh, University of California; D. K. Lynn, University of California; L. L. Maninger, Sylvania Electric Products Inc.; G. L. Matthaei, Stanford Research Institute; T. Morita, Stanford Research Institute; D. O. Peterson, University of California; V. G. Price; G. E. Microwave Lab; W. E. Scharfman, Staford Research Institute; Charles Susskind, University of California; and O. O. Thompson, Secode Corp.

March 24-25—**Annual Symposium on Human Factors in Electronics.** Bell Tel Labs Auditorium, 463 West Street, New York, N.Y. K. G. Van Wynen, Bell Telephone Laboratories, Room 628A, 463 West Street, New York, N. Y.

(Continued on page 26)

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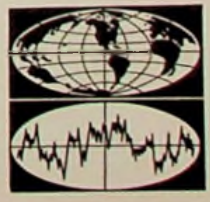

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Papers Calls

March 1—Rough draft manuscripts on any significant aspect of automatic control for the Joint Automatic Control Conference (Boston, Mass., September 7-9). Send to: Harvey A. Miller, JACC Program Committee IRE, Taylor Instrument Co., 95 Ames, Rochester 1, N. Y.

March 1—100-to-200 word abstract in duplicate for the URSI-IRE Spring Meeting (Washington, D. C., May 2-5). Send to: Mr. K. S. Kelleher, 1200 Duke Street, Alexandria, Virginia.

March 15 — Abstracts of 200-400 words for the Fifth Annual Conference on Non-Linear Magnetics and Magnetic Amplifiers (October 26-28). Send to: David Katz, Bell Telephone Laboratories, Whippany, N. J.

March 15 — 500-word abstract on policies for reliability for the Second Annual Bay Area Reliability Seminar (Monterey, Calif. May 6-7). Send to: Louis Fein, 431 Ferne Ave., Palo Alto.

Nomenclature

Unless 10 per cent of the membership records an objection, the Professional Group on Medical Electronics will change its name to the Professional Group on Bio-Medical Electronics, in accordance with an administrative committee action dated January, 1960.

GRID SWINGS

It Is Reported:

Ferro Magnetics Company, Palo Alto, has announced the appointment of **Loren T. Schoof** as manufacturing director. Schoof was previously employed by California Ink Company and Pacific Electric Manufacturing Corporation.

Vega Electronics Corporation announced the sale of $300,000 convertible debentures to **Electronics Capital Corporation,** San Diego. The debentures are convertible into 68 per cent of Vega's common stock, according to an announcement made jointly by **Russell J. Tinkham,** president of Vega, and **Charles E. Salik,** ECC's president. Vega Electronics will be engaged in the design, manufacture and development of precision digital and analog magnetic tape recording equipment and electroacoustic products. The company's main engineering offices and plant have been established in the Palo Alto area.

Tinkham and **Walter C. Hironimus,** Vega's vice president, were formerly executives at Ampex Corporation. Tinkham was president and founder of the Magnacord Corporation and is one of the early pioneers in the field of magnetic tape recording.

(Continued on page 28)

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- **Owen Laboratories, Inc.**
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- **Theta Instrument Corp.**
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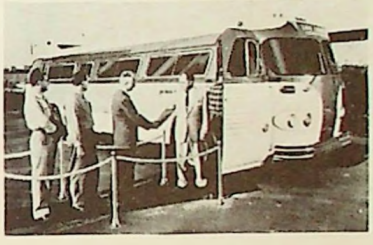

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MORE SWINGS

William Campbell McGee has joined the technical staff of Ramo-Wooldridge, a division of **Thompson Ramo Wooldridge Inc.**, as a member of the intellectronics laboratories. He received his AB degree in physics from the University of California, Berkeley, in 1949, and his MA degree in physics from Columbia University in 1951.

Robert J. Black has joined the same division as a member of the reconnaissance systems department. He also graduated from the University of California with a BS degree, but in electrical engineering.

Dr. Victor B. Corey, San Francisco Section chairman and former technical director of Donner Scientific Co. has been appointed a vice president of **United Control Corp.,** Seattle, Wash. He will have headquarters in the San Francisco area. Initial activities will include the development of precision components and systems to give United a new capability in inertial systems, automatic navigation and guidance, and stabilization controls for aircraft, missiles, and space vehicles. Longer range plans include the design and manufacture of industrial and process controls.

