

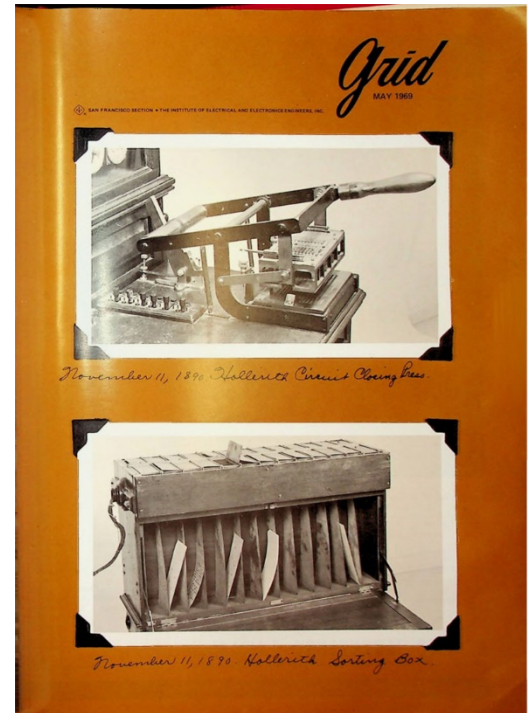
EDITOR'S PROFILE of this issue

from a historical perspective ...

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

May, 1969:

Cover: Shown is the Hollerith Electric Tabulating Machine, used to gather and analyze data for the 1890 census. This instrument evolved into the company we know as International Business Machines (IBM). I can remember going to Stanford's computer building at 1 AM so I could get an available card-punch machine to prepare Hollerith cards for a program deck to submit to run on the mainframe computer (a CDC 6600). More on page 14.



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

https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History

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

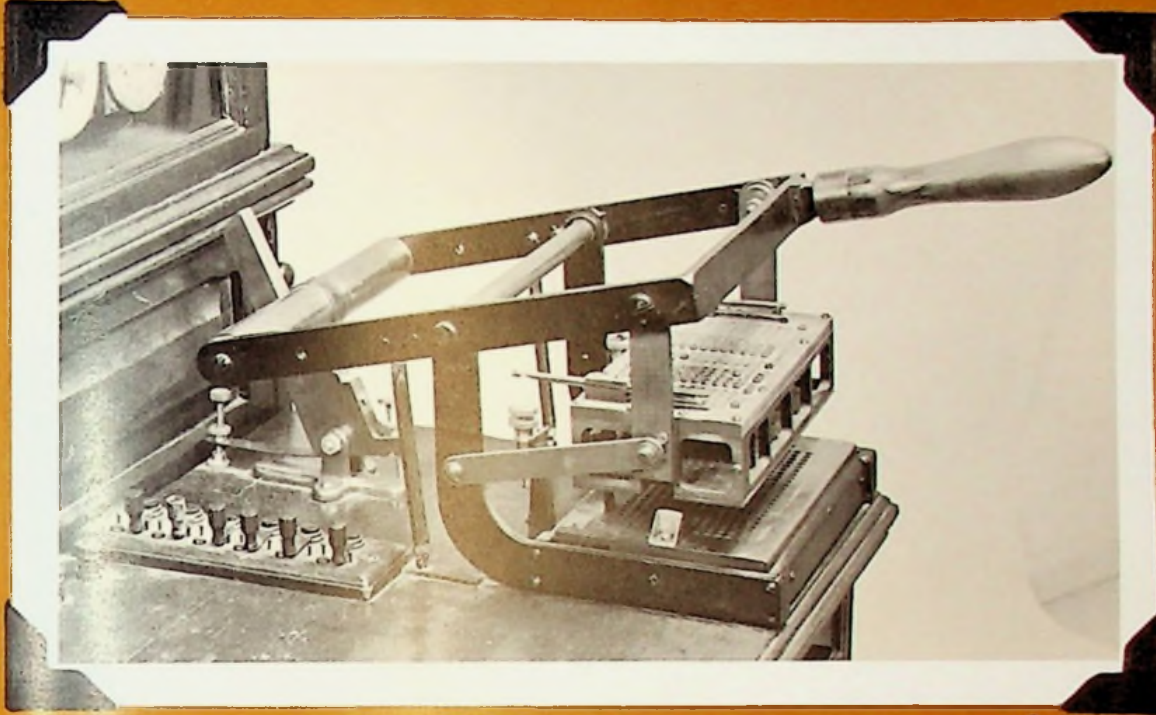
April, 2025

Contact p.wesling@ieee.org

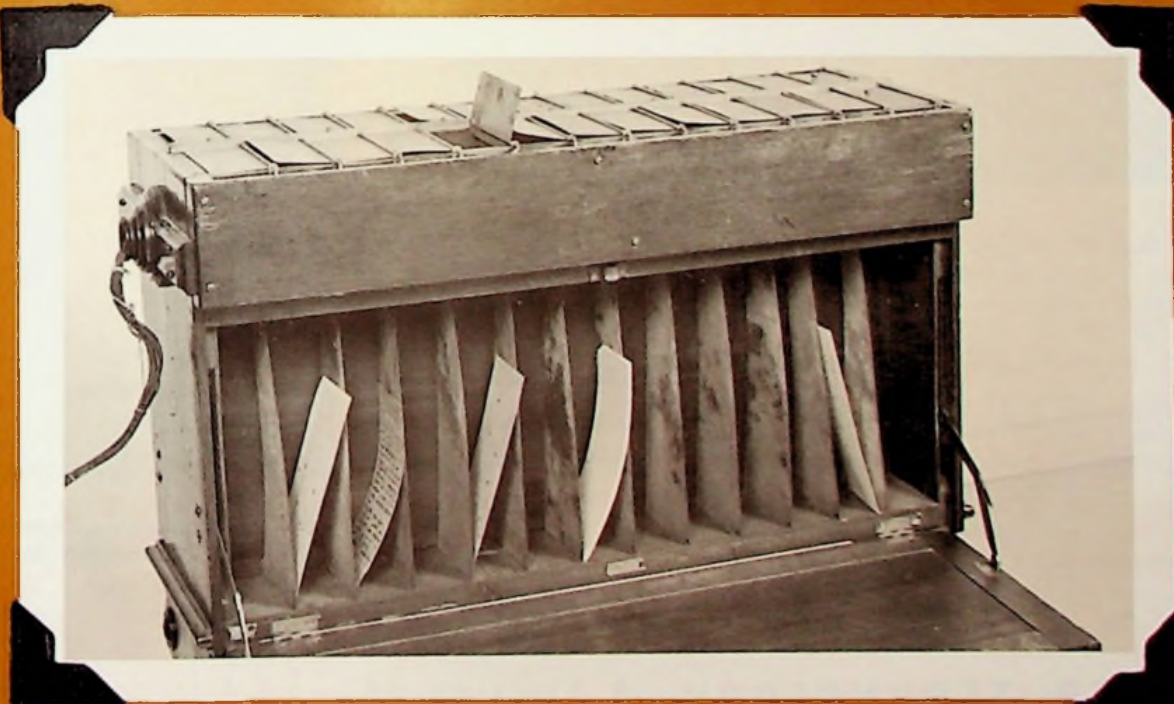
Grid

MAY 1969

⊕ SAN FRANCISCO SECTION • THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

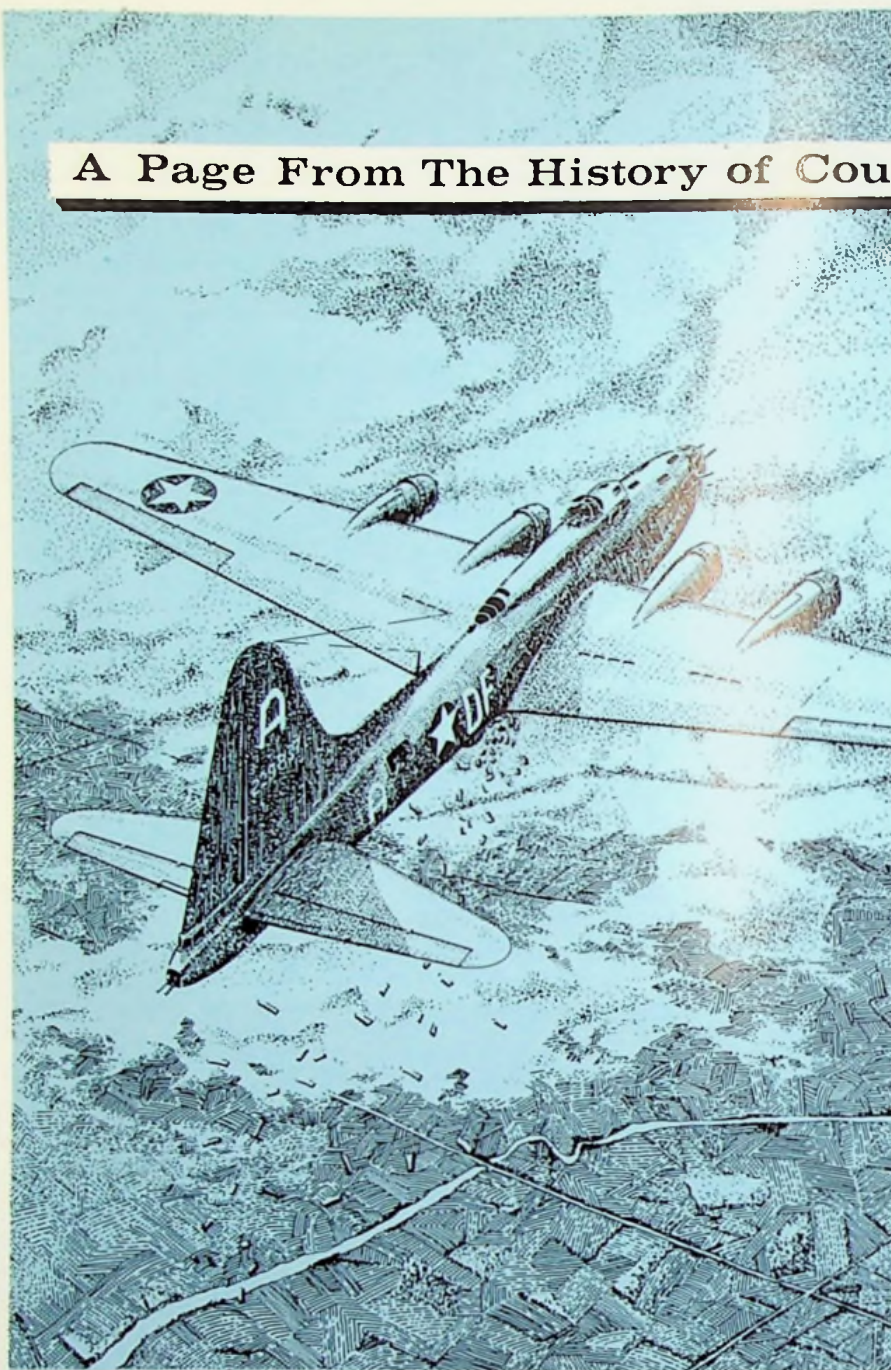


November 11, 1890 Hollerith Circuit Closing Press.



November 11, 1890. Hollerith Sorting Box.

A Page From The History of Countermeasures



Aluminum foil strips dropped in advance of air raids had a devastating effect on German radar in World War II. In some instances bomber losses from missions were reduced from an expected 5% to less than 2%.

If you know countermeasures and want to be a part of today's ECM achievements, talk to Applied Technology. We're innovators and manufacturers of electronic reconnaissance, surveillance and active countermeasures systems. Applied Technology equipment is credited with saving many lives in Vietnam.

Applied Technology has positions open in many disciplines on many levels.

ACT NOW ! PRESENT SPECIAL NEEDS

Engineers with experience in...

- Aerospace Ground Equipment
- Power Supplies
- Displays
- Digital Systems
- Instrumentation & Recorders
- Reliability
- Maintainability

WRITE OR CALL TO ARRANGE
CONFIDENTIAL INTERVIEW.

APPLIED TECHNOLOGY

A Division of
Itek Corporation

3410 HILLVIEW AVE. • STANFORD INDUSTRIAL PARK • PALO ALTO, CALIFORNIA



Call Collect
(7:30 a.m. to 5:00 p.m.)
(415) 321-5135

An Equal Opportunity Employer

ELECTRONIC WARFARE SYSTEMS • MICROWAVE COMPONENTS • SPECIAL COMMUNICATIONS • AIRBORNE RECORDERS

Battery Powered!



