

EDITOR'S PROFILE of this issue

from a historical perspective ...

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

September, 1965:

Cover: These are the rough plans for the Foothill Electronics Museum, to be constructed at Foothill College in Los Altos. More details on page 3. I visited it several times, and at one point it had a full-sized Chuck-E-Cheese animatronic "rat".

Page 4: A listing shows all the chapter officers for the SF Bay Area IEEE groups. Charles "Bud" Eldon is shown as heading up the Future Engineers Show.



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

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At time of scanning, the bound volumes are held by Paul Wesling. July, 2021 Contact p.wesling@ieee.org

IEEE
Grid

September 1965
SAN FRANCISCO SECTION
INSTITUTE OF ELECTRICAL
AND
ELECTRONICS ENGINEERS

**ANNUAL
DIRECTORY
ISSUE**



**meeting
reminder**

- Aerospace and Electronic Systems, Thursday, October 28
- Communications Technology, Wednesday, September 22
- Computer, Tuesday, September 28
- Nuclear Science, Monday, September 20
- Parts, Materials, and Packaging, Tuesday, September 28
- Santa Clara Valley Subsection, Saturday, October 16



*When this headline was current news...
 digital recording tapes
 had a packing rate of 200 bpi.
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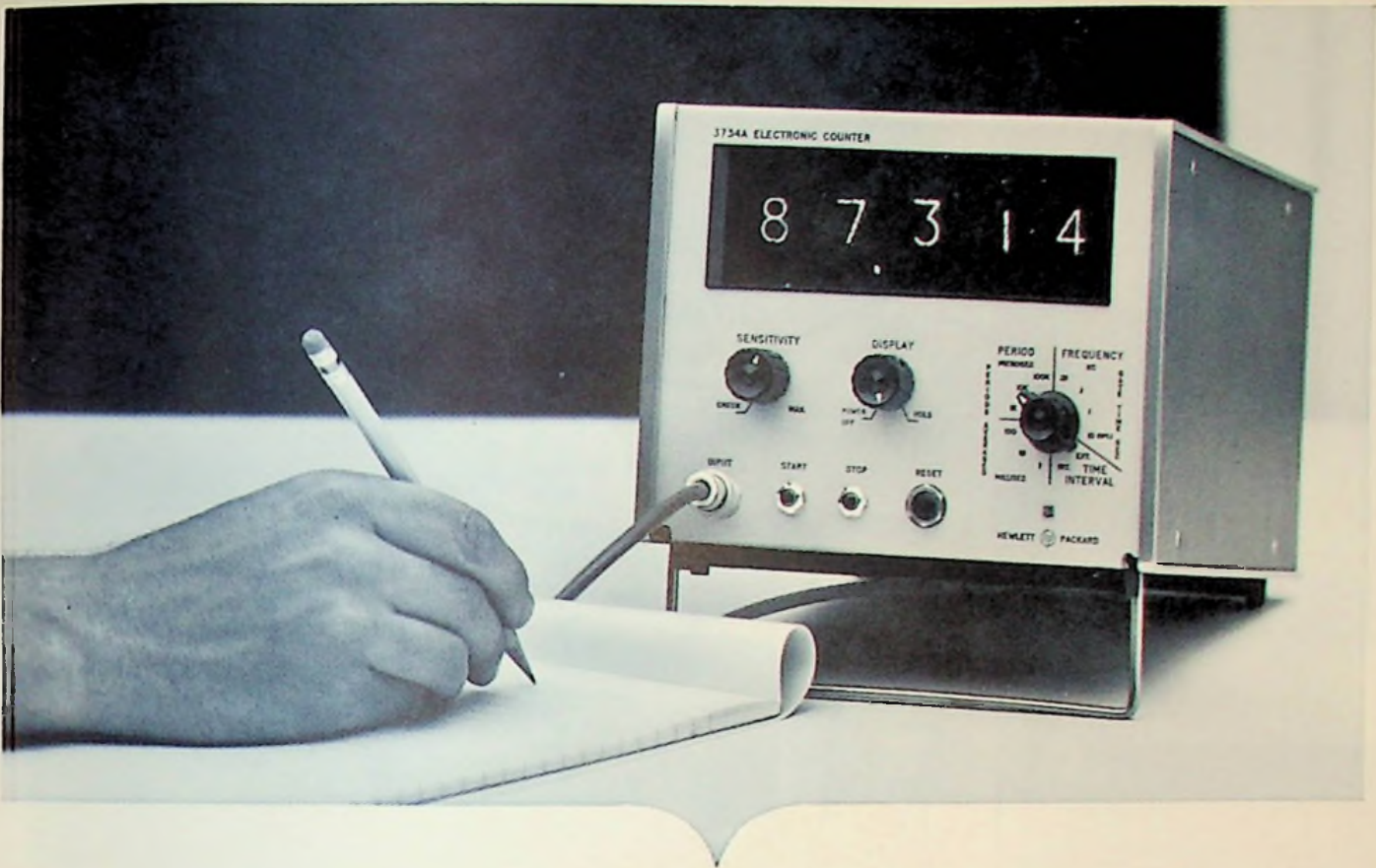
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*Data subject to change without notice. *Price in U.S.A. f.o.b. Palo Alto, California. For price in other countries, call your local hp sales office.*

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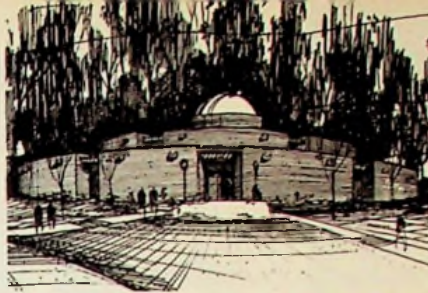
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cover story

ELECTRONICS MUSEUM

The board of directors of the Perham Foundation recently approved preliminary architect's plans for the Foothill Electronics Museum to be built at Foothill College in Los Altos Hills.

