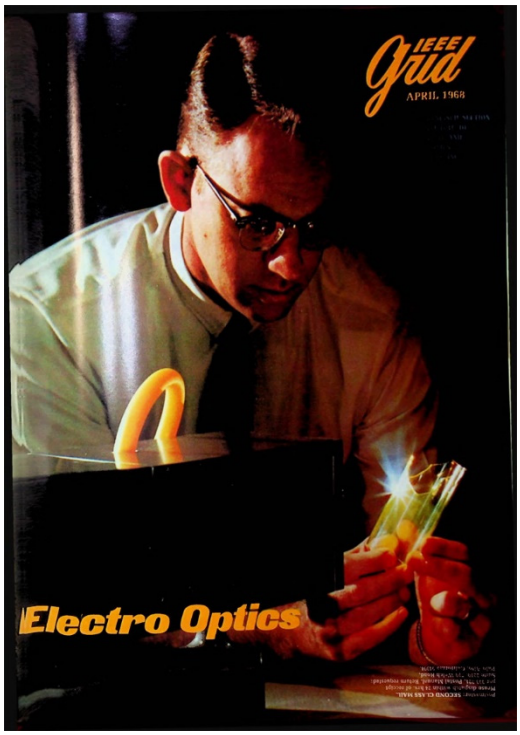
EDITOR'S PROFILE of this issue

from a historical perspective …

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



April, 1968:

Cover: A demonstration shows the power of the newly developed CO_2 laser.

Page 3: The SCV Subsection holds its annual Pioneers Night dinner, with both William Shockley and Gordon Moore as panelists. It would have been interesting to hear interactions between the Nobel Prize winner (for inventing the transistor) and one of the "Traitorous Eight" who left his company to found Fairchild! Photo on page 12 of the June GRID.

Page 16: Lenkurt Electric, where I worked for several years, gets a contract to build a microwave relay system along a railroad right-of-way, to sidestep AT&T's monopoly on long-distance services for voice communications. It builds a similar one along the Southern Pacific Railroad's central-California right-of-way, funded by SP. This becomes Southern Pacific Communications Company and the nucleus of Sprint Corporation (the "SPR" in **SPR**int stands for Southern Pacific Railroad) to become the fourth largest mobile network in the country.

Page 18: The electronics industry is still experiencing some poor employment from the earlier cutbacks in 1964-65. The GRID publishes a number of "positions wanted" profiles for graduating engineering students.

Page 19: Tempress tells about its expansion which includes a gym, shower rooms and a swimming pool – amenities that soon become a trademark of high-tech companies in our Valley. A few years later, my company (Tandem Computers) relocates from its startup location up on Bandley Drive (where Apple will locate) to Tantau Avenue in Cupertino, and the campus includes a tennis court and swimming pool. Several of us liked playing volleyball during lunch hours, so we obtained funds from Tandem to build a sand volleyball court next to the creek that ran through the campus.

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

Robert Johnson's title is Manager, Circuits and Antennas. He also is captain of the Applied Technology volleyball team.

Johnson joined ATI in 1959 when the Company's entire staff numbered less than a volleyball team. (Now we have more than 1500 employees.)

Some of his achievements include design of deceptive repeater-jammers, airborne and ground based K-band intercept receivers, radar warning receivers and associated test equipment. He holds patents for a microwave ratio/product meter, a fast pulse modulator, and an electro hydraulic control system.

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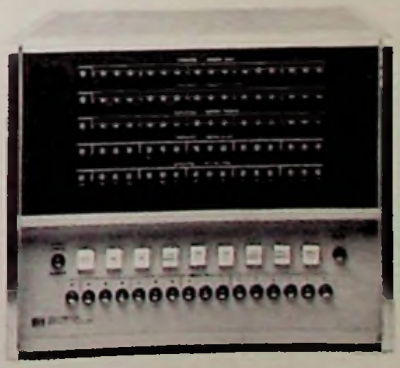

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DIGITAL COMPUTERS

06807

MEETING

AEROSPACE & ELECTRONIC SYSTEMS Story on page 12

A mechanically despun antenna for communications satellite applications. Marvin F. Fleming, Philco-Ford Corporation.

April 24, Wed. 7:30 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. No-host cocktails at 6:00 pm; dinner at 6:30 pm. $3.60. Reservations: Judy Burns at 742-6773, by noon, April 24. ELECTION MEETING: COME AND VOTE FOR NEXT YEAR'S OFFICERS!

ANTENNAS & PROPAGATION Story on page 10

Steerable communications antenna for the Apollo lunar module. Dale C. Lindley, senior microwave engineer, Dalmo Victor.

April 11, Thurs. 8 PM, Lockheed Auditorium Bldg. 202, 3251 Hanover St., Palo Alto. Dinner: 6:00 pm, Rick's Swiss Chalet, 4085 El Camino, Palo Alto. Reservations: Glen Keitel, 294-6414, ext. 2206 by April 11.

AUTOMATIC CONTROL See March Grid page 7

Considerations of computer requirements for digital control and digital filtering. Dr. Patrick E. Mantey, Systems Group, IBM Research Lab, San Jose.

April 16, Tues. 8 PM, University of Santa Clara Engineering Center, Room 551. Dinner: 6:30 pm, Le Boeuf (old Luccas) across from the University. No reservations required. Order from menu.

CIRCUIT THEORY Story on page 8

Integrated circuits and the network and microsystem program at Stanford. Prof. R. W. Newcomb, Stanford University.

April 17, Wed. 8 PM, Room 134 McCullough Bldg., Stanford. Dinner: 6 pm, Red Cottage, 1706 El Camino, Menlo Park. Order from menu. Reservations: Mrs. Stressner, 367-3112 by April 16.

COMMUNICATION TECHNOLOGY Story on page 6

Time Division Multiplexing of Asynchronous Signals. Dr. Virgil I. Johannes, Bell Telephone Labs.

April 17, Wed. 8 PM, Pacific Telephone Auditorium, 140 New Montgomery Street at 8:00 pm. Cocktails 5:45 pm, Dinner 6:15 pm, Monty's Restaurant, 645 Montgomery Street, San Francisco. Reservations: Milt Seymour, 593-8491.

COMPUTER Story on page 9

The Illiac IV Computer. Prof. Daniel L. Slotnick, University of Illinois.

April 23, Tues. 8 PM, McCullough Bldg., Room 134, Stanford University. Dinner: 6:15 pm, Rick's Swiss Chalet, Chef's Special steak $3.95 including tax and tip. Reservations: Merilee Ressel, 321-3300 ext. 451 by noon April 22.

EAST BAY SUBSECTION Story on page 8

The Northwest-Southwest 700 kv DC Intertie. Dr. Uno Lamm, Allmanna Svenska Elektriska Aktiebologet (ASEA).

April 29, Mon. 7:30 PM, PG&E Service Center, 4801 Oakport Road, Oakland. Dinner: 6:00 pm, Venetian Restaurant, 6701 Foothill Blvd., Oakland. Reservations: Oakland, Ruth Emerson, 835-8500; San Francisco, Mary Vilter, 399-4974; San Jose, Linda Jarrett, (408) 291-4567, by April 26.

EDUCATION Story on page 3

First meeting of newly organized Chapter. Come and get acquainted.

May 4, Sat. 10:00 AM, University Room at Rickey's Hyatt House, El Camino at Charleston Rd., Palo Alto. Smorgasbord luncheon ($2.25) at 1 pm. Reservations. Peninsula, Section Office, 327-6622; East Bay and San Francisco, C. L. Thacker, 647-1473.

ELECTRON DEVICES Story on page 7

Three part series on the relative roles of electron tubes and solid state microwave power devices in the 1970's. First speaker: Alan W. Scott, Varian Associates.

April 24, Wed. 8 PM, PH101, Stanford. Cocktails: 6 pm, Dinner: 6:30 pm, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Mrs. Rae Soldani, 326-8830 ext. 455, by noon, April 24.

ENGINEERING MANAGEMENT Story on page 7

First of three session series on management training.

April 10, Wed. 8 PM, Lockheed Cafeteria, Sunnyvale. No-host dinner at 6:30 pm, Bold Knight, N. Mathilda, Sunnyvale. No reservations required.

ELECTROMAGNETIC COMPATIBILITY Story on page 6

Power systems electromagnetic compatibility. Presentation by William I. Emmons, PG&E Co., supervising communications engineer, Kon Zaharoff, PG&E, dept. of energy research, followed by discussions by G. W. Cryer and J. J. Gillespie of the communication dept. of Electric Operations.

April 8, Mon. 8 PM, Hewlett-Packard Auditorium, 1501 Page Mill Road. Dinner: 6 pm, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: A.R. Carlson, 326-7000 ext. 2133, by noon, April 8.

CALENDAR

INDUSTRIAL ELECTRONICS & CONTROL INSTRUMENTATION Story on page 4

Nuclear Power Today. First annual ladies night. Edward D. Fuller, supervisor, engineering training program, General Electric Company.

April 19, Fri. 8 PM, Sheraton Thunderbolt Hotel, Bayshore Frontage Rd., Millbrae. No-host cocktails at 7 pm. Dinner meeting at 8 pm. Reservations: Anna Breda, 591-5363, by April 18. Order from menu.

INFORMATION THEORY Story on page 4

On source encoding. David J. Sakrison, associate professor of electrical engineering, Univ. of Calif., Berkeley.

April 18, Thurs. 8:30 PM, SRI main conference room B, 333 Ravenswood Ave., Menlo Park. Dinner: 6:15 pm, L'Auberge, 4826 El Camino, Redwood City. Reservations: Mrs. Rachel Bingham, 321-3300 ext. 453.

MICROWAVE THEORY & TECHNIQUES Story on page 5

One day seminar on Microwave integrated circuits. Roger Webster, Texas Instr.; Kenneth F. Sodomsky, Bell Telephone Labs; Bernard Hershenov, RCA Labs; Gordon Harrison, Sperry Microwave.

April 10, Wed. 1:30 and 7:30 (afternoon and evening sessions). SLAC Auditorium. — dinner. Registration: Richard Anderson, Hewlett-Packard Co., 1501 Page Mill Rd., 326-7000. If registration fee is paid in advance—$1.00. If paid at seminar—$2.00.

POWER Story on page 10

Power development in the Oroville Water Project. Alfred R. Golze', deputy director, California Department Water Resources.