15-MHz, Dual-Trace Portable Oscilloscope

Your waveform measurements no longer need be compromised by adverse field conditions or the absence of a convenient power connection. The Tektronix Type 422 Portable Oscilloscope brings the precision of the laboratory "on site" to meet your measurement requirements.

This compact, rugged oscilloscope combines small size and light weight with 15-MHz, dual-trace performance! Two models are available. One is powered from AC; the other from AC, DC, or internal rechargeable batteries. The AC version weighs less than 22 pounds including accessories and operates from 115 or 230 VAC $\pm 10\%$, 45 to 440 Hz, 40 watts. The AC/DC version (MOD 125B) with

built-in battery recharger weighs 30 pounds including accessories and batteries and operates from an internal 24-volt rechargeable battery pack; from 115 or 230 VAC $\pm 25\%$, 45 to 440 Hz, 27 watts; or from 11.5 to 35 VDC, 25 watts.

For a demonstration of the Type 422 in your application call your Tektronix Field Engineer or write, Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97005.

Type 422 Oscilloscope, AC powered	\$1495
Type 422 MOD 125B Oscilloscope, AC/DC powered (without battery pack)	\$1800
Battery Pack for Type 422 MOD 125B (order 015-0555-02)	\$ 125

U.S. Sales Prices FOB Beaverton, Oregon

FOR A DEMONSTRATION, CALL YOUR LOCAL TEKTRONIX FIELD ENGINEER.



Tektronix, Inc. SAN FRANCISCO FIELD OFFICES

1700 MT. DIABLO BLVD. • WALNUT CREEK, CALIFORNIA 94595 • PHONE 926-5100
FROM OAKLAND, BERKELEY, DUBLIN, ALBANY AND SAN LEANDRO, CALIFORNIA
9750 FABIAN WAY • FOLSOM, CALIFORNIA 95630 • PHONE 338-5500
SUITE 10, 1705 DE LA CRUZ BLVD. • SANTA CLARA, CALIFORNIA 95050 • PHONE 298-4010



ON THE COVER

This month's cover features the Hollerith Electric Tabulating Machine, the forerunner of today's sophisticated computers. The Hollerith machine consists of three main parts, namely, the press or circuit-closing device, the dials or counters, and the sorting box. This type of machine was used to compute the Eleventh Census of 1890. The annual joint meeting of the Santa Clara Valley Subsection and the San Francisco Section honoring Pioneers in Computers and Data Communication will be held on Wednesday, May 21. The feature speaker of the evening will be Mr. Victor R. Witt, Director of the San Jose Laboratory, Systems Development Division, IBM Corp. His subject will be the Evolution of Computer Development. Cover design by artist Ted Martinez.

Grid

volume 15
number 9

MAY, 1969

Published monthly except July and August
by San Francisco Section
Institute of Electrical and Electronics Engineers

EDITORIAL BOARD

John E. Barkle, Bechtel Corp.
John B. Damonte, LMSC
Larry G. FitzSimmons, Jr., PTT Co.
Donald O. Pederson, U.C. Berkeley

PUBLICATIONS ADVISOR

Merle Mass, Hewlett Packard Co.

EDITOR

Ernesto Montano

Address all mail except
address changes to
San Francisco Section Office, IEEE
Suite 2210, 701 Welch Road
Palo Alto, Calif. 94304
Telephone (415) 327-6622

Jean Helmke, Office Manager

1968-69 San Francisco Section Officers

Chairman: JOHN E. BARKLE
Vice Chairman: JOHN B. DAMONTE
Secretary: DONALD O. PEDERSON
Treasurer: LARRY G. FITZSIMMONS, Jr.
Membership Chairman: JAMES J. McCANN
PG&E, 781-4211

Members send address change promptly to
IEEE, 345 East 47th St., New York, N.Y. 10017
(Telephone: (212) PL 2-6800)

Advertising
E. A. Montano, IEEE
701 Welch Rd., Palo Alto, Calif. (415) 327-6622

Second Class postage paid at Palo Alto, Ca.
and at additional mailing offices

Subscriptions:
\$4.00 (members); \$6.00 (others);
overseas, \$7.00 per annum

Printed by
Metropolitan Printing Co., Portland, Oregon

Meeting

**AEROSPACE &
ELECTRONIC
SYSTEMS
MAY 22**

Story on
page 18

**ANNUAL BARBEQUE STEAK DINNER AND
WINETASTING.**

MAY 22, Thursday, 6:30 PM, Paul Masson Historic Mountain Winery, Saratoga. (see map with story). No phone reservations; mail check for \$5.00 per person to Roger Winslow, 19455 Melinda Circle, Saratoga, Calif. 95070, no later than May 12th. Limited to 220 people. No minors, please.

**ANTENNAS &
PROPAGATION
MAY 8**

Story on
page 7

**REFLECTION OF RADAR SIGNALS FROM
THE AURORA BOREALIS.** Dr. Walter G. Chesnut, Radio Physics Lab, SRI.

MAY 8, Thursday, 8 PM, SRI Auditorium, Bldg. 44 on Laurel Street, Menlo Park. Dinner: 6:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Dr. Allen Smoll, 321-4350, ext. 5854 by May 7th.

**AUTOMATIC
CONTROL
MAY 21**

Story on
page 8

**APPLICATIONS OF KALMAN FILTERING
THEORY.** Dr. Stanley F. Schmidt, Senior Scientist, Analytical Mechanics Associates, Inc., Palo Alto.

MAY 21, Wednesday, 8:00 PM, Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto. Dinner: 6:15 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. No reservations.

**CIRCUIT
THEORY
MAY 21**

Story on
page 8

INTEGRATED ELECTRONICS FOR A READING AID FOR THE BLIND. Prof. James D. Meindl, EE Dept., Stanford University.

MAY 21, Wednesday, 8:00 PM, 134 McCullough Bldg., Stanford University. Dinner: 6:00 PM, AuBerge Restaurant, 2826 El Camino Real, Redwood City. Reservations: Mrs. Janet Delaney, 642-3705 by May 20th.

**COMPUTER
MAY 27**

Story on
page 19

**ADVANCES IN CIRCUIT TECHNOLOGY AND
THEIR IMPACT ON COMPUTING SYSTEMS.** Robert A. Henle, Technical Engineer, IBM Corp., San Jose.

MAY 27, Tuesday, 8:00 PM, SRI Bldg. 44 on Laurel Street, Menlo Park. Dinner: 6:15 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Tom Whitney, 326-7000, ext. 3112 or 2707 by May 26th.

**EAST BAY
SUBSECTION
MAY 5**

**PRESENTATION OF AWARDS FOR THE EAST
BAY HIGH SCHOOL SCIENCE PAPER CON-
TEST.** Dinner meeting. Prof. D. O. Pederson, U.S. Berkeley, speaker. See April Grid, page 18.

MAY 5, Monday, 7 PM, Blue Dolphin Restaurant, San Leandro Marina (foot of Marina Blvd.) \$4.50 plus tax and tip. Reservations: Oakland: Florence Wanser, 835-8500, ext. 53; San Francisco: Mary Vilter, 399-4974; San Jose: Linda Jarrett (408) 291-4567 by May 2nd.

**ELECTROMAGNETIC
COMPATIBILITY
MAY 19**

Story on
page 12

THE STANFORD LINEAR ACCELERATOR. A lecture by Vernon G. Price, Head of Accelerator Operations. ELECTION MEETING. COME AND VOTE!

MAY 19, Monday, 8:00 PM, Hewlett-Packard Auditorium, 1501 Page Mill Road, Palo Alto. Dinner: 6:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Bill Swift, 326-7000, ext. 3088 by May 19th.

**ELECTRON
DEVICES
MAY 14**

Story on
page 9

**THE CAPABILITIES OF ELECTRON BEAM-
SEMICONDUCTOR ACTIVE DEVICES** by Dr. Carroll B. Norris, Jr., Research Associate, Stanford Univ. and **THE CROSS-FERTILIZATION OF
ELECTRON TUBE TECHNOLOGY WITH**

Calendar

OTHER DEVICE TECHNOLOGIES by Dr. Leonard Reed, Manager, Advanced Products Operation, EIMAC, Div. of Varian, San Carlos.

MAY 14, Wednesday, 8:00 PM, Physics Lecture Hall, PH 101, Stanford. Meet at 6:00 PM. Dinner at 6:30 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Glenna Morris, 327-7800 ext. 360 by May 13th.

INFORMATION THEORY
MAY 15

Story on
page 13

INCOHERENT-DETECTION GEOMETRY. Dr. Nelson M. Blachman, Sylvania Electronic Systems, Mt. View.

MAY 15, Thursday, 8:30 PM, SRI Bldg. 1, Conference Room B, 333 Ravenswood Ave., Menlo Park. Dinner: 6:15 PM, Ming's of Palo Alto, 1700 Embarcadero Road, E. Palo Alto. Reservations: Mrs. Mary Rodimon, 966-3217, by May 14th.

MAGNETICS
MAY 13

Story on
page 18

STATE OF MAGNETO-OPTICAL RECORDING TODAY. John W. Beck, Senior Engineer, IBM Corp., San Jose.

MAY 13, Tuesday, 8:00 PM, IBM Research Laboratory Cafetorium, Bldg. 0025, on Yorktown Drive, San Jose, No Dinner.

POWER
MAY 19

Story on
page 12

POWER SUPPLY FOR SAN FRANCISCO BAY AREA RAPID TRANSIT. John H. Samter, Senior Electrical Engineer, PG&E Co., S.F.

MAY 19, Monday, 7:30 PM, Engineers Club of San Francisco, 160 Sansome St., S.F. Cocktails: 5:30 PM; Dinner: 6:30 PM. Reservations: Engineers Club: 421-3184 by May 16th.

RELIABILITY
MAY 15

Story on
page 14

COMPUTER-AIDED DESIGN ANALYSIS. Frederick Tatar, Project Engineer, Philco WDL, Palo Alto.

MAY 15, Thursday, 8:00 PM, PH 101, Stanford University. Dinner: 6:30 PM, Stanford View Restaurant, 1921 El Camino, Palo Alto. Reservations: W. W. DeVille, 326-4350, ext. 6133 or W. L. Finch or Fran Hamada, 743-1577 by May 14th.

SAN FRANCISCO SECTION
JUNE 13

Story on
page 10

ANNUAL MEETING - DINNER DANCE, honoring 1969 Fellows and National Award winners from S.F. Section.

JUNE 13, Friday, 6:30 PM, Engineers Club of San Francisco, 160 Sansome St., S.F., corner of Pine St. Cocktails: 6:30 PM; dinner: 8:00 PM and dancing from 8:30 PM. Reservations by ticket at \$7.50 per person. Call Section office: (415) 327-6622 by June 7th.

SANTA CLARA VALLEY SUBSECTION/ S.F. SECTION
MAY 21

Story on
page 14

ANNUAL PIONEERS NIGHT JOINT MEETING. THEME: PIONEERS IN COMPUTERS AND DATA COMMUNICATION. Mr. Victor R. Witt, IBM Corp., will be the featured speaker. Subject: THE EVOLUTION OF COMPUTER DEVELOPMENT. Wives and guests invited.

MAY 21, Wednesday, 8:30 PM, Old Plantation, South Bernardo at West El Camino Real, Sunnyvale. Cocktails: 6:30 PM; dinner: 7:30 PM. Club steak dinner \$4.50 incl. tax & tip. (Across from Cherry Chase Shopping Center.) Reservations: Section office: 327-6622 by May 19th.

VEHICULAR TECHNOLOGY
MAY 19

Story on
page 10

MOBILE COMMUNICATIONS AS A PUBLIC UTILITY SERVICE. Paul Popenoe, Jr., Supervising Utilities Engineer, Calif. Public Utilities Commission, S.F.

MAY 19, Monday, 8:00 PM, Shadows Restaurant, 213 - 2nd Ave., San Mateo. Cocktails: 6:00 PM, dinner: 6:45 PM. Reservations: Bill Nye, 328-1200 or Al Illsberg, 433-3800 by May 19th.

ENGINEERS and MANAGERS

B.S., M.S., Ph.D.