Also approved was the \$250,000-fund-raising program in the electronics and space industries which is being handled by John R. Doscher & Associates of Santa Clara.

The announcement was made by Ralph M. Heintz, Jr., president of the foundation. The architects are Kump, Masten and Hurd, of San Francisco, who also designed all of the Foothill College buildings.

The museum will be a part of the Foothill College Space-Science Center. The plans call for a two-tier, semi-circular set of ten modular units, each 2,000 square feet in area. The buildings will be one-story brick structures of varying ceiling heights built into the side of a hill. At the top of the hill is the new observatory building, which houses a 16-inch reflecting telescope. The observatory sets the theme of the Space-Science Center.

The Perham Foundation will build the first five units of the museum at a cost of \$250,000 and will deed the buildings to Foothill College. Half of the space will be used to display the Perham Collection of historical electronic devices and artifacts. The collection will also be deeded to the college.

The other half of the space will be used for the display of contemporary electronic and space exhibits to be provided by industries in the Peninsula area.

Upon completion, the museum will be managed by the office of community services of the college with the foundation serving in an advisory capacity. Community services manages the Foothill College planetarium, which was visited last year by 26,000 elementary school children. Dr. Ervin Harlacher, director of the office of community services, expects similar use of the museum.

In addition, the museum will be used by the college and by industry for educational programs. It will also

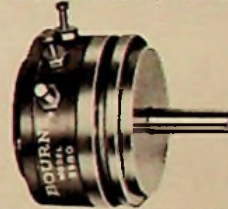
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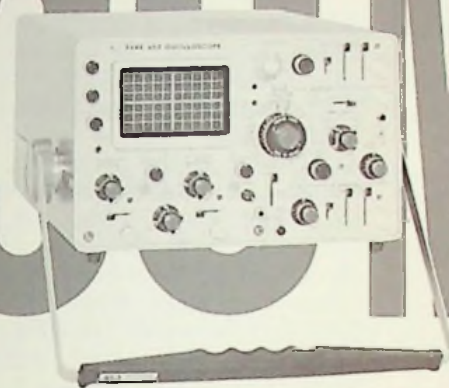
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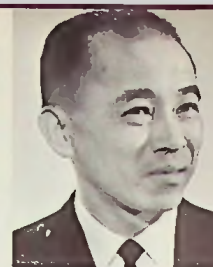
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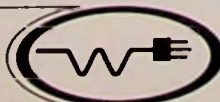
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now	44	60

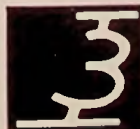


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section notes

BULLETIN BOARD NOTICES

Carrying the meeting calendar information that appears in Grid, but mailed in the preceding month, bulletin board notices are printed and distributed regularly by the section office to nearly 500 members who have agreed to post them on the 860 bulletin boards of their firms or organizations. If you would like to be added to the mailing list, call or write to section office, indicating how many copies you would like to post each month in locations where they will attract the attention of member or non-member engineers.

MORE ELECTRONICS MUSEUM

be open to the public on a scheduled basis.

Heintz said that the aim of the foundation is to make the museum the foremost facility of its type on the West Coast. "It is particularly appropriate that the museum will be located in the center of the electronics industry in Northern California," he said.

Completion is expected in mid-1967.

STUDENT BRANCHES



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Hurd

Fresno State College
Fresno, (209) 222-5161
Counselor: James H. Smith
Heald Engineering College
1215 Van Ness Ave.
San Francisco 9, 673-5500
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San Francisco 32, 584-2300, Ext. 706
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San Jose 14, 294-6414, Ext. 2019
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Counselor: Willard Wattenburg



Nettesheim



Bouldry

University of Santa Clara
Santa Clara, 296-3360, Ext. 227
Counselor: Henry Nettesheim
U.S. Naval Postgraduate School
Monterey, (408) FR 2-7171, Ext. 513
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SENIOR ELECTRONIC ENGINEERS

Design of circuits for compensating time base and intra-channel time displacement errors of signals reproduced from tape transports, design of signal and control electronics for tape transports, and design of amplifiers in the dc-2mc range.

B.S. plus three years experience in circuit design required. Good knowledge of state-of-the-art in available hardware is essential.

SENIOR MECHANICAL ENGINEERS

Analysis and design of mechanical components for tape transports and related products. Must be able to apply fundamental knowledge of applied mechanics and perform dynamic analysis whenever necessary. Will also generate and evaluate engineering drawings of finished design.