Corey, who was active in the establishing of Donner in 1953, has been responsible for the organization and management of the firm's technical activities. He was previously with Willys Motors Inc., Cornell Aeronautical Labs, and Sylvania Electric Products. He holds an AB in physics and mathematics from Central College, Mo., and an MS and PhD in physics from the University of Iowa.


Corey


Ferguson

Samuel A. Ferguson, vice president and general manager, Mountain View operations of Sylvania Electronic Systems, has been elected chairman of the San Francisco Council of the **Western Electronic Manufacturers Association** (WEMA).

Fifth Dimension, Inc., of Trenton, New Jersey, manufacturers of precision commutators for telemetering applications.

(Continued on page 29)

MORE SWINGS

has appointed **Jay Stone and Associates,** Sunnyvale, as representative.

Lynch Carrier Systems Inc. has changed its name to **Lynch Communication Systems Inc.**

New plant facilities doubling available floor space have been completed by **Knapic Electro-Physics, Inc.,** at 936-40 Industrial Avenue in Palo Alto. The added space will be used to expand research and development in new semiconductor materials.

Rapid growth in all of its product areas has set **Varian Associates'** building plans years ahead and upped the master plan for their Stanford Industrial Park location from 500,000 to 1,000,000 square feet.

Election of **William H. Heflin** as a vice president and a director of **Lenkurt Electric Co.** has been announced. Heflin has been general manager of the commercial products division during the past year. He succeeds **Philips B. Patton,** a vice president since 1952, who has resigned to retire from active business.

Alan F. Culbertson has been appoint director of engineering. He has been with Lenkurt since 1952 when he

(Continued on page 30)

MORE SWINGS

Heflin *Culbertson*

was employed as an applications engineer. He later was manager of transmission engineering and of product planning. The past year and a half he has headed the mobile telephone group which has developed and marketed new systems for vehicular telephone service.

Appointment of **George F. Clifford** as manager of the Spinco division of **Beckman Instruments, Inc.**, Palo Alto, is announced. Clifford formerly was acting manager of the division.

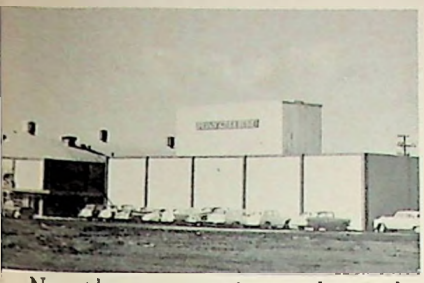
Clifford *Curtis*

ITT Laboratories has announced the appointment of **George L. Curtis** as manager of commercial projects and **B. R. Stack** as manager of military products. Curtis, 39, was formerly in charge of systems planning for the laboratory. He is a graduate of the University of Manitoba, Canada. Stack, 35, formerly served as a project engineer. He is a graduate of McGill University, Montreal.

Appointment of the **V. T. Rupp Company** as representative for **Analab Instrument Corp.** is announced. **Hap Nelson** will run the northern California office from 1182 Los Altos Avenue in Los Altos. Working with him in the area will be **Dick Adams.**

Three-year-old **Raytherm Corporation** has become **Raychem Corporation.** Raychem manufactures irradiated electrical

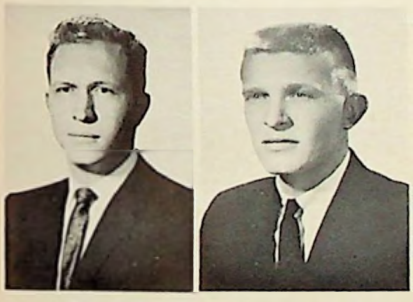
(Continued on page 33)



New plant construction at the newly named Raychem Corporation

and electronic insulations and components at its new plant in Redwood City. The modern facility is currently undergoing a major expansion which will bring its total plant and administrative working area to 60,000 sq ft and increase its capacity by 400 per cent.

Control of **Printonics Corp.**, Palo Alto, has passed into the hands of a management group headed by **Otto J. Feucht, Jr.**, and **John A. Rush**, who have assumed the positions of president and vice president, respectively. Feucht, former business manager of Printronics, is a graduate of the Stanford Business School and was formerly with the marketing division of Lenkurt Electric Co.



