

EDITOR'S PROFILE of this issue

from a historical perspective ...

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

December, 1967:

Cover: Eleven Section members have been selected as IEEE Fellows.

Page 4: Prof. Jim Meindl of Stanford is elected Fellow. He goes on to become president of Georgia Tech. Gordon Moore of Fairchild is elected Fellow. He leaves to co-found Intel, and makes his mark as the author of his observation that the number of transistors on a chip increases exponentially (doubling every 2 years) while the cost per transistor decreases exponentially (known as "Moore's Law").

Page 8: ESL Inc. holds an open house. ESL was co-founded by William (Bill) Perry in 1964 to transition from Sylvania Electronic Defense Laboratories' focus on analog electronic warfare to take advantage of digital techniques. He had graduated from Stanford, and goes on to serve as Secretary of Defense, and is now involved in preventive defense, working to eliminate nuclear weapons.

Page 11: Robert (Bob) Lucky of Bell Labs speaks on adaptive equalization (his first invention). As a new engineer at Bell Labs, he sat in on consultations with Fred Terman in 1956 about starting a graduate-level school in New Jersey (which he speaks about after my talk in Holmdel in 2019; I was staying at his home). He becomes an IEEE Fellow and executive VP of IEEE and is selected to be head of Bell Labs. In 1995 he received the IEEE Edison Medal. Most IEEE members remember his wry columns in SPECTRUM Magazine, and his book of anecdotes "Lucky Strikes Again".



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

https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History

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



On page 4

1968 FELLOWS AWARDS

Eleven section members selected

On page 6

*First meeting of new IE&CI chapter
joint with San Francisco Section*

CENTRALIZED VS. DISTRIBUTED CONTROL SYSTEMS

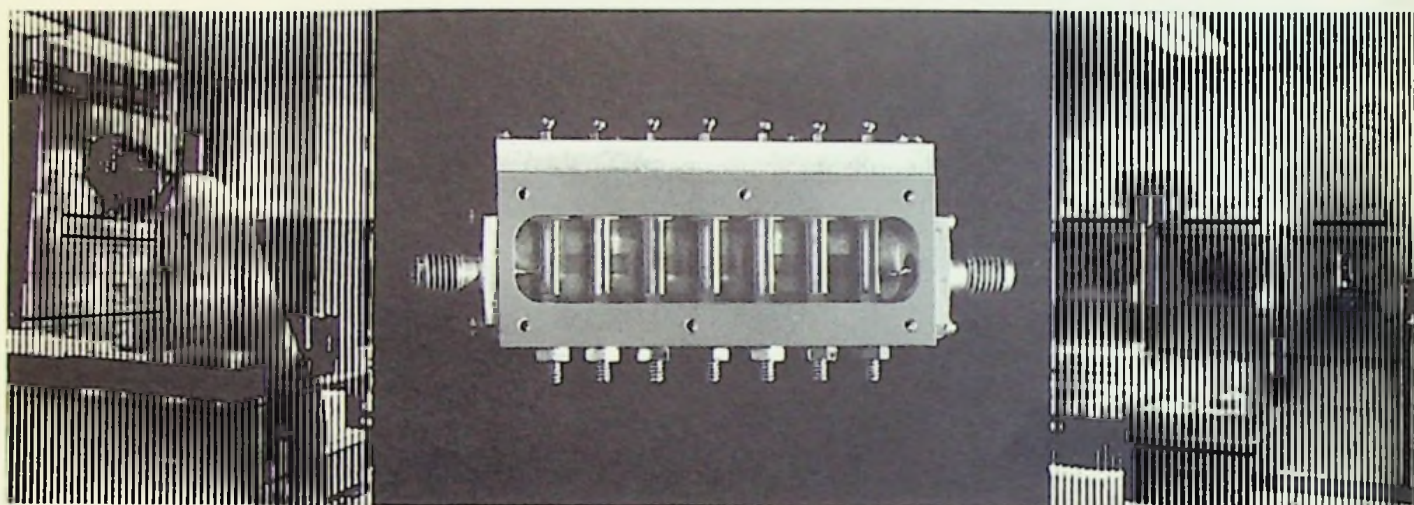
7 COMB POLE LINE FILTER 3730 - 4020

	C 0 1	C 1 2	C 2 3	C 3 4	C 4 5	C 5 6	C 6 7	C 7 8
	1.665	0.414	0.311	0.295	0.295	0.311	0.414	1.665
S/B	0.205	0.570	0.666	0.682	0.682	0.666	0.570	0.205

	C 0	C 1	C 2	C 3	C 4	C 5	C 6	C 7	C 8
	5.869	3.375	4.361	4.479	4.495	4.479	4.361	3.375	5.869
D/B	0.485	0.334	0.363	0.366	0.366	0.366	0.363	0.334	0.485

ELEMENT	LUMP CAP--PF
1	4.490040E-01
2	4.490040E-01
3	4.490040E-01
4	4.490040E-01
5	4.490040E-01
6	4.490040E-01
7	4.490040E-01

4 4 P S E N D O F J O B



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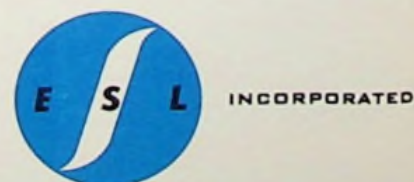
For example, by choosing to provide the design engineer with modern, in-house computational support, we relieve him of six to eight hours of dull, repetitive calculation in the design of the modern microwave filter shown.* Moreover, filters like this can be realized in less than three days, as measured from determination of need to proven prototype.

