

EDITOR'S PROFILE of this issue

from a historical perspective ...

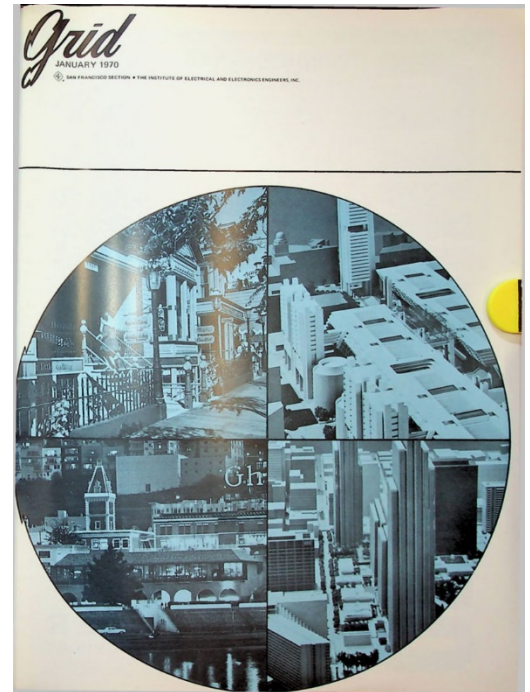
with Paul Wesling, SF Bay Area Council GRID editor (2004-2014)

January, 1970:

Cover: A depiction of San Francisco today and tomorrow. S.F. mayor Joseph Alioto will be speaking at a Golden Gate Subsection meeting. More on page 4.

Page 7: We have 11 new IEEE Fellows from our Section. Two stand out to me:

- Gene Amdahl, for contributions in the design of largescale digital computers. He was the chief architect for the IBM 360 series. Then, as an IBM Fellow at the Advanced Computing Systems (ACS) lab in Menlo Park, he developed newer concepts. He started Amdahl Corporation in 1970, where I worked for many years.
- Jean Hoerni of Fairchild, for the invention of the planar process for transistor and IC fabrication, in 1959. He was one of the "traitorous eight" that left Shockley Transistor to form Fairchild. Science fiction writer Isaac Azimov said the planar process was "the most important moment since man emerged as a life form", perhaps with a bit of exaggeration.



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

JANUARY 1970

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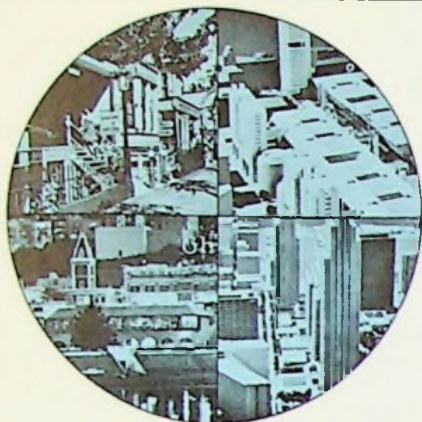
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ON THE COVER

The Golden Gate sub-section will act as host for the San Francisco section at its January 28th meeting honoring Mayor Alioto. The Grid cover depicts the San Francisco of today and the San Francisco of tomorrow. (See Calendar for details.)

Grid

volume 16
number 5

JANUARY 1970

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Ernesto Montaño

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

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MEETING CALENDAR

AEROSPACE & ELECTRONIC SYSTEMS JAN. 22

Story on
page 4

JAN. 22, Thursday, 8:00 PM, FAA Control Center, 5125 Central Ave., Fremont. Cocktails: 6:00 PM; dinner: 6:30 PM, Fremont Ranch Restaurant, 681 Peralta Blvd., Fremont. Reservations for tour and dinner: R. Winslow or P. Hoppe, 326-4350, ext. 6143 by Jan. 20th.

ANTENNAS & PROPAGATION JAN. 21

Story on
page 5

JAN. 21, Wednesday, 8:00 PM, Philco-Ford Bldg. 56 Auditorium, 3939 Fabian Way, Palo Alto. Cocktails: 5:30 PM; dinner: 6:15 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. No reservations.

CIRCUIT THEORY JAN. 21

Story on
page 10

JAN. 21, Wednesday, 8:00 PM, 134 McCullough Hall, Stanford University. Dinner: 6:15 PM, Stickney's Hick'ry House, El Camino at Embarcadero, Palo Alto. Dinner reservations: Section office: 327-6622 by Jan. 20th.

COMPUTER JAN. 27

Story on
page 12

JAN. 27, Tuesday, 8:00 PM, Room 134 McCullough Hall, Stanford University. Dinner: 6:15 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Mary McGlone, 321-3300, ext. 270 by Jan. 26th.

EAST BAY SUBSECTION JAN. 26

Story on
page 10

JAN. 26, Monday, 7:30 PM, Spenger's Fish Grotto, 1919-4th Ave. (immediately adjacent to the intersection of University Ave. and Interstate 80), Berkeley. Dinner (no host) 6:30 PM, Spenger's. Reservations: Ruth Clark, 569-2012 by Jan. 23rd.

ELECTROMAGNETIC COMPATIBILITY JAN. 19

Story on
page 14

JAN. 19, Monday, 8:00 PM, Hewlett-Packard Auditorium, 5301 Stevens Creek Blvd., Santa Clara (adjacent to Interstate 280). Dinner: 6:00 PM, Custom House, 20060 Stevens Creek Blvd., Cupertino. Reservations: Paul Gagner, 969-1050 by noon, Jan. 19th.

ELECTRON DEVICES JAN. 15

Story on
page 12

JAN. 15, Thursday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails: 6:00 PM; dinner 7:00 PM. Reservations: Section office, 327-6622 by Jan. 14th.

ENGINEERING IN MEDICINE & BIOLOGY JAN. 20

Story on
page 16

JAN. 20, Tuesday, 8:00 PM, Room M112, Medical School, Stanford. (Inner court of building closest to Campus.) Dinner: 6:00 PM, Rickey's Hyatt House, 4219 El Camino at Charleston Rd., Palo Alto. Reservations: E. R. Lewis, 642-3338 by Jan. 19th.

GOLDEN GATE SUBSECTION JAN. 28

Story on
page 4

TOUR OF FAA AIR ROUTE CONTROL CENTER. Limited to 20 persons. (Additional tour tentatively scheduled for Jan. 29th). See story for directions.

THE COMPUTER AS AN AID IN DESIGNING HIGH GAIN UNFURLABLE SPACECRAFT ANTENNAS. Jack L. Bellamy, Lockheed M & S Co., Sunnyvale.

AUTOMATED INTEGRATED CIRCUIT DESIGN - AN OVERVIEW. First of a series of meetings on computer-aided circuit design. Prof. Donald O. Pederson, UC, Berkeley, with W. J. McCalla, B. A. Wooley, R. I. Dowell, P. M. Russo, Ph.D. Candidates, UC, Berkeley.

HYBRID COMPUTER SOLUTION OF OPTIMIZATION PROBLEMS. Dr. Robert M. Howe, Chairman of the Board, Applied Dynamics.

INNER SPACE: A NEW ENGINEERING FRONTIER. Thomas E. Everhart, Professor of Electrical Engineering, UC, Berkeley.

EMP EFFECTS ON COMMUNICATION GROUND STATIONS. Dr. William E. Waters, Senior Engineering Specialist, Philco-Ford Corp., Palo Alto.

NEGATIVE ELECTRON-AFFINITY PHOTO-EMITTERS. H. Sonnenberg, Sylvania Electronic Systems, Mt. View.

CARDIAC TRANSPLANTATION. Eugene Dong, M.D., Assistant Professor of Surgery, Cardiovascular Surgery Research Group, Stanford University Medical School.

SAN FRANCISCO TODAY AND TOMORROW. Joseph Alioto, Mayor of San Francisco.

JAN. 28, Wednesday, 12 noon, Leopard Restaurant (2nd floor) 140 Front St., San Francisco (near California St.) Reservations: Art Wells, 467-1880 or Roland Grannis, 982-8729, by Jan. 26th. \$3.25 including tax and tip.

**INDUSTRY &
GENERAL
APPLICATIONS**
JAN. 8

Story on
page 16

**THIRISTOR DRIVES INDUSTRIES' ADO-
LESCENT.** Donald J. Feyrer, Product Planning,
Industrial System Div., Cutler-Hammer Co. Mil-
waukee, Wis.

JAN. 8, Thursday, 8:00 PM, Sea Wolf, Jack London Square, Oakland.
Dinner: 7:00 PM — \$5.00 including tax and tip. Reservations: Bruce Kronmil-
ler, 451-9600 or H. B. Thysell, 557-2025 by Jan. 7th.

**INFORMATION
THEORY**
JAN. 29

Story on
page 5

**CARRIER RECONSTRUCTION AND BAND-
WIDTH LIMITATION EFFECTS ON QUAD-
RIPHASE SIGNALLING PERFORMANCE.** J.
J. Jones, Sr. Engineering Specialist and Dr. R. J.
Sherman, Sr. Engineering Specialist, both of
Philco-Ford, Palo Alto.