Require B.S. plus three years of experience in transport or computer peripheral equipment design.

JUNIOR ENGINEERS AND DEVELOPMENT TECHNICIANS

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NUCLEAR SCIENCE

Guy A. Armantrout, Lawrence Radiation Laboratory, Livermore, will address the Nuclear Science chapter on state-of-the-art detectors for nuclear spectroscopy at its September 20 meeting.

The lecture will survey the manufacture and applications of a number of different types of semiconductor radiation detectors currently being used for nuclear spectroscopy. Special emphasis will be placed on large volume Ge Li drifted detector gamma-ray spectrometers and the work which is being carried out on detector development at LRL Livermore.



Armantrout



Farina

COMPUTER CHAPTER

Subsystem level MOS integrated devices will be Donald E. Farina's subject at the Computer chapter's meeting on September 28. He is manager of the subsystems components operation at General Micro-electronics Inc., Santa Clara.

MOS integral circuits with high functional complexity have been fabricated with upwards of 600 MOS devices contained in one silicon chip. These MOS subsystem devices can provide significant cost reduction over that of conventional double diffused integrated circuits. The purpose of the presentation will be to describe some of these accomplishments, and to discuss some of the new logic and circuit design techniques that are made possible by the unique properties of the MOS devices.

Specifically, synchronous delay and temporary MOS gate memory are used to form logic operators that dissipate power only during the clock pulse time. Therefore, low speed (10 Kc) logic systems dissipate only 20 μ w per NAND function, as compared to 2 mw at medium speed (1 mc).

The MOS devices used are very small. A half adder function requires the same die area as a bonding pad and a J-K flip-flop—0.008 x 0.008 inches. Consequently, a 40 NAND gate complex function can be accommodated in a die area of 0.065 x 0.065

(Continued on page 20)

MEETING CALENDAR

September 20, Monday, 8:00 P.M.—Nuclear Science
State of the art detectors for nuclear spectroscopy

Guy A. Armantrout, Lawrence Radiation Lab

Place: Hap's Restaurant, Pleasanton

Dinner: 6:30 P.M., Hap's

Reservations: 447-1100, Ext. 8011, by Sept. 17

September 22, Wednesday, 7:00 P.M.—Communications Technology

Straflcher String Trio—entertainment and social event

The Trio: Dr. E. Engleman, M.D.; Chalmers Smith, Attorney; Craig Vittetoe, Teacher and Writer

Place: Paul Masson Winery, Saratoga (see map on page 13)

Dinner: Barbecue at 7:00 P.M., on the patio of the Paul Masson Winery

Reservations: Robert Howland (408) 291-4039, George Griffith, 591-8461, Ext. 525, by Sept. 21. Price: Approx. \$4.50

September 28, Tuesday, 7:30 P.M.—Parts, Materials, and Packaging

Stanford Linear Accelerator Tour

Speaker and Guide: Douglas Wm. Dupen, head of technical and public information department, SLAC

Place: Administration Bldg., SLAC, 3101 Sand Hill Road, Menlo Park

September 28, Tuesday, 8:00 P.M.—Computer Chapter

Subsystem level MOS integrated devices

Donald E. Farina, Manager of the Sub-Systems Components Operation, General Micro-electronics, Inc., Santa Clara

Place: GE Computer Lab, 310 Deguigne Dr., Sunnyvale

Dinner: 6:15 P.M., Old Plantation, El Camino and Bernardo, Sunnyvale

Reservations: Dr. Wendell Sander, 321-7250, Ext. 257, by Monday, Sept. 27

October 16, Saturday, 5:00 P.M.—Santa Clara Valley Subsection

Oceanography

James M. Snodgrass, division head special developments, Scripps Institute of Oceanography

Place: Officers' Club, U.S. Naval Postgraduate School

Dinner: 7:00 P.M., (same); cost: \$3.75 each

Reservations: Lt. Cmdr. Passantino in Monterey at 624-9371 or Lt. Shortal in Carmel at 372-9133; Art Wells in San Francisco at JU 6-4074 or Don McCauley in Palo Alto, 326-4350, Ext. 4757 or Ext. 5841, at least one week in advance

October 28, Thursday, 8:00 P.M.—Aerospace and Electronic Systems

Mariner IV

(Speaker to be announced)

Place: Lockheed Auditorium, Palo Alto, Bldg. 202

No dinner



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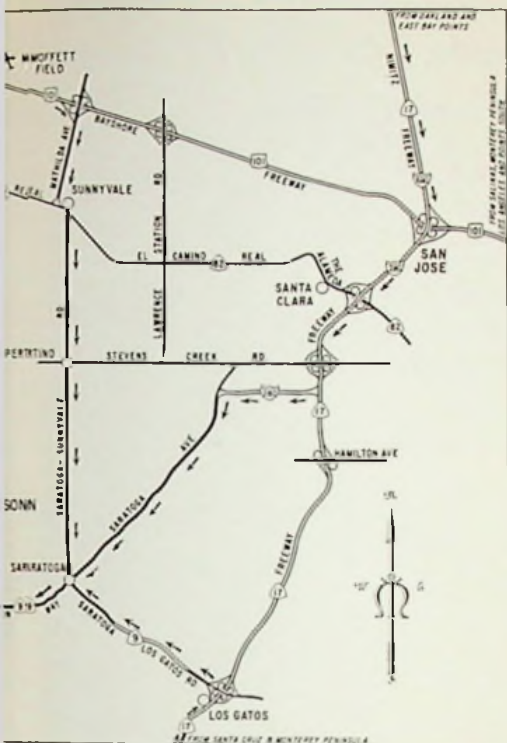
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meeting ahead

COMTECH

The Communications Technology chapter will start its season with a wine-tasting, barbecue, and chamber music program at the Paul Masson Winery in Saratoga on Wednesday, September 22.