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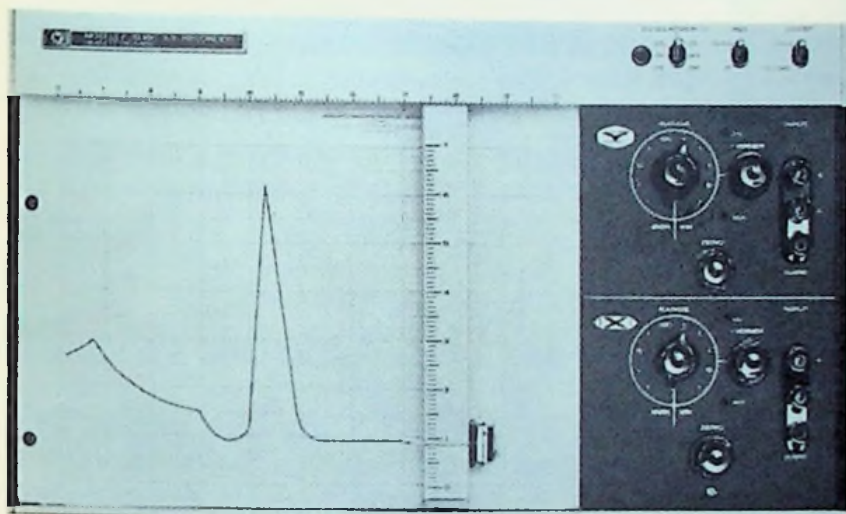
***Filter Description** Seven resonator comb-line filter, 0.1 db ripple design. Equal-ripple bandwidth 290 MHz centered at 3875 MHz. Passband insertion loss 0.6 db maximum. Stop-band rejection 60 db minimum 200 MHz from either pass-band edge. Volume 0.8 cu. in.; weight 1.3 oz.

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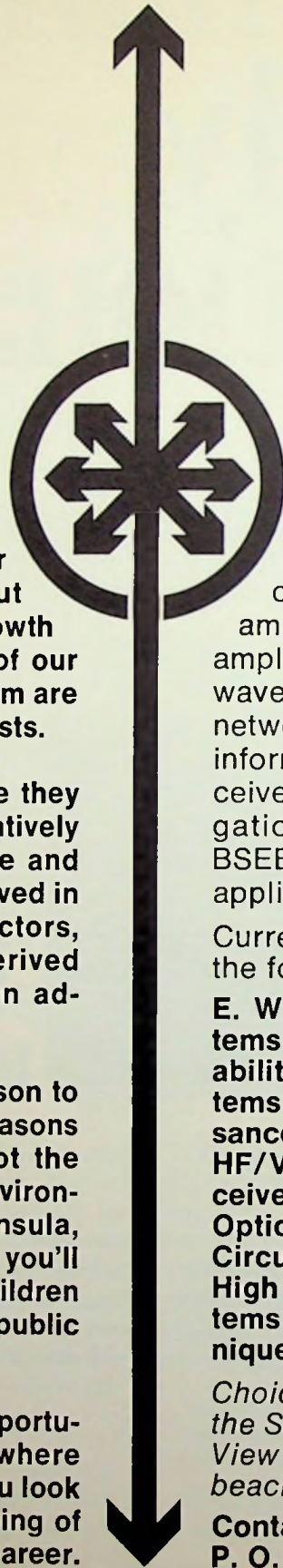
from 1 mv/inch to 10 V/inch. No interaction between channels, with independent servo system for each axis, and the exclusive AUTOGRIP paper holddown reduces maintenance to occasional wiping of the surface. Bench or rack-mount. Price: 7035B, \$945; 7005B, \$1195.

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MT & T Features Two Speakers at December 13 Meeting

There will be two interesting talks at the December 13 meeting of the Microwave Theory & Techniques chapter. Dr. Arthur O. McCoubrey will discuss microwave quantum resonances in atomic time and frequency standards. Modern atomic standards are capable of reproducibly generating the unit of time or frequency within a few parts in 10^{12} and the synchronization of widely separated time keepers within microsecond limits has been established. Depending on specific needs for such high levels of reproducibility, long-term stability, and with the possibility of trade-offs, short-term stability or compactness, the atomic standards are based upon quantum resonances in cesium, hydrogen or rubidium. In each of these cases the resonances occur at microwave frequencies and the talk will describe the origin of the phenomena in terms of a classical picture of motion within the atom and the corresponding coupling to microwave circuits. If time permits, the sharpness of the resonance will also be described in qualitative terms familiar to the electrical engineer.

Examples of state-of-the-art atomic frequency standards will be on hand and a short tour through a Hewlett-Packard atomic frequency standard laboratory has been arranged following the meeting.

The second talk will be given by Dr. Joseph J. Murray who will discuss the application of a microwave-gated photomultiplier in high energy physics. This will be the story of a scientific effort that was only partially successful. A special type of microwave-gated photomultiplier, a so-called DCFEM, was built to fulfill a limited objective, which it did. Measurements were made of the temporal distribution of particles in secondary beams at SLAC. More sophisticated applications envisioned beforehand, however, turned out to be impractical because of basic limitations of the gating process which in this device

requires absorption of very low energy electrons on a photoelectric surface.

Dr. McCoubrey received his Ph.D. in Physics at University of Pittsburgh in 1953. He worked in Westinghouse Research Laboratory in Pittsburgh in a number of projects involving microwave technology and the development of radar TR switches and microwave-frequency reference cavities. In 1957 he was head of the Physics Department at National Company in Massachusetts, where he led research in atomic frequency and was also involved in nuclear magnetic resonance problems. He is currently manager of R & D, quantum electronics division at Varian.