April 9, Tues. 7:30 PM, Engineers Club, 160 Sansome St., San Francisco. Cocktails at 5:30 pm; Dinner at 6:30. Reservations: Engineers Club, 421-3184, by noon, April 8.

RELIABILITY Story on page 9

Techniques of design review. Robert A. Blais, senior staff engineer, Lockheed.

April 18, Thurs. 8 PM, PH 104, Stanford. Dinner: Stanford View Restaurant. Meet speaker 6 pm, dinner 6:45. Reservations: Adeline Fako or Hal Caldwell, 966-3342, 966-3153. Choice of barbeque chicken or steak $3.00. Res. by April 16.

SAN FRANCISCO SECTION Story on page 4

San Francisco Section Annual Meeting. Honoring newly elected Fellows of the Institute, and introducing the 1968-69 officers of the Section.

June 7, Friday, Palo Alto Hills Golf and Country Club, 3000 Alexis Drive, Palo Alto. Cocktails from 6:30 pm, dinner and dancing 8 pm to midnight. Music by Jack Fisher and his orchestra. Tickets will be available at $7.50 per person. Dress informal. Make reservations through Section office, 327-6622.

SAN FRANCISCO SECTION/SCV SUBSECTION See March Grid page 3

Joint meeting. Annual Pioneers Night. Ladies welcome. Pioneers in solid state electronics. The panel will be composed of Prof. Charles Susskind, moderator; Dr. John Linvill and Dr. Gerald Pearson of Stanford University, Dr. Gordon Moore of Fairchild R & D, Dr. John Woodyard of University of Calif., Berkeley and Dr. William Shockley, Bell Telephone Labs, N.J.

April 17, Wed. 8:30 PM, Crystal Room, Dinah's Shack, 4269 El Camino, Palo Alto. No host social hour at 6:15 pm, smorgasbord buffet at 7:30 pm. $3.75 including tax and tip. For reservations call Section office; 327-6622.

SYSTEMS SCIENCE & CYBERNETICS Story on page 12

From primitive tactile sensory spot to human hearing: a plausible sequence of evolutionary adaptations. Dr. John L. Stewart, president, Santa Rita Technology, Menlo Park.

April 15, Mon. 8 PM, Conference Room B, Stanford Research Institute, 333 Ravenswood Ave., Menlo Park. Dinner: 6:15 pm, Red Cottage, 1706 El Camino, Menlo Park. Reservations: Margie Hensley, 324-4701, by 4 pm, April 12.

VEHICULAR TECHNOLOGY Story on page 8

Field trip of Federal Aviation Agency Communications Control.

April 15, Mon. 8 PM, Federal Aviation Agency Comm. facility, Fremont. No-host cocktails: 6 pm; Dinner 7 pm, The Ranch Restaurant, 681 Peralta Ave., Fremont. Reservations: Mrs. Joan Black, 349-3111, ext. 220, by noon, April 11th. Reservations required for dinner and tour.

On the cover

The cover picture shows Richard Reynolds, an engineer in Sylvania's new Electro-Optics Organization, demonstrating that the focused beam from a recently developed CO_2 laser will break uranium glass. The laser is a highly stable, single frequency model designed to transmit signals to orbiting satellites through a telescope.

New Education Chapter Plans First Meeting

The newly organized chapter on education will hold its first meeting on Saturday, May 4, at 10 am in University Room at Rickey's Hyatt House in Palo Alto. A no-host luncheon will be served at 1 pm following the meeting.

Junior College instructors and all other interested persons in the Bay Area are invited to attend. The meeting will be informal and will emphasize "getting acquainted."

1968 IEEE EMC SYMPOSIUM

The 1968 IEEE Symposium on Electromagnetic Compatibility will be held at the Benjamin Franklin Hotel, Seattle, Washington, July 23, 24, 25, 1968.

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Section Annual Meeting to be a Dinner Dance

The Annual Meeting of the San Francisco Section will be a Dinner Dance held at the Palo Alto Hills Golf and Country Club on Friday, June 7, 1968. Music will be provided by Jack Fisher and his orchestra, well known Bay Area entertainer. No formal program is planned for the evening with the exception of a brief ceremony to present certificates to members of the Section who have been elevated to the Fellow grade, and to introduce the newly elected officers of the Section.

No-host cocktails will be available from 6:30 pm followed by a Roast Prime Rib of Beef Dinner, and dancing from 8:00 pm to Midnight. Tickets are priced at $7.50 per person and will be available from Committee members or from the Section Office in Palo Alto. Dress will be informal. The Palo Alto Hills Golf and Country Club is located at 3000 Alexis Drive in Palo Alto.

As has been the practice in past years, individual Group Chapters and Subsections are encouraged to organize tables for outgoing and incoming officers and other members of the Chapter, and their wives. Arrangements for tables and appropriate signs to identify the Group can be made by calling Mrs. Jean Helmke at the Section Office (327-6622).

This Dinner Dance is a deviation from our past practice for the Annual Meeting and we are looking forward to everyone having a good time while getting acquainted.

IE&C to Hold First Ladies Night April 19

NUCLEAR POWER: 5th ENERGY SOURCE SUBJECT OF TALK

The Industrial Electronics & Control Instrumentation chapter will hold its first annual ladies' night on Friday, April 19 at the Sheraton Thunderbolt Hotel in Millbrae, at 8:00 pm. The speaker for the occasion will be Edward D. Fuller, supervisor of the engineering training program for atomic power equipment at General Electric Co., San Jose. He will discuss the interesting subject of nuclear power as a 5th energy source.

He will show that this nation needs nuclear power as an important 5th source of energy with which to meet our rapidly growing requirements. In addition, to being an increasingly good economic decision for a utility, a nuclear power plant is a clean and attractive installation.

Mr. Fuller received his BS in physics from San Jose State College; his MS in mechanical engineering in 1964 from Nuclear Option, Stanford. He was employed in 1960 by GE as an engineering assistant. From 1962-66, he was physicist on conceptual reactor core design and optimization. From 1966 he has been on his present assignment with GE. He is a member of the American Nuclear Society. You are invited for no-host cocktails at 7:00 pm.

IT Meeting to Feature Sakrison On Source Encoding April 18

Shannon's classical source coding theorem applies to the case where the distribution of the source is known completely. In many cases of interest only vague knowledge of the source statistic is available to the person designing a source encoder. In this talk a rate distortion function is defined for a class of sources and a corresponding coding theorem is proven.

Dr. David J. Sakrison received his Sc.D. degree in 1961 from M.I.T. From 1961 to 1963 he was an Assistant Professor of Electrical Engineering at M.I.T. Since 1963 he has been an Associate Professor of Electrical Engineering at the University of California, Berkeley. His current interests center on information processing.

This meeting of the Information Theory Chapter will be in the main conference room at SRI, Thursday, April 18 at 8:30 pm. Dinner at L'Auberge at 6:15 pm. See calendar.

MTT Microwave Integrated Circuits Seminar April 10

The San Francisco MTT Chapter is sponsoring a one-day seminar on Microwave Integrated Circuits, to be held at the Stanford Linear Accelerator Auditorium on April 10, 1968. The program will feature four invited speakers for a full afternoon on this important new area in microwave technology, followed by an evening panel discussion session with the same four speakers, to provide adequate opportunity for audience feedback. Invitations have been extended to other MTT chapters in the west to participate in this seminar, to promote interchange of ideas and information on a more regular basis.

The various speakers and their topics will be as follows:

Roger Webster, Texas Instruments, Dallas, Texas: Mr. Webster will discuss means for implementing microwave integrated circuits, as well as certain design implications and some specific realizations, such as encountered on the MERA program.

Kenneth F. Sodomsky, Bell Telephone Labs, Reading, Penna.: Dr. Sodomsky will briefly review the technology employed at BTL in the fabrication of MIC's, and cover the present status of device technology. He will then describe circuit configurations used at BTL for mixers, amplifiers, control circuits, etc., and summarize current development work on MIC's.

Bernard Hershenov, RCA Labs, Princeton, N.J.: Dr. Hershenov will review work at RCA on an integrated low-noise X-band receiver, and on integrated lumped-element thin-film 2-GHz amplifiers. Receiver components include circulators, TD amplifiers, balanced mixers, and frequency multipliers, while the 2-GHz amplifier incorporates small planar lumped L's and C's in both single and cascaded stages.

Gordon Harrison, Sperry Microwave, Clearwater, Florida: Dr. Harrison will describe the design and performance of hybrid MIC's utilizing both active and passive devices on dielectric and ferrite substrates. Circuits will include junction circulators, ferrimagnetic phasers, YIG filters, and mixers, all on ferrite substrates, as well as avalanche oscillators and passive devices in MIC form.

The evening panel discussion will include the speakers of the afternoon, as well as Dr. George Bodway of Hewlett-Packard, who is in charge of H-P's MIC work. Audience participation in this discussion is encouraged, and projection facilities will be available to allow presentation of a reasonable number of slides from the audience, hopefully representing latest accomplishments in the MIC field at laboratories other than those represented on the panel.

Roger Webster

Kenneth Sodomsky

Gordon Harrison

Bernard Hershenov

MR. ROGER WEBSTER

Mr. Webster received the BSEE from the University of California in 1943. He was a Research Associate at the Radio Research Lab at Harvard, a Research Assistant at California Institute of Technology, and an engineer at Stancil Hoffman Corporation until 1951, when he joined Texas Instruments. He is presently responsible for microwave development in the Semiconductor Research and Development Laboratory at Texas Instruments.

Mr. Webster is a member of Tau Beta Pi, Eta Kappa Nu, and is a Fellow of the IEEE. He is an Associate Editor of the Journal of Solid State Circuits.

DR. KENNETH F. SODOMSKY

Dr. Sodomsky received his Ph.D. from the University of London in 1959, and has been with Bell Telephone Labs since 1960, working on microwave integrated circuits since 1964. He is at present supervisor of the Microwave Hybrid Integrated Circuits Group at the Reading Laboratory.