Feucht *Rush*

Librascope, Inc., together with the **Kearfott Company, Inc.**, **Link Aviation, Inc.**, and **General Precision Laboratory, Inc.**, have merged and become divisions of a corporation to be known as **General Precision, Inc.** The new firm will be a wholly owned subsidiary of the **General Precision Equipment Corporation.**

Dr. John L. Grigsby has joined the Palo Alto advanced electronic systems firm of **Applied Technology, Inc.**, as chief engineer. He will direct the company's expanding engineering activities in reconnaissance receiving systems, active electronic countermeasures, and special instrumentation for ionosphere

(Continued on page 34)

MORE SWINGS

and radio-astronomy studies.

Formerly Grigsby was with the Stanford University applied electronics laboratory, since 1952 serving successively as engineer, project engineer, and group leader. He also served as a consultant to several electronic firms and was a member of a special advisory committee to the U. S. Army.

Neville *Proschan*

John F. Neville is appointed to head the product and material control section at the electronic defense laboratories of **Sylvania Electric Products Inc. Dr. Frank Proschan,** an engineering specialist at EDL, has received one of five awards presented by the Ford Foundation in a national competition for doctoral dissertations. **Dr. Romayne F. Whitmer** is appointed to head the microwave physics laboratory. He was formerly head of the laboratory's theoretical studies department. Groundbreaking ceremonies for a new 32,000-sq ft Santa Cruz plant have taken place. The Santa Cruz facility is part of the computer products operation of Sylvania.

Sylvania shovels work in Santa Cruz, wielded by R. C. Harper, vice president of Sylvania; Dr. Ted Foster, mayor of Santa Cruz; and James Lambert, production supervisor at the new facility