Dr. Murray's early experience was in electrical engineering, commencing with a BS in EE from Southern Methodist University in 1943. After spending a number of years in the Submarine Force he received an MS in EE in 1951, also at Southern Methodist University and a Ph.D. in physics in 1954 at Cal Tech. Between 1954 and early 1967 his work with the Alvarez group at Berkeley included the development of electrostatic separator and electrostatically separated particle beams. Since early 1967 he has been at SLAC and is currently involved in the development of an RF separated K beam and a Compton scattered laser beam for use with the 82" hydrogen bubble chamber.

EAST BAY SUB-SECTION CALENDAR

- November 27, 1967 The Electric Car
- January 29, 1968 Tour of Lawrence Radiation Laboratory at Berkeley
- February 26, 1968 Aerospace Subject—Title to be announced
- March 25, 1968 Tour of General Motors Plant at Fremont
- April 29, 1968 The Pacific Northwest-Southwest 700 kv DC lines
- June 7, 1968 Ladies Nite—Wine tasting and dinner. Location to be announced

It is the intent of the officers of the East Bay Subsection to provide technical sessions of general interest to all members. The subsection meetings are not intended to be highly technical or extremely specialized. Wives are welcome at all meetings.

meeting reminder

Story
on Page

- 11 Communication Technology, Wednesday, January 17
- 6 Industrial Electronics & Control Instrumentation/SFS, Tuesday, December 12
- 8 Industry & General Applications, Tuesday, December 5
- 12 Instrumentation & Measurement, Tuesday, December 12
- 3 Microwave Theory & Techniques, Wednesday, December 13
- 6 San Francisco Section/IE & CI, Tuesday, December 12

(See complete calendar on page 16)

EDITORIAL

In preparing the Grid each month we are endeavoring to include items which will be informative, newsworthy and keep the membership abreast of pending local events.

To prepare a publication such as the Grid takes more than an editorial staff; it takes the interest and cooperation of the membership as a whole. We want news about you, your group, your company.

This month, we are beginning to restyle Grid in the hope that it will spark greater interest by the membership and increase news input.

Please contribute!

IEEE Grid

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1968 FELLOWS

SAN FRANCISCO SECTION

LOUIS FEIN for contributions to the orderly assimilation of computer sciences into technology and society.

MARTIN H. GRAHAM for contributions to digital computers and bio-medical electronics.

RICHARD C. HONEY for contributions to the fields of microwave antennas and laser applications.

ELIAHU I. JURY for teaching and comprehensive research contributions in sampled data systems, and writing of authoritative books.

OTTO KORNEI for fundamental and extensive contributions to magnetic recording technology for video and audio applications, and creative contributions to xerography.

WILLIAM K. LINVILL for contributions to sampled-data and computer control systems, and to systems analysis techniques.

JAMES D. MEINDL for leadership and contributions in the field of microelectronics and integrated circuitry.

GORDON E. MOORE for contributions and leadership in research, development and production of silicon transistors and monolithic integrated circuits.

HENRY G. OCH for contributions to analog and digital computer design and utilization in military systems.

HENRY J. ORCHARD for contributions to the theory and engineering design of passive and active circuits.

LEO YOUNG for contributions in the field of microwaves.



LOUIS FEIN

He is computer consultant and founding president, Synnoetic Systems, Los Altos; founding president, Computer Control Co.; former staff member of Raytheon Computer Dept., Martin Hubbard Corp., Submarine Signal Co., Harvard Underwater Sound Lab., and Earlham College. Author of 53 papers in the fields of computers, education, artificial intelligence, information retrieval, reliability, and the social implications of technological change. Holder of patents in electrical and acoustical transmission devices. B.S.,

(continued on page 6)



MARTIN H. GRAHAM

He is currently Professor of Electrical Engineering and Computer Sciences at University of California, Berkeley. He is an associate director of the Computer Center at U.C. He received his BS EE at Polytechnic Institute of Brooklyn, his MS in Engineering Science and Applied Physics at Harvard and his PhD in Electrical Engineering from Polytechnic Institute of Brooklyn. In 1950, Dr. Graham joined the staff at Brookhaven National Laboratory in Long Island as research Fellow to work on a project involving design of a high current

(continued on page 6)



WILLIAM K. LINVILL

Following receipt of a liberal arts degree from William Jewell College, he entered the cooperative course in electrical engineering at Massachusetts Institute of Technology, receiving the joint Bachelor's and Master's degree in 1945. His doctoral thesis on analysis and design of sampled data control systems was completed in 1949. Following award of his doctorate, he was on the faculty at MIT as Assistant Professor from 1949 to 1953 and as Associate Professor from 1953 to 1958. His research interests were in computer control systems for

(continued on page 6)



JAMES D. MEINDL

James D. Meindl received the B.S., M.S., and Ph.D. degrees in electrical engineering from the Carnegie Institute of Technology, in 1955, 1956, and 1958, respectively. From 1955 through 1959 with the Westinghouse Electric Corporation and Autonetics Division of North American Aviation, Inc., he was engaged in the development of advanced solid-state circuit techniques for industrial and military control systems. With the U.S. Army as a First Lieutenant from 1959 to 1961 he was assigned to the Electronic Components Laboratory of the

(continued on page 6)



GORDON E. MOORE

He received his B.S. degree in Chemistry from University of California and his Ph.D. in Physical Chemistry in 1954, from California Institute of Technology, Pasadena, California. He was with the Applied Physics Laboratory of Johns Hopkins University, then Shockley Semiconductor Laboratory; was one of the founders of Fairchild Semiconductor in 1957 and since 1959 has been Director of the Research and Development Laboratories of Fairchild