Urgent Requirements
by Our Clients in
Commercial Product
Areas for Experienced
Engineers to Staff
Key Positions in fields of

VIDEO CIRCUITRY
MICROWAVE DEVICES
SMALL COMPUTERS
PERIPHERAL EQUIPMT.
DISPLAY SYSTEMS
DATA ACQUISITION
INSTRUMENTATION
MECHANISMS
FLUIDICS

•
for personal and
confidential referrals
to client management,
at no cost to you
please submit resume
•

ENGLERT and COMPANY

*Management
Consultants*

2555 Park Boulevard
Palo Alto, Calif.
(415) 326-7390

1969/70 East Bay Subsection Candidates



CHAIRMAN
THEODORE HAMM, Jr.

Ted Hamm was graduated from the University of California at Berkeley in 1957 with the BSEE degree. He has been associated with the Lawrence Radiation Laboratory for the past ten years and currently is a Project Group Leader in the EE Department at the Lawrence Radiation Laboratory in Livermore. He is a past Program Chairman, Secretary-Treasurer and Vice Chairman of the East Bay Subsection of IEEE (IRE). He is currently Vice Chairman of the East Bay Subsection.



VICE CHAIRMAN
J. L. CATTOLICA

Graduate of the University of California with a B.S. degree in Electrical Engineering. He joined the Pacific Gas and Electric Company in 1937, and worked with the Construction Department. He later transferred to the Engineering Department as an Electrical Engineer, holding various positions in the Engineering and Operations Department. His present position is Senior Substation Engineer, East Bay Division.

Mr. Cattolica was an Electronics Officer in World War II.

He has worked on several committees for the East Bay Subsection, was Program Chairman in 1964 and Arrangements Chairman in 1965 and Treasurer in 1967 and Secretary in 1968.



TREASURER
C. J. BILLS

Mr. Bills received the B.S. degree in Business Administration from the University of Missouri in 1953. From 1953 to 1955 he served as an Executive Officer in the U.S. Army 14th Armored Cavalry Division in Germany. In 1956 he joined the Electrical Cable Division of the U.S. Rubber Company in Houston, Texas. Since 1957 he has been associated with the Kaiser Aluminum-Electrical Products Division, Houston, Texas and San Leandro, California where he is now District Manager. He is a member of the San Francisco Electric Club and has been an IEEE member since 1957. He is currently student relations chairman for the IEEE East Bay Subsection.



SECRETARY
F. G. DOELL

Mr. Doell graduated from the University of Washington in 1962 with a B.S. degree in Electrical Engineering. He is currently employed by Pacific Telephone and Telegraph Company as a Senior Engineer in the Chief Engineer's Protection group.

Mr. Doell is Subchairman of the San Francisco Section Membership Committee and has been Program Chairman for the East Bay Subsection for the past three years.



SECRETARY
LEWIS L. NEUBACHER

Mr. Neubacher is a graduate of Purdue University with a BSEE degree. He is registered professional engineer in the state of California. He was employed by Pacific Gas and Electric Company in 1931 in the Valuation Department. Subsequently he served as District Planning Engineer, Division Senior Substation Engineer and currently as Division Senior Distribution Engineer in Oakland. At present he is Arrangements Chairman of the East Bay Subsection of IEEE.



TREASURER
ROBERT B. NANNIZZI

Mr. Nannizzi graduated from the University of California in Berkeley in 1963 with a B.S. degree in Electrical Engineering. After graduation he worked for Lockheed Missiles and Space Company for two years in the field of satellite communications. In 1965 he joined Bechtel Corporation as a Power Systems Engineer. He has been an IEEE member since 1962, served on the Membership Committee in 1966 and has been Publicity Chairman for the East Bay Subsection for the past two years.

1969 VACATION PLANS



EUROPE GOLDEN CIRCLE
21 DAYS VISITING ENGLAND – DENMARK – SWITZERLAND
ITALY – FRANCE – SPAIN – PORTUGAL **\$895**

EUROPE
CHARTER FLIGHT

30 DAYS

VIA BOEING 707 JET
DEPARTING: JULY 22
RETURNING: AUGUST 20


\$350

GRAND
EUROPEAN TOUR

30 DAYS

ENGLAND – HOLLAND – ITALY
GERMANY – SPAIN
SWITZERLAND – FRANCE
INCLUDES: EXCELLENT HOTELS –
MOST MEALS – SIGHTSEEING – ETC.

\$550



AROUND THE WORLD
30 DAYS TOUR-\$1495

SPRING, SUMMER, FALL

VISITING HAWAII – JAPAN – FORMOSA –
HONG KONG – THAILAND – KASHMIR – NEPAL – TURKEY – GREECE

INCLUDES: JET ROUND TRIP – 1ST CLASS HOTELS – FULLY ESCORTED!



Are you interested in a 2-week tour of Europe
including air fare, hotels and sightseeing?

Tours or charter flights (your own organization charter
or shared with another group) offered to all IEEE
members and their families by Continental Express
International Passenger Services.

For complete information address inquiries to:
IEEE Grid Box CE

1969/70 Subsection Candidates for Santa Clara Valley



VICE CHAIRMAN

Marvin B. Rudin, President, Analog Integrated Microsystems, Inc., Santa Clara. Mr. Rudin received the BSEE in 1949 from Cal Tech and the MSEE in 1951 from the same institution. He has performed work and written papers on analog integrated circuits, telemetry multiplexing, modulation, and synchronization, and microwave stabilized oscillators for radar application. He has also taught a graduate course in logical design of digital computers, and has managed advanced development in data systems and computers at Radiation, Dynatronics, and Hughes. Since entering the Santa Clara Valley in January, 1966, Mr. Rudin was Manager of LIC R and D at Fairchild Semiconductor until November, 1968, when he left to form Analog Integrated Microsystems.



CHAIRMAN

Richard W. Towle, President, Towle Electronics Lab, a Los Altos Company featuring prototype Instrumentation development. Prior to forming this company, Mr. Towle was Chief Engineer and Technical Director at Advanced Technology of American-Standard in Mountain View. Before that, he was manager of Space Craft Signal and Data Processing Section at Philco in Palo Alto, and was a Research Specialist at LMSC. He received his B.S. in Physics from Iowa State University at Ames in 1950. Mr. Towle is presently Chairman of the Engineering Management Chapter. He served as General Chairman of the NTC in 1967 and as Program Chairman in 1965. He was President of the Santa Clara Valley Section of ISA in 1963-64.



SECRETARY

O. Thomas Purl, presently vice President, Devices Group, Watkins-Johnson Company. In this position he is responsible for the activities of the Tube Division, Stewart Division, and the Solid State Division of the Company. He has been with Watkins-Johnson Company for over ten years starting as a Project Engineer on traveling-wave tube programs. Formerly he was associated with the Research Laboratories of Hughes Aircraft Company, Culver City, California, where he was head of the Power Traveling-Wave Tube Section. He obtained BSEE, MS, and Ph.D. degrees from the University of Illinois in 1951, 1952 and 1955 respectively.



TREASURER

Andrew F. Leon, current publicity chairman of the IEEE Santa Clara Valley Subsection. Mr. Leon received his B.S. and M.S. degrees in Electrical Engineering from San Jose State College. He joined IBM, San Jose, in 1963 and has been involved in the following programs: designing analog memory and backup systems for the Process Control area and advanced circuit design in Video Data Transmission Interface Systems. Presently he is involved in recording electronics.



TREASURER

Robert D. Balkow is a Senior Engineer with Pacific Telephone in San Jose. His engineering duties have included development and design work in data transmission. Most recently he has been engaged in engineering of both transmission and switching equipment. He was Pacific Telephone's engineering coordinator for the installation of COMSAT's Jamesburg, California, earth station and its integration into the national network. He is a native of Spokane, Washington. He is a graduate of San Jose City College. His 17 years experience with Pacific Telephone has included assignments in Salinas, Sacramento and San Jose.

radar signals from aurora borealis

The lights in the sky shown in this picture are the Rayed Auroral Arcs. The dish is 60'. This radar has been used at frequencies of 30MHz through 780 MHz.

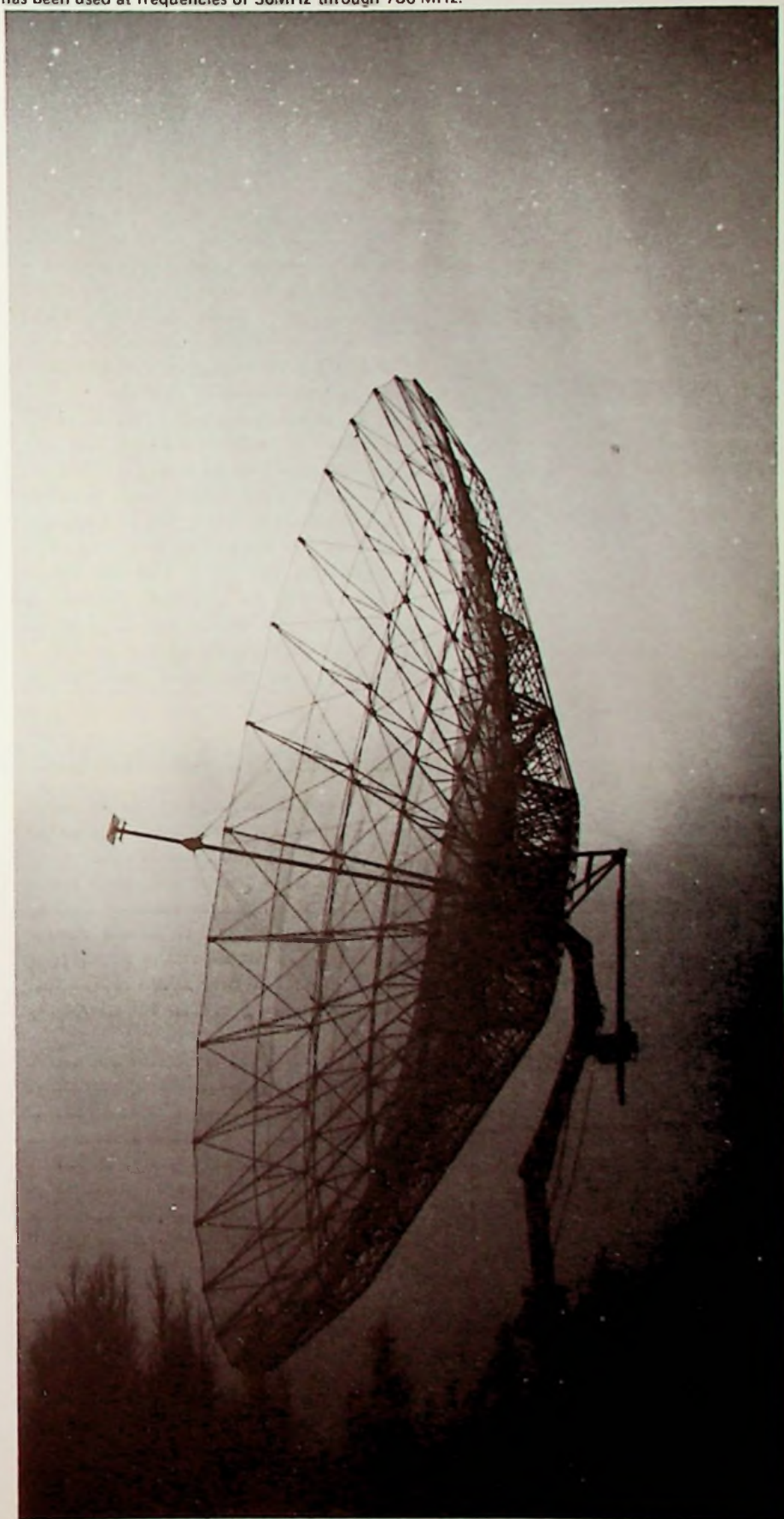
The discussion presented Thursday evening, May 8 to the Antennas and Propagation Chapter by Dr. Walter G. Chesnut will be a tutorial exposition of the development of our current state of understanding of the radar/auroral interaction. He will then describe experimental measurements of auroral radar reflections performed by members of the Radio Physics Laboratory of SRI using six radar frequencies from 50 MHz through 3000 MHz.