JAN. 29, Thursday, 8:30 PM, Stanford Research Institute, Bldg. 1, 333
Ravenswood Ave., Menlo Park. Dinner: 6:15 PM, Ming's of Palo Alto, 1700
Embarcadero Rd., East Palo Alto. Reservations: Mrs. Toshi Furukawa,
326-4350, ext. 6162 by Jan. 28th.

**MICROWAVE
THEORY &
TECHNIQUES**
JAN. 14

Story on
page 13

**MICROWAVE ACOUSTICS — PRESENT AND
FUTURE.** Dr. Frank Olson, Microwave Elec-
tronics, Palo Alto and Dr. Tom Reeder, Stan-
ford University. Guest Chairman: Dr. Al Bahr
of Stanford Research Institute.

JAN. 14, Wednesday, 8:00 PM, Bldg. 44, Stanford Research Institute, Laurel
St., Menlo Park. Cocktails: 5:30 PM; dinner 6:00 PM, Rick's Swiss Chalet,
4085 El Camino Way, Palo Alto. Reservations: Kathi, 969-9304 by noon Jan.
13th.

**PARTS, MATERIALS
& PACKAGING**
JAN. 27

Story on
page 11

**MICROELECTRONICS ENGINEERING
COURSE. FIRST OF 6 SESSIONS:** Modern
practices and processes for fabrication and qual-
ity control of semiconductor devices. Course
Director: Dr. Don McWilliams, Director, Re-
search Dept. at Calif. State College.

JAN. 27, TUESDAY, 7:30 PM, Conference Room of Research Bldg. (Bldg.
7), Varian Associates, 611 Hansen Way, Palo Alto. Registration fee \$10.00
(See coupon with story). No dinner.

POWER
JAN. 13

Story on
page 14

**1100-kv UNDERGROUND TRANSMISSION
TEST FACILITY AT WALTZ MILL,** Pennsyl-
vania. Frank S. Young, Mgr. of Underground
Transmission Section, Westinghouse Electric
Corp., East Pittsburgh, Pa.

JAN. 13, Tuesday, 7:30 PM, Engineers Club of San Francisco, 160 Sansome
St., S.F. Dinner: 6:30 PM. Reservations: 421-3184 by Jan. 12th.

RELIABILITY
JAN. 8

Story on
page 13

COMPONENT RELIABILITY ANALYSIS.
Claus Wiebe, Project Engineer, Philco-Ford,
SRS Div.

JAN. 8, Thursday, 7:30 PM, The Bold Knight, 769 No. Mathilda, Sunnyvale.
Cocktails: 6:00 PM, dinner: 6:30 PM. Reservations: Gil Bowers, 962-4111 or
Lew Finch, 743-1577 by Jan. 7th.

**SYSTEMS SCIENCE
& CYBERNETICS**
JAN. 22

Story on
page 14

VISION PROGRAMS FOR A ROBOT. Dr.
Richard O. Duda, Stanford Research Institute.

JAN. 22, Thursday, 8:00 PM, Stanford Research Institute, Main Conference
Room B, 333 Ravenswood Ave., Menlo Park. Dinner: 6:00 PM, L'Omelette,
4170 El Camino, Palo Alto. Reservations: Carolyn Smith, 326-6200, ext.
2312 by noon Jan. 22nd.

**VEHICULAR
TECHNOLOGY**
JAN. 19

Story on
page 15

**AUTOMATED COMMUNICATIONS DIS-
PATCH SYSTEM.** Sam Anzelmo, Sr. Engineer,
Solid Systems Lab, Sylvania Electronics Sys-
tems, Mt. View.

JAN. 19, Monday, 8:00 PM, The Bold Knight, 769 No. Mathilda Ave.,
Sunnyvale (near Lockheed). Cocktails: 6:00 PM; dinner: 7:00 PM. Reserva-
tions: W. H. Nye, 328-1200 or Al Isberg, 433-3800 by Jan. 16th.



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Section Chairman's Message

On January 1 we entered a new decade — the 1970's! What, oh what will the decade hold in store for us? The IEEE seems headed for an era of change. The Groups are being reorganized about a "cluster" and "society" structure. The Board of Directors is considering a liberalized publication policy for the Spectrum. Excom's recent meetings with the Student Chapter Chairmen and Advisors clearly indicate that our young engineers feel an obligation to use engineering to "right" many of the social evils of our day.

Where does that leave you and me? Right in the middle of one of the most exciting eras of IEEE development!

The IEEE is the largest Electrical Engineering Society in the world and the only large EE Society in the USA. It should not be surprising therefore, that our socially conscious engineering associates should attempt to use the IEEE as a forum for the discussion of the social and political problems that involve engineers. Whether the IEEE should stray from its "technical, literary and educational" stereotype is a matter of opinion. It depends on the desires of the vocal majority of our members. How do you feel



John B. Damonte

about a liberal IEEE? Are your convictions strong enough to cause you to write me a letter or do you wish to go along with the masses? Let me hear from you and I promise to make Headquarters aware of your feelings.

My best wishes for a happy and prosperous New Year.

John B. Damonte
Chairman

IEEE, San Francisco Section

AES Tours FAA

AES will tour the FAA Air Route Traffic Control Center in Fremont on January 22. The tour will cover the control "floor" where all controllers and operators work, and will provide a graphical display of what goes on there. Tour members will see and hear how the controllers communicate and how they identify an airplane on radar. A question-and-answer period will then be held in the conference room.

Cocktails and dinner are scheduled at the Fremont Ranch Restaurant before the tour. To reach the restaurant, take the Nimitz Freeway (No. 17) to Thornton Ave., go east to Fremont Blvd. two or three blocks to Peralta and turn left to the restaurant. To get to the Traffic Control Center, go back down Peralta to Fremont, cross Fremont and stay to the left. Peralta will change to Williams. Stay on Williams to Central Ave. and turn right. The Control Center is just west of Blacow Road on the north side of the street.

The tour is limited to 20 persons, so make reservations early. See Calendar for details. Note: a second tour is tentatively scheduled for 1/29/70 to accommodate an additional twenty persons, if this becomes necessary.

Golden Gate Sub-Section Hosts Mayor Alioto

The Golden Gate sub-section will act as host for the San Francisco section at its January 28th meeting honoring Mayor Alioto.

Mayor Alioto is aware that our membership today is made up of responsible citizens who are equally concerned with matters of civic interest as we are with matters of technical concern. Therefore, the Mayor will address the January 28th meeting on a subject of topical interest to all.

The meeting will be a luncheon meeting to be held at the Leopard Cafe, 140 Front St., San Francisco. A full house is anticipated, so advance reservations are an absolute requirement. Reservations will be handled on a first-sign-up basis until maximum seating capacity is assigned.

For reservations, please call: Artwell Electric, 467-1880 as soon as possible.

Joseph Lawrence Alioto was the nation's foremost trust-buster and managed the world's largest rice milling organization before he became San Francisco's thirty-third Mayor on January 8, 1968.

Alioto was born in San Francisco on February 12, 1916, son of Giuseppe and Domenica Alioto. Alioto's father came to San Francisco as a boy from Sicily and his mother is a native San Franciscan.

He is a graduate of St. Mary's College, Moraga, California, and the Catholic University of America Law School in Washington, D.C., and has received Honorary Doctor of Law degrees from St. Mary's College, Santa Clara University, and from the Catholic University of America.

From law school, Alioto joined the Department of Justice where he worked five years in the anti-trust division under Judge Thurman Arnold and Justice Tom Clark. In the 1950's, he served as president of the Board of Education and then the Redevelopment Agency in San Francisco.

In private practice, he developed and still directs the largest anti-trust law office in the nation, and he was president of the Rice Growers Association from 1959-1969. Additionally, he founded a successful independent bank.



Mayor Alioto

The Mayor is a sponsor of the San Francisco Symphony, Opera and Ballet, the American Conservatory Theater, the San Francisco Film Festival and is a director of the Festival of Two Worlds, Spoleto, Italy.

Computer Aids in Designing High Gain Unfurlable Spacecraft Antennas

The high-speed digital computer makes it possible to evaluate integrals and perform other computations which, twenty years ago, would not have been attempted. In his presentation at the Wednesday, January 21 A&P meeting, Jack L. Bellamy will illustrate how the computer is used to calculate the gain of an unfurlable spacecraft antenna as the surface undergoes dynamic distortions due to the varying thermal environment in orbit.

First, the equations for determining the antenna gain by the current distribution method are derived, resulting in an integral which, in general, must be evaluated numerically. The factors in

this integral which relate to the surface and its distortions are discussed. The computational steps from preliminary to final design are then illustrated by means of a flow chart.