Following dinner, a half-hour program of chamber music will be presented by the Straflcher String Trio. Chairman F. S. Beale will give a brief prospectus of the technical programs scheduled for the coming year.

meeting ahead

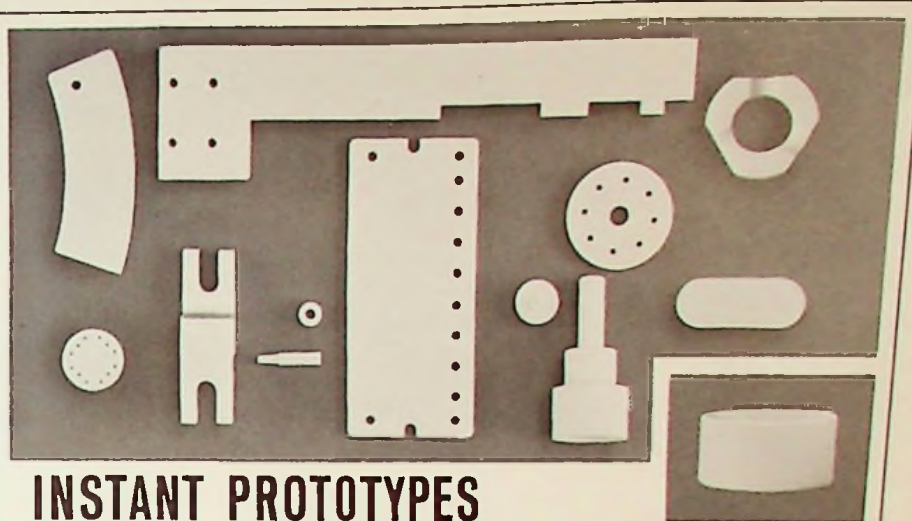
SLAC REVISITED

The Parts, Material, and Packaging chapter (made up of former members of Product Engineering and Production and Component Parts) will tour the Stanford Linear Accelerator, including the klystron gallery and accelerator housing, at 7:30 p.m. on Tuesday, September 28.

The first 700-foot section of the accelerator has been successfully turned on to test the various components and systems involved.

Speaker and guide will be Douglas Wm. Dupen, head of technical and public information dept., SLAC. The group will assemble at the administration building, 3101 Sand Hill Road, directly across from the Sharon Heights Golf Club.

Thirty-three sections make up Region 6, largest in IEEE.



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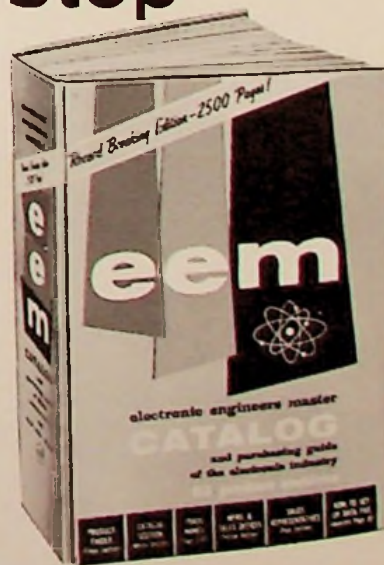
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TENTATIVE PROGRAM SCHEDULE

San Francisco Section, 1965-66

SECOND:

Tuesday:

Fresno Subsection
Engineering in Medicine and
Biology, EMB (G-18)
Power, P (G-31)

Wednesday:

Instrumentation and Measurement,
IM (G-9)
Industry and General Applications,
I&GA (G-34)

Thursday:

Broadcasting, B (G-2)
Vehicular Communications, VC (G-6)

THIRD:

Monday:

Nuclear Science, NS (G-5)

Tuesday:

Antennas and Propagation, AP (G-3)
Reliability, R (G-7)
Automatic Control, AC (G-23)

Wednesday:

Santa Clara Valley Subsection
Circuit Theory, CT (G-4)

Thursday:

Audio, A (G-1)
Information Theory, IT (G-12)
Microwave Theory and Techniques,
MTT (G-17)

FOURTH:

Monday:

East Bay Subsection

Tuesday:

Engineering Writing and Speech,
EWS (G-26)
Engineering Management, EM
(G-14)
Computer, Comp (G-16)
Parts, Materials and Packaging,
PMP (G-21)

Wednesday:

Communication Technology, Com-
tech (G-19)
Electron Devices, ED (G-15)
Electromagnetic Compatibility,
EMC (G-27)

Thursday:

Aerospace and Electronic Systems,
AES (G-10)

Those groups planning only four or five meetings during the year (September through June) should consult other chapters assigned the same night, to stagger their meetings by months. Appropriate joint meetings should also be arranged whenever possible.