For many years it has been known that the aurora borealis and magnetic disturbances affect radio propagation. More recently experiments have shown that under certain conditions radar reflections could be obtained from the auroral ionosphere. It then was apparent that radar aurora could interfere with successful operation of civil and military aircraft radars deployed in the northern United States and Canada. As a result extensive studies were begun to understand the nature of the reflection processes. Subsequent research has shown that the radar returns from aurora were only obtained if the radar beam line and the earth's magnetic field direction in the scattering region intersect at almost exactly 90 degrees. Morphological studies have revealed that the location of radar aurora and visual aurora may overlap but usually are not exactly superposed. It is currently believed that the auroral reflections that are observed by radar result from Bragg scattering of the radar signals from longitudinal plasma waves that grow — or are amplified — when currents flow in the auroral ionosphere.



Dr. Chesnut

(Continued on page 10)



SIGNAL GENERATORS FOR AM & FM TO 1000 MHz

MODELS 180 & 180R AM Signal Generators provide for fast, precise alignment of complex RF radio and TV circuitry. Model 180 covers 2 to 400 MHz; Model 180R-5 to 475 MHz. Direct reading scales and dials, and individually calibrated frequency dials. Manual or automatic controls provide accurate output voltages at all levels. Solid state supply delivers regulated voltage to oscillator. Provision for external pulse modulator. Convenient stacking or rack mounting panels.

MODEL 188 FM Signal Generator is designed specifically for laboratory and production line testing of hi-fi FM receivers. Two-speed tuning for fast frequency setting. Incremental knob for extremely fine tuning. Internal or external modulation measured in three convenient ranges without external audio voltmeter. Solid state supply provides regulated plate, heater, and audio modulation voltages. Double shielding minimizes RF leakage. 50-ohm source impedance with low VSWR; wide deviation with exceptionally low distortion.

MEASUREMENTS

THOMAS A. EDISON INDUSTRIES
MCGRAW-EDISON COMPANY
P.O. BOX 180, BOONTON, N. J. 07005
TELEPHONE: (201) 334-2131



Kalman Filtering Theory Utilized in Recent Years

Two areas where Kalman Filtering Theory has been utilized extensively in recent years are in the development of navigation and attitude determination systems for aerospace and marine applications. These applications are special cases of the general data processing problem of combining measurements from many sources to yield estimates of related quantities. Dr. Stanley F. Schmidt, speaker at the Wednesday, May 21 Automatic Control meeting, will discuss the general applications of the theory by use of examples from aerospace navigation problems. Some problem areas and a few special techniques for obtaining practical data processing schemes will be outlined.

Dr. Schmidt has had a very broad experience in applying filtering and estimation theory to practical problems. He and associates at NASA Ames Research Center made probably the first application of the Kalman filter theory. This application was for an onboard navigation system for manned circumlunar missions. The actual Apollo onboard system utilizes many of the techniques developed by this Ames study effort.



Dr. Schmidt

Other applications for which the author has contributed include development of post flight analysis techniques for launch vehicles and spacecraft, precision attitude determination techniques for spacecraft and augmented inertial navigation systems for aircraft and space vehicles. Dr. Schmidt received his B of EE from Marquette University and his M.S. and Ph.D. in EE from Stanford. He is an Associate Fellow of the AIAA and a member of the IEEE.

The 8:00 p.m. meeting in the Lockheed Auditorium is an election meeting. A 6:15 dinner is scheduled at Rick's Swiss Chalet. See calendar for details.

Electronic Aid for the Blind

A novel dictionary-size optical-tactile reading aid for the blind has been developed using integrated electronics. It allows a blind person immediate access to virtually all printed material used by sighted people. James D. Meindl, Associate Professor of Electrical Engineering at Stanford, will discuss this topic at the May 21 meeting of the Circuit Theory Group.

The reading aid is a direct translation device which converts the optical image of a printed character to an exact tactile facsimile, which a reader detects with his fingertip. Salient features include a unique silicon monolithic optical image sensor, an efficient multiplexing system based upon integrated circuitry and a densely packaged piezoelectric tactile stimulator array. Reading speeds of 45 words per minute have been achieved using laboratory models of the reading aid.

Professor Meindl is the author of over thirty technical papers on semiconductor devices, integrated circuits, and micropower circuits, as well as a book on micropower circuits. He received the Ph.D. degree in electrical en-



Prof. Meindl

gineering from Carnegie Institute of Technology in 1958. A Fellow of the IEEE, Editor of the IEEE Journal of Solid-State Circuits, and Chairman of the 1969 International Solid-State Circuits Conference, Professor Meindl was recognized by the Arthur S. Fleming Commission in 1967 as one of the ten outstanding young scientists working for the Government.

The AuBerge Restaurant in Redwood City is the location of the 6:00 p.m. dinner. The meeting will follow at 8:00 in the McCullough Bldg., Stanford. See calendar for all details.

ED Hears Norris and Reed on Mar. 14

The Electron Devices Chapter will hear two speakers at the Wednesday, May 14 meeting. Dr. Carroll B. Norris will present some properties of a class of active elements employing an electron beam to control the output current of a semiconductor device and Dr. Leonard Reed will review several major electron tube techniques which have resulted in the conception and up-grading of "new" devices.

Dr. Norris will show that the basic beam-semiconductor devices have high gains, fast response and large output capability. He will give numerical data that allow the capabilities of the device to be evaluated in a given application.



Dr. Norris

In his talk, Dr. Reed will include the gas laser, originally a low-power device, which can now deliver visible light power up to 10 watts for extended periods. Problems that have been largely solved include argon ion gas clear-up, cathode life, bore erosion, and power deterioration. Quartz windows still employ epoxy seals, although alternatives are available for future use. He will discuss the application of ceramic-metal, gas tube, and microwave technologies to high-power lamp design, which has resulted in more compact, rugged light sources. Use of the recently developed ion plating technique has produced high-quality IR reflectors. Ordnance devices such as EBWs (exploding-bridge wire) and nuclear batteries can be manufactured with good yields and high reliability using vacuum tube procedures. A special type of electron tube, a high density heat flux diode, is proving to be of great use for nuclear fuel simulation studies in 1000° F. alkali metal environments. Three-foot-long, 37-pin clusters of these tubes putting out megawatts of power is planned for the early 1970's. The application of space power plant development alkali metal techniques for cooling in special electron tube situa-

tions is receiving attention, as is thermionic converter developed heat pipe technology. The potential use of pyrolytic graphite, boron nitride, niobium and other space age materials in high-power TWT and simple planar triode structures will also be discussed.

Dr. Norris received the B.S., M.S. and Ph.D. degrees in electrical engineering from Stanford in 1963, 1964 and 1967 respectively. His graduate work at Stanford was supported by an NSF fellowship. In 1963 he joined Lockheed Research in Palo Alto, where he worked with analysis and synthesis of R and RC distributed parameter networks. His doctoral work at Stanford concerned electron beam p-n junction active devices and measurements. Dr. Norris is presently a Research Associate at Stanford. He is a member of Tau Beta Pi and Phi Beta Kappa.

Dr. Reed graduated from the University of Wales with B.S. degrees in Chemistry and Metallurgy. He was awarded a B.I.S.R.A. Fellowship and attended Imperial College, London. In 1957, Dr. Reed joined the Kaiser Chemical Laboratories and was placed in charge of Research and Product Development in San Jose. He joined Eitel-McCullough, Inc., in 1960 and directs work on liquid metal corrosion, materials development for aerospace and electronic use as well as product and device development in the areas of energy conversion, chemical processing, electro-optics and special electron tubes. He is a Fellow of the American Ceramic Society, a member of the American Chemical, American Optical Societies, the Society for Aerospace & Materials Power Engineers, and a member of the IEEE. He is also a member of the executive committee of the Electronics Division of the American Ceramic Society, and of the IEEE Electron Tube Techniques Committee.



Dr. Reed

The meeting will be held at Stanford after a 6:30 dinner at Rick's Swiss Chalet. The group will meet at 6:00 p.m. See calendar for other details. IMPORTANT: ELECTION OF 1969-70 OFFICERS. COME AND VOTE!

IT'S NOT THE
HIGH HURDLES
THAT HURT
THE HORSE'S HOOVES
BUT THE
HAMMER,
HAMMER,
HAMMER
OF THE HIGHWAY.

Anonymous



A job shop providing technical personnel.

Services Division of
General Devices, Inc.
1518 No. Fourth, San Jose, Calif.
Tel: 294-6855

NEW
50 AMP SCR
POWER
SUPPLY **\$649**



Technological advances enable CHRISTIE to offer an economical 50 amp SCR power supply with improved performance and reliability.

- 1.5-37 VDC, 0-50 AMPS
- $\pm 0.25\%$ voltage regulation
- ± 1.5 amp current regulation
- 1% rms ripple
- 25-100 msec response

CHRISTIE ELECTRIC CORP.

3410 W. 67th St.
Los Angeles, Calif. 90043
Phone (213) 750-1151

Other SCR power supplies up to 135 volt or 600 amps

(415) 837-6478

WESGO

Your local
manufacturer
of
**GOLD, SILVER,
PLATINUM**
and alloys thereof
IN ALL FORMS

ALUMINA CERAMICS

rapid delivery in
prototype quantities

BRAZING ALLOYS

For service call
593-3121

WESTERN GOLD & PLATINUM
Belmont, California

SYSTEMS ENGINEERS

Responsible for adapting computer-based control system to customer's process.

2-4 years experience in process control, work with computer-based systems or experience in the paper industry.

BS degree in engineering (preferably electrical), physical sciences or EDP. Strong technical background with sales orientation.

FIELD SERVICE ENGINEERS

Responsible for maintenance of digital control systems.

3-4 years digital experience with a thorough understanding of basic electronics. Process control and linear circuit experience desired.

Military electronics school or equivalent with some college desired.

Those selected will undergo a company-sponsored training program and be assigned total responsibility for field operation of digital process control systems. Rapid advancement assured for those capable of meeting the challenge.

measurex
CORPORATION

330 Mathew Street Santa Clara, California
(408) 241-3385

Annual Dinner Dance for Section

Following the successful precedent from last year, the 1969 Annual Meeting of the Section will be a dinner dance honoring National Award Winners and the 1969 Fellows from the San Francisco Section. The affair will be held at the Engineers Club of San Francisco on Friday, June 13. Music will be by the Jack Fisher Quartet ably assisted by Sylvia Gaylord. Except for introductions and a brief presentation ceremony, no formal program has been planned.

The Club is located on top of the Hong Kong Bank Building at 160 Sansome Street (corner of Pine Street). Cocktails at popular prices will be available from 6:30 p.m. Dinner will be served at 8:00 and music for dancing will begin at 8:30. The cost will be \$7.50 per person; tickets will be available from the Section office and a number of other sources.

As has been the practice in the past, Group Chapters and Subsections are encouraged to organize tables. Also, individual tables for six or more may be reserved. Arrangements for tables and identifying signs may be made by calling Mrs. Jean Helmke at the Section office.

Radar Signals

(Continued from page 7)

Dr. Chesnut received a B.S. in Engineering Physics from Lehigh University in 1950, an M.S. in Physics from Lehigh in 1952 and a Ph.D. in Physics from the University of Rochester in 1956. While at Rochester and for two years thereafter at the Brookhaven National Laboratory, Dr. Chesnut engaged in high energy meson scattering experiments. Since joining the Radio Physics Laboratory of Stanford Research Institute, he has concentrated on research into high-altitude nuclear detonation phenomenology and effects upon radar propagation. As a Staff Scientist he has also engaged in experimental radar studies at the White Sands Missile Range of atmospheric reentry. His research has included study of the effects of ionospheric chemical doping on radio and radar with the aim of better understanding ionospheric processes. He has been investigating the scattering of radar signals by the aurora borealis. His work also includes research on various applications of stellar interferometry.

The meeting is scheduled for 8:00 p.m. in the SRI Auditorium and will be preceded by a 6:00 p.m. dinner at Rick's Swiss Chalet. See calendar for further details.

Popenoe on Mobile Communications

The Vehicular Technology Chapter will be addressed by Paul Popenoe, Jr. on the subject of Mobile Communications as a Public Utility Service, at their meeting on Monday, May 19th. Mr. Popenoe's talk will include a definition of mobile radio-telephone public utility service, a brief history of Federal and State regulations of such service, a description of the functions of the California Public Utilities Commission in regulating radio-telephone service and a survey of present utilities and the services they offer. In addition, he will review the communications equipment requirements for public utilities radio-telephone service from a systems point of view. Special emphasis will be placed on the need for public utilities systems to provide the highest quality of service consistent with managing the volume of communications traffic. The role of the equipment designer and manufacturer will be related to the requirements of overall systems design.