RICHARD C. HONEY

Ph.D. in Physics, 1945, California Institute of Technology; Elect. Engineer, 1950, Ph.D. in Elect. Engineering, 1953, both from Stanford University. From 1948 to 1952 he was with Stanford Electronics Research Lab. In 1952 he joined SRII microwave antennas and antenna theory, radar scanning and instantaneous direction finding antennas, linear arrays, including modern electronic scanning techniques, microwave components and parametric amplifiers. 1966 staff advisor for research. Manager, Elec-

(continued on page 6)



ELIAHU I. JURY

He received his EE degree in Israel Institute of Technology, his M.S. from Harvard and his Sc.D. in Engineering from Columbia University. He joined the E.E. faculty at Berkeley in 1953, where he is presently a Professor of Electrical Engineering. Dr. Jury is the author of two textbooks: "Sampled-Data Control Systems", and "Theory of Application of the Z-Transform Method", both of which were published by John Wiley & Sons, Inc. He also published extensively in the fields of Automatic Control, Circuit Theory, Bio-Engineering and Applied Mathematics.



OTTO KORNEI

Otto Kornei was born in Vienna, Austria, graduating with the equivalent of an MS degree in Electrical Engineering. After years in the fields of facsimile and sound film recording, he came to the United States in 1938. As a consultant in New York City, he was instrumental in the original development of xerography. Subsequently, he joined the Cleveite Corporation in Cleveland where he contributed toward the solution of many important problems in phonograph and magnetic recording, especially in video recording. In 1956, Mr. Kornei joined

(continued on page 6)



HENRY G. OCH

He joined the technical staff of Bell Telephone Laboratories in 1927, and was initially concerned with the design of filters and networks for carrier and transatlantic radio systems. In 1936, he transferred to the mathematical research department as consultant on transmission networks and feedback amplifier circuits for carrier telephone systems. He turned to military work in 1940 as consultant and designer of the first electronic computer for anti-aircraft fire direction. He continued this work during World War II taking part in basic system

(continued on page 6)



HENRY J. ORCHARD

He was born in England in 1922 and received the degrees of B.Sc. and M.Sc. in mathematics from the University of London in 1946 and 1951 respectively. During World War II he was teaching telecommunications at the Central Training School of the British Post Office Engineering Department. In 1947 he was transferred to their Research Station at Dollis Hill where he was occupied with research into network theory and design. In 1961 he emigrated to the United States and joined Lenkurt Elec-



LEO YOUNG

Cited for contributions to the field of microwaves, he is head of the Microwave Techniques Laboratory at Stanford Research Institute. His research interests include microwave filters, antennas, acoustics, and optics. He has published numerous papers and co-authored a book on microwave filters. He is editor of the series "Advances in Microwaves," and has written a book on electrical units. A graduate of Cambridge University, England, he holds a doctorate from The Johns Hopkins University, and was formerly with the Westinghouse Elec-

Fellows continued on page 6

Joint Meeting of S.F. Section With New IE&CI Chapter Dec.12

The San Francisco Section is joining with our newly organized chapter of the Industrial Electronics & Control Instrumentation Group on Tuesday, December 12 at the Engineers' Club of San Francisco. The speaker will be Thomas Taussig, lecturer in the department of Electrical Engineering and Computer Sciences at University of California, Berkeley. Mr. Taussig received his BS EE degree at California Institute of Technology, and took graduate studies at University of California, Berkeley. He is presently employed as an engineer at Lawrence Radiation Lab, Berkeley, as Group Leader of the Data Reduction Group, and had the responsibility of system design and construction of measuring machine controllers and computer interface. Mr. Taussig will discuss centralized vs. distributed control systems using small computers. Problems encountered in control system designs for the 200 GeV accelerator will be discussed, as well as solutions that might apply to industrial applications. This promises to be a subject of interest to both electrical and electronics engineers.

At this meeting, the newly organized IE & CI chapter will be represented by Lance Pennington, who has been diligently active in its promotion. He has many interesting plans to promote activity resulting in one of the most active and dynamic chapters in the Bay Area.



Dr. Thomas Taussig

LOUIS FEIN

Long Island University; M.S., University of Colorado; Ph.D., Brown University, all in physics. Computer Group ADCOM, 1960-63; Cybernetics Committee, 1965; associate editor, Transactions, Systems Science & Cybernetics.

MARTIN H. GRAHAM

deflection tube and use in DC amplifiers and high speed scalars. In 1956 he was sent to Los Alamos to study the construction of the Maniac II computer, and later returned to Brookhaven to work on the Merlin computer. In 1957 he was associate Professor at Rice University. He has published in the field of digital computers and in addition to his interest in computers, he now is working on medical electronics, and has published in this field also. For the past two years he has made intensive study on the EEG problem at Baylor University, where he was also part time Professor.

RICHARD C. HONEY

tromagnetic Techniques Laboratory, Electronics and Radio Sciences Area: laser developments and applications to military systems, meteorology and medicine.

OTTO KORNEI

IBM in Poughkeepsie, New York, to work in the field of digital magnetic recording. In 1960, he transferred to IBM in San Jose, California, where he has been Manager of Storage Technology in Advanced Technology. Mr. Kornei is the author of many professional papers and the originator of a large number of significant patents. In 1960 he was elected Honorary Member of the Audio Engineering Society. He is listed in American Men of Science.

HENRY J. ORCHARD

tric Co. in San Carlos, Calif. as a consultant in network design. Presently he is in the Advanced Development department in charge of circuit research and scientific computing.