Most Section meetings will be joint with subsections or chapters. When not joint, they will be scheduled during the first week of month whenever possible to avoid conflicts. Contact Program Chairman Ed Hulse or Group Coordinator Victor Kaste (see directory) to arrange joint meetings with the Section.

The closing date for meeting material has been moved from the 20th to the 15th of the preceding month in order to advance the publication date, effective with the October issue. Those members not receiving the Grid by the 5th of the month are asked to call the Section/Grid office, 327-6622.

san francisco section

RURAL ELECTRIFICATION CONFERENCE

The 9th annual rural electrification conference of the IEEE was held at the St. Francis Hotel, San Francisco, on May 24-25. The conference was sponsored by the rural electric committee of the IEEE Industry and General Applications Group with the effective cooperation of San Francisco and Sacramento sections. Ten papers were presented covering overhead and underground lines, motors, motor over-current protection, sponsored research, some specific uses of electricity on the farm, and foreign developments

section inputs

CHANGE OF ADDRESS

If you plan to change your address, notify headquarters and the section office at least three weeks in advance of the effective date.

in rural electrification. Three presentations were not accompanied by papers.

One of the highlights of the meeting was the awarding of a certificate and a \$100 prize to Dr. Naim M. Abou-Taleb, U.N.E.S.C.O. expert in Mexico, for his paper "Problems Facing Developing Countries in Their Planning for Rural Electrification."

WESTERN ELECTRONIC SALES GAIN IN '65 AFTER '64 DROP

The sales curve of the western electronics industry is turning upward again, following a slowdown during 1964.

Most companies in the West are forecasting higher sales this year, to bring total output for 1965 to \$3.840 billion, according to the Western Electronic Manufacturers Association (WEMA). Factory sales in the 13 western states dropped last year to \$3.735 billion from the \$3.875 billion in 1963.

WEMA President William H. Heflin noted that percentage increase of western sales will be parallel to the industry's national growth of 2.5 to 3 percent. The association predicts total U.S. sales for 1965 will rise to \$16.4 billion, from last year's volume of \$16 billion.

Employment in the West's electronics companies stood at 236,500 at the beginning of the year, Heflin said, 12,000 fewer employees than a year earlier.

Although WEMA did not attempt to forecast employment trends, Heflin said that "many companies are stepping up their hiring activity again to

handle increasing production and research."

Sales and employment figures were derived from a survey conducted by WEMA during the first quarter of this year.

The Los Angeles metropolitan area holds the largest concentration of electronics manufacture, with 1964 sales of \$2.150 billion and employment of 143,000. The San Francisco bay area accounted for \$800 million last year, with employment of 45,000.

Arizona continues to be the fastest-growing complex of electronics, the WEMA survey disclosed. Sales for 1964 in that state totaled \$265 million, an increase of 13.2 percent over the previous year. Year-end employment stood at 17,100.

Figures for other areas of the West last year included \$175 million in sales and 10,800 employment for San Diego; \$165 million in sales and 9,400 employment for the Pacific Northwest; and sales of \$180 million and employment of 11,200 in the balance of the West.

TRANSFORMER DESIGN ENGINEER

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SENIOR PROJECT ENGINEER

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TUCSON, HUACHUCA SECTIONS HOST REGION 6 IN 1966 ANNUAL CONFERENCE, APRIL 26-28

Technical papers are solicited for the 1966 IEEE Region 6 annual conference which will take place April 26-28, 1966, in Tucson, Ariz., at the Pioneer International Hotel. The conference will feature an exceptional program of technical papers and invited speakers.

Among the speakers will be: Dr. Richard Bellman, Rand Corporation; Dean W. L. Everitt, University of Illinois; and Dr. W. G. Shepard, University of Minnesota.

Among the session chairmen will be: Dr. N. Abramson, Harvard University; Dr. J. A. Aseltine, Space Technology Laboratories; Dr. A. V. Balakrishnan, University of California at L. A.; Dr. S. Buschbaum, Bell Telephone Laboratories; Mr. Igor Bazovsky, Litton Industries; Professor Leopold Felsen, Polytechnic Institute of Brooklyn; Dr. J. C. Hancock, Purdue University; Dr. N. Hilberry, University of Arizona; Dr. L. E. Killion, Scientific Advisor, USAEPG; Dr. E. W. Kimbark, Bonneville Power Administration; Dr. G. A. Korn, University of Arizona; Dr. G. Leitmann, University of California; Dr. I. A. Lesk, Motorola Semiconductor Products Div.; Professor J. H. Mulligan, New York

University; Dr. A. Papoulis, Polytechnic Institute of Brooklyn; Dr. D. O. Pederson, University of California; Dr. M. E. Van Balkenburg, University of Illinois; and Dr. J. R. Wait, National Bureau of Standards.

Topics include: communications systems, medical electronics, automatic control, circuit theory, quantum electronics, integrated circuits, solid state device technology, basic sciences, military electronics, information theory, engineering education, nuclear generation of power, electromagnetics, digital computers, hybrid and analog computers, reliability, system theory, solid state and gaseous plasmas, optimal control, atmospheric electricity, high voltage DC transmission of power, and propagation of pulses, (in man-made or natural wave guides).