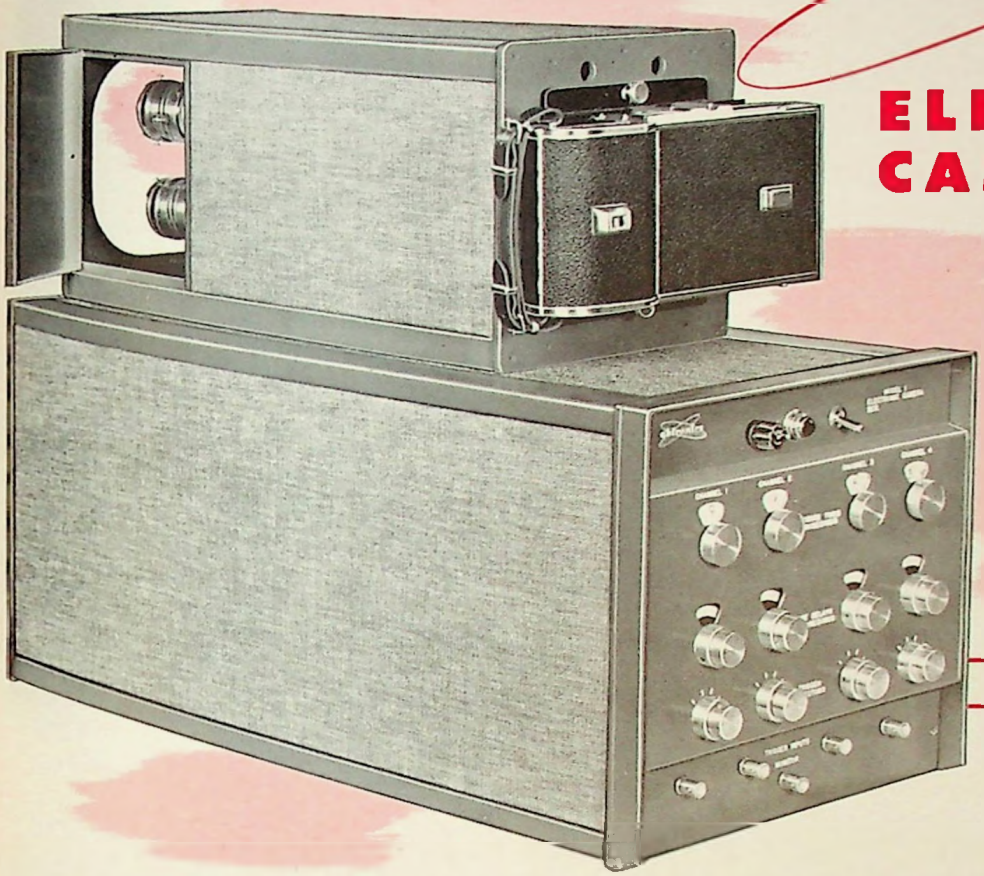
Membership Status

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

Lynn R. Anspaugh
Wallace L. Baker
John D. Balducci
Fred Barline
Murray J. Baron
David A. Bean
John R. Beckworth
Elmer C. Biegel
Georg Bruun
Albert E. Busch
Albert H. Callahan
William G. Coe
John S. Constantinides
James S. Farley, Jr.
Sherman R. Farrell
M. Sgt. Jack H. Firth
George E. Forsen
Michael Furukawa
Alfred R. Gavenas
Maurice V. Gowdey
Robert J. Grenzeback
George H. Hagn
Willis W. Harman
James W. Hebb
Garth Hess
Donald L. Hupfer
Robert L. Jones
Eugene W. Kinaman
William R. Long
Ralph E. Love, Jr.
Robert P. MacKenzie
William A. Malilo
Eric A. Meadowcroft
Charles E. Merkel
Lloyd E. Pawkett
Harry Pinckernell
Don G. Pinol
Albert F. Premo, Jr.
Zachary Rosenman
Wayne E. Roth
Robert J. Rowley
Donald J. Sass
Aivares Savelis
Charles J. See
Norman P. Shein
Herbert F. Shodiss
James E. Simpson
Raymond D. Sinclair
Richard A. Soref
Peter F. Spencer
Harold J. Stirling
Enn Tammaru
Edward A. Thompson
L. J. Travis, Jr.
John Van Geen
Daniel G. Vaughan
Layton O. Warn
Stanley K. Weiss
Sidney Wiesner
Victor R. Witt
Ford La R. Wright

(Continued on page 36)

NEW abtronics ELECTRONIC CAMERA



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MORE MEMBERSHIP

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Charles E. Alvine
Robert H. Arnold
Allen C. Ashley
Anastosio Baiz
Milton E. Barber
William H. Barnes
Rodney P. Barth
Stanley R. Bishop
William F. Boucher
John M. Brown, Jr.
Malcolm C. Bruce
Daniel O. Bushey
Robert M. Campbell
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Li-Hsiang S. Cheo
Thomas H. Clark
Carl D. Clift
Darrell V. Coble
Albert E. Cressey, II
Ronald R. Crum
John A. Daly
Patrick Dare
Harold R. Day
Bruce W. Doerner
William K. English
Walter Gee
Lloyd E. Gillies
Jerry A. Goldstone
Gerald A. Geismore
Gerald C. Gray
Michael P. Hallett
David K. Halstead
Stevens Halsted
Jerry D. Haney
Douglas B. Heyen
Milton Ham
Robert A. Jacobsen
Keith O. Johnson
Ray M. Johnson
Jack H. Jones
Clinton C. Julson
Yates A. Kier
Barton W. Kingham
Lowell A. Klaisner
Robert H. Knight
Alfred F. Krochmal
Skul Kumragse
Charles R. La Porte
Paul Lipsius
William J. McLaughlin
Larry G. Meares
Allan M. Miyoshi
Tod Morcott
Lawrence Moser
Steve Y. Muto
Glen A. Myers
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Robert W. Rhomberg
Robert E. Rickleffs
William P. Rodriguez
Rodney R. Rubert
George A. Sarnack
Rodney M. Schneider
Kwang K. Smih
James F. Shively
Arnold N. Silverman
Charles H. Smith
Don C. Smith
Jack Soottoo
Frank J. Sordello
Charles A. Spindt
Donald O. Stanley
Robert D. Strum
James R. Sweet, Jr.
William R. Terrell
Lester E. Thompson
James R. Tucker
Gordon B. Vail
Richard L. Walter
Yie-Fong Wang
Harry W. Webb, Jr.
Harold N. Wells
Carl E. Westenskow
David W. Wilbur
Robert A. Wilcox
Milford H. Wilson
Lewis I. Wood
Malvin L. Yeater

Following are the names of members who have recently been transferred to a higher grade of membership as noted:

SENIOR MEMBER

Warren A. Birge
Dr. Robert E. Finnigan
Peter J. Ullman
Reinhold F. Nylander
B. R. Stack