Mr. Popenoe graduated from the University of California in 1948 with a degree of Bachelor of Science in Electrical Engineering. After graduation, he worked in the geophysical field and had three years of operating and engineering experience in electrical communications with the Western Union Telegraph Co. He came to work for the Public Utilities Commission in 1952. He is a registered professional Electrical Engineer and a member of the IEEE. He has testified many times at public hearings before the Public Utilities Commission on technical matters relating to communications, and has also testified before the Federal Communications Commission.

The meeting will be held at the Shad-ows Restaurant in San Mateo. See calendar for details.

NEW MEMBERS

The Section
welcomes these new members

R. A. Getzoff
D. H. Jeong
K. Pringle
H. L. Silcocks
T. E. Wempe

Congratulations to these members
recently advanced to the grade of
Senior Member

J. Peschon
K. Thorn-Olsen
R. M. Walker

WESCON Forecasts 'Shape and Content' of Big August Week

In the merry month of May, activities leading toward the WESCON exposition and convention should be merrily on their way.

With an expected "guest list" of 45,000 or more professionals for the August event in the Cow Palace, and with product exhibits by 650 companies assured, the shape and content of a dozen different programs must emerge in the Spring.

This month, these progress reports are rendered:

Thirteen working committees are up and running — and some of them have been at work for several months. The committees are made up of Bay Area engineering and executive volunteers, and by August 1, the overall committee roster will include about 400 names.

The WESCON technical program committee, under direction of Dalton W. Martin (Vidar Corp.) and Dick Towle (Towlelectronics Laboratory), has charted 22 technical sessions for its four-day program, subject to committee review of final progress reports.

The two-day International Electronic Circuit Packaging Symposium, to be held concurrent as part of WESCON activity, is also lined up tentatively. Program was chosen in New York during the IEEE convention by the papers selection committee headed by H. J. Scagnelli (Bell Labs) and E. C. Neidel (Sandia Corp.).

Twenty-five Future Engineers from eight states (including five from the San Francisco Section area) are hard at work on the projects and technical papers they will present at WESCON. They were chosen in open competition from more than 770 entries by an FES judging committee. At stake are \$2400 in scholarship awards.

Entries close May 15 in the Industrial Design Awards program, which will display about 20 of the finest electronic product designs of the year. Judging is being undertaken by a team of nationally recognized industrial designers, all members of the Industrial Designers Society of America. This year, final awards will be presented at a special IDA luncheon during WESCON.

Negotiations are underway for an increase in free shuttlebus service between Palo Alto and the Cow Palace during the show. The feature, introduced in 1967, was a highly popular service. Arrangement will be made for parking private cars in Palo Alto at the shuttlebus terminal point.

Ray Jaeger of Lawrence Radiation Laboratory is chairman of the 1969 Science Film Theater program. The "theater" will be located in the Cow Palace, and will screen 25 or so new and significant science and engineering films on a daily basis. Jaeger, an LRL motion picture producer, continues the cooperation of the Information Film Producers of America with WESCON.

The provocative paintings of Elbon will be displayed in a large Cow Palace lounge area during WESCON. You may know the artist better than you think — "Elbon" is "Noble" spelled backward. The first part of the name is "Dr. Daniel." In addition to fine arts, his other interests include Motorola Inc., of which is vice chairman of the board.

tired of shaggy dog stories?...



Is Someone Trying To Pull
The Wool Over Your Eyes?
Limits Seem To Be Missing?

If you would like to know what it is you are buying, look at Melcor's specifications for their new series of Low Drift FET Input Op Amps with an accessible, Built-In Zeroing Potentiometer.

LIMIT SPECIFICATIONS:

Model	Input Voltage Drift Max. 0-85°C	Output Min.	Gain Min.	Bias Current Max. 25°C
1841	0.85mV	±10V ±5MA	300K	50pa
1842	0.425mV	±10V ±5MA	300K	50pa
1843	0.255mV	±10V ±5MA	300K	50pa

TYPICAL SPECIFICATIONS:

Fifty percent of a production lot must achieve typical specifications.

Input Impedance: 10,000 megohms • Unity Gain Bandwidth: 1.5MHz • Power Bandwidth: 40KHz • Slew Rate: 3V/usec • Common Mode Rejection: 5000 • Noise: 4μV.

The above units, as well as numerous others are available from stock.

Write for more detailed information on this series of units and many other Melcor Operational Amplifiers.

MELCOR ELECTRONICS CORPORATION
AMPLIFIERS FOR INDUSTRY

1750 New Highway, Farmingdale, L.I., New York 11735

Tel: 516-694-5570 • Twx: 510-224-6429



The Engineer as Expert Witness

"The Engineer as Expert Witness," a full-day lecture and discussion program, will be held Saturday, May 24 at the University of California, Berkeley. Designed to help engineers prepare for court appearances and to cover some of the areas in which expert witness testimony is most often sought, the program topics will include evidence and the Evidence Code, the validity of assumptions and tests, the purpose of depositions, qualification of witnesses, simplicity of answers and the right to explain answers, review of depositions and use of visual aids. Product and work liability and accident analysis will be subjects of panel discussions.

The program will start at 9:00 a.m. and conclude at 4:30 p.m. Advance registration is required. The fee, including lunch, is \$37.50. For complete information, write to Continuing Education in Engineering, University of California Extension, 2223 Fulton St., Berkeley, 94720, or call (415) 642-4151.

Sell your products and services through the Grid, the best electronic/electrical engineering medium in northern California.

Need RF-shielded enclosures? LMI is here, not miles away.

Consultation, evaluation, design, engineering and manufacturing of RF-shielded enclosures isn't exactly easy. So why invite problems by working long distance? Use LMI's local strength from first call to complete installation.

In the San Francisco area call

LMI LectroMagnetics, Inc.

c/o Bill Coe & Associates

(415) 593-6057

P. O. Box 1383

San Carlos, California 94070

Three Kilometer Accelerator at SLAC

The Electromagnetic Compatibility Chapter will have Vernon G. Price as the speaker for its Monday, May 19 meeting. Mr. Price, Head of Accelerator Operations at the Stanford Linear Accelerator Center, will review the 3 Kilometer linear electron accelerator. Price will explain what an accelerator does, why it is used and the basic principles of its operation. Some physics experiments now under study will be mentioned. He will give a comparison of SLAC with other big machines in the United States, Europe, and Russia and briefly describe the electronic system, including our approach at suppression of Electromagnetic Interference.

Price received his BSEE and MSEE degrees from the University of Utah. Following graduation he was an Honors Cooperation Student at Stanford. During the construction of SLAC, he served



Mr. Price

as Head of the Waveguide Design and Fabrication Group.

Those planning to attend should check the calendar for the locations and other details concerning the 6 p.m. dinner and 8 p.m. meeting. Reservations necessary. Election meeting. COME AND VOTE!

Ultra-Sound Used in Heart Transplants

Using ultrasound, a new technique similar to naval sonar, Stanford University researchers can now detect heart changes that lead to early rejection in heart transplant patients. Early rejection is the crisis that most often proves fatal in the heart transplant operations so far attempted. During early rejection, the heart cells fill with fluid and the heart muscle walls swell and stiffen. These danger signals can be detected by ultrasound signals bounced against the stiffening muscles. A commercially available machine is used which emits and receives high frequency sound waves. As the sonic impulses bounce against the heart wall, they are recorded and converted into electrical signals which can be displayed on a television screen.

The researchers reported that the changes detected by this ultrasound method correlate very well with the signs of rejection obtained by other available methods. Danger signals for early rejection can be obtained by watching for changes in the strength of the voltage signaled by the electrocardiogram, changes in the heart's electrical activity and in the rhythm of its contractions, and by careful listening via a "phonocardiogram" to the sounds of blood flowing from veins into the stiffened heart.

The new technique was described at the annual meeting of the American College of Cardiology by Dr. John S. Schroeder.

Power Supply for BART

"Power Supply for San Francisco Bay Area Rapid Transit" will be discussed by Mr. John Samter at the Power Group meeting on Monday evening, May 19, at the San Francisco Engineers Club.

The 75-mile BART system will require 190 megawatts for operating the trains and 20 megawatts for supplying the passenger stations by 1985. To supply the traction load, a completely new 34.5 kV subtransmission system fed from seven 115 kV PG&E substations is being constructed. To supply the passenger stations, special services are being extended from the PG&E distribution system at over 30 locations.



Mr. Samter

Mr. Samter, Senior Electrical Engineer with the Pacific Gas and Electric Company, has been directly concerned during the past four years with coordinating his company's plans with those of the consulting engineers who have designed the BART system.

Cocktails and dinner may be attended before the meeting. See calendar for complete details.

Geometric Approach to Incoherent Detection Reviewed

"A Geometric Approach to Incoherent Detection" will be discussed by Dr. Nelson M. Blachman at the Information Theory Chapter meeting to be held at the Stanford Research Institute, Menlo Park, at 8:30 p.m. on Thursday, May 15.

Discrimination between two narrow-band signals in the presence of additive gaussian noise when the forms of both signals are known except for phase is basically a four-dimensional problem, with each signal accounting for two dimensions. While much of three-dimensional geometry carries over directly to four dimensions, there are interesting differences; for example, two planes generally intersect in a single point.

Dr. Blachman will discuss some aspects of this geometry and will show how they account for the optimality of matched-filter reception. In addition he will show that, in the case of equal-energy, equiprobable signals, a large variety of different filter pairs will perform precisely like a pair of matched filters. One such pair has orthogonal impulse responses, and its performance is therefore relatively easy to analyze.



Dr. Blachman

Dr. Blachman is a senior scientist at Sylvania's Electronic Defense Laboratories in Mountain View. He also worked at the Underwater Sound Laboratory and Central Communications Research of Harvard University, on the Accelerator Project of the Brookhaven National Laboratory, and at the Office of Naval Research in Washington and in London. Dr. Blachman is the author of the book "Noise and Its Effect on Communication" and he is a Fellow of the IEEE.

Dinner is planned for 6:15 p.m. at Ming's, East Palo Alto. Reservations. Details in calendar.

Santa Clara University Presents Summer 3-Week Program

The University of Santa Clara will present a three-week program this summer entitled Computer Methods for Power System Analysis. The program is divided into three sessions. The first session, July 21-25, concerns mathematical techniques and computer programming. The second session, July 28-August 1, deals with steady-state analysis of power networks for network planning, design and operation. The third session, August 4-8, covers transient analysis including stability and controllability.

FEES:

The fees for one session, \$200; for two sessions, \$300; for three sessions, \$400. Participants may choose to live in University housing or in any of a number of local tourist facilities. The University campus is located two miles from the San Jose Airport. For further information, write to Professor J. A. Peterson, Department of Electrical Engineering, University of Santa Clara, Santa Clara, Calif. 95053, or call (408) 246-3200, Extension 226 or 227.

Senior and Intermediate Positions In Computer Systems

ELECTRONIC ENGINEERS

.. video amplifiers, pulse circuits, instrumentation

LOGIC DESIGNERS

.. computer interface, signal transmission

PROGRAMMERS

.. real time executive, disc support, diagnostic programming

PHYSICIST

.. instrumentation design in optics and nuclear radiation

ELECTRONIC TECHNICIANS

.. integrated circuits, computer interface

QUALITY ASSURANCE MANAGER

.. 5 years experience in electronics systems



measurex
CORPORATION

330 Mathew Street
Santa Clara, Calif. 95050
408-241-3385

WESCON Invites Scientific Motion Pixs

This call invites the nomination of technical and scientific motion pictures to be included in the "Science Film Theater" which will be a part of the technical program of the 1969 Western Electronic Show and Convention in San Francisco, August 19-22.

The Science Film Theater makes available a full-day program of outstanding informational films to the expected WESCON audience of 50,000. The program will be repeated each of the four days.

All films submitted will be judged for their technical excellence and suitability by professional members of the Information Film Producers of America. IFPA is a professional association dedicated to the advancement of communications through the film medium.

Companies, universities, government agencies and other organizations are invited to nominate films produced and released since April 1968.