Submission of papers should include a cover letter containing the name and address and telephone number of the author and the author's affiliation. Authors are requested to submit three copies of a 300-500-word summary of their paper. Carbons or Xerox copies may be used. They are also requested to submit four copies of a 35-50-word abstract

of their paper. Carbons or Xerox copies may be used.

Submission of the summaries and abstracts should be sent on or before December, 1965, to: Dr. L. O. Huelsman, c/o Department of Electrical Engineering, University of Arizona, Tucson, Arizona 85721.

Authors will be notified of the status of their papers as soon as the technical program committee has completed its review. This should not be later than January, 1966. At the time of notification of acceptance, authors will receive any appropriate editorial comments and instructions for preparing the final manuscript.


The papers presented at the IEEE 1966 Region Six annual conference will be published in the convention records. Copies of the convention records will be mailed to participants following the meeting. Abstracts of the papers will be made available at the time of the conference.

Papers will be presented at a three-day meeting composed of four sessions each morning and four sessions each afternoon. All sessions are presently planned to be unclassified and will cover submitted papers as well as specially invited papers.

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educational notes

UC BIOMEDICAL GRANT

A grant totalling nearly \$500,000 to support graduate and postdoctoral training in biomedical engineering has been awarded to the College of Engineering at the University of California at Berkeley, George J. Maslach, dean of the college, has announced.

The grant, by the National Institutes of Health, is the first such NIH award to an engineering college in California.

Extending over a five-year period, the grant will ultimately provide stipends for 15 doctoral candidates and four postdoctoral researchers in biomedical engineering.

Dr. Irving Fatt, professor of petroleum engineering and assistant dean of the college, will be responsible for administering the grant program.

"Bioengineering," said Dean Fatt, "is a relatively new field, in which we seek to apply the principles of engineering analysis and design to solve critical problems in the medical and life sciences. A substantial research program is already underway at Berkeley.

"The training grant meets a special need for student support, because the requirements for the Ph.D. in biomedical engineering are more arduous and take longer to meet than in most other engineering fields."

Besides Dean Fatt, eleven faculty members of the College of Engineering will participate in the training program. Their specialties include electrical, industrial, and mechanical engineering and mineral technology.

Faculty specialists in a number of life science fields will also join in the interdisciplinary effort. Included are molecular biology, optometry, medical physics, physiology, and zoology.

In addition to the stipends of some \$3,800 a year for each doctoral candidate, and up to \$7,800 a year for postdoctoral researchers, the grant provides for tuition, laboratory supplies, and costs of publication of findings.

Recipients of the NIH stipends will be selected from outstanding applicants on a nationwide basis.

los angeles district

AES WINTER CONVENTION

A. S. Jerrems, technical director, aerospace group, Hughes Aircraft Company, has been elected chairman of the 1966 Winter Convention on Aerospace and Electronic Systems, to be held at the International Hotel, Los Angeles, on February 2, 3, and 4, 1966.

(Continued on page 19)



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16 FELLOWS NAMED

Sixteen members of sections in Region Six were honored late in 1964 when they were elevated to the grade of Fellow. The San Francisco Section, largest in the region, led with nine Fellows, one of whom, George Matthaei, has since moved to Santa Barbara.

The Fellows, by section, and their citations follow:

Hawaii: Carl H. Williams; development of low-cost power distribution systems.

Orange County: Nicholas A. Begovich; controlled phased array radars.

Portland: Everett J. Harrington, power circuit breakers and the application of high voltage capacitors.

San Francisco: William Culshaw; microwave optics, interferometers and gas lasers. Charles P. Ginsburg; video recording techniques and equipment. Willis W. Harman; engineering education in the fields of electron dynamics, linear systems and communication theory. G. Leslie Hill; power circuit protection and the testing of electrical insulation. Ernest S. Kuh; active and passive circuit theory and engineering education. George L. Matthaei; theory and design of microwave networks and parametric amplifiers. Alexander M. Poniatoff; outstanding leadership in the magnetic recording industry. Donald H. Preist; extending the limits on power and frequency in communication and radar. Calvin F. Quate; theory and design of low noise amplifiers.

San Gabriel Valley: Roy W. Gould; theory of microwave tubes.

Santa Monica Bay: George R. Brewer; electron dynamics and ion propulsion. Harry G. Romig; quality control. George F. Smith; areas of electron emission, storage tubes and lasers.

MORE AES

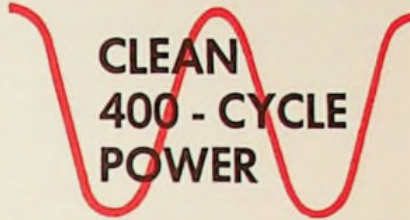
The annual event, formerly the Winter Convention on Military Electronics, has taken on a new name for next year to reflect the broadened scope of the meeting. It is co-sponsored by the Los Angeles District and the group on Aerospace and Electronic Systems (AES).

1966 will mark the seventh year that the winter convention has been held in Los Angeles. The AES sponsoring group represents the merger of four former IEEE groups—Military Electronics, Aerospace, Space Electronics and Telemetry, and Aerospace and Navigational Electronics.