DR. BERNARD HERSHENOV

Dr. Hershenov received his B.S. degree in Physics in 1950, his M.S. degree in Mathematics in 1952, and his Ph.D. in Electrical Engineering in 1959, all from the University of Michigan. From 1951-1952 he worked for the University of Michigan Dental Materials Laboratory studying the physical properties of dentin. From 1959-1960 he worked on high-power unimoded magnetrons for the G.E. Company. He joined the Microwave Research Laboratory of RCA Laboratories in March 1960 and in January 1968 became head of the Microwave Integrated Circuits Group. He was the recipient of an RCA Achievement Award in 1964 and 1967. He is a member of the Administrative Committee of the Magnetics Group of the IEEE Professional Group on Magnetics as well as Chairman of the Microwave Magnetics Technical Committee.

Dr. Hershenov is a member of Phi Kappa Phi, American Physical Society, IEEE and Sigma Xi.

DR. GORDON R. HARRISON

Dr. Harrison received a B.S. in Physics from Arkansas State in 1952, and an M.S. and Ph.D. in Physics from Vanderbilt University (1958). He was first employed at the Oak Ridge National Laboratory, and later by the Convair Division of General Dynamics before joining Sperry in 1957. He is presently head of the Applied Research Section of Sperry Microwave, where he has been responsible for research and development on ferrimagnetic materials and their utilization in various microwave devices., including the MIC area.

Dr. Harrison is a member of the IEEE, the American Physical Society, the American Ceramic Society, Sigma Pi Sigma, Sigma Xi, and Alpha Chi.

In order to insure adequate facilities for the seminar, pre-registrations are being taken by Mr. Richard Anderson, the chapter treasurer, at Hewlett-Packard (5-U), 1501 Page Mill Road, Palo Alto, Calif. 94304, with a nominal registration fee of $1.00. Registrations at the seminar will be handled on a space-available basis, at a fee of $2.00. The afternoon session will begin at 1:30 pm, and the evening session at 7:30 pm.

EMC to Hear Emmons and Zaharoff April 8 On PG&E's Electromagnetic Radiation Problems

Mr. W. I. Emmons, Supervising Communication Engineer at PG&E, has arranged a program to be given before the April 8 meeting of the EMC Group Chapter on the problems of minimizing the effects of electromagnetic radiation caused by or transmitted on the PG&E power system. The meeting will be held in the Hewlett-Packard Auditorium at 8 pm on Monday, April 8. Dinner is to be at Rick's Swiss Chalet at 6:00 pm.

Mr. Kon Zaharoff of the Department of Engineering Research will discuss design parameters and the results obtained for the newly constructed EHV Transmission Lines (500 kv) which are now in operation in PG&E's operating area. This presentation will be followed with discussions by Mr. G. W. Cryer and Mr. J. J. Gilespie of the Communications Department of Electric Operations who will discuss procedures for processing Radio and TV interference complaints and the methods which are employed for locating, identifying and eliminating such interference. Additional information was printed in the March *Grid*, page 8. See calendar.

W. I. EMMONS, Supervising Communications Engineer. A native Californian. Received a BS degree in E.E. in 1936. Employed as a sales engineer with Weston Instruments until 1940 when he was called into the U.S. Navy. Joined the Communications Department in 1950 as a communication engineer. Became a Supervising Engineer in 1957 and headed conversion of the private telephone system to dial operation.

KON ZAHAROFF came to the USA in 1949. (Fortyniner!) Received BS degree in E.E. from U.C. in Berkeley in 1952. Joined PG&E right after graduation. Worked on problems of cathodic protection, precision power measurements, insulation of large generators. Is now responsible for research in EHV and Hi-Power Laboratories. Registered Professional Engineer in California. Member of IEEE Radio Noise Subcommittee.

ComTech to Hear Virgil Johannes on Time Division Multiplexing of Asynchronous Signals

At the Wednesday, April 17 meeting of the Communication Technology Chapter, Dr. Virgil I. Johannes of Bell Telephone Laboratories will describe some of the latest Bell Laboratory developments in time division transmission systems that will accommodate asynchronous digital input signals. He has been working on various aspects of digital transmission systems at the Laboratories since 1961.

The merits of digital transmission have led to its widespread use in such diverse fields as telemetry, data communication, and short haul voice carrier. Systems with capacities orders of magnitude higher than those now in use have been proposed and reached the laboratory stage. A basic problem in such systems is the multiplexing of lower speed signals from various sources, which may not be locked together in frequency. This talk will include a brief description of techniques for synchronizing a digital system, and a review of methods for multiplexing asynchronous digital signals. Phase averaging, master clock, pulse stuffing, and dumping techniques will be described. The practical implications, and relation to possible future developments such as time division switching will be assayed.

Dr. Johannes received his Bachelor of Science degree from City College of New York and his Masters Degree and Doctorate from Columbia University. He taught at City College and Fairleigh Dickinson University where he was head of the Electrical Engineering Department. He presently heads the Digital Transmission Systems Department at Holmdel, New Jersey.

Dinner will be at Monty's Restaurant, 645 Montgomery St., SF. Cocktails at 5:45 pm, Dinner at 6:15 pm. The meeting will be in the Pacific Telephone Auditorium, 140 New Montgomery St., at 8:00 pm. See calendar.

DAVID CAMMACK SELECTED STUDENT BRANCH DELEGATE TO REGION SIX CONVENTION

David Cammack, San Francisco State Student Branch Chairman, was selected as one of the two student branch chairmen to be delegates attending the Region 6 International Convention in New York in March.

BIDS INVITED

Foothill College is inviting bids on a 250 **KVA, DC Power Supply** presently stored on its Los Altos Hills campus. The following equipment is included:

1. General Electric Control Cubicle; 4160 volts input with 3-pole circuit breaker.
2. General Electric Inductrol Regulator; 3-phase, 60-cycle, 115-KVA, 4160 volts input, 160 gallon oil capacity, including protective capacitor.
3. General Electric Transformer-Rectifier Unit; 125 KVDC, 2.0 amp, 1600 gallon oil capacity.
4. 96 Pyranol Capacitors; 13.5 microfarads at 12.5 KVDC.
5. Two Six-tier Aluminum Capacitor Racks with free standing bushing.
6. General Electric Control Console for remote operation.
7. Miscellaneous Hardware.

SPECIFICATIONS

Input: 4160 Volts, 60-Cycle, 3-Phase ac.
Output: 125 KVDC, 2.0 amps max.
Appraised Value: $45,300
Minimum Bid: $20,000
All bids to be "As is, where is".

For further information call or write to:
Mr. Richard E. Van Horn, Jr.
Foothill College, 13245 El Monte Avenue
Los Altos Hills, Cal. 94022
(415) 948-8590, Ext. 341

EM to Start Three Session Series On Engineering Management Training

The SF Chapter of the Engineering Management Group is holding a three session series on Engineering Management training, starting with the April 10th meeting.

The sessions will deal with three major topics; namely, (1) The Responsibility of Top Management to the working manager. (2) the Function of the University in relation to management training, and (3) The working manager's level.

The intent of these sessions is to promote interest and awareness in Engineering Management training and education, especially at the middle and lower management levels, with particular emphasis on how the neophyte can become a manager and progress to an effective working level manager.

The meetings will be held at the Lockheed cafeteria in the Sunnyvale facilities, on the second Wednesday of the month—April 10, May 8, and June 12, 1968.

A no-host dinner will be held at the Bold Knight in Sunnyvale, convening at 6:30 pm, for those interested. Invite your friends and bring your attention and your questions for the speakers.

Further information may be obtained from Dick Towle, 948-0410, or Rolfe Folsom, 948-9157.

1968 VTG Conference
December 3-4, San Francisco

The National IEEE 1968 VTG Conference sponsored by the Vehicular Technology Group of the Institute of Electrical and Electronics Engineers will be held in the Hilton Hotel, San Francisco, December 3 and 4. Details will be announced.

Electron Devices Group Begins Series Of Three Meetings Looking Ahead Into the '70s

With this meeting, the Electron Devices Group begins a three-part series entitled "The Relative Roles of Electron Tubes and Solid State Microwave Power Devices in the 1970's." The subject of the first meeting will be "Electron Tube Microwave Power Devices in the 1970's," and the speaker will be Mr. Alan W. Scott of Varian Associates.

Alan W. Scott received his BS degree in Physics from Stanford in 1952 and a MS degree in Physics from the California Institute of Technology in 1954.

From 1954 to 1957 he was an ordnance officer at the Navy Bureau of Ordnance. From 1957 to 1962 he was engaged in the development of high power traveling-wave tubes at the Microwave Tube Division of the Hughes Aircraft Company. From 1962 to 1964 Mr. Scott was Manager of the high power traveling-wave tube product line at Sylvania's Microwave Device Division. He continued in this capacity with Microwave Electronics Corporation. From 1965 to 1967 he was engaged in the development of low cost microwave tubes for home ovens with his own company, Scott Electronics Inc. He is currently with the traveling-wave tube development of Varian Associates.

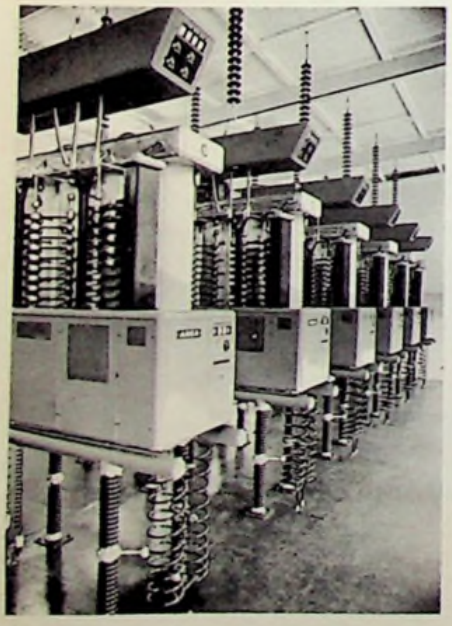
The meeting will be on April 24, at 8:00 pm, in Room 101, Physics Building, Stanford University. Cocktails at 6:00 pm, dinner at 6:30 pm at Rick's Swiss Chalet, preceding the meeting. See calendar.

Dr. Lamm, Father of High Voltage DC Transmission To Address East Bay Subsection April 29

Dr. Uno Lamm, Electrotechnical Director for Allmanna Svenska, Elektriska Aktiebologet (ASEA) of Sweden will speak at the Monday, April 29 meeting of the East Bay Subsection. The subject of Dr. Lamm's speech will be the Northwest-Southwest 700 kv DC Intertie. Dr. Lamm is appropriately recognized as the father of high voltage DC transmission. He was responsible for the original breakthrough which made the high voltage mercury arc rectifier valve possible. Dr. Lamm supervised the installation of the first high voltage DC system from the island of Gotland to the Swedish mainland.