The results of calculations used for the preliminary design phase are presented, showing the method of selecting the number of panels to be used in the Flex-Rib reflector and the effect of the resulting systematic approximation error on antenna gain performance. The generalized equation for the reflector surface is shown and the method of determining surface distortions as a function of orbit hour is discussed. Curves of rms error and gain degradation versus orbit hour for a synchronous satellite spacecraft antenna are shown.

The role of the computer in the testing of large aperture spacecraft antennas in the future will be discussed and a demonstration of the use of the Tymshare computer in running a typical program will also be presented.

Mr. Bellamy is presently a Group Engineer for Lockheed M&S Company where he supervises the Electrical Design Section of the Antennas and RF Electronics Department.



Jack Bellamy

Carrier Reconstruction and Bandwidth Limitation Effects on Quadriphase Signalling Performance

The talk to be presented at the Thursday, January 29, Information Theory meeting at SRI will consist of two parts. The first part, presented by Dr. Richard J. Sherman, will determine the performance of a quadriphase communication system where the receiver's phase reference is noisy and derived from the received signal by means of a narrowband tracking filter (phase-locked loop). The second part, presented by J. Jay Jones, will evaluate the performance degradation due to various channel filters operating on a quadriphase signal and will compare these results with those for a bi-phase signal.

Several interesting results will be presented corresponding to specific filtering conditions. These results include mismatched data detection filtering (no transmission filtering) and numerous examples of combined transmission filtering with different data filters. The effects of symmetrical bandwidth limiting on QPSK and BPSK signals will be demonstrated as well as mistuned-broadband filtering. Included are degradation re-



R.J. Sherman



J.J. Jones

sults for parabolic and cubic phase distortion and also cascading of identical transmission filters. The effect of pulse rise-time will also be shown.

Since 1966, Mr. Jones has been engaged in the study of military satellites communication systems in the Communications Sciences Department, Space and Re-entry Systems Division, Philco-Ford Corporation, Palo Alto, where he is a Senior Engineering Specialist.

Since 1967, Dr. Sherman has also been a Senior Engineering Specialist with Philco-Ford in Palo Alto where he has investigated such problems as FM distortion and phase modulation systems.

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Jean A. Hoerni



IEEE 1970

Thomas Kailath



William S. Price



Lawrence Stark



Ray L. Leadabrand



C. Denis Mee



Raymond E. Miller



FELLOW AWARDS

Amdahl, Gene M. — For contributions to the design of large-scale digital computers.

Barkle, John E. — For contributions to high-voltage systems.

Cornell, Lloyd P., Jr. — For leadership in the engineering of a large utility communication network.

Eldred, W. Noel — For contributions in designing radar equipment, transmitters, and vacuum tubes; for leadership in the marketing of electronic instrumentation.

Hoerni, Jean A. — For the invention of the planar transistor, and for other contributions to the theory and technology of semiconductor devices.

Kailath, Thomas — For inspired teaching and contributions to information, communication, and control theory.

Leadabrand, Ray L. — For contributions to the electromagnetic measurements of the aurora and of the radar characteristics of nuclear explosions.

Mee, C. Denis — For contributions to the physics and technology of magnetic recording.

Miller, Raymond E. — For contributions to the advancement of the theoretical understanding of computation through work in switching theory and theoretical models.

Price, William S. — For contributions to the electrical, mechanical, and environmental aspects of EHV transmission.

Stark, Lawrence — For contributions to neurological control systems, to bioengineering education, and to the use of computers in medical instrumentation.

The IEEE Board of Directors, at its meeting on November 13-14, 1969, elected 11 of the San Francisco Section IEEE members to the grade of Fellow, effective January 1, 1970.

The grade of Fellow is the hallmark of unusual distinction and is conferred only upon persons with outstanding and extraordinary qualifications in their particular field.

On behalf of the San Francisco Section and all of its members we extend hearty congratulations and best wishes to our new Fellows on this happy occasion.

It has been the practice of the San Francisco Section to present the Fellow Award Certificates at the Annual Meeting. We plan to continue this practice and ask that all members reserve the evening of Friday, June 5, 1970, so that we may suitably celebrate the achievements of our new Fellows.

GENE M. AMDAHL

Dr. Gene M. Amdahl received his Ph.D. in Theoretical Physics from the University of Wisconsin in 1952. He then joined IBM where he worked on simulation studies and machine design for character recognition. During this period, he was project engineer and chief designer for the IBM 704 and initial planner for the IBM 709 and IBM 7030. In 1956, Dr. Amdahl joined Ramo-Woolridge for a short time, working on radar track following techniques. He then joined Aeronutronics as Manager of Data Processing Engineering until 1960, when he rejoined IBM, where he was Manager of Architecture for the IBM 360 System, following which Dr. Amdahl was an IBM Fellow working on Advanced Computing Systems until June of 1968. At that time, he was appointed Director of Advanced Computing Systems in the Menlo Park facility, remaining in that capacity until May, 1969, when he resumed his IBM Fellowship. In April, 1967, Dr. Amdahl was elected to membership of the National Academy of Engineering.

J. E. BARKLE

John E. Barkle received his B.S. in Electrical Engineering from Carnegie Institute of Technology (now Carnegie-Mellon University) in 1939 and joined Westinghouse Electric Corporation where he worked primarily on electric utility engineering problems. He contributed significantly in the analysis of power system stability and in system protection. In 1953 he was named Manager, Electric Utility Engineering Department where he directed investigations of fundamental engineering principles concerning lightning and switching surge phenomena, radio influence, EHV transmission and relay protection.

He joined the Power and Industrial Division of Bechtel Corporation as As-

sistant Chief Electrical Engineer in 1957. He has successively been Chief Electrical Engineer, Engineering Manager and is now Project Manager.

Mr. Barkle has been active in IEEE throughout his professional career. He has served on many technical committees and is currently a member of the Power Group Council and Administrative Committee and of the Industry and General Application Group Council. He has authored over forty technical papers and is co-author of two books in the field of power engineering. He was Chairman of the San Francisco Section in the 1968-69 operating year and is currently Junior Past Chairman.

Mr. Barkle is also a member of Tau Beta Pi, Pi Mu Epsilon, the San Francisco Electric Club, the Engineers Club of San Francisco where he served as President in 1967, and CIGRE.

LLOYD P. CORNELL, JR.

Lloyd P. Cornell, Jr., received his B.S. in Electrical Engineering from the University of California in 1942. After 4 years in the Signal Corps, achieving the rank of Major, he joined the Pacific Telephone Company as engineer in the Plant Department in San Francisco. In 1956, he was made Transmission and Protection Engineer, in charge of all transmission engineering for Northern California and Nevada. In 1960, he assumed charge of all communication engineering in a new operating area as Chief Engineer, Northern Counties Area, Sacramento, during which period he supervised the planning, design and construction of a new radio microwave route across the Sierra, of an award-winning Area headquarters building, and of a fully underground telephone office for the military "Autovon" defense network. During this period he was active in the Sacramento Valley Engineering Council, and was General Chairman of Engineers' Week in Sacramento in 1964.

Returning to San Francisco in 1964 as Assistant Vice-President, Engineering, Mr. Cornell became responsible for technical standards and engineering methods for Pacific Telephone, and has played a leading part in undergrounding of residential telephone cables. He is the author of four technical publications. He is a Registered Professional Engineer and is a member of both the Commonwealth Club and the Pacific Coast Electrical Association.

W. NOEL ELDRED

Noel Eldred majored in electrical engineering at Stanford University, earning a bachelor's degree in 1931 and the degree of engineer in 1933. At Stanford he was elected to two national honor societies, Phi Beta Kappa and Sigma Xi. After graduation, he was employed by Heintz & Kaufman, Ltd., San Francisco manufacturer of vacuum tubes and transmitters, as a development engineer, sales manager and plant superintendent. His Hewlett-Packard career began in

1944 as a development engineer. He was promoted to general sales manager in 1947, to vice president for marketing in 1957 and to Executive Vice President in January, 1969. He was elected to HP's Board of Directors in February, 1969. Mr. Eldred has long been active in industry and community affairs. Currently he is a director of Memorex Corporation in Santa Clara and Royco Instrument Company in Palo Alto; a member of the American Marketing Association's Northern California Chapter; member of the Sales Marketing Executives/California and sponsor of the Planned Parenthood Association of Santa Clara County. At Stanford, he is President of the Stanford Associates and a member of the Stanford Cabinet.