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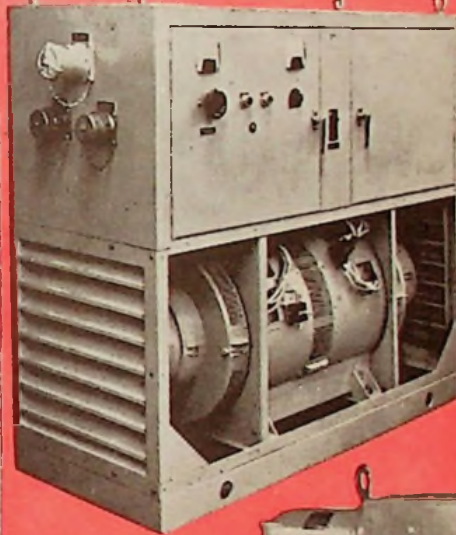
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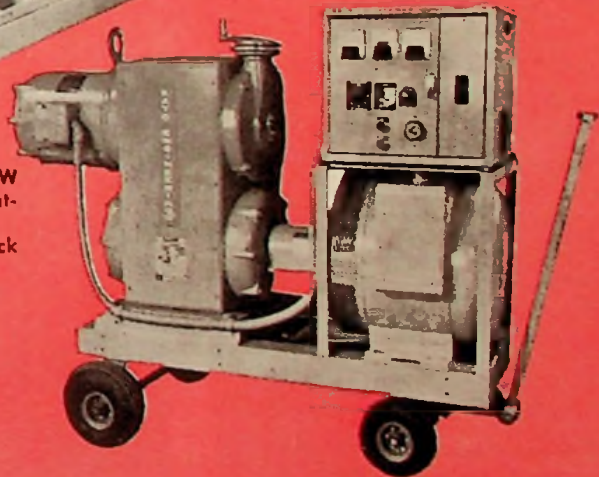
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Farina will consider new computer systems organizations that have become economical for the first time. In particular, the use of digital differential analyzers with distributed memory for airborne computer applications in lieu of a GP computer will be discussed. Cost reductions of 10 to 30 times can be realized through the use of DDA techniques in a typical navigation computer application. In addition, this computer can be 10 to 100 times faster than that obtainable with conventional integrated circuits. Because of the extremely small size of MOS shift registers, the memory can be distributed within each integrator, obviating the need for magnetic drums or delay lines.

Following the presentation, Professor James Angell of Stanford University will summarize and comment on the salient points, and will then encourage the audience to provide observations and questions.

Farina received his BS degree in electrical engineering from New York University in 1953 and did graduate work in physics and mathematics at Adelphi College. He was group leader of digital circuit development in the computer systems department at Sperry Gyroscope Corporation. Previous to his present position, he was supervisor of the digital device development group at Fairchild Research & Development Laboratory.

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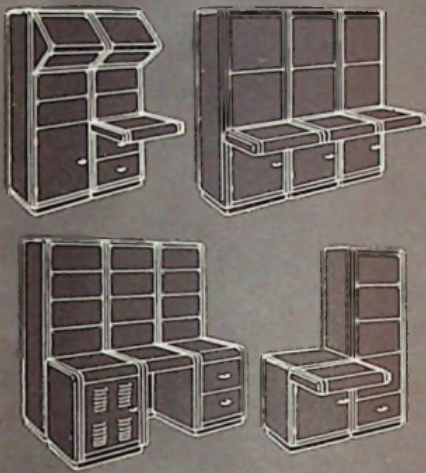
Lt. Gen. Gordon A. Blake, USAF, retiring director of the National Security Agency, Fort Meade, Md., joined Stanford Research Institute, Menlo Park, in June as head of a new research project on international telecommunications.

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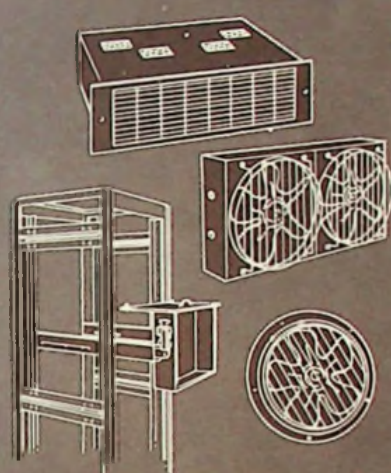
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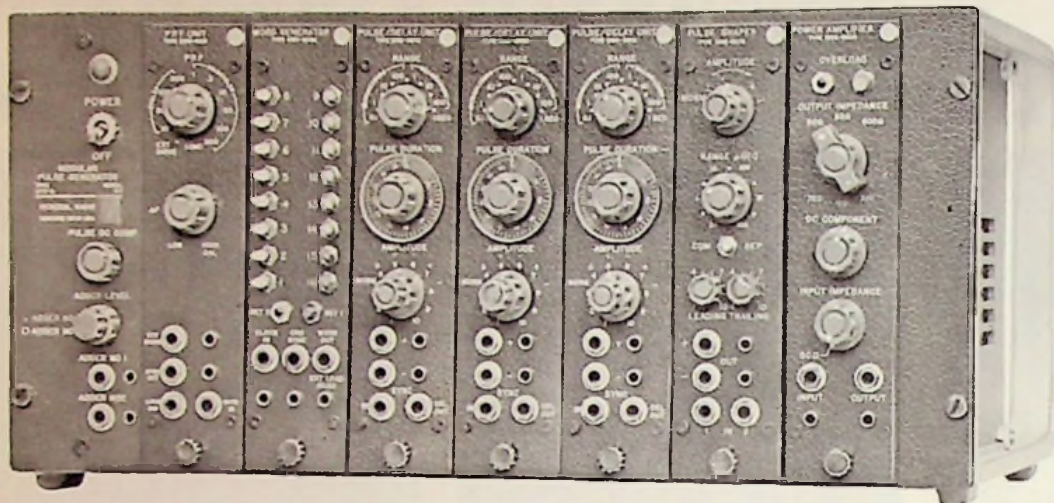
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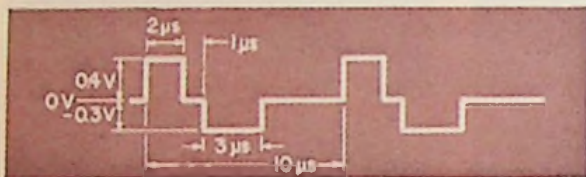