MEMBER

Elmer D. Akerberg
E. Franklin Barnett
Clifford B. Clemo
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Frederick B. Jacobus
Donlan F. Jones
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James E. Medlin
Daniel M. Nemirow
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Kenneth M. Regenos
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American Mach. & Fdry.	McCarthy Assoc.
Analab Instrument Corp.	V. T. Rupp Co.
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Boonton Electronic Products, Inc.	O'Halloran Assoc.
C and H Supply Company	Jess W. Coffer
Callite-Tungsten Corp.	Jack Kaufman
Data Instr., Tele.	T. Louis Snitzer Co.
Daytronic Corp.	McCarthy Associates
Di/An Controls, Inc.	Jay Stone & Assoc.
Dymec, Div. Hewlett-Packard Co.	Neely Ent.
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John Fluke Mfg. Co.	McCarthy Assoc.
Franklin Electronics, Inc.	T. Louis Snitzer Co.
General Communication	T. Louis Snitzer Co.
Glass-Tite Industries	Jay Stone & Assoc.
Hewlett-Packard Company	Neely Enterprises
Heli-Coil Corp.	Premmco, Inc.
Houston Instrument Corp.	McCarthy Associates
Hughes Products Co.	McCarthy Assoc.
Kauke and Co., Inc.	Jay Stone & Assoc.
Keithley Instruments	T. Louis Snitzer Co.
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Polarad Electronics	T. Louis Snitzer Co.
Radiation Counter Labs	White and Company
Rantec Corp.	O'Halloran Assoc.
Sanborn Company	Neely Enterprises
Sensitive Research Instrument	McCarthy Assoc.
Sierra Electronic Corp.	T. Louis Snitzer Co.
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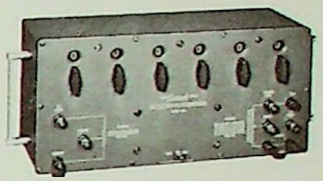
low effective series impedance

very low phase shift

RT-10R

STANDARD RATIO TRANSFORMERS

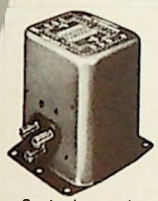
Sixteen models of these variable, tapped auto-transformers are stocked, differing in mechanical construction, type of switching, number of decades, degree of resolution, max. input voltage, etc. Models available, either case-or rack-mounted.



1001

RATIO STANDARDS

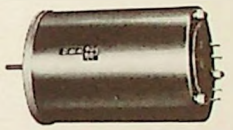
Combining precision RatioTrans with precise resistive dividers, these units offer the ultimate in accuracy (up to .0001%), for calibration and instrument standard labs. Available in 6 combinations of AC & DC sections.



ST-100

SPECIAL-PURPOSE TRANSFORMERS

Gertsch produces many types designed for bridging, isolation, and calibration applications. Many models are available, varying in turns ratio, input impedance, and other specifications.



RRT-1

SHAFT-DRIVEN RATIOTRANS

—precision shaft-angle to AC voltage ratio transducers, with the ratio reading visible through a window in the case. Units are driven by ¼" shafts, and supplied in either 100-turn or 1000-turn models.

PROGRAMMABLE RATIOTRANS

—for automatic checkout equipment and other programmed devices. Gertsch units accept decimal, binary-coded decimal, or straight binary data arriving from punched tape or card readers. Units can be designed to customers applications.

You can set the ratios on these RatioTrans® by almost any method, from simple, manual in-line decade, to coaxial rotary set, proportional shaft position, or remote binary selection. MIL Spec. types available.

CRT-3

COAXIAL SWITCH RATIOTRANS

These small, lightweight instruments, accurate to 0.001%, are available in 2 types—one a 2½" diameter unit qualified to MIL Specs... the other a 3½"- diameter unit, economically priced.

CRT models are available with up to 6-place resolution, and in a variety of decade arrangements. Gertsch also manufactures a complete line of coaxial-switched resistive dividers.

All types are built to typical Gertsch quality standards... many units available from stock. Requests for specials will be given prompt attention. For complete data, request Cat. =6.