The Pacific Northwest-Southwest intertie is the largest high voltage DC project ever attempted. Dr. Lamm is here to assist in this installation and his remarks should provide an excellent topic for discussion.

The meeting will be at the PG&E service center 4801 Oakport Road, Oakland at 7:30 pm. Dinner will be at the Venetian Restaurant, 6701 Foothill Boulevard at 6:00 pm.



Equipment in valve hall in the 600 MW 500 kilovolt HVDC transmission system.

Construction to Begin Soon On HP's Santa Clara Plant

Hewlett-Packard Company today announced it will soon begin construction of a major new plant in Santa Clara, California. The plant will be built on a 55-acre site acquired by the company in 1966. The site is located at the intersection of Stevens Creek Boulevard Lawrence Expressway.

Circuit Theory Chapter to Hear R.W. Newcomb On Recent Stanford Results in the Synthesis of Linear Integrated Circuits

Integrated circuits offer fascinating opportunities in the areas of university education, research, and interaction with industry. On the one hand theories are more and more needed because of the precision of the area while on the other hand more and more people educated in the area are desired to meet growing industrial needs. Likewise the growth of the field requires quick assimilation of basic research results to keep pace. Taking into account these factors a portion of the program at Stanford will be outlined with regard to the position of integrated circuits in the context of microsystems.

Technically, recent Stanford results on the synthesis of linear integrated circuits will be outlined and reviewed. Included among these will be gyrator and state-variable circuits for low sensivity behavior, lumped-distributed synthesis and designs for compactness, quasilossless synthesis for time-variable structures, adjustable parameter configurations for variable phase networks, NIC circulator circuits, and general synthesis methods applicable to computer aided design. Problems under present consideration will be briefly discussed.

R. W. Newcomb was born in Glendale, Calif., June 1933, received the BSEE from Purdue (1955), the MS from Stanford (1957) while a Research Intern at Stanford Research Institute, and the PhD from the University of California (Berkeley, 1960) where he was also a Teaching Associate. Since 1960 he has been on the professional staff at Stanford spending the academic year 1963-1964 as Visiting Professor at the University of New South Wales (Australia) and the first half of the academic year 1967-1968 as Professeur Invite at the Universite Catholique de Louvain (Belgium). He is the Network Series editor for Prentice-Hall, author of "Linear Multiport Synthesis" and the forthcoming works "Concepts of Linear Systems and Controls" and "Active Integrated Circuit Synthesis." Professor Newcomb's research concentrates in the area of microsystems, but incorporates related topics of interest to his coworkers and students.

The meeting will be held Wednesday, April 17 at 8 pm in Room 134 McCullough Building at Stanford. Dinner at 6:00 pm at the Red Cottage. See Calendar.

Vehicular Technology to Tour Federal Aviation Agency

The Vehicular Technology Chapter meeting for Monday, April 15 will consist of a tour of the Federal Aviation Agency (FAA) Communications Control Facility. The facility is located at 5125 Central Avenue in Fremont, California. The tour will start at 8:00 pm.

Dinner will be at The Ranch Restaruant, 681 Peralta Avenue, in Fremont at 7:00 pm with cocktails at 6:00. See calendar.

Computer Chapter to Study ILLIAC IV Computer April 23 with Professor Slotnick

Prof. Daniel L. Slotnick of the University of Illinois will discuss the ILLIAC IV computer at the Tuesday, April 23 meeting of the Computer Chapter. The ILLIAC IV computer is an array of 256 processors, each with independently addressable memory under the control of up to four control units which provide instructions to the array. Processing and input/output exchange rates are uncommonly high. The organization of this system will be described together with a survey of current thoughts on software and applications. The speaker will briefly discuss his opinions on future developments in the design of large machines.

Prof. Slotnick received his B.A. degree from Columbia College in 1951, and his Ph.D. degree from The New York University, Institute of Mathematical Sciences in 1956. From 1957 to 1960 he was with International Business Machines Corporation. From 1960 to 1965, he was with Westinghouse Electric Corporation, Aerospace Division, Baltimore, Maryland. Since 1965, he has been Professor of Computer Science at the University of Illinois and Director of the ILLIAC IV Project. Professor Slotnick is a Senior Member of the Institute of Electrical and Electronics Engineers and was recipient of the American Federation of Information Processing Society Prize in 1962 for his design of a parallel array computer.

Dinner will be at 6:15 at Rick's Swiss Chalet in Palo Alto, with the meeting at 8 pm in Room 134, McCullough Bldg., Stanford University. See calendar.

MEMBERSHIP

Membership in an IEEE Group may be compared with the use of a power tool. It'll do nothing for you until you exert some effort. In return, it should multiply your effort many times.

RCA OFFERS SEMINARS

The RCA Institutes, Inc. Institute for Professional Development, will present three seminars in the San Francisco Area through June 1968:

April 1-5, Digital Communications; May 13-17, Logic Design; June 6-10, Integrated Circuits. Contact Mr. M.V. Mahoney, Mgr. Technical Seminars, RCA Institutes, Inc., IPD, 132 West 31st Street, New York, N.Y. 10001.

Robert Blais to Address Reliability Group On Techniques of Design Review

Robert Blais is Senior Staff Engineer to the Manager of Lockheed's Space Systems Division Reliability organization. For more than ten years, Mr. Blais has participated directly in the achievement of the high degree of reliability enjoyed by Lockheed's Agena series satellites and other Lockheed programs. As such, he has been a major contributor in all aspects of design review.

He will discuss design reviews from the practical approach of problems encountered and remaining short-comings, rather than the theoretical position of the ideal design review.

The concept of design review implies the need for participation of many disciplines in team effort to review and resolve many facets of development, design, fabrication, inspection, and test of today's complex aerospace equipments. The requirement for disclosure of critical information prior to the formal design review meeting has never been more urgently needed. Computerized techniques can aid this data gathering function.

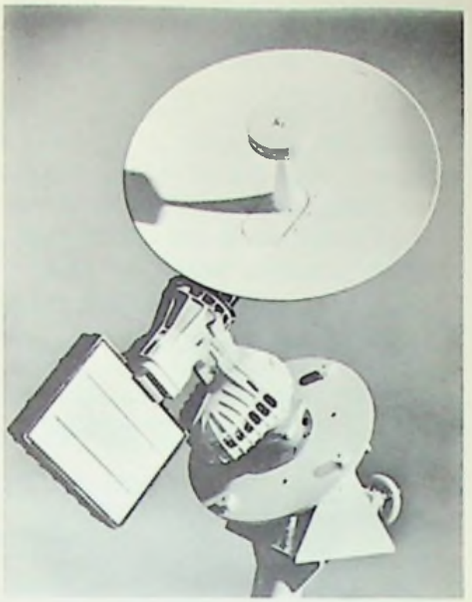
The meeting will be held in Room 104, Stanford University Physics Lecture Hall at 8 pm on Thursday, April 18. Meet the speaker at the Stanford View Restaurant at 6 pm. Dinner at 6:45 pm. Reservations required. See calendar.

Dale Lindley Will Describe to A&P a Steerable Communications Antenna for the Apollo Lunar Module at April 11 Meeting

NASA's Apollo Lunar Module—the spacecraft which will accomplish the actual manned lunar landing—requires dependable communications for the success of its mission. The S-Band steerable communications antenna provides the primary communications link (voice, telemetry, biomedical data, and possibly television) between the Lunar Module (LM) and the Earth. Use of the antenna begins while in lunar orbit when the LM is entered by two astronauts from the Apollo Command Module. It continues to operate through descent from orbit, landing site selection, and until the landing has been completed and the astronauts have actually stepped out onto the lunar surface. At this time the primary communications job will be taken over by a high-gain paraboloidal antenna which will be erected on the surface. The LM antenna again assumes primary responsibility during the lunar ascent and the critical rendezvous and docking phases.

Because the exact landing site selection is made by the astronauts in the last few seconds before landing, it is not possible to give an exact flight profile for the LM. The LM communication antenna must, therefore, be capable of tracking the earth under the conditions of (1) a wide range of vehicle motions, (2) the presence of portions of the vehicle near the antenna-Earth line of sight, and (3) impinging hot gases (in excess of 1000°F) from the reaction control jets. These conditions have prevented the use of the more conventional infra-red Earth tracking systems and have resulted in the development of a novel microwave tracking system. The antenna generates the required tracking information by use of monopulse error signals which are multiplexed onto the received communications signal. The resulting system produces minimal gain losses and requires virtually no modification of the communications transceiver.

Dale C. Lindley received his B.S.E.E. degree from the University of California, Berkeley, in 1961 and his M.S.E.E. degree from the University of Santa Clara in 1966. He is presently employed as a Senior Microwave Engineer at the Dalmo Victor Company in Belmont, California.



The meeting will be held in the Lockheed Auditorium, Bldg 202, 3251 Hanover St., Palo Alto at 8:00 pm. Dinner is at Rick's Swiss Chalet at 6:00 pm. See calendar.

Power Group Will Study California Water Projects With Alfred Golze on April 9

The April meeting of the Power Chapter will be centered around a timely talk by Alfred R. Golze titled "Power Development in the Oroville Water Project", at the Engineers Club, San Francisco on Tuesday, April 9th.

Mr. Golze, who has been Deputy Director of the Department of Water Resources since February 1967, will outline the overall goals and accomplishments of his department. He will highlight the Oroville projects' electrical features because of its current interest.

He graduated from the University of Pennsylvania, earning his B.S. in Civil Engineering, and performed his graduate work at the University of Colorado and George Washington University. He is a registered professional engineer in California and the District of Columbia and has authored *Reclamation in the United States* and *Your Future in Civil Engineering*, which are text and reference books.

Mr. Golze's career has been devoted to conservation of resources, first in 1933, with the Department of the Interior through the Bureau of Reclamation and, in 1961, coming to his work in California as Chief Engineer. Later, as Deputy Director, Mr. Golze started with the Hoover Dam and served the Bureau of Reclamation in many capacities. He is a Fellow of the American Society of Civil Engineers and is past president of the National Capitol Section.

Guests and members will find this a meeting of high interest. All are welcome. See the calendar for details.

Microwave Exposition June 4-6

The second Annual Microwave Exposition will be held in San Francisco, California, June 4th, 5th and 6th at the San Francisco Hilton Hotel.