The procedures for selection are as follows:

1. Write a letter describing subject matter and general content of each film, along with general film specifications.
2. All correspondence should be addressed to the Chairman by April 30, 1969. The selection committee will review all nominations and notify the entrants accordingly. (Films must be made available for final screening on/about June 1.)
3. All films nominated must be of professional quality, black and white or color, with sound-on film. Only 16mm release prints may be accommodated for the theater.

Although there is no restriction, because of the desire to present a wide range of information to the diversified audience, it is preferred that the films not exceed 25 minutes in length. Short, concise report-type films are encouraged.

Please address letters to: Raymond Jaeger, Chairman, WESCON Science Film Theater Committee, 3600 Wilshire Blvd. - Suite 1920, Los Angeles, California 90005.

Instructions as to shipping, insurance, date of return, etc. will be issued to organizations whose entries are chosen for the final selection process.

YOUR NOMINATIONS FOR THE WESCON SCIENCE FILM THEATER FOR 1969 ARE INVITED!

Annual Joint Meeting Presents Pioneers' Night

The annual joint meeting of the Santa Clara Valley Subsection and the San Francisco Section honoring Pioneers in Computers and Data Communication will be held on Wednesday, May 21. The feature speaker of the evening will be Mr. Victor R. Witt, director of the San Jose Laboratory, Systems Development Division, IBM Corp. His subject will be The Evolution of Computer Development.



Mr. Witt

During his 18 years with IBM, Mr. Witt has been closely associated with the development of the various memories of storage devices required by IBM computing systems. This included development of the first IBM tape drives, non-mechanical ferrite core memories, and during the last eight years, the development of direct access storage devices at the San Jose Development Laboratory. Mr. Witt obtained his BSEE in 1950 from New York University. He is a member of the Commonwealth Club in



First machine developed to prove the feasibility of reading numbers printed with magnetic ink. Seated: Technician Don Gazzano; standing: Dr. Fred Kemphoefner, Director Engineering Sciences Laboratories at SRI; S. Clark Beise, President (retired) Bank of America; Charles Conroy, Asst. Vice President, Bank of America and T. H. Morrin, formerly Director Engineering Div at SRI.

San Francisco and is a senior member of the IEEE.

The joint meeting will be held at the Old Plantation in Sunnyvale. Wives and guests are cordially invited. A no-host cocktail hour has been arranged at 6:30, providing an opportunity to renew acquaintances and to reminisce. The club steak dinner has been planned for 7:30, followed by the program at 8:30. Reservations can be made by phoning the section office, 327-6622, not later than May 19. See calendar for further details.

LANCER/A New Computer Program

A new computer program called LANCER, which was developed to perform AC-DC steady-state analysis on time-sharing systems, will be introduced by Mr. Frederick Tatar at the Thursday, May 15 meeting of the Reliability Chapter. The program represents a marked improvement over other circuit analysis systems currently available on time-sharing. It has built-in models for semiconductors, uses a non-linear solution technique, and operates in conjunction with a library file which contains part parameter data. It was designed to simplify coding requirements as much as possible so that the time and expense per circuit analysis is a minimum.

After a brief detail of the program structure, capabilities, and input requirements, a demonstration will be performed utilizing a portable teletype console. Technical manuals will be distributed and availability of the program will be discussed.

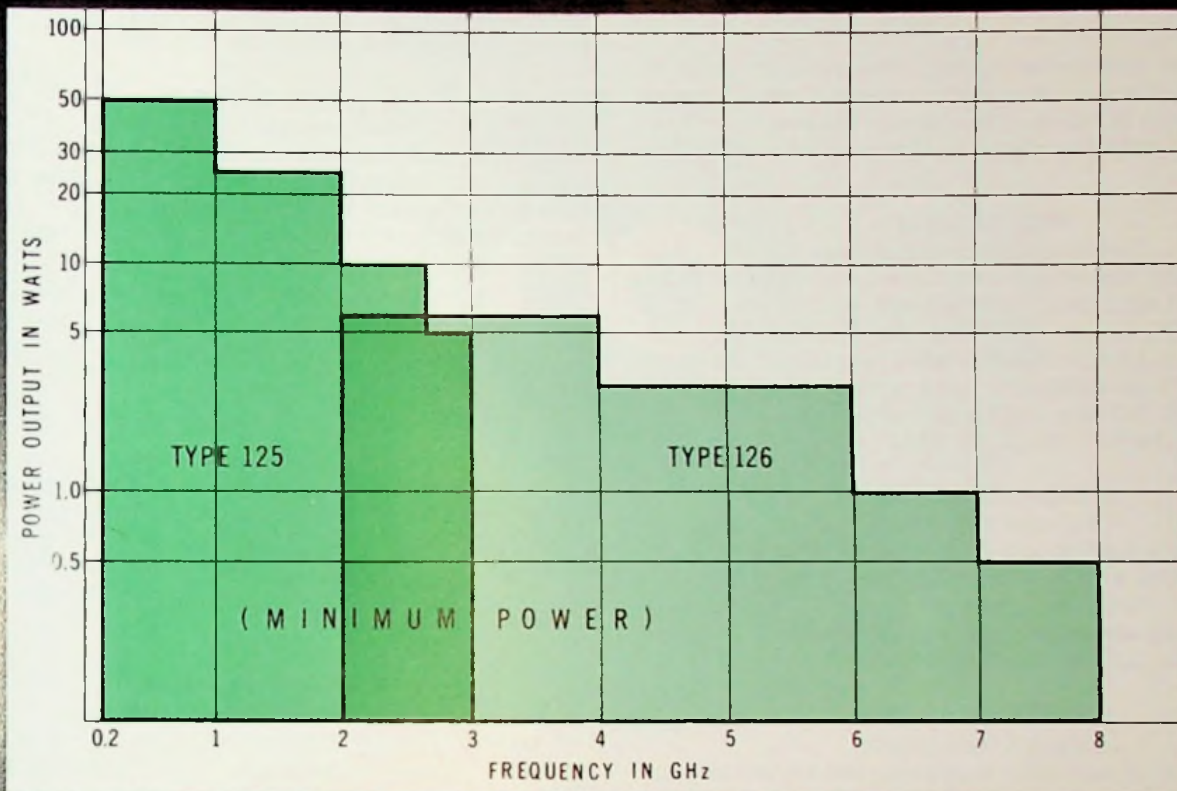


Mr. Tatar

Prior to joining Philco, Mr. Tatar contributed to the Agena Program at Lockheed Missiles and Space Company. His responsibilities were in design review, statistical applications and data processing. He received his B.S. in Physics from Loyola University, Chicago, and his M.S. in Applied Mathematics in 1966 from Santa Clara University.

There will be a dinner at the Stanford View Restaurant before the meeting which is scheduled for 8:00 p.m. in PH 101, Stanford. See calendar for all details.

Meet our power twins



All's two **Power Signal Sources** cover the entire range from 200 to 8000 MHz. Powerfully.



Meet AIL's Power Signal Source twins: Type 125 covers the range from 200 to 3000 MHz, is priced at \$3950. New Type 126 operates from 2000 to 8000 MHz, at a price of \$4950.

Only AIL can do the job with just two units. Our Type 125 and Type 126 span the range of up to eight competitive instruments.

The chart shows the really abundant power you get at each frequency. The values shown are guaranteed minimum specs—higher CW values and peak-pulse powers of several hundred watts are attainable. But that's just the beginning.

Each source has internal 100% square wave modulation, external pulse and amplitude modulation capability, 0.004% frequency stability, and 1% power stability.

Want to use them for your low level signal source needs, too? Both units provide over 60 dB power adjustment range to cover all of your requirements.

So why consider six or more signal sources when AIL's power twins do the job—and at much lower cost! For convincing proof, call our "hot line" to arrange a demonstration. Just dial 516-595-3216 during East Coast business hours.



Or write for our new catalog describing AIL's full line of Microwave Instruments, including complete specifications for the Types 125 and 126 Power Signal Sources.

YOUR AIL SERVICE REPRESENTATIVE IN THE SAN FRANCISCO AREA IS:
Wright Engineering
175 S. San Antonio Road
Los Altos, Calif. 94022
Phone: 941-4405

AIRBORNE INSTRUMENTS LABORATORY

DIVISION OF CUTLER-HAMMER INC. / DEER PARK, LONG ISLAND, NEW YORK 11729



AIL

DIVISION

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.

RICH BEACH 21

Full-time summer employment

I am especially interested in electrical engineering communication signals. I will obtain my BS in Engineering Science (equivalent to BSEE) in June, 1970, from San Francisco State College. I have a 3.7/4.0 GPA and am a recipient of the Scaiff Scholarship. I am looking for work with a firm this summer with possible full-time employment after graduation. 2465 Shannon Dr., So. S.F., 94102. Ph. 589-5710.

CLAUDIO CERNOBORI 29

Full-time employment

I am seeking a position as a Jr. Electronics Technician. I expect to graduate with an AE from Cogswell Polytechnical College in June, 1969. I am a member of the K.T.S. Society. I have previously worked as a journeyman automobile mechanic. 1 Prague St., S.F., 94112. Ph. 334-3831.

H. EL-BIETAR 28

Part-time employment

I am interested in electronics engineering and am working toward a B.S. in Electronics at San Francisco State. I am seeking part-time work in the afternoons. 290 17th Ave., No. 3, S.F., 94121. Ph. 387-6583.

ROBERT C. FROSTHOLM 20

Full-time summer employment

I am interested in electronic engineering, particularly in the field of communications. I will receive my BSEE in June, 1970, from San Francisco State. I have had sales experience, some experience as a laboratory technician in electronic work, and hold an advanced class amateur radio license. 5912 Wood Dr., Oakland, 94611. Ph. 655-8794.

MICHAEL ITTELMAN 29

Full-time summer employment

My special interest is electronics and I will have my BSEE in June, 1970, from San Francisco State College. Please contact me at 691 O'Farrell St., No. 101, S.F., 94109. Ph. 775-5954

JOHN H. JENSEN 25

Full-time employment

I am particularly interested in bio-medical engineering or learning systems. I have an AA degree in Electronics Technology and a BSES from San Francisco State. I have served as president of the Engineering Society. I have had 8 months experience with Litton in San Carlos in Magnetron testing, as lead man of the cold test group. 685 Hillside Blvd., No. 1, Daly City, 94104. Ph. 756-3214.

ALBERT LEE 19

Full-time summer employment

I am interested in employment relating to electronics and electrical technology. I plan to have my Associate in Engineering from Cogswell Polytechnical College in January, 1970. I am a member of Kappa Tau Epsilon and am serving as Student Body Secretary-Treasurer. My only experience is laboratory work at the College. 881 Union St., S.F., 94133. Ph. 885-4175.

LELAND HAROLD LEE 19

Full-time summer employment

I am interested in electrical technology. I expect to receive my Associate in Engineering in January, 1970 from Cogswell Polytechnical College. I am Vice-President of the 1969 Student Body and Secretary-Treasurer of Kappa Tau Epsilon. If you are interested in my possible employment, please contact me at: 746 Hyde St., S.F., 94109. Ph. 776-5070.

DION LEEDS 28

Full-time summer employment

I am seeking technician work in medical electronics. I will have my AE from Cogswell in February, 1970. I have 2 years experience as Aviation Electronic Technician, U.S. Navy and 6 months experience with the Neurological Institute, Mount Zion Hospital, S.F., as data analyst and electronic technician. I earned 198 quarter units as a Social Science and Electronics Engineering major at California State Polytechnic College before my military service. 29 Woodland Ave., S.F., 94117. Ph. 731-1747.

FRANK LOUIE 20

Full-time employment

My main interest is computers but I am interested in acquiring engineering work experience in all fields of electronics and general engineering. I will have earned my BS in engineering by January, 1971 from San Francisco State. I am a member of the Engineering Society and the AIAA. 2434 Jones St., S.F., 94133. Ph. 775-0414.

GREGORY McHUGH 20

Full-time summer employment

I am especially interested in computers and will have my BSEE from San Francisco State in June, 1970. I was a National Merit Finalist in 1966 and am IEEE Student Branch Chairman. I am interested in working full-time this summer with possible extension to permanent full-time work after graduation. I have had 3 years experience in programming 360/20, 360/30 and 1130 computers in the warehousing and transportation industry. 216 North Mayfair Ave., Daly City, 94014. Ph. 755-4055.

H. MARK SCHULZ 22

Full-time summer employment

I am seeking a position related to communication or computers. I plan to have my BSEE in January, 1970, from San Francisco State College. Please write or phone me at 421 Genessee St., S.F., 94127. Ph. 333-6743.