JEAN A. HOERNI

Jean A. Hoerni graduated in Mathematics from the University of Geneva, Switzerland, and took a Ph.D. from Geneva in Physics and another from Cambridge University in England. Post-doctoral work as a Research Fellow in Chemistry at Cal Tech preceded his joining Shockley Semiconductor Corporation in Mountain View. There he participated in the development of four-layer switching diodes and studies of diffusion in semiconductors. From 1957 to 1961, as head of the Physics Section and Diode Development, he developed and patented the planar process so basic to all of transistor technology today. PNP double-diffused transistors also resulted from this work. For two years he was Vice-President and General Manager of Amelco Semiconductor, and for another two years was an engineering consultant assisting Union Carbide in establishing a new semiconductor operation. In 1967 he founded Intersil, Inc. in Cupertino, of which he is now President and Chairman of the Board, continuing pioneer development work in field-effect transistors and operational amplifiers. Dr. Hoerni received the 1966 John Scott Award for his development of the planar process. He has authored 23 papers and is a member of Sigma Xi and the American Physical Society.

THOMAS KAILATH

Dr. Kailath was born in Poona, India. He received his B.E. in Telecommunications Engineering from the University of Poona, India, in 1956, his S.M. and Sc.D. in Electrical Engineering from the Massachusetts Institute of Technology in June 1959 and June 1961, respectively. During 1956-1957, he was employed at the L.D. College of Engineering, Ahmedabad, India, and during 1961-1962, he was employed at the Jet Propulsion Laboratories, Pasadena, California, where he also taught part-time at the California Institute of Technology. Since 1963 he has been at Stanford University where he is currently a Professor of Electrical Engineering. From January 1963 until June 1963, he was a Visiting Scholar at U.C., Berkeley.

Dr. Kailath's research interests are in statistical data processing; he has published several papers on time-variant multipath channels, feedback communication systems, detection theory and linear and nonlinear estimation. He (along with a co-author) received the 1967 IEEE Information Theory award for a paper on feedback communication systems. For the academic year, 1969-1970, he will be a Guggenheim Fellow at the Indian Institute of Science, Bangalore, India.

Dr. Kailath has been a consultant to several industrial companies, and is also editor of the Prentice-Hall series in Information Theory. He is a member of IEEE, SIAM, IMS, URSI and Sigma Xi.

RAY L. LEADABRAND

Ray L. Leadabrand took his B.S. in Communications Engineering in 1950, at San Jose State College, and continued at Stanford for an M.S. in Electrical Engineering in 1953. His first job was with Philco, installing and testing antennas and communications equipment in Korea and Japan. As a Research Assistant at Stanford's Radio Physics Laboratory, he studied radar scattering effects of aurorae and meteors. In 1955, he joined in similar work at Stanford Research Institute in the Radio Systems Laboratory. Assuming the position of Manager of this group in 1962, Mr. Leadabrand directed research in the radar characteristics of nuclear explosions, and in deep space electron density measurements. His group was also responsible for the 150-foot antenna operation and maintenance used in the Stanford Center for Radar Astronomy, and has followed Pioneer deep space probes and Mariner V measurements of the Venusian ionosphere and atmosphere.

In 1968, Mr. Leadabrand was appointed Executive Director of the Electronics and Radio Sciences Division of SRI. He has contributed heavily to scientific literature with over two dozen technical papers and numerous papers presented and many SRI reports authored. He has been active in the IEEE Group on Antennas and Propagation, and is currently serving as a member of the editorial board of IEEE Proceedings. He is a member of Sigma Xi, AAAS and URSI, and the American Geophysical Union.

C. DENIS MEE

Dr. C. Denis Mee received the B.Sc. degree in Physics from London University in 1948, the Ph.D. degree from Nottingham University in 1951 and the D.Sc. degree from Nottingham in 1967. After three years of industrial research in England involving magnetic materials, he was associated with the MSS Recording Company there, where he developed data-recording magnetic tape. In 1957 he joined CBS Laboratories to do research on advanced magnetic-recording techniques. Dr. Mee joined IBM in 1962 and worked at the Research Center on exploratory memory devices. Subsequently, he transferred to San Jose, where he now is Manager of the SDD Laboratory's Advanced Technology group. He received the IEEE Achievement Award of the IEEE Audio Group in 1964 for outstanding contributions to magnetic recording. He is also the author of Volume II of Selected Topics entitled "The Physics of Magnetic Recording." He has published numerous articles in scientific journals. He was Chairman, IEEE Technical Committee on Magnetic Recording (Magnetics Group) from 1965 to 1969, and served on the Program Committee for the SF Chapter on Magnetics. He has served on the Program Committee for several Intermag Conferences. Dr. Mee is also a Fellow of the Institute of Physics and the Physical Society (England).

Dr. Mee is also a Fellow of the Institute of Physics and the Physical Society (England).

RAYMOND E. MILLER

Raymond E. Miller is a Research Staff Member of the IBM Research Center at Yorktown Heights, New York where he has been employed since 1957. Currently he is head of the Computational Structures Group in the Mathematical Sciences Department. For the 1969-1970 school year he is serving as the Visiting Mackay Lecturer in the Electrical Engineering and Computer Sciences Department of the University of California at Berkeley, where he is teaching several graduate courses on parallel computation.

Since receiving the Ph.D. degree in Electrical Engineering from the University of Illinois in 1957, he has been actively engaged in research aimed at providing a fundamental and theoretical understanding of computational processes and structures. He has written a number of papers on switching circuit theory, incompletely specified sequential machines and asynchronous circuits, is the author of the two-volume set of books, "Switching Theory" published by J. Wiley and Sons in 1965, and holds four patents in the area of digital systems. Recently his research interest has been the development of theoretical foundations for computational structures with particular emphasis on parallel computation.

He is chairman of the IEEE Technical Committee on Switching and Automata Theory of the IEEE Computer Group. Also, he is a member of the Association for Computing Machinery and is the Area Editor for Theory of Computation of the Journal of the ACM. In addition, he is a member of the Association for the Advancement of Science, Pi Tau Sigma, Tau Beta Pi, Phi Kappa Phi, Sigma Xi, and RESA.

WILLIAM S. PRICE

William S. Price graduated from the University of Illinois with a B.S. in Electrical Engineering in 1939 and joined American Electric Power first as a load dispatcher, and later as Doble Test engineer, responsible for field testing of high voltage equipment. After a 3-year interlude with the Navy in underwater ord-

nance, he became Relay Engineer in AEP's New York office, with the development of the first 1-cycle electronic relaying system resulting in the first of 16 AIEE/IEEE and 4 CIGRE papers he has written, all of which concern EHV transmission problems. In 1953, he assumed leadership of the Electrical Research Section of AEP concerned with problems of 345 KV transmission systems, particularly with respect to corona loss and radio interference levels from transmission lines. Studies of trip-out phenomena from lightning resulted in improved shielding concepts, especially vital in the development of AEP's 765 KV transmission system.

Since October, 1963, Mr. Price has been Extra High Voltage Transmission Consultant with Bechtel Corporation in San Francisco and has participated in transmission system projects for Labrador and for the State Electricity Commission of Victoria, Australia. He has been very active in CIGRE committees and ASA and IEEE standardization committees, including 10 years as Secretary-Treasurer of the U.S. National Committee of CIGRE. His recent paper on contaminated insulator flashover won Best Paper Prize for 1969 in the IEEE Power Group.

LAWRENCE STARK

Lawrence Stark received an A.B. degree from Columbia College in 1945, and an M.D. degree from Albany Medical College in 1948. In 1957 he became a "board certified" neurologist, following training at the neurological Institute, Columbia University. Graduate studies in the electrical engineering department at Yale University occupied part of his time from 1954 to 1959. His research interests began with biochemistry at Oxford in 1949 and then shifted to neuromuscular physiology, first at University College, London in 1950-51, and then during his term as assistant professor of physiology at N.Y. Medical College in 1951-52. Following naval service in the Korean war, he joined the faculty at Yale University as assistant professor of neurology. In 1960 he joined the "Center of Communication Sciences" at Massachusetts Institute of Technology as Head of the Neurology Section. In 1965 he moved to Chicago where he became Professor of Bioengineering and Chairman of the Biomedical Engineering Department, Presbyterian — St. Luke's Hospital and College of Engineering at the University of Illinois at Chicago. In 1968 he accepted a professorship of physiological optics at the University of California, Berkeley. In 1969 he was also appointed professor of engineering science and a member of the Coordinating Committee on Bioengineering for the Berkeley campus. Dr. Stark is a member of a number of engineering, scientific and medical societies, serves on governmental committees and on editorial boards, and has consulted in engineering science for industry.

Computer-Aided Circuits Design Overview



Richard I. Dowell



William J. McCalla



Paul M. Russo



Bruce A. Wooley



Prof. Pederson

To achieve an automated, optimized design of an integrated circuit, several sub-problems must be initially solved. These problems include: 1) The adequate modeling of active and passive components; 2) The analysis and simulation of non-linear DC, non-linear transient, and linear small signal circuits; 3) The development of suitable performance indices; 4) The use of efficient methods of establishing performance sensitivity to parameter change; and 5) The implementation of automated optimization procedures.