1968 FELLOWS

(Continued from page 5)

WILLIAM K. LINVILL

air traffic control and air defense. In 1954, he became more specifically interested in the systems area and in 1956 took a two-year leave of absence from MIT to lead an Institute for Defense Analysis project on NATO Air Defenses. In 1958, he became a Senior Staff member of the RAND Corporation. In 1960, he joined Stanford University as a Professor of Electrical Engineering, and in 1963 became Chairman of the Institute in Engineering-Economic Systems there where he established and continues to expand a systems training and research program featuring field internships for graduate students. In 1967 he became Chairman of the Department of Engineering-Economic Systems. He is a member of the IEEE Systems Science Committee; is Chairman of the Problem Definition, Modeling, and Simulation Technical Committee, and active in a number of groups and subcommittees including the Advisory Committee of the New Technical Activities Committee, the Systems Science and Cybernetics Group, the Power Engineering Education Committee, and the Awards Board of the IEEE Education Medal Committee.

JAMES D. MEINDL

U.S. Army Electronics Command at Fort Monmouth, initiating a research program on integrated circuits. From 1961 through 1967 Dr. Meindl was Chief of the Microelectronics Section, Chief of the Semiconductor and Microelectronics Branch and Director of the Integrated Electronics Division of the U.S. Army Electronics Command. In 1967 he joined the faculty of the Electrical Engineering Department of Stanford University as an Associate Professor, where he is now engaged in graduate teaching and research on integrated circuits. Dr. Meindl has contributed a number of techni-

cal papers on integrated circuits. He is a member of Tau Beta Pi, Eta Kappa Nu, Sigma Xi, and Phi Kappa Phi and a senior member of the IEEE. He was a technical program chairman of the 1966 International Solid-State Circuits Conference and is Editor of the IEEE Journal of Solid-State Circuits. He was recognized as one of the ten outstanding young scientists in government service by the 1967 Arthur S. Flemming Awards Commission.

HENRY G. OCH

analysis and planning for anti-aircraft directors, various types of radar, and fire control computers. He received a War and Navy Department award for outstanding contributions to the Office of Scientific Research and Development during World War II. After the war, he supervised the design of the first integrated anti-aircraft fire control system. In 1952, he turned his attention to the design of airborne equipment and was given responsibility for development of several bombing and navigation systems. He was appointed Director of Missile Systems Development in 1957, responsible for the NIKE HERCULES Project and the test and firing operations of all NIKE missiles at White Sands. In 1962, he was appointed Director responsible for the development of digital computers and the associated program design for the NIKE ZEUS and NIKE-X Anti-Missile Systems. Mr. Och holds 23 patents and is co-author of an article published in "I.R.E. Transactions". He is a senior member of the Institute of Electrical and Electronics Engineers, and a member of Tau Beta Pi, Iota Alpha and Eta Kappa Nu. He retired June 20, 1967 after 40 years of service and is now a part time management consultant at UNIVAC, St. Paul.

LEO YOUNG

tric Corporation in Baltimore. He was visiting professor at Leeds University, England, during the summer of 1966. He is active on many IEEE committees. In 1963 he was awarded G-MTT's Microwave Prize.



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Development Engineer Innovative individual needed to help design and develop new test equipment. Must be digital oriented with a BSEE plus 2 years' experience. Previous logic design experience preferred.

Electronic Engineer (Senior) Should be digital oriented with a knowledge and understanding of production equipment. BSEE required with mechanical engineering experience desired.

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WESTERN WATER AND POWER SYMPOSIUM

APRIL 8-9, 1968

The world's engineers have been invited to share in the solutions the western United States has found for the problems of providing water and power for its millions.

Details of the planning, design and economics of the west's big water and power developments will be explained and analyzed at a first-of-its kind meeting to be held in Los Angeles April 8 and 9, 1968, at the Ambassador Hotel.

The Western Water and Power Symposium will be sponsored by the Los Angeles sections of three national engineering societies, the American Society of Civil Engineers, the American Society of Mechanical Engineers, and the Institute of Electrical and Electronics Engineers.

Announcement of the symposium was made by Robert A. Skinner, recently retired general manager of the Metropolitan Water District of Southern California, who will be the general chairman.

"The engineers sponsoring the symposium believe it will provide the engineering profession and others across the country and abroad a significant opportunity to gain first-hand information about the solutions found to the challenging problems encountered in

our water and power developments in the west," Skinner said.

"We expect as many as 1,000 engineers and university students to attend the two full-day sessions and profit from the presentations of technical papers, panelists and special speakers."

Alfred R. Golze', deputy director of California's State Department of Water Resources, will be the program chairman.

"The symposium will cover problem solving in major and minor developments of the west," Golze' explained. "We will concentrate on telling today's lesson so that tomorrow's project will benefit. Desalination, high-head pumping plants, effect of earthquakes on dams and transmission of extra-high voltage electric power are among the subjects to be covered.

"We will have a storehouse of information about the engineering innovations and advances that are so important to the success of our western water and power developments.

"This will be the profession's first opportunity to see in perspective, at one time and place, the solutions that have been devised by our western engineers—those in federal, state and local agencies, utilities, private practice and consultants."

Multi-Megawatt Rectifier Power Supplies at SLAC

The Industry & General Applications chapter will enjoy a talk by Paul Edwards at SLAC on December 5th.

Mr. Edwards is a graduate of Stanford University and his professional background includes employment with General Electric Co., Pacific Electric Manufacturing Co. and the Microwave Lab at Stanford. He will discuss the operations of multi-megawatt rectifier power supplies at SLAC having output currents in the order of 15,000 amperes and a requirement for current regulation within one-tenth of one percent. Regulation, accomplished by means of silicon controlled rectifiers, introduces power input system waveform distortions resulting in problems with harmonics and power factor. The problems and their correction will be covered.