The Western States comprise a major microwave center. Innumerable scientific and technological developments have been spawned in the colleges and universitites of California and the neighborhood states. Industrial, commercial and military microwave applications are widespread throughout the area.

Mr. Manfred Meisels, editor of Microwaves Magazine, will act as program chairman of the technical sessions which are expected to draw a record attendance. The theme for the Exposition, "Design For The 70's" will include sessions on semiconductors, lasers, antennas, radar, filters, measurements and micromin.

Speakers are already scheduled from the U.S. Army Electronics Command, National Bureau of Standards, RCA Laboratories, International Microwave Power Institute and the RCA Missile and Surface Radar Divisions.

The Exposition area, in the Hilton Plaza, will display more than 100 sophisticated microwave components, instruments, test equipment and systems. Attendance is expected to exceed 4000.

For information contact: Technical Industry Expositions, Inc., 100 6th Ave., New York, N.Y. 10013. (212) 925-1200.

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From Primitive Sensor Spot to Human Hearing Subject of SSC Chapter April 15 Meeting

A PLAUSIBLE SEQUENCE OF EVOLUTIONARY ADAPTATIONS

Few now believe that the elegant human hearing system appeared spontaneously, but rather that it evolved from more rudimentary mechanisms. An argument is presented by Dr. John L. Stewart for the development of hearing, as mediated by matters of survival in an hostile environment, starting from a single sensory cell responding to pressure or touch. Growth of both neural and mechanical structures is postulated wherein logical purposes for lateral and recurrent inhibitory processes are revealed. The complex structure that finally results can be studied both theoretically and in simulated form in order to identify phenomena in auditory perception.

Dr. John L. Stewart is president of Santa Rita Technology, Inc., Menlo Park, California. He was educated at Stanford, receiving the Ph.D. in electrical engineering in 1953. Previously he had contributed to guidance theory and design of early Corporal missiles at JPL and to AMTI radar at Hughes Aircraft Co. His analog ear research was begun in 1960 at Arizona.

Dr. Stewart has authored three textbooks and a number of papers in engineering and life sciences journals and has been a regular contributor to Bionics symposia.

The meeting will be held in conference room B, Stanford Research Institute, Menlo Park, at 8:00 pm on Monday, April 15. Dinner will be at the Red Cottage. See Calendar.

AES Chapter to Hear Marvin Fleming on A Communications Satellite Antenna April 24

The Wednesday, April 24 meeting of the Aerospace and Electronic Systems Chapter will feature a presentation with slides on "A Mechanically Despun Antenna for communications satellites."

The speaker will be Marvin F. Fleming, supervisor, Philco-Ford Corp. Mr. Fleming is currently responsible for the system design section of the Guidance and Control Department at Philco-Ford. He has been responsible for the synthesis and development of the attitude and orbit control system for the Philco-Ford communications satellite.

In past efforts, he has accumulated varied experience in analysis and design efforts for control systems and components. These include IR earth sensors, sun sensors, satellite attitude stabilization systems, startrackers, reentry inertial guidance systems and information processing systems.

He received his BS in Electrical Engineering from the Pennsylvania State University in 1959 and has performed graduate work at Cornell University and University of Pennsylvania.

Elections for A&ES officers for the coming year will also be held, following the dinner at Rick's Swiss Chalet in Palo Alto. See meeting calendar.

1968 Conference on Precision Electromagnetic Measurements

Several new areas will be accented at the biennial conference on Precision Electromagnetic Measurements which will be held June 25-28, 1968 at the National Bureau of Standards Laboratories in Boulder, Colorado, sponsored by the IEEE Instrumentation and Measurement Group and the National Bureau of Standards.

The scope of the conference continues to cover basic precision measurements at frequencies ranging from DC through microwaves and lasers and the precise measurement of time and frequency.

For the first time, however, the conference will devote major attention to the rapidly developing field of automated precision measurements, required for example, in large scale electronic systems such as steerable arrays.

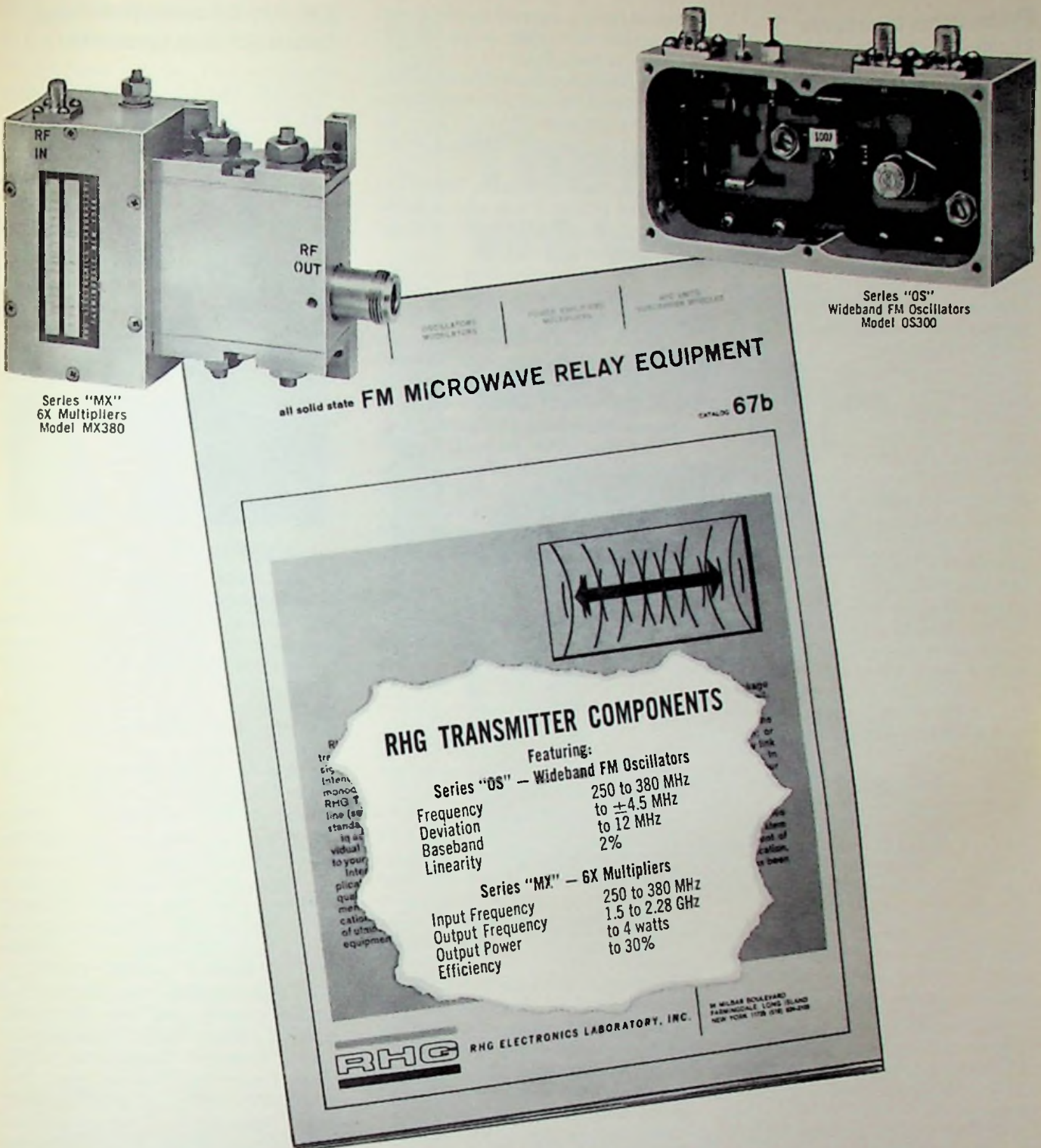
Bay Area Technical Symposium High Level Computer Language

The Seventh Annual Bay Area Technical Symposium is to be devoted to the theme of the Effective Use of High Level Languages. It will be held on April 19th at the Jack Tar Hotel in San Francisco. The proposed speakers are:

Professor Peter Wegner, Cornell University—Introduction to Concepts and Structures of Programming Languages; Mr. Mark I. Halpern, IBM—Task Structures and Programming Techniques; Professor John J. Donovan, MIT Project MAC—Compiler Techniques; Professor William McKeeman, Stanford University—Software-Hardware Interaction; Dr. John Peck, The University of Calgary—Trends and Extensions, PL/1 and ALGOL 68.

Engineering in Medicine and Biology Conference

The 21st Annual Conference on Engineering in Medicine and Biology will be held in Houston, Texas, at the Shamrock-Hilton Hotel, November 17-21, 1968. On this occasion, approximately 250 scientific papers, 8 special tutorial sessions, and 4 workshops will be presented. These papers will describe many of the latest techniques in the physical sciences, engineering and mathematics which are employed in diagnosis, therapy and rehabilitation. They will also identify the uses of engineering in the control of man's environment and in the solution of problems in biomedical research. The tutorial sessions will consist of formal lectures by experts who will describe the state of the art in their fields and discuss the unsolved problems.



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Electro Optics Organization Chartered by Sylvania

Sylvania Electric Products Inc., a GT&E subsidiary, has chartered a new Electro-Optics Organization (EOO) at its Mountain View installation to handle work for both government and industry in the electro-optics field.

The new organization will be part of the Western Division of Sylvania Electronic Systems (SES), an operating group of the company with over-all responsibility for GT&E government projects systems management.

Dr. Burton J. McMurtry has been named director.

McMurtry

In describing the scope of his new work, Dr. McMurtry stated, "The Electro-optics market has already reached one billion dollars and our studies indicate that the laser market may reach a billion in the near future. Electro-optical technology will find increasing use in many military applications such as night vision, as well as industrial purposes like process control and air pollution detection as man seeks to control and improve his environment."

EOO, the new organization's abbreviated name, is now responsible for expanding Sylvania's electro-optics activities in a variety of fields. Equipment designed and manufactured by the organization will incorporate lasers and conventional light sources.

The organization's employees have been relocated from the main Sylvania location in Mountain View at Whisman Road and Evelyn Avenue.

Sylvania plans to increase its Western Division payroll of 3,700 by at least 1,900 within five years. As part of the division's expected growth, three more buildings will be added to the five main structures on the 61-acre Mountain View property in that period. More construction is being considered for the 21-acre manufacturing facility of the division located in Santa Cruz.