These aspects of an over-all design package will be brought out at the January 21st Circuit Theory meeting by

Donald O. Pederson in an overview based on the work at Berkeley on the computer-aided analysis and design of integrated circuits. This is the first of a series of chapter meetings on the general subject of computer-aided circuit design. Four brief individual presentations by Ph.D. candidates are also included to stress specific problems associated with the analysis and design of bias circuits, DC-coupled broadband amplifiers, and fast ECL logic gates.

Professor Pederson joined the Electrical Engineering Department of the University of California, Berkeley, in 1955, where he is now engaged in research in semiconductor electronics and optimum

integrated circuit realizations. Professor Pederson is a Fellow of the IEEE and this year received the IEEE Education Medal.

Ph.D. candidate Richard I. Dowell is presently completing his studies at Berkeley in the field of Computer Aided Design. Candidate William J. McCalla is working in the frequency domain of computer-aided design. Paul M. Russo, in completing his studies, is placing special emphasis on the analysis and optimization of nonlinear networks in the time domain. Bruce A. Wooley is completing his Ph.D. research in the areas of semiconductor electronics and the computer-aided design of integrated circuits.

Inner Space — A New Engineering Frontier

As time has progressed over the last several decades, more and more problems have fallen into the realm of engineering. Some of these problems involve processes occurring in spaces of fantastically small dimension.

The engineer must be able to observe the organization (and, if possible, the operation) of structures of extremely small dimension, often considerably less than a wavelength of visible light. With its high resolution over extraordinary depths of field, the scanning electron microscope has not only allowed engineers to observe such structures, but has provided them with remarkable three-dimensional perspectives. Dr. Thomas E. Everhart will emphasize particularly microscopical studies of semiconductor device operation and microscopical studies of nervous-system organization at the East Bay Subsection meeting, Monday, January 26.

Dr. Everhart is professor of Electrical Engineering and Computer Sciences at the University of California, Berkeley.



Scanning electron micrograph of connection (points of communication) between nerve cells. Magnification: 60,000 X

He obtained his B.A. from Harvard in 1953, his M.Sc. from UCLA in 1955, and his Ph.D. from Cambridge in 1958. From Cambridge he came directly to Berkeley, where he has taught and conducted research in electron microscopy

and solid-state devices.

The no-host dinner at 6:30 PM and the meeting at 7:30 will both be held at Spenger's Fish Grotto, Berkeley. For reservations, call Ruth Clark, 569-2012, by Friday, January 23.

Charles Dalziel Wins IGA Award

Charles F. Dalziel has been awarded first prize for his paper entitled "Re-evaluation of Lethal Electric Currents," published in the IGA Transactions. Mr. Dalziel has been a member since 1933, a Fellow since 1957 and was Chairman of the San Francisco Section AIEE in 1957-58. He received the BS degree with honors in 1927, the MS degree in 1934 and the EE Degree in 1935 from the University of California, Berkeley. From 1927 to 1929 he was testman and student engineer with General Electric Co. He was with San Diego Gas & Electric Co. from 1929 to 1932 in charge of System Protection, and during 1932 he taught at San Diego State Teachers College. Since 1932 he has been with the department of electrical engineering at UC Berkeley and in 1968 became Professor Emeritus.



Charles Dalziel

From 1941 to 1944 he was supervisor of the University's Engineering Science Management War Training Program and from 1944 to 1945 was Chief Technical aide for the National Defense Research Committee, Office of Scientific Research and Development. During the years 1951 and 1952, he was Fulbright visiting Professor at the Instituto Elettrotecnico Nazionale Galileo Ferraris in Turin, Italy. He has also served as a consultant to Kaiser Engineers, the Los Alamos Scientific Laboratories, the Lawrence Radiation Laboratories and the Rucker Co. Prof. Dalziel is a member of Eta Kappa Nu, Tau Beta Pi, Sigma Xi and is a registered professional engineer in the state of California. He is the author of more than 110 technical papers published in numerous professional journals throughout the world. Among other things, Prof. Dalziel discusses electric stimulation of muscles and relationships between Fibrillation Magnitude and body weight in an attempt to establish more accurately the likely fibrillation threshold current for man. We congratulate Prof. Dalziel for his achievement and exceptional paper.

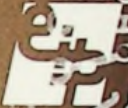
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Microelectronics Engineering Course

The Parts, Materials and Packaging Chapter will conduct a 6-session course, topics of which were presented in the December GRID, p. 10. This course offers an opportunity for engineers to secure a sound background in microelectronics design.

In addition to Engineering information and data presented at the various sessions, attendees should have a copy of the book "MICROELECTRONICS" published by Research and Education Association, 342 Madison Ave., New York City 10017, since it will be used as a text for much of the material to be covered. This hard-cover 448-page book can be secured directly from the publishers at \$15.75 per copy.

All programs will be held in the Conference Room of the Research Building (building 7) Varian Associates, Hansen Way, Palo Alto. Registration fee of \$10.00 is required. To assure a place in the course, fill in and mail the advance registration coupon along with a check made out to PMP Chapter and mail to

Ed Hilton, Secretary-Treasurer. Dates of the classes are January 27, February 3, 10, 17, March 3, 10, all at 7:30 PM.

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John Granger New IEEE President

Dr. John V. N. Granger, Chairman of the Board of Granger Associates, Palo Alto, has been elected by the voting members to be President of the IEEE for 1970. Dr. Granger succeeds Dr. F. Karl Willenbrock, Provost of the Faculty of Engineering and Applied Sciences at the State University of New York, Buffalo. He will preside over the activities of the world's largest engineering society, having some 160,000 members located throughout the world.

Dr. Granger has been a teaching Fellow in Physics and Communications at Harvard University, instructing in the pre-radar school for Army and Navy officers. He was also a project engineer in the Radio Research Laboratory there, working on UHF search and intercept receivers and on development of airborne VHF direction finders and homing systems for missiles. During World War II he served the U.S. Ninth Air Force and the First Tactical Air Force in planning and evaluating radar countermeasures. Returning to Harvard, he became a Research Fellow in electronics and a Group Leader in the Electronics Research Laboratory, writing his doctoral thesis on low frequency aircraft antennas.



John V. N. Granger

Dr. Granger is the author of numerous published papers on aircraft antennas and airborne communications. He received the Eta Kappa Nu award as the "Outstanding Young Electrical Engineer" for 1952, and the IRE "Pacific Electronics Achievement Award" for 1955. He is a Fellow of the IEEE and a Fellow of the Electronics Institution of East Africa.

He joined Stanford Research Institute in 1949 to organize and supervise the antenna research program. At his resignation to form Granger Associates in 1956, he was Assistant Director of the Engineering Division. He serves as Chairman of Granger Associates, Ltd., in England and as Chairman of Granger Associates (Pty.) Ltd., in Australia.

How Can The Santa- Clara Valley Sub-Section Best Serve Its Members?

A recent Santa Clara Valley Sub-Section executive committee discussion about the purpose and effectiveness of our large Sub-Section brought up several new viewpoints, and a strong feeling that a review is in order.

When there are so many professional groups in a concentrated physical area, does the Sub-Section usefully help the members simply by means of additional meetings; or should the Sub-Section efforts be concentrated on assisting new professional groups in organizational chores; or on membership drives; or on assisting professional groups to bring symposia to our area; or to work with the Student Chapters or . . . ?

Recent low interest in the Sub-Section activities make these questions pertinent, and if enough of you care to take the time and drop a note to me at 26493 Weston Drive, Los Altos 94022, perhaps a discussion meeting can be set up and then our collective viewpoints can be presented to the San Francisco Section Executive Committee. They, too, would like to make the Section and Sub-Sections more effective, and we can count on attentive help if a reasonable program is presented to them. Please take time to write!

R. W. Towle, Chairman
Santa Clara Valley Sub-Section

Negative—Electron— Affinity Photoemitters

Until recently, photocathode design was in large part an art. The discovery in 1965 of the concept of negative-electron-affinity surfaces allows the design of efficient photoemitters at an arbitrary wavelength, within the limits of physically realizable materials of course. Thus for the first time, the design of efficient photoemitters for the infrared becomes possible. Photoemitters based on this principle have been designed and will be described by Dr. H. Sonnenberg at the Electron Devices Chapter meeting on January 15.

These cathodes have a much higher quantum efficiency than conventional photocathodes, and are beginning to find their way into practical devices. Such devices represent a marriage between solid state and tube technology. Simple physical considerations will be presented to explain the function of these new photocathodes. Experimental results, including quantum efficiency curves contrasted with conventional photocathodes, will also be presented.

Since joining Sylvania Electronic Systems, Mountain View, in 1966, Dr. Sonnenberg has been engaged primarily in detector investigations, ranging from 10.6 micron laser light detection to the present photocathode work.

Hybrid Computer Solution of Optimization

It is probably safe to say that the design of technological systems, as it is currently carried out by scientists and engineers, is basically a trial and error procedure. The design process is certainly aided by past experience and intuition, and high-speed computers are often used as a design aid. In this capacity, however, the computers are used mainly as tools to analyze proposed systems in order to determine whether or not each trial design is satisfactory.