While the installations discussed are in experimental service, the subject is considered to be timely in view of the trend toward larger regulated power rectifier units in industrial applications.

ESL Open House Unveils Advanced Lab Facilities

Recently, ESL, Inc., showed its new Laboratories in Sunnyvale to members of the Business Community and Press. The new facility, which has 60,000 square feet of offices and Lab space, houses the Research and Development activities of Electro-magnetic Systems Laboratories.

ESL was founded in 1964 by Dr. William J. Perry, President; Mr. Clarence S. Jones and Mr. James M. Harley, Vice Presidents, and Mr. James F. O'Brien, Secretary/Treasurer.

It is an independent Corporation entirely owned by its employees. By the end of its first year, there were 30 employees. Since then, the Company has doubled in size each year to its present staff of 200 employees . . . and annual sales of \$5,000,000. The staff is highly technical—nearly half of the employees are Engineers and Scientists—and half of these have advanced degrees.

ESL performs theoretical analysis and advanced development in electronic warfare for the Department of Defense. Analytical investigations are facilitated by an IBM Model 360 Computer and 3 wide-band magnetic tape recorders with associated processing equipment; the development work by an antenna range, anechoic chamber, environmental test facilities, model shop and a completely equipped Laboratory.

ESL plans to add an additional building of the same size in the near future. The 30 acre site will accommodate a total of 5 such buildings.

APPLICATIONS ENGINEER San Francisco Bay Area

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Field Operations Engineers: Planning and implementing site operations, directing field technicians, installing and testing, interfacing with customer equipment and regulatory agencies.

Systems Engineers: Data communications, network and feasibility analysis, interfacing of software and hardware, terminals, communications, commercial computers, and displays.

Mechanical Engineers: Electronic packaging, equipment design and fabrication, cost estimating, component evaluation.

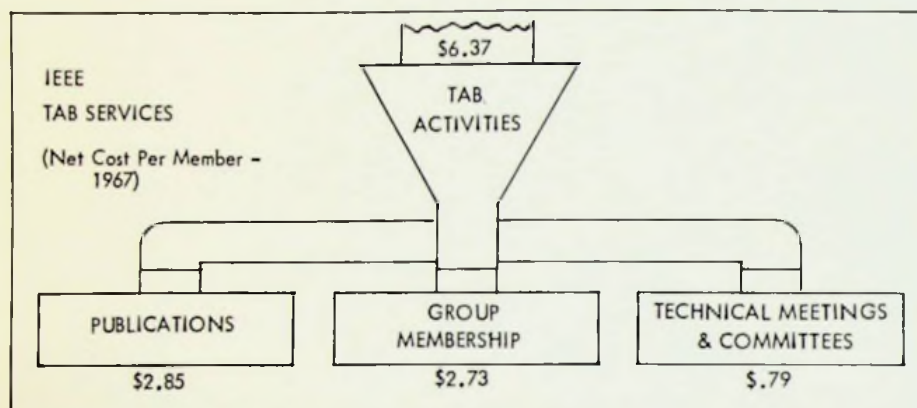
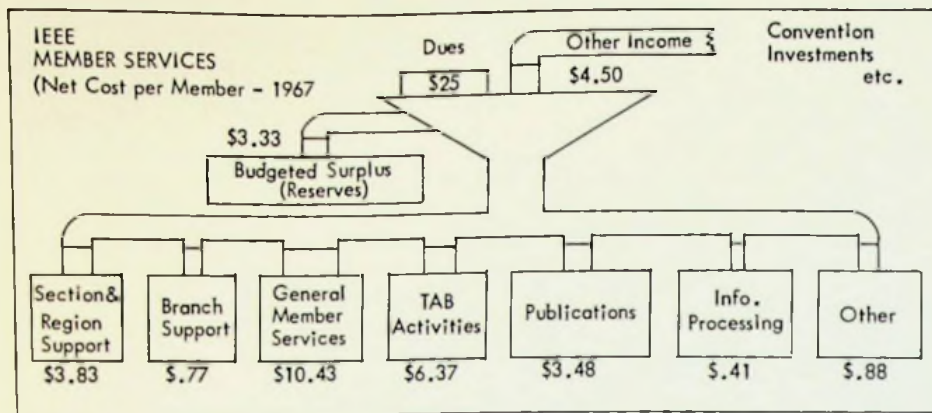
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Larkin 1968 WEMA Chairman

Kenneth T. Larkin heads the slate of six Bay Area electronic executives who have been elected to the board of directors of the Western Electronic Manufacturers Association.

Larkin, director of information systems at Lockheed Missiles & Space Co., is the new chairman of the San Francisco Council. The San Francisco group is one of eight WEMA councils which represent 440 electronic companies in the Western states.

Within the San Francisco council, Henry W. West, Jr., group vice president, Ampex, will serve as vice chairman. Named to the office of secretary-treasurer was James N. Donovan, treasurer, Varian Associates.

Also serving as 1968 WEMA directors from the Bay Area will be Alan W. Drew, president of Friden, Inc.; Herbert W. Dwight, Jr., vice president and general manager of Spectra-Physics, Inc.; and Peter Dietz, vice president of Data Technology Corp.

San Francisco is one of eight WEMA regional councils.

The Association, as part of its program to industry management, co-sponsors with IEEE the annual Western Electronic Show and Convention, scheduled this year in Los Angeles, August 20-23.

IEEE Membership Upgrading

All members are encouraged to apply for the highest IEEE membership grade for which they are qualified.

The Honorary and Fellow grades are sponsored by others and when approved are conferred by the Board of Directors. These are not self-initiated. Student membership requires registration in specific fields in recognized universities. IEEE members of Associate and Member standing may apply for higher grade recognition. No cost is involved in transferring.