Dr. McMurtry, head of the EOO unit, is no stranger to laser and electro-optics work. He is especially well known for his work in photomixing techniques and light demodulation.

He was born in Houston, Texas, and educated at Rice University, where he received a bachelor of arts in 1956 and a bachelor of science in 1957.

In 1957 he joined Sylvania's Microwave Device Division in Mountain View. From 1957 to 1961, while an employee, he participated in the company's Honors Cooperative Program with Stanford University. He received a master of science and later a doctorate degree in electrical engineering from Stanford.

Joint experiments during this period with Dr. Anthony E. Siegman of the Stanford faculty, led to their development of the traveling-wave phototube. This was a state-of-the-art advancement in obtaining information from a modulated light beam.

From June 1962 to December 1963 Dr. McMurtry headed the Microwave Device Division's Optical Device Department at Mountain View. In that position he contributed to programs on traveling-wave phototube analysis and development, optical heterodyne demodulation of light, high-frequency and FM demodulation, and scannable traveling-wave phototubes.

His technical papers and article in the fields of microwaves and optics have been presented and published internationally. His paper *Microwave Phototube Design Considerations* won for him the 1964 Alfred Noble Prize, one of the highest national honors conferred upon young scientists.

Among its accomplishments in the field, Sylvania has developed and built a laser vibration analyzer for wind tunnel tests of spacecraft models; FM and super-mode lasers; devices which track and photograph rocket sleds traveling at six times the speed of sound; and a CO_2 laser designed to track satellites via telescope.

J. Bouldry Appointed To National Student Activities Committee

Professor John M. Bouldry, Student Branch Counselor, SF Section, has been appointed to the IEEE Student Activities Committee for 1968. This is one of the more important bodies reporting to the Educational Activities Board.

AIAA PANEL DISCUSSION TECHNOLOGY/URBAN DEVELOPMENT

On Thursday, April 25, 1968, the San Francisco Section of the American Institute of Aeronautics and Astronautics is sponsoring a panel discussion on the interaction of technology with future urban development. The panel will be chaired by Mr. Leo Ryan, State Assemblyman from northern San Mateo County and will include Dr. Richard Dorf, (urban development), Chm., Electrical Engineering Department, University of Santa Clara, Professor Holt Ashley, (engineering education), Department of Aeronautics and Astronautics, Stanford University, and Mr. Howard Ross, (transportation), Stanford Research Institute. A dinner meeting will preceed the panel discussion; the affair will be held at Rickey's Hyatt House in Palo Alto. Admission will be by ticket only. For tickets and further information contact Dr. C. E. Woolridge, 326-6200, ext. 3483.

NEW MEMBERS

The San Francisco Section welcomes the following new members:

T. G. Anderson
O. O. Madarang
J. Y. Ogawa
J. H. Oliphant
A. Poulett
A. F. Leon
V. Matulovic
H. Ohara
W. R. Piper
W. K. Savick
R. E. Schulz

Western Sales Increase Forecast At End of Vietnam Conflict

A 7% sales increase forecast for the West's electronic industry in 1968 might be doubled if the Vietnam conflict were to end tomorrow, according to the Western Electronic Manufacturers Association (WEMA).

A WEMA survey confirms that this year's growth rate will be considerably under the 12% sales gain in 1967 and the healthy 18% increase recorded in 1966 by electronics firms in the 13 western states.

A major reason for the slowdown, said WEMA President Robert M. Ward, is the diversion of U.S. Government spending to weaponry and other warfare needs. "Contrary to what some people may believe," Ward explained, "only a small percentage of Western companies produce equipment for tactical warfare.

Rent an engineer

Lockheed companies have taken a positive step to iron out the peaks and valleys in employment. If Lockheed has surplus people, the company will rent them out rather than lose them. Since January of this year, Lockheed has made 15 proposals to other aerospace firms all the way from Philco-Ford in California to Martin-Marietta in Florida. In the Philco proposal, for example, Lockheed offers 100 design engineers currently surplused by contract funding conditions at Lockheed but vitally needed at Philco. Lockheed continues to carry the rented employee under full fringe benefit and seniority protection.

While none of the rent-an-engineer proposals has been accepted yet, Lockheed has succeeded in placing 23 skilled craftsmen with two Southern California firms. The 23 carry full coverage of the IAM-Lockheed union contract while on-loan.

Conference on Magnetism And Magnetic Materials In New York Nov. 18-21

The Fourteenth Conference on Magnetism and Magnetic Materials will be held at the New York Hilton Hotel, New York City, from Monday, November 18, through Thursday, November 21, 1968. The Conference is sponsored jointly by the Institute of Electrical and Electronics Engineers and the American Institute of Physics in cooperation with the Metallurgical Society of AIME, The Office of Naval Research, and The American Society for Testing and Materials.

WESCON to Present Hybrids' Symposium

A two-day lecture program on designing with hybrid microelectronics has been confirmed as a special feature of WESCON week in Los Angeles next August.

It is the second of the concurrent symposia announced for WESCON. The 1968 International Electronic Circuit Packaging Symposium has been set for August 19 and 20 at the Statler Hilton Hotel, and the "hybrids" series will follow at the Statler on August 21 and 22. WESCON's own four-day technical program of 25 sessions will be held at the nearby Biltmore Hotel.

The 20 lectures on designing with hybrids are being organized under the sponsorship of the IEEE Parts, Materials and Packaging Group. Wayne Martin, RCA (Aerospace System Div.) is co-chairman of the series with S. M. Stuhlbarg (Raytheon), who was chairman of the 1967 WESCON symposium titled "Microelectronics Comes of Age." Like that program, the hybrids series will be a compact, follow-on version of an eight-week lecture program currently in presentation at MIT.

Both the IECP and hybrids symposia will offer a complete volume of technical preprints to registrants. Registration at either symposia also includes admission to all WESCON exhibits and the WESCON technical program.

$2 Million Contract To Lenkurt

Receipt of a $2 million contract from Illinois Central Railroad for a microwave communications system, has been announced by Lenkurt Electric, GT&E subsidiary.

Charlton W. Hunter, President of Lenkurt, said installation of the new 600-channel capacity communications system will begin this year and will be completed the first part of 1969. It will extend from Chicago to Jackson, Miss. At Jackson, the new system will interconnect to another 181-mile microwave network, which continues to Illinois Central's Mays Yard in New Orleans. The 181-mile system is now being completed by Lenkurt under another contract.

When completed, the new microwave network will be tied into the computer facilities of the railroad at Chicago.

Equipment Type

In microwave communications, radio signals are focused like a beam of light and transmitted from point to point over line-of-sight distances until the desired terminal is reached. Hundreds of voice conversations may be transmitted simultaneously in this manner through the use of multiplexing techniques.

People

Charles Anderson Heads SRI

Charles A. Anderson, formerly President of J. I. Case Co. of Racine, Wisconsin, has been named President and Chief Executive Officer of Stanford Research Institute. He assumed his new duties March 1.

Mr. Anderson comes to the Institute from a distinguished career in business and the academic community. A graduate of the University of California and the Harvard Business School, he has been a member of the faculty of the Harvard School of Business Administration and held the post of Professor and Associate Dean of the Graduate School of Business at Stanford

Sierra/Philco Appoints H. W. Jordan

H. Weaver Jordan has been appointed Product Marketing Manager, transmission measurement equipment, Sierra Electronic Operation, Philco-Ford Corporation. He will have overall marketing responsibility for transmission measurement equipment, one of the firm's two lines of instruments used primarily in the telecommunications industry.

Jordan came to Sierra from Lenkurt Electric Co., Inc., where he was a Project Manager and Staff Sales Engineer.

Elmer D. Hill Joins Applied Technology

Elmer D. Hill, Palo Alto, has joined the Applied Technology Division of Itek Corporation as staff scientist. Hill was formerly a staff scientist for Watkins-Johnson Company of Palo Alto.

Hill earned his B.S. degree in Electrical Engineering from Stanford University in 1956 and his M.S. degree there in 1957. Previous experience: U.S. Army as an instructor in guided missile electronic systems, Jet Propulsion Lab in Pasadena, Stanford University Electronics Laboratory and Chief, Division of Technical Services, U.S. State Department Office of Security in Washington, D.C.

Vega Appoints T. J. Nicholson

Thomas J. Nicholson has been appointed Executive Vice President and General Manager of Vega Electronics Corporation according to P. L. Gundy, President. Nicholson has been Executive Vice President of M. V. R. Corporation in Palo Alto for the past several years and was previously with Ampex and General Electric.

Melabs Appoints Dwight Caswell

Mr. Dwight Caswell has been appointed as a Senior Staff Specialist by MELABS, Palo Alto. He will serve as a staff advisor and market analyst for MELABS' microwave component product line; he will also head a group making feasibility studies of unique microwave components.

Dwight Caswell is one of the "old timers" in the microwave field, he first began work on microwave ferrite devices in 1952. One of his major contributions to the ferrite device field was to "ruggedize" components so that they could meet the rigorous conditions of military and space useage. He holds a number of patents for ruggedized circulators, switching circulators, and applications on allied microwave components.

He has also published several papers, including a tutorial series on microwave ferrite devices which appeared in MICROWAVES. He is a Senior Member of the IEEE.

Hugh Webber Named General Manager Gordon L. Ness Assocates

Gordon Ness Associates has announced Hugh E. Webber's appointment as General Manager of the organization.

In this position Webber will be responsible for the administration of the firm's many operations in consulting, acquisition and merger activities, and the general management of other company interests such as Pacific Assemblers Company, Inc. (PASCO).

He is a Fellow of the IEEE, and is an Associate Fellow of the American Institute of Aeronautics and Astronautics. He has been issued nine patents and directed compilation and authored key chapters of *Microwave Theory and Techniques Handbook* published by McGraw-Hill.

Fairchild Instrumentation Appoints Takashi Mori and Thomas Shillingburg

Takashi Mori has been promoted to Manager, Digital Voltmeter Development at Fairchild Instrumentation. Mori was previously a Senior Engineer with the Instruments Groups of the test instrumentation firm, a division of Fairchild Camera and Instrument Corp.

Thomas Shillingburg has been appointed Systems Quality Assurance Manager at Fairchild Instrumentation, according to an announcement by Dean Mack, Systems Plant Manager.