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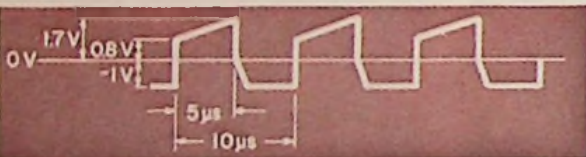
PULSES MADE TO ORDER



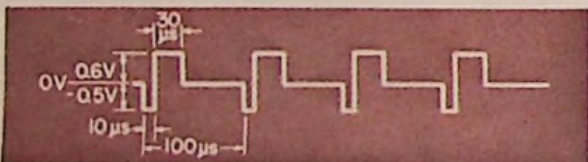
One PRF Unit and three Pulse/Delay Units operating at 100 kc/s. The positive and negative pulses are controlled by separate Pulse/Delay Units; the third unit controls the delay between the pulses.



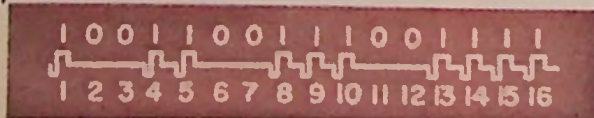
One PRF Unit, one Pulse/Delay Unit, and one Pulse Shaper with the PRF Unit set for 5 kc/s. Rise and fall times are independently variable.



One PRF Unit, one Pulse/Delay Unit, and one Pulse Shaper. Prf is 100 kc/s, and the zero-volt level is adjusted by the main chassis PULSE DC COMPONENT control.



Waveform that appears at the ADDER No. 1 terminal with one PRF Unit driving two Pulse/Delay Units at 10 kc/s. Amplitudes and durations of positive and negative pulses can be independently adjusted.



Pattern produced when a word generator is connected between the PRF Unit and the first Pulse/Delay Unit of the example given above, with switches set as shown.

This new pulse generator can produce thousands of different pulse shapes as single pulses, in bursts, or as trains of pulses. You can even form the desired pulses into binary patterns or words up to 112 bits long. The pulses can be amplified internally, delayed in time, or have noise or sine waves added to them. Amplitudes, durations, and delays of all segments of complex pulses are independently controllable; positive and negative outputs are available simultaneously. Whatever you may need — rectangular pulses, doublets, pulses with pedestals, ascending staircases, descending staircases, triangles, trapezoids, etc. — this instrument can do the job for you.

This instrument has been designed in modular form so that you can order only the pulse-generating capability you require. The various circuits that generate and shape the pulses are packaged in five separate modules, and as many as seven of these can be inserted in the main frame of the generator.

The main frame contains a power supply and other circuits that are common to all modules. As each module is inserted, electrical connections are made through mating of a plug and jack. Two ADDER busses with their corresponding output controls and jacks are included on the main frame to provide signals that represent the "sum" of outputs from the individual modules.

Modules from which you can now custom build your own pulse generator include:

PRF UNIT — provides internally generated repetition rates from 2.5 c/s to 1.2 Mc/s, from dc to 2 Mc/s when driven externally. Price: \$150

PULSE/DELAY UNIT — delays input pulses from 100 ns to 1 second and adjusts amplitude, polarity, and duration. Price: \$165

PULSE SHAPER — adjusts rise and fall times from 100 ns to 10 ms, either individually or simultaneously. Limit of 3 per frame. Price: \$375

POWER AMPLIFIER — delivers 20-volt pulses of either polarity into a 50-ohm load. Limit of one per frame. Price: \$250

WORD GENERATOR — produces binary words up to 16 bits long; as many as seven modules can be cascaded to provide 112-bit capability. Price: \$400

MAIN FRAME (without modules) — Price: \$500



GENERAL RADIO COMPANY
WEST CONCORD, MASSACHUSETTS

Sales Engineering Office in SAN FRANCISCO: 1186 Los Altos Avenue, Los Altos, Calif. 94022
James G. Hussey • Allan L. Abbott • David M. Lloyd