The alternative is to approach design from a true optimization point of view. Here the designer establishes a performance index which indicates quantitatively the goodness of the design. He then proceeds to determine the system configuration and parameters which maximize this performance index consistent with any necessary constraints. In recent years the extensive research in optimal control is an example of optimum design procedures.

Due to the tremendous computing-speed capabilities of hybrid computing systems, Dr. Robert M. Howe, speaker at the January 27th meeting of the Computer Chapter, feels that this type of computer will play a major role in pushing engineering design procedures toward optimization methods. Not only can hybrid computers reduce problem-solution costs to the point where optimization methods are economically feasible, but also they provide the man-machine interaction and graphic output display capability so necessary to allow effective optimization procedures to be implemented.

Dr. Howe has been on the faculty of the University of Michigan for more than 15 years and is currently Chairman of the Aeronautical and Astronautical Engineering Department. In 1957 he was co-founder of Applied Dynamics, Inc. and is now the Chairman of the Board.

MTT Stresses Microwave Acoustics



Dr. Bahr



Dr. Olson



Dr. Reeder

The January 14 meeting of the microwave Theory and Techniques Chapter will feature three leaders in the current microwave acoustic upsurge. Guest Chairman for the evening will be Dr. Al Bahr of SRI. Speakers will be two well-known local researchers, Dr. Frank Olson and Dr. Tom Reeder.

Bulk wave delay lines are the first microwave acoustic devices to receive component status, and are now commercially available from UHF through X-band. The subject of Dr. Olson's talk will be recent advances in bulk delay lines with emphasis on applications. Radar, ECM, and signal processing applications will be among those discussed. Dr. Reeder will speak about the newer

surface-wave device area. Surface-wave devices are being considered for such discrete components as amplifiers, phase shifters, and filters, and hold considerable promise for future microwave IC technology.

Dr. Olson presently serves as Associate Director of Engineering at Microwave Electronics in Palo Alto. Dr. Reeder was associated with Dr. Olson at Microwave Electronics on acoustic device work. He is presently engaged in research on acoustic surface-wave devices at the Stanford Microwave Laboratory.

The meeting will take place in Bldg. 44, SRI on Laurel Street in Menlo Park. A group dinner will be held before the meeting.

Charles F. Coleman Receives Zworykin Award

Charles H. Coleman is the recipient of the 1970 Vladimir K. Zworykin award, given annually for the most important technical contribution to electronic television.

Mr. Coleman is a Senior Staff Engineer in the Video Engineering Department of Ampex Corporation. Since joining Ampex in 1960, he has been engaged in the development of time-base correcting systems for monochrome and color video-tape recorders. He has also been concerned with the development of high fidelity video-tape recording standards for use with color television, culminating in the presently used "High Band" standards.

From 1953 to 1960, Mr. Coleman was with the Columbia Broadcasting System. From 1947 to 1953, he was with the Balaban and Katz Corporation at their pioneer station, WBKB in Chicago.

Mr. Coleman holds several patents in the television and video-tape recording fields, and is the author of several papers.

Component Reliability Analysis

Claus Wiebe, Project Engineer for Philco-Ford SRS Division, will speak at the Reliability Chapter's first meeting in 1970. He will discuss the qualitative application of physical analysis at component levels as a tool in improving reliability. Typical examples will be reviewed in which a study of the electrical and packaging features of a proposed component revealed design weaknesses. The discussion will point out the value of extending in-depth analysis from failed or defective devices to devices that are considered normal.

The meeting will be held Thursday, January 8, at the Bold Knight in Sunnyvale. Cocktails at 6:00 PM and dinner at 6:45 will enable members to meet the speaker prior to the 8:00 PM meeting.

Reservations for the dinner are helpful. Call Gil Bowers (962-4111) or Lew Finch (743-1577).

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EMP Effects on Satellite Ground Stations

Many of the destructive effects of an EMP on the apparatus of a satellite communications ground station may be computed if the EMP is defined as a time-dependent transient. Dr. William E. Waters will discuss several techniques which have been used for such calculations at the Monday, January 19 Electromagnetic Compatibility Chapter meeting. The results of the analysis will then be applied to a number of specific problems including: 1) The microwave energy captured by the receiving antenna in a narrow passband; 2) The energy captured by a three-element Yagi; 3) The energy captured by a deep-buried conduit; and 4) The energy captured by an exposed heat exchanger. Certain techniques for shielding and grounding the equipment to provide EMP hardening will also be discussed.

Dr. Waters received his bachelor's and master's degrees from the University of Kentucky and his Ph.D. from the University of Maryland. For many years he was active in the microwave tube field. Recently he has given attention to RF propagation, EMP and electromagnetic interference problems concerning satellite communications systems. He is a senior engineering specialist at Philco-Ford, WDL, Palo Alto, where he is responsible for the EMP hardening and electromagnetic interference protection of several WDL-designed ground stations.

Progress Report From Waltz Mill Facilities

As part of the Electric Research Council's overall R&D program, Westinghouse Electric Corporation operates the underground transmission test facility at Waltz Mill, Pennsylvania. Designed for a maximum voltage of 1100 kv, this facility is now being used to test underground transmission systems rated from 115 kv to 750 kv.

Frank S. Young, Manager of Westinghouse's underground transmission section, will discuss the project at the IEEE Power Chapter meeting January 13 at the Engineers Club of San Francisco, 160 Sansome Street. Meeting time is 7:30 PM, following dinner at 6:30.

Overall objectives of the ERC test program and technical features of the test station will be presented, along with details of tests currently being conducted. Also included will be a discussion of the test data obtained to permit economical design of the 1100-kv substation at Waltz Mill.

Vision Programs For a Robot

The Artificial Intelligence Group at Stanford Research Institute has constructed a computer-controlled mobile automaton that can wander through an experimental room and is beginning to explore the adjoining corridors. The robot is equipped with a television camera and transmits pictures back to the computer for analysis. Dr. Richard O. Duda will describe several of the computer programs that have been developed at SRI for scene analysis at the SSC January meeting on Thursday, the 22nd. Routines for preprocessing, object location, object identification, wall location, and region analysis will be described. A variety of examples illustrating their operation will be shown.



Richard Duda

Dr. Duda joined Stanford Research Institute in 1962 where he has been working on pattern recognition and related topics in artificial intelligence. He is the author of several papers on pattern classification, feature extraction, and the use of context in pattern recognition, and has taught courses covering these subjects for the University of California Extension and the University of California, Berkeley. He is currently the Contributing Editor for Pattern Recognition of the IEEE Computer Group News.

1971 FELLOW GRADE NOMINATIONS

Individuals or Group officers may propose nominees for 1971 Fellows by sending in preliminary proposals or resumes to Section Headquarters. Details were given in November GRID (p. 13). A deadline of February 2nd has been set for Section consideration and endorsement, with final submission to New York required by April 30th. Unusual professional distinction is the principal criterion, with membership in IEEE for seven years or more in any grade. All members are invited to make suggestions.

Vic Siegfried, Chairman
Fellow Committee

Dr. McCluskey — National Computer Group Chairman



Dr. McCluskey

Congratulations are due Dr. Edward J. McCluskey of Stanford University. He has been elected National Chairman of the IEEE Computer Group. He is a Professor of Electrical Engineering and of Computer Science at Stanford and is the Director of the Digital Systems Laboratory. Dr. McCluskey has been active in local IEEE activities, most recently as Chairman of the local Computer Chapter.

Due to the demands of his national office, Dr. McCluskey has submitted his resignation from the local chairmanship. Stephen F. Lundstrom, Fairchild R&D Labs, the elected Vice Chairman, will fill the chairmanship.

GRAD EE REGISTRATION FOR SPRING 1970 SAN JOSE STATE COLLEGE

A reassessment of the situation shows a number of vacancies still remaining for Spring 1970 Semester in the Graduate Electrical Engineering Department at San Jose State College. Interested qualified persons may obtain an application form by filing a "Petition for Special Late Admission to the Graduate Division" form. These forms may be obtained from the Graduate Studies Office, Room 150, Administration Building, San Jose State College, 125 South 7th Street, San Jose 95114; (408) 294-6414. An application form will be sent to all qualified persons requesting one until the available spaces are filled.

Automated Communications Dispatch System

An automated dispatch system which improves the allocation, the deployment, and the monitoring of uniformed police field units and related emergency services has been developed by Sylvania. This computer-driven system automates many of the traditional dispatching functions by providing instant information on the status of field units, the location and verification of the authenticity of street addresses, the disposition of pending requests for service, and by maintaining communications records. The conceptual design and development of Automated Communications/Dispatch Systems has been one of the most recent activities of Mr. Sam Anzelmo, a Senior Engineer with the Sociosystems Laboratory of Sylvania Electronic Systems. Mr. Anzelmo will speak at the VT Chapter's January 19th meeting, 8:00 PM, at the Bold Knight in Sunnyvale.