Transfers from Member to Senior Member require ten (10) years in active practice of the profession, and certain items of career performance, which may include publication of technical papers, technical work accomplishment or direction, creative contributions to the scientific community, establishment or furtherance of engineering or scientific courses, or combinations of these requirements. In addition, four (4) references are required for transfer to Senior Member.

Probably the greatest advantage of higher membership is the candidate's requirement for self-approval and appreciation of his accomplishments in engineering and scientific fields. Another advantage is the general upgrading of IEEE membership, with favorable reflection on the candidate.

Westerners Listed In New IEEE Speakers Directory

The recently published IEEE Speakers Directory lists several local men as outstanding speakers who have recently addressed various IEEE groups.

The papers listed in this Directory have been considered by the Chairman of IEEE Sections as the most outstanding of those presented at the respective Section, Subsection and Group Chapter meetings during the past year.

NILS NILSSON, Stanford Research Institute, Stanford University, Stanford, Calif. 94305

Preliminary Design of an Intelligent Automation

LLOYD LUDWIG, Manager, Space Flight Operations Dept., Hughes Aircraft Co., Fullerton, Calif.

Project Surveyor

ROGER FULLER, Engineering Manager, Deep Submergence Rescue Vehicle Program, Lockheed Aircraft Co., Sunnyvale, Calif.

Opportunities of the Interspace Frontier.

DR. H. CHRISTIAN ZWENG, Stanford University, School of Medicine, Stanford, Calif. 94305

Lasers in Medicine

DOUGLAS W. DUPEN, Public Information Office, Stanford Linear Accelerator Corp., P. O. Box 4349, Stanford, Calif. 94305

The Stanford Linear Accelerator

JOSEPH C. MARSHALL, Westinghouse Electric Corp., San Francisco, Calif.

Rapid Transit Systems

DE LOYCE ALCORN, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, Calif. 91109

The Surveyor

The talks by Zweng and Alcorn were heard recently by members of the San Francisco Section as arranged by Program Chairman, Jack E. Barkle.

The IEEE Executive Committee has acted to encourage Student Associate membership in regionally-accredited junior colleges which have significant programs in engineering and physical sciences. Associate Student Branches can be established in institutions "other than schools of recognized standing" if approved by the Regional Director and the IEEE Executive Committee.

HELP THE SECTION GROW
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Communication Technology

SCHEDULE

Digital Data Communications Symposium

Wednesday, January 17, 1968, San Francisco Hilton

- 9:00 A.M. Registration
- 9:30 A.M. Introduction
- 9:45 A.M. "Techniques in High Speed Digital Data Transmission"
A. Lender, *Lenkurt Electric Co., Inc.*
ABSTRACT: A brief review of the fundamental aspects of digital transmission will be presented, followed by a discussion of the current methods used for high speed data communications with emphasis on multilevel and correlative techniques. Specific embodiments of such techniques and the application to communication channels will be described.
- 10:45 A.M. Coffee Break
- 11:00 A.M. "Adaptive Equalization"
R. W. Lucky, *Bell Telephone Laboratories*
ABSTRACT: Equalization systems which continually monitor channel conditions and readjust themselves in order to provide optimum equalization have numerous benefits over earlier methods. Different techniques for adaptive equalization of Digital Communication systems will be described. Also experimental results and features of various adaptive equalization schemes will be compared.
- 12:00 Noon Luncheon
- 1:30 P.M. "Convolutional Coding for Burst Channels"
A. Kohlenberg, *Codex Corporation*
ABSTRACT: The use of convolutional coding for forward error correction on channels with both random and burst errors will be discussed. Diffuse, threshold-decoded Massey codes, and Gallager codes, will be explained and compared. Test results on a variety of channel types will be reported.
- 2:30 P.M. "Designing Multiple Computer Communication Systems"
E. T. Eiselen, *International Business Machines Corporation*
ABSTRACT: Some of the systems principles involved in the design of data communication networks for systems involving multiple computers and terminals will be illustrated. A generalized application involving a variety of terminals connected by various means to local computers which are in turn interconnected into a nation-wide network will be described. A network configuration will then be developed from system requirements which will be derived from the information flow statistics of the generalized application. Applications will be related to real problems in industry.

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E. E. COMBS
(Vice-Chairman, Comtech Group) Publicity Director

M. SEYMOUR
(Secretary-Treasurer, Comtech Group) Registration Director

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(Lenkurt) Arrangements Director

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Use of on-line computers in physics, chemistry and biomedical research

Systems Design and Development

Laser systems
Nanosecond data acquisition systems

Instrumentation

Solid state and integrated circuit design
Ultra-wideband oscillography
Space research instrumentation

Nuclear Effects

Information storage memory systems
Detector development
Large-scale digital and analog systems

For more information write to Mr. Dan McGee, Personnel Department.



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The Automatic Measurement Of Parameters

At the Dec. 12 meeting of Instrumentation & Measurements chapter, Gordon C. Padwick will speak on The Automatic Measurement of Parameters.

Mr. Padwick is a native of England, having just recently moved to Saratoga. He is a 1957 graduate of the University of London, where he obtained a BSC degree in electrical engineering. He was with Mullard in Southampton, IBM World Trade Laboratory until 1961 and then became associated with the General Electric Co. in Portsmouth, England. His affiliation with Fairchild began in 1963. He is presently Applications Manager for the Systems Group of Fairchild Instrumentation in Sunnyvale. He is a member of IEE (England) and IEEE.