Gertsch

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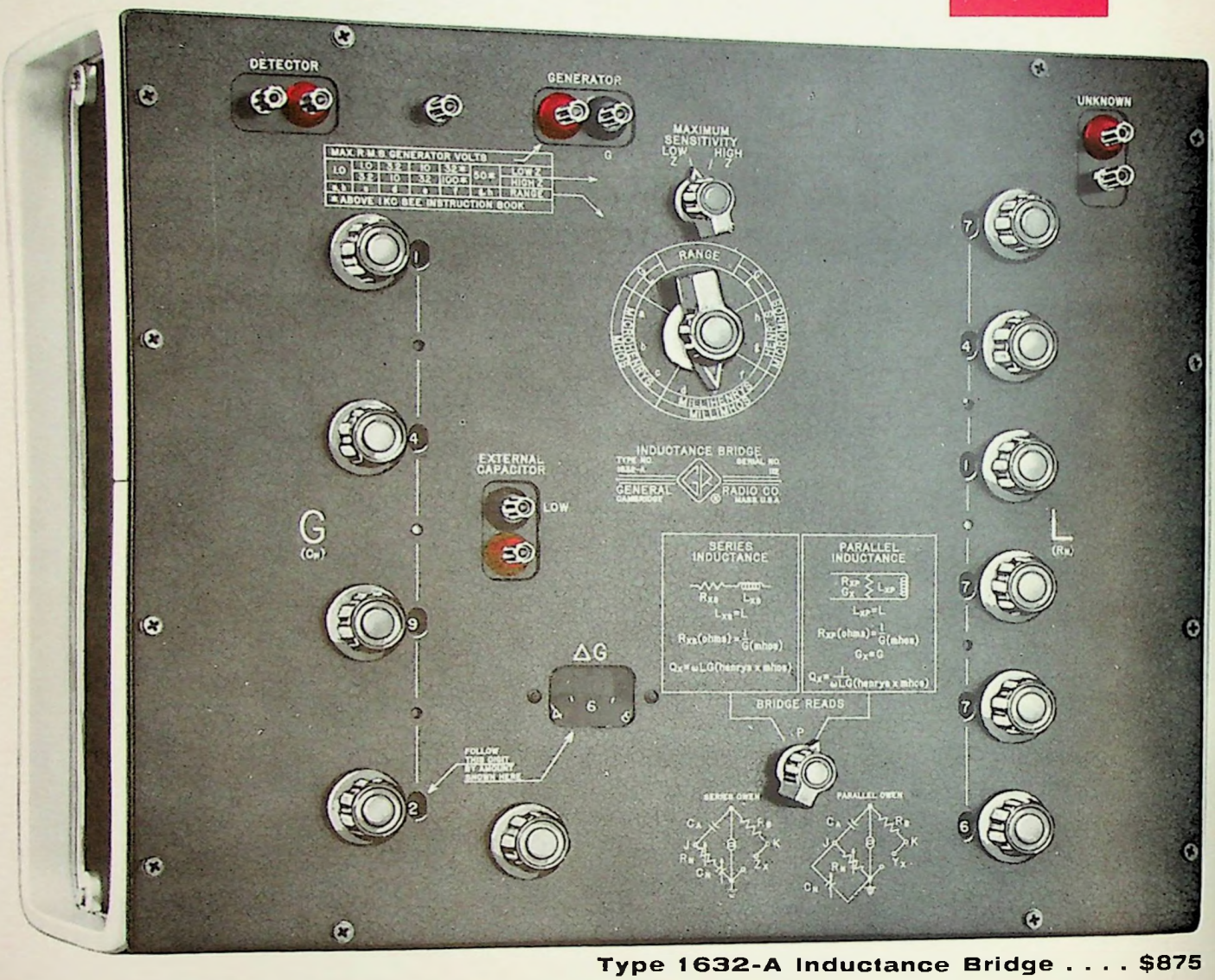
NEW — FOR THE PRECISE MEASUREMENT OF INDUCTANCE



Type 1632-A Inductance Bridge $875

★ The ideal bridge for the calibration of inductance standards.

★ Wide range — 0.0001 μh to 1111h.

★ Basic direct-reading inductance accuracy is ± 0.1%.

★ High resolution — six significant figures.

★ No sliding balance.

★ Easy, in-line readout. Range switch locates decimal point and identifies units of measurement.

★ Designed for use at 1 kc and lower, the bridge will make measurements to at least 10 kc with slight reduction in accuracy.

★ Measures either parallel or series inductance over mid-range; parallel inductance for high-Q inductors, series inductance when Q is low. Direct reading in terms of conductance and inductance.

★ Incremental inductance measurements may be made at low a-c and d-c voltages.

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