Sam Anzelmo

The system operation is organized around a small inexpensive computer, a color situation display, and a data terminal. The situation display is configured from a color television and a 35mm slide projector to produce colored alpha-numeric characters over a map background. The colored characters are used to represent up-to-the-minute status and location of each unit in the field, as well as the priority and the location of requests for service pending action. A video data terminal at each complaint clerk and dispatch position provides a means to input and output data to the system and to transfer information between operators. A digital-type magnetic tape recorder maintains time records of all activities.

Increased capability, improved response time, and more efficient record utilization make the project worthy of further testing. Existing police operations can now benefit from these improvements, but the improvements inherent in the system appeal to all groups concerned with vehicular emergency services.

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Sydney Conference

The Steering Committee of the INTERNATIONAL CONFERENCE ON MICROELECTRONICS, CIRCUITS AND SYSTEM THEORY TO BE HELD AUGUST 18-21, 1970, at the University of New South Wales, Sydney, invites papers in the following general categories: new solid state devices, microwave and bulk effect devices, circuits and systems theory, linear integrated circuits, digital integrated circuits, computer-aided design, and integrated subsystems. Contributors should submit three copies of a synopsis of their paper (not less than 200 words) by March 23, 1970 to the Joint Conference Secretariat. For registration forms and further details, contact the Joint Conference Secretariat, I.R.E.E. Australia, Box 3120, G.P.O., Sydney, 2001, Australia.

A TOUR OF THE SOUTH PACIFIC FROM AUGUST 15 TO SEPTEMBER 6, 1970 IN CONJUNCTION WITH THE SYDNEY CONFERENCE has been suggested by American Express in conjunction with Pan American. For this, individual flights to Sydney for those requiring arrival earlier than the tour can be arranged by American express. The price for the South Pacific tour is \$1,698.00. Possible savings are available if 15 or more participate. Those interested in the tour should contact R. W. Newcomb, ERL, Stanford University, Stanford, Calif. 94305 before March, 1970. He will then put the group in contact with American Express for organizational arrangements.

Hulme Joins HP

John R. Hulme, who was systems and applications engineering manager for a number of years and more recently department manager for electronics research at Fairchild Camera and Instrument Corporation's Semiconductor Division, has joined Hewlett-Packard Company's Santa Clara Division.

In his new position as applications manager for integrated circuits, Hulme will assume responsibility for new circuit applications at the HP Santa Clara Division and will coordinate integrated circuit development and applications among HP divisions.

A native of Utah, Hulme received a B.S. degree in electrical engineering from the University of Utah in 1955 and his M.S.E.E. from the University of Southern California in 1959. He is an IEEE member and has authored numerous publications on integrated circuit design and applications.

Thiristor Drives.... Industries' Adolescent

Donald J. Feyrer will address the Industry & General Applications Chapter meeting on January 8 at the Sea Wolf Restaurant in Oakland.

Mr. Feyrer will discuss thiristor drive development and uses for industrial applications. He will also give comparisons with other types of drives and future designs in the drive market.

Donald Feyrer graduated from Marquette University in 1959 with a Bachelor of Electrical Engineering degree. Responsibilities at Cutler-Hammer have included application engineer and sales engineer, as well as the supervision of marketing and engineering activities in general purpose and paper industries drives. Presently Mr. Feyrer does planning for Cutler-Hammer drive business. He is also a member of TAPPI's engineering committee and is Cutler-Hammer's representative on NEMA's drive committees.

Cardiac Transplants Discussed

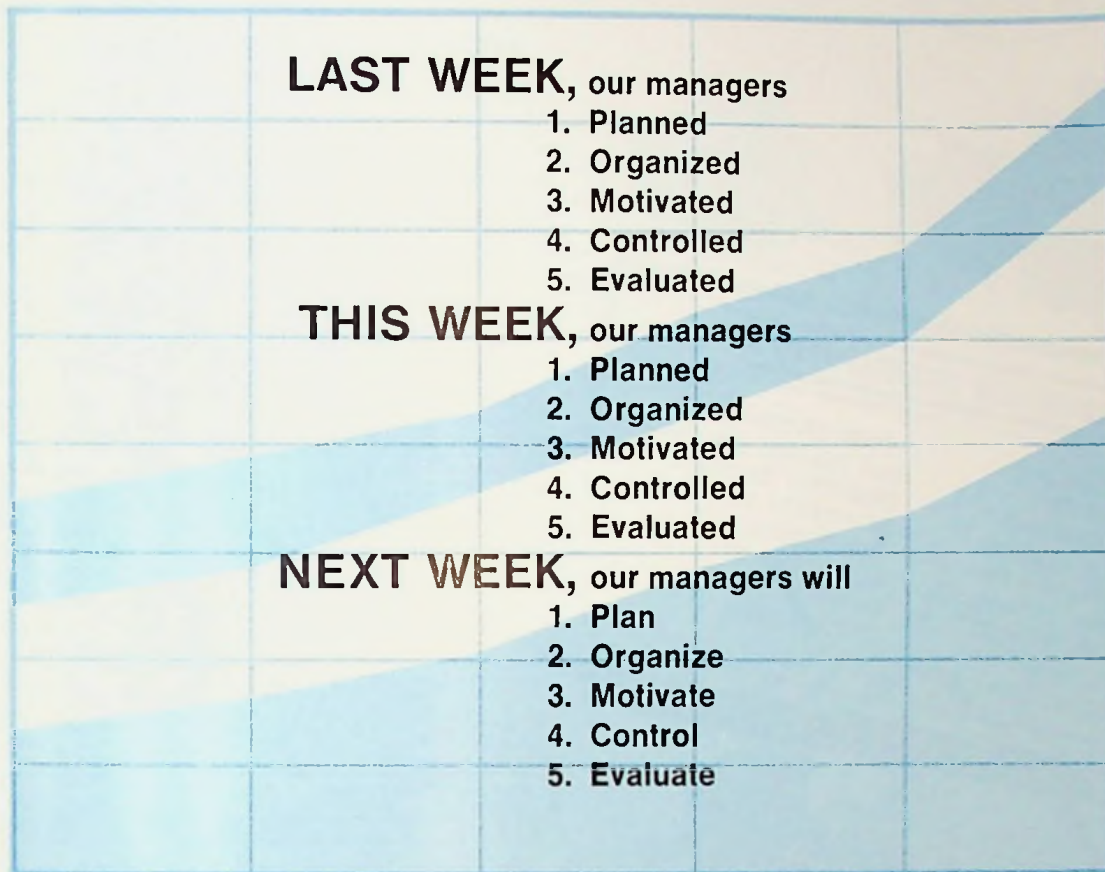
The history of cardiac transplantation, from its early experimental phases in laboratory animals through its evolution to clinical applicability to humans will be outlined by Dr. Eugene Dong. Dr. Dong will be the speaker at the Tuesday, January 20, EMB Chapter meeting to be held in room M112 at the Stanford Medical School. He will emphasize the recent developments that have made human transplants feasible as well as the problems that still exist in transplantation and the current animal research aimed at solving those problems. Of particular significance is the disruption of the cardiovascular control system by the lack of feedback from the central nervous system to the transplanted heart.



Dr. Eugene Dong

Dr. Dong received his A.B. in Physiology from the University of California at Berkeley and his M.D. from U.C. Medical School at San Francisco in 1959. After internship at Bellvue Hospital in New York City, he undertook postgraduate training at Stanford and has remained there as Assistant Professor of Surgery and as a member of the Cardiovascular Research Group.

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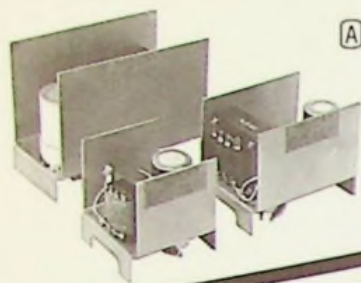
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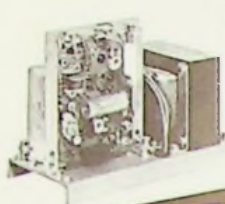
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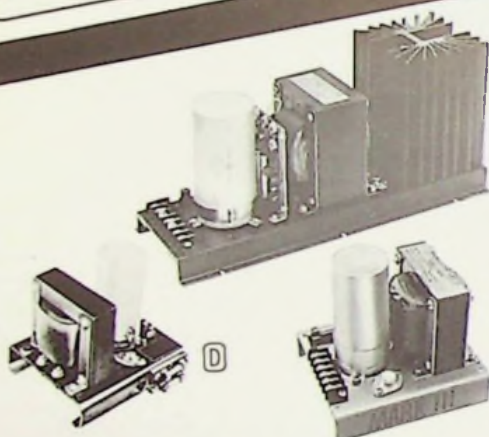


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(C)

MODEL C214-OEM DC SUPPLY (FIG. D)

Specially designed for driving relays, solenoids, motors and other surge-type loads. Provides DC output of 28 volts at 2.5 amps. **AC Input:** 115/230 VAC ($\pm 10\%$), single-phase, 50/60 Hz. **Line and Load Regulation:** $\pm 2\%$. **Ripple:** 0.1% rms ± 10 mV. **Operating Temperature:** 0° to 40° C; can be used up to 70° C with derating. **Size:** 6" w. x 5" d. x 5.5" h. **Weight:** 7 lbs.