JOE WONG 20

Full-time employment

I would like experience in the field of engineering and am especially interested in computers. I will have my BS from San Francisco State in February, 1971. I belong to the Engineering Society and the CSIO. 618 19th Ave., S.F., 94121. Ph. 752-0594.

SHEN YEE 24

Full-time summer employment

I will graduate from San Francisco State College in 1970 and am presently looking for a summer position in electronic engineering. I have had two years of Electronic Technology courses at San Francisco City College. 475-A Green St., S.F., 94133. Ph. 392-4824.

VICTOR YOUNG 21

Part-time summer employment

I am interested in maintenance or assembly line work. I expect to obtain my Associate Degree in Electrical Engineering from Cogswell Polytechnical College on June 12, 1969. I have served as president of the school honor society and am a member of Who's Who Among Students in American Junior College. 856-D Pacific Ave., S.F., 94133. Ph. 986-2025.



assume everything

Assume everything. This is the time and place to do it.

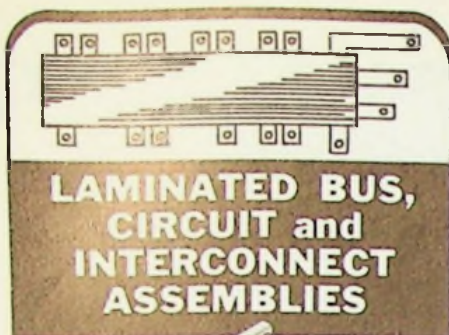
The excitement of the San Francisco Peninsula is but a fringe benefit of Kaiser Aerospace & Electronics. There's a stimulating environment here, a major contribution to the leadership of Kaiser in the design and development of airborne display systems. In advanced aircraft, in aerospace, in shipboard instrumentation.

Our people are expanding new horizons—and they're doing it because they're "control thinkers"—people who can discipline themselves to a specific problem but still take a wide-open approach to achieve the solution.

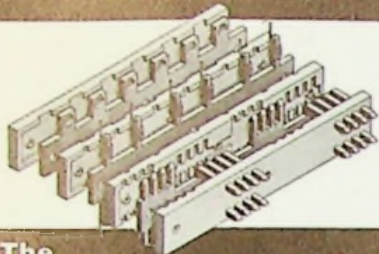
We are always interested in the career minded engineer who would be interested in joining our team of professionals. You may be just the one for us. Check over these current opportunities and then forward your resume to the attention of Mr. E. M. Russell, 1651 Page Mill Road, Palo Alto, California 94306. We are an equal opportunity employer.

Avionics Display Systems
Electronic Design
Linear Circuits
Electronic Design
CRT Excitation & Deflection Circuits

KAISER
AEROSPACE &
ELECTRONICS



LAMINATED BUS, CIRCUIT and INTERCONNECT ASSEMBLIES



**The
Practical Approach to
Power-Signal & Voltage
Distribution.
Prototypes within 10 days**

**OFF-THE-SHELF OR CUSTOM-
DESIGNED UNITS for all
Commercial, Industrial and
Military applications.**

Please Request New Design Catalog CA-69.

Chemical & Aerospace Products Inc.

231 E. Lomita Blvd. • Wilmington, Calif.
Phone (213) 775-2581

BEFORE MAKING HOTEL RESERVATIONS IN Los Angeles

USE THIS COUPON

BEL-AIR SANDS
11461 Sunset Boulevard
Los Angeles 49, California
Please send me color brochure

NAME _____
ADDRESS _____
CITY _____ STATE _____

To Get Complete Information on the

BEL-AIR Sands Resort Motor Hotel

Near U. C. L. A., adjacent to Beverly Hills, Westwood and Brentwood areas, the Bel Air Sands is set in a tropical garden with a magnificent view from 8 acres of mountain-side privacy. Minutes from Famous Restaurant Row. Movie, Radio and TV Centers. Just 15 minutes from L. A. Airport.
★ 2 Olympic size Heated Swimming Pools. Wading Pool ★ Poolside Dining
★ Free TV ★ Beauty Shop ★ PRIVATE PATIOS ★ EXCELLENT FOOD

FREE
GARAGE
PARKING

BEL-AIR SANDS
11461 Sunset Blvd. Los Angeles 49, Calif.
Phone GRanite 6-1241 - TWX WLA 6-657

State of Magneto-Optical Recording Today

The potential of magneto-optical recording and the possibility that it can compete with conventional magnetic recording in meeting the requirements of future large capacity memory systems will be reviewed at the May 13 Magnetics Chapter meeting by Mr. John Beck.

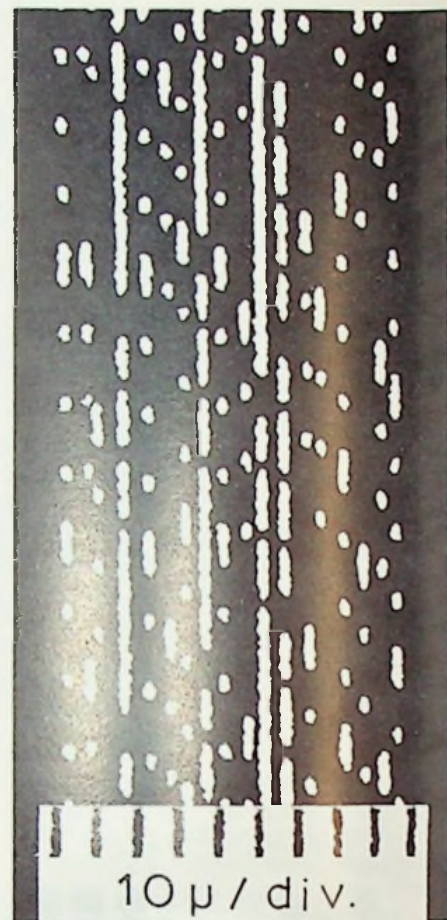
The discussion will center on the storage material. There are requirements placed on the material by system performance goals. There are also constraints imposed by the limitations of other components needed to comprise a complete memory system.

The results of our investigations in this area employing gadolinium iron garnet thin films addressed by an argon-ion laser will be summarized.

John W. Beck is a Senior Engineer in the Advanced Technology Group of the Systems Development Division Laboratory, IBM Corporation, San Jose. Since joining IBM in 1955, he has worked in the process control and mass memory development areas, the last three years specifically on magneto-optical recording. Mr. Beck was employed from 1951 to 1955 by North American Aviation, Inc. as a Research Engineer.

Mr. Beck received a BSEE degree from the University of Minnesota in 1950 and the MS and Engineers degrees in EE from Stanford University in 1959 and 1961 respectively. He is a member of the IEEE.

The meeting will be held at 8:00 p.m. in the IBM Research Laboratory Cafetorium (Bldg. 025) on Yorktown Drive. This is the first building encountered after entering the most northern entrance



to the San Jose facility from Cottle Road.

Following the meeting will be a demonstration of several data gathering systems, including EPR and far IR spectrometers, under the control of a time-shared 1800 process control computer. The demonstration will be conducted by Dr. Paul M. Grant of the IBM Research Division.

Annual Barbeque and Wine Tasting

The Aerospace and Electronic Systems Chapter will enjoy their annual barbeque steak dinner with wine tasting at the Paul Masson Mountain Winery on Thursday, May 22. The menu will include choice New York steaks barbequed at the winery. Paul Masson will supply all the wines for the wine tasting, as well as the table wines for the dinner. Since an accurate count of attendance is necessary, please mail your check for \$5.00 per person to Roger Winslow, 19455 Melinda Circle, Saratoga, 95070, not later than May 12. See calendar for complete details.



Fracture in Structures

A five-day program, Fracture - Its Analysis and Prevention, will be presented by the University of California Extension, Berkeley, Monday through Friday, April 21-25.

Rapid advances are currently being made in the fundamental understanding of fracture, in design techniques to prevent fracture in structures, and in the development of high strength materials. These research results are usually reported in a variety of specialized journals which assume a considerable background of knowledge on the part of the reader.

The program will be held at the University of California Extension Center, 555 Laguna St. (at Market St.), S.F. The faculty member in charge will be Iain Finnie, Professor of Mechanical Engineering, University of California, Berkeley. The enrollment fee is \$200. Advance enrollment is required for individuals or companies. For further information please write or telephone Continuing Education in Engineering, University Extension, University of California, Berkeley, Calif. 94720; phone (415) 642-4151.

Advances in Circuit Technology and Their Impact on Computing Systems

At the Tuesday, May 27 Computer Chapter meeting, Robert A. Henle will describe changes in logic circuit technology and relate these to the environment of changing requirements in computing systems and improvements in the control of materials and material processes. In his discussion, he will cover the fundamental problems and objectives for today's environment and future trends in circuit performance, density, power, cost and reliability, including the influence of supporting technologies and their limitations, such as cooling and power.

Mr. Henle received the B.S. and M.S. degrees in electrical engineering from the University of Minnesota, Minneapolis, in 1949 and 1951. In 1951 he joined the IBM Corporation as a Technical Engineer concerned with the possible application of transistors to computers, and in 1955 was placed in charge of a transistor servo-amplifier project. He became Manager of transistor circuit development in the IBM Product Development Laboratory, Poughkeepsie, N.Y., and in 1959 became Manager of ad-



Mr. Henle

vanced technical development. In 1960 he became manager of circuit technology in the newly-formed IBM Components Division, East Fishkill Facility, Hopewell Junction, N.Y. Mr. Henle was named an IBM Fellow in 1964 and since that time has been active in the development of monolithic memories and the effective utilization of Large Scale Integration. He is a Fellow of the IEEE and Secretary of the IEEE Computer Group.

Details concerning the meeting and dinner are in the calendar.

AN INVITATION TO EXCEPTIONAL INDIVIDUALS

Announcing the formation by Bourns, Inc., Analog Integrated Microsystems (AIM) Inc. and other investors of a new company devoted to the manufacture of analog monolithic circuit functions of the highest precision and quality, to be known as

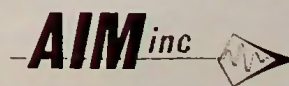
PRECISION MONOLITHICS, INC.

Three professional positions are still available on the initial team, carrying excellent salaries and the right to purchase Founder stock:

- Semiconductor Process Development Engineer
- Analog IC Design Engineer
- Analog IC Systems Applications Engineer

We are interested in individuals of the highest calibre having both expertise and a high interest and motivation in the above areas.

Please send resume or inquire in writing to AIM Inc.
Att: Mr. Marvin B. Rudin, President or
Dr. Garth Wilson, Vice President Engineering
2700 Scott Blvd., Santa Clara, Calif. 95050



Classified Advertising

ELECTRONIC TEST EQUIPMENT

Inspect the largest display of used electronic test equipment in the Bay Area. Save \$\$\$! Reduce delivery time for those company-funded projects on brand-name equipment.

Halted Specialties Company
Phone 969-0510
1690 Plymouth Avenue
Mt. View, California 94040

ELECTRONICS ENGINEER

Challenging opportunity for MSEE with industrial experience in digital circuits and power control. Contact Art McGee, (408) 289-3298.

FMC CORPORATION
CENTRAL ENGINEERING
LABORATORIES
1185 Coleman Avenue
Santa Clara, California

IT'S GOOD BUSINESS TO WORK AT



DON HAINES
ADMINISTRATIVE
ENGINEER

RADIO CORPORATION
Best Benefits - Profit Sharing
Equal Opportunity Employer

ENGINEERING & RESEARCH
6001 W. Dickens Ave.
Chicago, Ill. 60639
312-745-4807

ADVERTISER/AGENCY INDEX

AIM, Inc.	19
Airborne Instruments Laboratory	15
(Campbell-Mithun, Inc.)	
Applied Technology Inc.	Inside Front
(R. G. Williams Co.)	
Bechtel Corporation	20
(Conley, Baker & Steward)	
Bel Air Sands	18
(Nemer Advertising Agency, Inc.)	
Chemical & Aerospace Products Inc.	18
(Paul & Baum, Inc.)	
Christie Electric	9
(Len Woolf Co.)	
Englert and Company	3
FMC Corporation	20
General Devices, Inc.	9
Halted Specialties Company	20
Kaiser Aerospace	17
(Coakley-Heagerty, Inc.)	
Lectromagnetics, Inc.	12
(Van der Boom, McCarron, Inc.)	
Measurements	8
Measorex Corporation	10 & 13
(Kniep Associates)	
Melcor	11
(Samuel H. Goldstein)	
Raytheon Company	Inside Back
(Hoag & Provandie, Inc.)	
Tektronix, Inc.	1
(Dawson, Turner & Jenkins, Inc.)	
Wanlass Electric Company	Back Cover
(William E. Wilson Co.)	
Western Gold & Platinum	10
(Hal Lawrence, Inc.)	
Zenith Radio Corporation	20

Manufacturer/Representative Index

Aerotech Jay Stone & Assoc.
Anadex Instruments Jay Stone & Assoc.
Applied Dynamics, Inc. J. D. Kennedy Co.
Applied Microwave Laboratories Jay Stone

Ballantine Operation,
Singer Co. T. Louis Snitzer
Basler Electric Co. Abbott Engineering Co.
Beckman Instruments, E.I.D. O'Halloran Assoc.
Boonton Electronics Corp. O'Halloran Assoc.
Business Information Tec. T. Louis Snitzer Co.