Thompson to Philco-Ford

E. M. Thompson has been appointed sales engineer for the Sierra Electronic Operation of Philco-Ford Corp.

Mr. Thompson will be responsible for sales and applications engineering on tunable level meters and other instruments for radio and telephone equipment measurements.

Lenkurt Promotes D. Davis

Danny N. Davis has been promoted to Manager of Lenkurt Electric Co., Inc.'s European operations. Davis was a communications engineer in Lenkurt's Washington, D.C., office. He will be located at Wiesbaden, Germany.

Formerly Davis was employed by the Technical Material Corporation, Mamaroneck, N.Y.; Tele Signal Corporation, Hicksville, N.Y.; Federal Electric Corporation, Paramus, N.J.; and Philco Corporation, Philadelphia. While in military service, he was engaged in radar communications and navigation work.

POSITIONS WANTED BY STUDENT MEMBERS

The following advertisements have been made available by Grid without charge to these student members seeking opportunities to begin or continue their careers. Please contact them directly at the address or phone number given for each.

HOSEIN BATENI 29

Full-time summer employment

I am interested in design. I have a AA Degree in Mechanical and Electronic Drawing and expect to have a BSEE S 1969 from SFSC. I have done circuit board designing for Lynch Communications, SF. I am a foreign student now, but intend to change my visa to immigration after 1969 and plan to stay in the U.S. 1392 6th Ave., SF. Ph.664-4934.

ROBERT A. BEEDE 23

Part-time summer employment

I am interested in Audio, electroacoustical and acoustical engineering. I am a member of Audio Engineering Society. I expect to have my BSEE in Jan. 1969 from SFSC. Have worked 1 year as QA technician in QAμ Circuits, Dept. 8, Fairchild Semiconductor, Mountain View. Conscience prevents me from working on war machine products. 1709 Broderick St., SF. Phone 922-3558.

DAVID A. CAMMACK 24

Full-time summer employment

I am interested in systems, control, computer (especially analog) simulation. Am Chairman, SFSC/IEEE Student Branch; delegate to 1968 student convention in New York. I expect to attain BS from SFSC in June 1968. I have been accepted for graduate study in quantum electronics at MIT. Have had experience in data processing as machine operator, programmer, wiring specialist. 6750 Fulton St., SF. 94121. Ph. 387-3548.

RICHARD CASHDOLLAR 21

Part-time summer employment

I am generally interested in electronic engineering. I expect to have my BSEE in January 1969 from SFSC. 3440 Longview Dr., San Bruno. Ph. 355-2894.

JOHN JENSEN 24

Full-time summer employment

I am especially interested in microwave. I have my AA from Sacramento City College 1964 and expect to attain a BSEE from SFSC in June 1969. I have worked for Litton Industries from 6/66 through 2/67 as a cold test technician. 685 Hillside Blvd., Daly City. Ph. 756-3214.

GARY GREENBERG 23

Full-time summer employment

I am interested in electronics, generally, and am a member of the Engineering Society at SFSC. I have had experience in the repair of TV, radio, amplifiers — tube/transistor. 1435 31st Ave., SF. Ph. 661-1087.

ALEXANDER TAKAHASHI 26

Full-time employment

Interested in control systems (temperature or power). Expect my BSEE in June 1968 from SFSC. I speak both Russian and Japanese. 8 Dell St., Mill Valley. Ph. 388-1692.

STEPHEN JOHNSON 27

Full-time summer employment

I am interested in electronic engineering. I expect to have my BSEE in Feb. from SFSC. I have had 4 years in U.S. Air Force as repairman: radio, transmitters, etc. 66 Carmel, SF. Ph. 664-8539.

LUDWIG KIRAMIDJIAN, JR. 20

Full-time summer employment

I am interested in the production of electronic components. I expect to have my BS in Jan. 1970 from SFSC. 599 40th Ave., SF. Ph. 221-6557.

CHRIS HADJIMICHAEL 24

Full-time summer employment

I am interested in communications, solid-state electronics (design). I have been elected to the Honor Society at SFSC. I expect to graduate from SFSC June 2, 1968. I am a foreign student on a student visa. I intend to stay in the U.S. for at least 2-3 years — until completion of my graduate work at Santa Clara University. 745 43rd Ave., No. 11, SF. Ph. 992-5551.

BERTON H. STEPHENS 29

Permanent full-time employment

Interested in electronic engineering — simulation. Expect to have my BS in June 1968 from SFSC. President of Engineering Society, member: IEEE, AIAA, ASCE. 1 year experience as microwave test technician, 2 years dictation system technician. Home by 5:30 pm at 551 Joost Ave., SF. 94127. Ph. (415) 587-1097.

TIMOTHY A. GOMES 22

Full-time employment

I am especially interested in integrated circuits. I have been an engineering trainee at San Francisco Bay Naval Shipyard. I expect to attain my BSE from SFSC in June, 1968. 3550 California Street, SF 94118. Ph. 931-7495.

RONALD WIKOFF 24

Full-time employment

I'm interested in some phase of marketing or management. I expect to have my BS in Industrial Technology in June 1968 from Fresno State (3.82 Grade Pt. Avg.). I am a member of: Epsilon Pi Tau, Alpha Gamma Sigma. Have had 4 years experience as aviation electrician U.S. Navy (Rate E5) I am married and have 2 sons, 2 1/2 and 4 1/2. 2825 No. Adoline, Fresno. Ph. Fresno 224-3324.

ASEE Report Says Master's Degree a Minimum

A minimum of at least a master's degree should be required in the training of U.S. engineers, according to a report from the American Society of Engineering Education (ASEE).

An exhaustive four-year study by the ASEE's Committee on Goals of Engineering Education saw today's engineers as members of one of the last major professions in which only a bachelor's degree is required.

"The greatest challenge facing engineering educators today is that of achieving a workable balance," the report stated. "Programs should make possible greater depth in the physical sciences, engineering sciences and mathematics, and should permit the opportunity for more effective integration of the social sciences and humanities..

"The basic engineering problem of baccalaureate plus master's degree seems to offer the opportunity needed to achieve this goal. By including a year of graduate study, the student should be able to acquire a pattern and habit of self-development which will stand him in good stead throughout his engineering career."

EWS Group Special Issue On Computer-Aided Documentation

A special issue of the IEEE *Transactions on Engineering Writing and Speech*, to appear in August 1968, will deal with both the software and systems aspects of computer-assisted documentation.

Authors for this special issue will examine such topics as: *Machine-Aided Computer Program Documentation, A Time-Shared Data Retrieval System, Computer-Assisted Correction of Unorthographic Text*, and *Text Editing in a Multi-Access System.*

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PPalo Alto; 327-0830

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PP. O. Box 1383
SSan Carlos; 593-6057

[illegible]omponents Sales California
33980 Fabian Way
PPalo Alto; 326-5317

[illegible]ar West Industrial Sales
FP.O. Box 11134
FPalo Alto; 321-3943

O'Halloran Associates
3921 E. Bayshore,
Palo Alto; 326-1493

Rupp Co., V. T.
1182 Los Altos Avenue,
Los Altos; 948-1483

King Engineering Co., Inc.
525 Grant Street
San Mateo; 342-9645

L & M Engineering
2620 The Alameda
Santa Clara; 243-6661

Walter Associates
175 S. San Antonio Road,
P.O. Box AN
Los Altos; 941-3141

Willard Nott & Co.
1485 Bayshore Blvd.
San Francisco; 587-2091

Snitzer Co., T. Louis
1020 Corporation Way,
Palo Alto; 968-8304

Stone & Assoc., Jay
140 Main Street,
Los Altos; 948-4563

Geist Co., W. K.
Box 746, Cupertino;
968-1608, 253-5433

AWS Western Welding Technical Conference

The Santa Clara Valley Section of the American Welding Society (AWS) is presenting the Sixth Western Welding Technical Conference on Thursday and Friday, May 9th and 10th, 1968, at Rickey's Hyatt House Hotel, Palo Alto, California. The Conference theme will be "New Frontiers In Metals Joining", and the program will consist of concurrent sessions on Aerospace, Electronics, Structures and Vessels, and Nondestructive Testing. The conference will be of interest to a number of IEEE members. A total of forty-five technical papers on welding, brazing, and soldering are to be presented by authors who are recognized authorities in their respective fields. Fifteen of these papers will be delivered at the sessions on Electronics, and will include topics such as Laser welding, Electron Beam welding, metal-to-ceramic joining techniques, microwelding, and X-ray TV inspection of Electronic Components.

A Registration fee of $25.00 covers all technical sessions, Luncheon on Thursday, Friday Social Hour, and Conference Abstracts. Registration forms may be obtained from: Thomas L. Jekyll—AWS Welding Conference, c/o Hipp Welding, Inc., P.O. Box 28, Palo Alto, Calif.

All this, and Money, too?

Tempress Research, manufacturer of miniature high precision tools and machinery for the semiconductor manufacturing industry, has announced a new 42,000 square foot manufacturing plant, now under construction in Los Gatos, California. The complex, estimated at just under a million dollars, will include a gymnasium, locker and shower rooms, game courts, putting green and a swimming pool, as important supporting elements to the carefully planned production and office areas.

Frank Christensen, founder and president of the 5-year-old multi-million dollar company, considers such recreational facilities a prime requirement for Tempress employees who perform delicate and trying tasks, spending long hours with microscopes and other microminiature machinery aids. Tempress products, measured in thousandths of an inch, include tungsten carbide lead bonding capillary tips and ultrasonic bonding tools, used to attach wires of smaller diameter than a human hair within transisters smaller than a collar button.

"After all," said Christensen, "only well-rounded, happy people can be expected to function at a level of total efficiency—so necessary in the production of the Tempress finished product."

Laser Provides Light Knife for Surgery

A new "light knife" has been constructed that permits surgeons to use the focused beam of a laser as easily as they would a scalpel. Until now, laser devices used in medical experiments did not provide much freedom of movement.

The new device, developed at Bell Telephone Laboratories, guides the beam from the laser source through a hollow, jointed arm to a small probe which is held like a scalpel. The probe is about the size of a fountain pen and can be moved easily in any direction by the surgeon. The probe also may be attached to a surgical microscope for more delicate operations. In this case, the beam is transmitted through the microscope which can be positioned by the surgeon.