Wanlass Model	Output Volts	Net Each, Lots of			
		1-9	10-24	25-49	50-99
C214-OEM	28 VDC	\$46.00	\$43.50	\$41.50	\$39.00

MARK III PRECISION REGULATED ECONOMY DC SUPPLIES (FIG. E)

Economy DC power supplies feature excellent regulation and ripple, plus: Adjustable automatic current limiting; overload and short circuit protection; adjustable overvoltage crowbar. Available in nominal DC outputs of 5, 12 and 24 volts; adjustable $\pm 10\%$ with derating. Input and output are through a terminal strip on the open-type chassis, with clear anodized finish. **AC Input:** 115/230 VAC ($\pm 10\%$), single-phase, 47-400 Hz. **Line Regulation:** $\pm 0.1\%$ or 10 mV. **Load Regulation:** $\pm 0.1\%$. **Ripple:** 0.01% rms or 1 mV. **Size:** 6" w. x 5" d. x 5.5" h. **Weight:** 6 lbs.

Wanlass Model	DC Output	Net Each, Lots of			
		1-9	10-24	25-49	50-99
III-OEM5-5	5 V at 5 amps	\$89.50	\$85.00	\$80.50	\$76.00
III-OEM12-5	12 V at 5 amps	89.50	85.00	80.50	76.00
III-OEM24-2.5	24 V at 2.5 amps	89.50	85.00	80.50	76.00

REGULATED DC POWER SUPPLIES (FIG. A)

DC power supplies in ratings of 30, 60 or 120 watts. Feature automatic short circuit protection, floating output grounding (either positive or negative may be grounded), open chassis type construction. Choice of four models in each power rating, with transformer taps and voltage adjustment potentiometer for selection of output voltages from 3.6 to 60 VDC. **AC Input:** 105-125 V, 57-63 Hz, single-phase (47 to 440 Hz with derating). **Regulation:** $\pm 1\%$ for $\pm 10\%$ line change, $\pm 1\%$ for no-load or full load. **Ripple:** 0.1% rms (± 10 mV). **Size:** Model 30-OEM, 5" x 5" x 5"; 60-OEM, 6" x 5" x 7"; 120-OEM, 7" x 5" x 10". **Shipping Weight:** 30-OEM, 5 lbs.; 60-OEM, 7 lbs.; 120-OEM, 12 lbs. 30 OEM-30W or 2.5 A. Max., 60 OEM-60W or 5 A. Max., 120 OEM-120W or 10 A. Max.

Wanlass Model	Voltage Range	Net Each, Lots of			
		1-9	10-24	25-49	50-99
30-OEM-1	3.6-9 VDC	\$46.00	\$43.75	\$41.50	\$39.00
30-OEM-2	9-17 VDC	46.00	43.75	41.50	39.00
30-OEM-3	17-30 VDC	46.00	43.75	41.50	39.00
30-OEM-4	30-60 VDC	46.00	43.75	41.50	39.00
60-OEM-1	3.6-9 VDC	\$75.00	\$72.50	\$70.00	\$67.50
60-OEM-2	9-17 VDC	75.00	72.50	70.00	67.50
60-OEM-3	17-30 VDC	75.00	72.50	70.00	67.50
60-OEM-4	30-60 VDC	75.00	72.50	70.00	67.50
120-OEM-1	3.6-9 VDC	\$125.00	\$122.50	\$120.00	\$117.50
120-OEM-2	9-17 VDC	125.00	122.50	120.00	117.50
120-OEM-3	17-30 VDC	125.00	122.50	120.00	117.50
120-OEM-4	30-60 VDC	125.00	122.50	120.00	117.50

DUAL OUTPUT 24 AND 5V DC POWER SUPPLY (FIG. B)

Regulated power supply, ideal for applications using lamps, relays, motors, etc. Also ideal for use with integrated circuits and transistors requiring a separate 5 VDC source of well-regulated power. The 5 VDC output includes an overvoltage crowbar for applications, has temperature coefficient of .05%/° C. **AC Input:** 100-130 VAC, single-phase, 47-63 Hz. **DC Output:** 24 VDC at 2 amps; 5 VDC at 1 amp. **Regulation:** 24 VDC output, $\pm 1\%$ line and $\pm 1\%$ no-load to full-load; 5 VDC output, $\pm 0.1\%$ line and $\pm 0.1\%$ half to full-load. **Ripple:** 150 mV peak-to-peak for 24 VDC; 10 mV peak-to-peak for 5 VDC. **Response Time:** 0.2 msec. **Size:** 8 1/4" w. x 4" d. x 5 1/4" h. **Weight:** 9 lbs. max.

Wanlass Model	DC Output Volts	Net Each, Lots of			
		1-9	10-24	25-49	50-99
D-OEM-1	5 and 24	\$109.00	\$103.50	\$98.00	\$92.50

SERIES IC AND HPIC ALL SILICON DC POWER SUPPLIES (FIG. C)

All silicon solid state power supplies, specially designed for powering integrated circuits, operational amplifiers and MOS circuits. Available in ratings from 3.6 to 60 volts, 1 to 25 amps. Output voltage is adjustable, $\pm 5\%$ minimum from nominal output. Features "foldback" current limiting and remote sensing. **AC Input:** 100-130 VAC, 47-63 Hz, single-phase. **Ripple:** 5 mV rms maximum. **Recovery Time:** 50-100 μ sec. **Line and Load Regulation:** Standard type IC, $\pm 0.25\%$; high performance type HPIC, $\pm 0.05\%$. **Size:** 60-IC, 11.5" w. x 5.2" d. x 6.0" h.; 120-IC, 15.5" w. x 5.2" d. x 6.3" h.; 200-IC, 17.0" w. x 6.2" d. x 8.0" h. **Weight:** 60-IC, 11 lbs.; 120-IC, 16 lbs.; 200-IC, 27 lbs.

For Overvoltage Protection Crowbar, add \$20.00 to price.

STANDARD SERIES IC

Line and load regulation, $\pm 0.25\%$.

Wanlass Model	DC Output Volts	Output Watts	Net Each, Lots of			
			1-9	10-24	25-49	50-99
60-IC-1	3.6-6.3	7.5 A *	\$125.00	\$118.75	\$112.50	\$106.50
60-IC-2	12-15-18	60	125.00	118.75	112.50	106.50
60-IC-3	24-28-36	60	125.00	118.75	112.50	106.50
60-IC-4	48-60	60	125.00	118.75	112.50	106.50
120-IC-1	3.6-6.3	15 A *	170.00	161.50	153.00	144.50
120-IC-2	12-15-18	120	170.00	161.50	153.00	144.50
120-IC-3	24-28-36	120	170.00	161.50	153.00	144.50
120-IC-4	48-60	120	170.00	161.50	153.00	144.50
200-IC-1	3.6-6.3	25 A *	225.00	213.50	202.50	191.50
200-IC-2	12-15-18	200	225.00	213.50	202.50	191.50
200-IC-3	24-28-36	200	225.00	213.50	202.50	191.50
200-IC-4	48-60	200	225.00	213.50	202.50	191.50

HIGH PERFORMANCE SERIES HPIC

Line and load regulation, $\pm 0.05\%$.

Wanlass Model	DC Output Volts	Output Watts	Net Each, Lots of			
			1-9	10-24	25-49	50-99
60HPIC-1	3.6-6.3	7.5 A *	\$150.00	\$142.50	\$135.00	\$127.50
60HPIC-2	12-15-18	60	150.00	142.50	135.00	127.50
60HPIC-3	24-28-36	60	150.00	142.50	135.00	127.50
60HPIC-4	48-60	60	150.00	142.50	135.00	127.50
120HPIC-1	3.6-6.3	15 A *	195.00	185.50	175.50	166.00
120HPIC-2	12-15-18	120	195.00	185.50	175.50	166.00
120HPIC-3	24-28-36	120	195.00	185.50	175.50	166.00
120HPIC-4	48-60	120	195.00	185.50	175.50	166.00
200HPIC-1	3.6-6.3	25 A *	250.00	237.50	225.00	212.50
200HPIC-2	12-15-18	200	250.00	237.50	225.00	212.50
200HPIC-3	24-28-36	200	250.00	237.50	225.00	212.50
200HPIC-4	48-60	200	250.00	237.50	225.00	212.50

*Maximum output current.

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