Century Electronics
& Instruments T. Louis Snitzer Co.
Cherry Electrical
Products Corp. Abbott Engineering Co.
Chronetics, Inc. T. Louis Snitzer Co.
Cimron Division,
Lear Siegler, Inc., T. Louis Snitzer
Circuitronics Div.,
R. N. Industries, Inc. Abbott Engineering Co.
Cober Electronics Jay Stone & Assoc.
Computer Instruments Corp. Bill Coe & Assoc.
Cunningham Corporation/
Gleason Works T. Louis Snitzer
Custom Materials, Inc. Jay Stone & Assoc.

Digitronics Corp. Components Sales Calif.
Doric Scientific Jay Stone & Assoc.
Dynago, Inc. Jay Stone & Assoc.

Eldorado Electronics T. Louis Snitzer Co.
Elgor Corp. T. Louis Snitzer
Emcor-Borg-Warner Corp. T. Louis Snitzer Co.
EMI Gencor Div.,
Whittaker Corp. O'Halloran Assoc.

F.A.M. Engineering Jay Stone & Assoc.

Gombos Microwave Walter Associates
Guidline Instruments T. Louis Snitzer Co.

Hallmark Standards, Inc. T. Louis Snitzer Co.
Hughes Aircraft Co., E.D.D. O'Halloran Assoc.

INSACO, Inc. Bill Coe & Assoc.
Instrumentation Technology
Corporation Components Sales Calif.

Interdyne T. Louis Snitzer
Invac Corporation Components Sales Calif.

Lectromagnetics, Inc. Bill Coe & Assoc.

McLean Engineering Labs .. T. Louis Snitzer Co.
Micro Instrument Co. Jay Stone & Assoc.
Micro-Power Inc. Walter Associates
Micro Tel Corp. Walter Associates
Microwave Electronics Corp. .. Jay Stone & Assoc.

Narda Microwave Corp. O'Halloran Assoc.
Norelco/Phillips
Electronic Instruments O'Halloran Assoc.

Omni Spectra Inc. Walter Associates

PRD Electronics T. Louis Snitzer Co.
Panasonic Oscilloscopes O'Halloran Assoc.
Peninsula Microwave Labs., Inc. Jay Stone & Assoc.

Polarad Electronic Instruments T. Louis Snitzer Co.
Precision Mechanisms Corp. Components Sales

Quan-Tec Labs Jay Stone & Assoc.

Rayonic Corporation Abbott Engineering Co.
Rodda Company Walter Associates

Sierra Electronic Operation,
Phileo-Ford Corp. T. Louis Snitzer Co.
Solar Electronics Co. Bill Coe & Assoc.

Telonic Instruments & Eng. .. T. Louis Snitzer Co.

Waltronic Sales Walter Associates
Weinschel Engineering, Inc. Jay Stone & Assoc.

Zehntel, Inc. Jay Stone & Assoc.

Representative Directory

Abbott Engineering Co.
2600 El Camino Real
Palo Alto; 327-0830

Bill Coe & Assoc.
P.O. Box 1383
San Carlos; 593-6057

Components Sales California
Palo Alto; 326-5317

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

Walter Associates
"The Village Corner"
P.O. Box AN
Los Altos; 941-3141

Snitzer Co., T. Louis
10320 Saratoga-Sunnyvale Road
Cupertino; 257-8333

Stone & Assoc., Jay
330 Second St.,
Los Altos; 948-4563



MICROWAVE ENGINEERS AND PHYSICISTS

TO JOIN THE RESEARCH GROUP AT THE BECHTEL LABORATORY

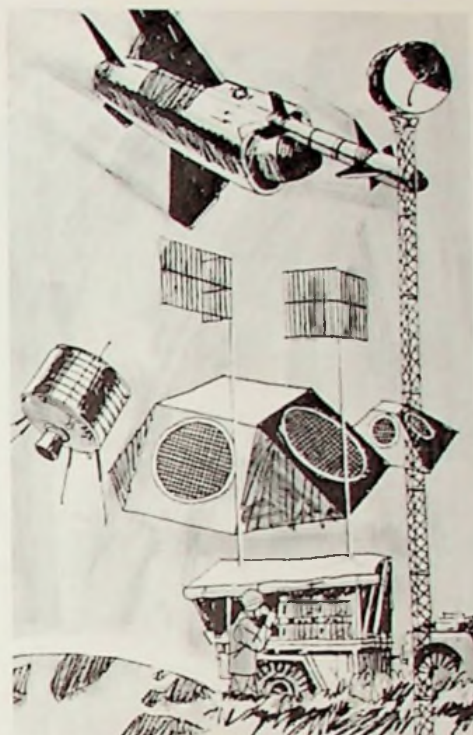
An opportunity to work in the rapidly expanding field of industrial microwave applications with BECHTEL, an international leader in engineering, management and construction. These positions are with the Scientific Development Department and are located in Burlingame. Background of microwave tube and antenna experience, as well as a good understanding of the interaction of electromagnetic energy with matter is preferred. Also desirable is the ability to perform sophisticated microwave measurements necessary to develop hardware. B.S. or M.S. plus three years of experience is required.

Send resume in confidence to: Don Colvin, Department 489,

Bechtel Corporation

Fifty Beale Street, San Francisco, Calif. 94119
Bechtel is an equal opportunity employer m/f

Maybe you're not looking in the right places.



You *should* be checking these opportunities at Raytheon's Communications and Data Processing Operation.

We are heavily involved in both government and commercial communication systems and our current expansion dictates the need for additional senior engineering talent in the following communications and data processing areas:

Digital communications SAM-D and P.C.M.

Senior engineering positions are open for those with experience in anti-jam, secure and command and control military communication systems. Design through production experience on field-proven hardware is essential. Candidates must have an adequate understanding of software necessary to support complex systems. BSEE and at least five years experience in digital equipment design required.

Satellite earth stations

Senior Applications Engineers are needed for the engineering and completion of microwave communication systems for messages, television, and data service. Candidates should have experience in the application of equipment to meet system requirements, propagation analysis, frequency coordination and over all performance calculation. Work will include planning, installation and testing phases of wide band microwave communication systems.

Systems engineers

Digital switching design and systems experience needed

for the design evaluation and analysis of automatic digital switching networks or high speed multi-processors. Logic design, programming skills, and familiarity with high speed I/O interfaces with third generation computers are desired. Candidates should have 5-10 years experience with minimum of BSEE.

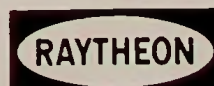
Advanced communications systems

Staff engineer to Systems Department Manager to plan and conduct company and customer funded studies of advanced communications systems. Systems experience required in RF systems, modulation of coding techniques, survivable systems or satellite communication systems, plus MSEE.

Communications research

Principal engineer/scientist with a minimum of MSEE and at least ten years experience in applied mathematics and in analytical techniques to conduct research in signal design and analysis, communications techniques, topological and probabilistic networks, mathematical models, and information theory studies.

Send your resume, including salary information, to Gerald Trotman, Management & Professional Recruiting, Equipment Division Headquarters, Department 79, Raytheon Company, Post Office Box 520, Waltham, Massachusetts 02154.



An Equal Opportunity Employer

Wanlass Electric announces three new magnetic product lines.

(And everything else that used to be)
(known as Microdot Magnetics, Inc.)



If you missed seeing our 20 foot exhibit
at the New York IEEE Show... YOU
MISSED 4 UNUSUAL NEW PRODUCTS

If you didn't make the March IEEE Show, you ought to know about these noteworthy new products you missed.

(1) You would have seen SCOPACTM, our new instrument that eliminates line disturbances that cause pre-triggering, jumping off scale, false signals, jitter and erroneous readings from oscilloscope and CRT-type device operation.

(2) If you have need for a portable source of three-phase power, you would have jumped for joy over PHASACTM, our new instrument that converts single-phase power from standard wall outlets into three-phase (208/240VAC) power.

(3) For designers of IC/MOS circuits, we unveiled our new PIC-Series of parametrically pre-regulated, series regulated Standard DC Power Supplies.

(4) For engineers who want a markedly "better" regulated, economy OEM Power Supply from Wanlass Distributor stock, we displayed the MARK III Series.

To top it off, we held a "sneak preview" on the former Microdot Magnetics lines described at right.

You'll have other chances to see all these new products, plus many more, at NEREM, ISA, NEC, FJCC and WESCON shows. So don't despair...see you there!

The magnetic products, people and equipment of
Microdot Magnetics, Inc. are now on the Wanlass team.

Last month we announced the activation of our new 24,000 square foot Magnetics Operation in Santa Ana, and gave you a hint as to the new products you could expect. It was no idle promise. Today, we offer even more.

During March, negotiations were concluded for the acquisition of the product lines, equipment, assets and existing contracts of Microdot Magnetics, Inc. The entire organization, including personnel and equipment are now in our Magnetics Operation building...and on the team.

This acquisition will reinforce our overall magnetics capability through the addition of three product lines of high quality, ready to ship within days of your order. Specifically, the 3 new Wanlass product lines purchased from Microdot Magnetics are:

FREQUENCY CHANGERS. This line of magnetic and all solid-state AC-DC-AC frequency changers includes the 50, 60 and 400 Hz ranges (others, if desired) in any combination of input and output voltages or phases (1, 2, 3, 6, etc) from 250VA to 50KVA. Typical regulation is 0.25% for frequency, 1% for line, and 2% for load, with waveform dis-

tortion available from 1 to 7%. These units follow the Wanlass theme of reliability and ruggedness consistent with price, and have been specifically designed for continuous duty in industrial or military applications.

INVERTERS. The demand for quality inverters for field, plant and shipboard use continues...and the new Wanlass line meets every need. All magnetic and solid-state inverters (DC to AC) with input voltages of from 6 to 240VDC are available with any combination of frequency, voltages and phases out. Regulation for these units is 0.25% for frequency, 1% for line, and 2% for load.

MAGNETIC DEVICES. Microdot units now offered by Wanlass include toroids, pulse transformers, saturable core reactors and magnetic amplifiers, all engineered, designed and manufactured to industrial requirements and to the military specifications of MIL-T-27C.

As we said last month, Wanlass is starting a new cycle of progress in magnetics...and the acquisition of Microdot Magnetics is just the beginning. A rather good one, at that!

New team members...

Pictured are Dr. Claus Ludeke (left), Engineering Manager, and Herbert D. Bissel (right), Product Line Manager for the Wanlass Magnetics Operation.

Dr. Ludeke holds a Ph.D. in Electrical Engineering from the Swiss Federal Institute of Technology, Zurich. In addition to his former position as Chief Engineer for Microdot Magnetics, Inc., he was a research scientist at Kurz & Root Co. of Appleton, Wisconsin, for many years.

Herb Bissel is a graduate engineer from Yale University. In addition to his experience as Marketing Manager for Microdot Magnetics, he has been West Coast Regional Manager for Varo, Inc., of Garland, Texas, and Manager of Product Development for ITT Federal Labs at San Fernando, California.



Write for our new capabilities brochure...
The Capacity for Achievement

WANLASS ELECTRIC COMPANY

A SUBSIDIARY OF AMBAC INDUSTRIES INC.



1540 EAST EDINGER AVENUE • SANTA ANA, CALIFORNIA 92707 • PHONE 714 546-8990 • TWX 910-595-1526