The knife-like arm consists of an alternating series of six hollow tubular sections and six hollow blocks. The tubes are connected to the blocks at right angles to each other so that they form an elbow. Prisms within the blocks bend the laser beam around each 90-degree corner. The tubular sections are constructed of inner and outer aluminum. One tube is connected to the block on one side and the other tube to the block at the opposite end. Ball bearings set between inner and outer tubes allow free rotation about a common axis. The net result is that the arm, which looks like a series of "L's" strung together, has full mobility.

Because the tubes swivel and the corners remain rigid, the light always makes 90-degree turns. After it zigzags through the tubes, the light exits through the hand-held probe. A lens at the tip of the probe focuses the light to a pinpoint a short distance away. The coherence of the laser beam is preserved by the good reflective characteristics of the prisms. Thus, with coherence maintained the light can be focused to a microscopic spot.

"MICRO CIRCUITS. IT'S CALLED TECHNOLOGICAL FALLOUT."

DALMO VICTOR ADDING NEW ANECHOIC CHAMBER

Construction of a large tapered anechoic chamber is currently underway at Dalmo Victor, a Textron division, Belmont, California. The chamber is believed to be the largest and most accurate of its kind in Northern California.

According to Don J. Stoddard, Jr., aerospace antenna engineering manager at Dalmo Victor, the chamber is designed for testing over a frequency range from 100 MHz to 35 GHz.

R.O. ASSOCIATES EXPANDING

RO Associates Incorporated, electronics manufacturer, has expanded operations substantially and moved to new, modern manufacturing and office facilities here.

RO manufactures functional analog modules, system power supplies, industrial control circuits, and temperature controllers. The company was founded five years ago in San Carlos, California, by Dr. Robert H. Okada, president. This is RO's first major expansion. Some 30 people are now employed in the modern 5,000-square-foot facility.

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INTEGRATED CIRCUITS SUMMER INSTITUTE

The Second Annual Integrated Circuits Engineering Summer Institute will be at the University of Arizona, Tucson. It is jointly sponsored by the Electrical Engineering Department through its Solid State Engineering Laboratory and the Division of Continuing Education. The Institute will be offered at three different times. They are:

Session I	June 3-14, 1968
Session II	June 17-28, 1968
Session III	June 8-19, 1968

The two-week session fee is $450.

The two-week sessions will consist of intensive and comprehensive design and fabrication experiences based upon lectures prepared by the staff of the Solid State Engineering Laboratory.

For further information, contact Dr. Roy H. Mattson, Director of the Institute and Head of Electrical Engineering Department.

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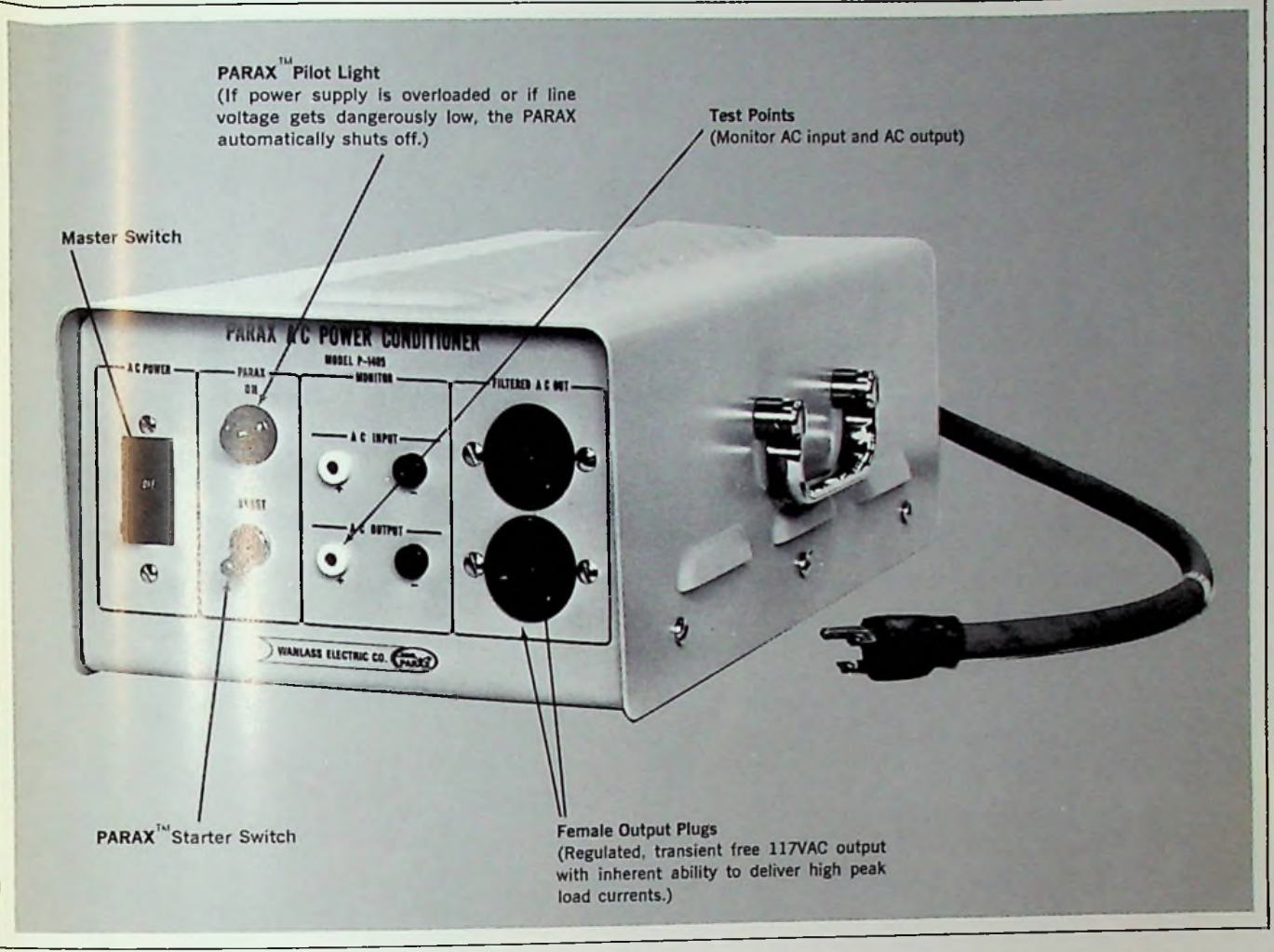

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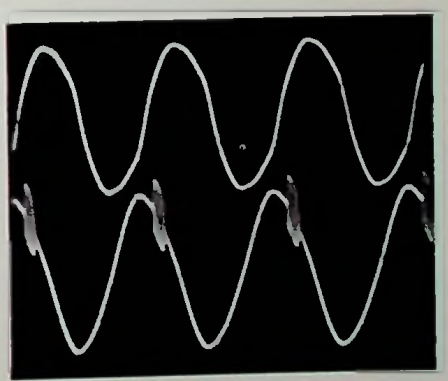

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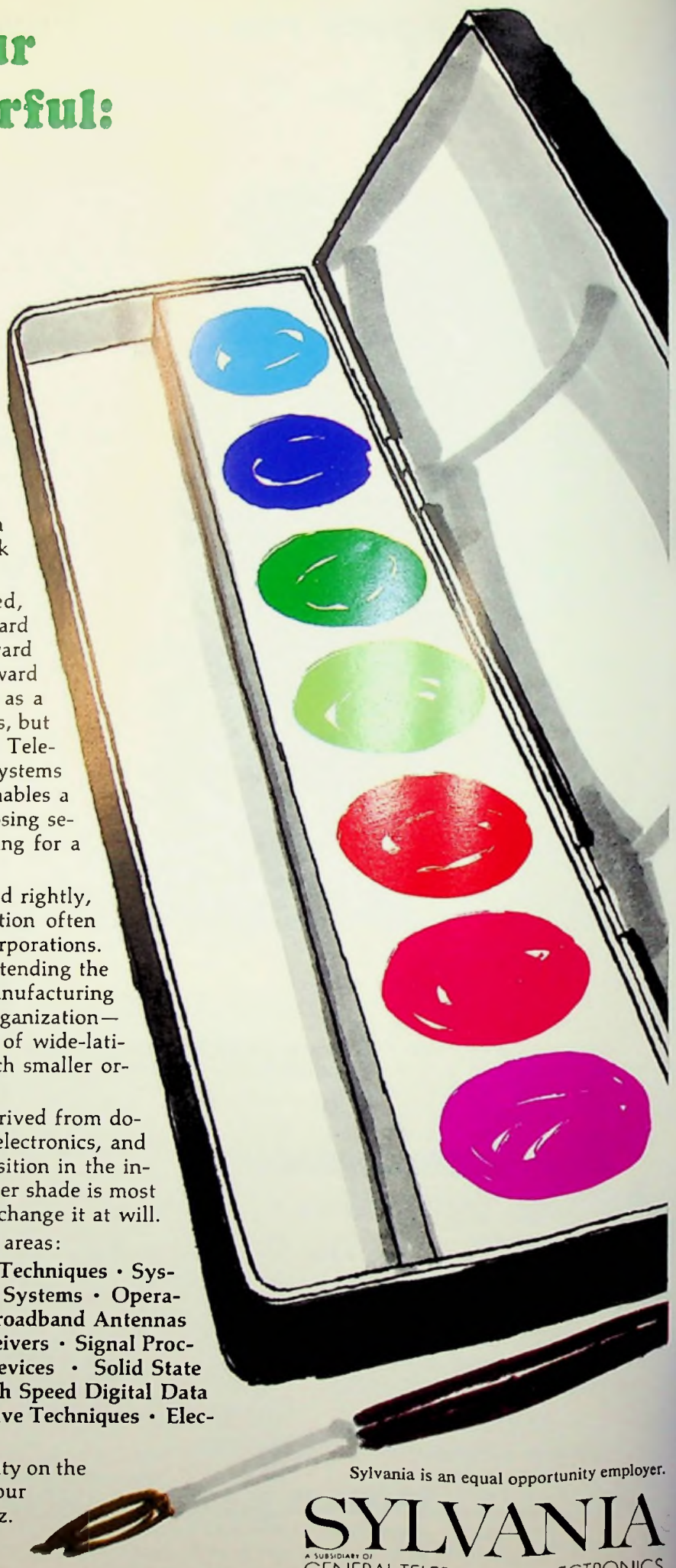

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