Mr. Padwick will discuss measurement techniques in the semiconductor industry. The rapid growth of the industry, the development of sophisticated integrated circuits, transistors and diodes, the unprecedented demands for high reliability; the need to minimize cost and to handle very large quantities of devices rapidly, have all led to a demand for automatic test equipment. He will discuss the economics of the test systems and the facts that decide how automatic and therefore, how expensive, a test system should be to meet particular requirements.

An additional attraction will be a tour of the Systems Facilities at the Fairchild Instrumentation Division's recently completed building.

Call For Papers 1968 (2nd) IEEE Computer Conference

"Impact of Large Scale Integration on Information Processing Systems".

The Second Annual IEEE Computer Conference will be held on June 25-27, 1968, at the International Hotel in Los Angeles, California, sponsored by the IEEE Computer Group.

Papers are solicited in the general areas of: 1. Design automation, 2. Reliability, 3. Serviceability, 4. Maintainability, 5. Device manufacturing—computer manufacturing interface, 6. Engineering education, 7. Memory—active vs. passive, 8. Programming aids, 9. Machine organization—customizing, 10. New applications, 11. Application of array theory to LSI.

Authors are requested to submit 2000 word digests of their papers by January 15, 1968 to the Program Committee Chairman: Dr. Harold Petersen, c/o Rand Corporation, 1700 Main Street, Santa Monica, California.

LOCKHEED VIDEO MATRIX HOSPITAL SYSTEM

Lockheed Missiles & Space Co. has announced it has developed a remote computer terminal—sort of a far-flung input-output station—that greatly increases the speed and efficiency of hospital administration.

Known as the Lockheed Video Matrix, the new terminal will permit doctors, nurses and other hospital personnel to sidestep long series of paperwork operations and see medical orders executed with a minimum of time and effort.

The terminal will have its first extensive use at the Mayo Clinic in Rochester, Minn. LMSC's Hospital Information Systems group, which developed the terminal, has a contract to study the feasibility of computerizing much of Mayo's information flow.

Besides speeding execution of doctors' orders, the Lockheed Video Matrix will bring faster communication among nurses and other hospital personnel; store information on hospital operations for use by administrators; and join the many departments of a hospital in a network better equipped to serve the public efficiently.

The terminal consists of a video screen, keyboard, printer and "light pen," a photosensing device. In a normal situation, a number of terminals located throughout a hospital would be linked to a central computer containing millions of characters of information about patients and ways of treating them.

A doctor wishing to issue a medical order takes a seat before the video screen. He inserts a magnetically coded card—his personal property—into a slot on the console; this identifies him, by name, as an authorized user.

Automatically, a list of the doctor's patients in the hospital area of that terminal appears on the screen. He points with the light pen to one patient's name, and it is set aside internally by the computer.

Next, a list of possible types of treatment appears. The doctor points the pen at one type, and its subdivisions appear on the screen. For example, if he selects "antibiotics," the screen shows a list including penicillin, streptomycin and others.

He chooses a specific medication with the pen. Then the computer "asks" him about amounts and frequency of dosages by showing the possibilities on the screen. The doctor, still using the pen, makes his choices, and the order is complete.

At this point, the doctor aims the light pen at the phrase "New Text" at the bottom of the video screen, and the screen shows him what he has pre-

scribed. If the order is correct, he points the pen at the word "Enter," and the order becomes official.

Now the computer takes over, breaking the order into its individual parts and communicating them to the proper departments. An order for a drug will be printed automatically on a Lockheed terminal located in the hospital pharmacy. If the doctor has ordered laboratory tests for his patient, his order is printed on an identical terminal in the lab. All this is automatic, requiring no intermediate paperwork by nurses or other personnel.

The light pen does its vital work by sensing the invisible but constantly scanning television beam as it crosses a key word or phrase. If the pen is pointing at the word "antibiotics" when the beam crosses it, a "blip" is created. This is transmitted through the pen and its cord into the computer, which then knows to subdivide the antibiotics group on the screen.

Highly specific or topical information, such as new patients' names or room numbers, may be introduced into the system through the Lockheed Video Matrix' standard typewriter keyboard. The terminal's printer can put anything in the system on paper on a moment's notice.

Physicians who have tested the Lockheed Video Matrix are enthusiastic about its future in hospitals. The doctors have deemed the terminal setup fast, efficient and remarkably easy to operate.

The LMSC Hospital Information Systems group foresees widespread use of the new terminal. The group holds contracts with Mayo Clinic, the University of Saskatchewan Hospital in Canada, and El Camino Hospital in Mountain View.

William A. Porter has been named executive director of planning and product research for Dalmo Victor, a Textron division, Belmont.

NEW SECTION OFFICE HOURS

In order to coincide with the hours of most electronic firms in the Bay Area, the Section office will be open from 8:30 AM to 4:30 PM beginning December 1. After business hours, you may leave a recorded message on our Ansafone. Your call will be acknowledged as soon thereafter as possible.

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WESCON/68 Executive Committee

Directors of the Western Electronic Show and Convention have elected officers for WESCON/68, scheduled for August 20-23 in Los Angeles.

Chairman of the Board is John J. Guarrera, president of Guide Industries; while William J. Moreland, vice-president and general manager, Conrac, is chairman of the executive committee.

WESCON/68 show director is Donald C. Duncan, president of Duncan Electronics, and convention director is Floyd L. Goss, assistant manager of the Los Angeles Department of Water and Power.

These four and Wescon General Manager Don Larson comprise the executive committee.

1967 Western States Directory Available

The 1967 edition of the Western States Electronics Marketing Directory is available now. It contains more western listings than all other directories combined. It lists all electronic manufacturers, research labs, military electronic activities, etc. in the eleven western states.

It is divided in four sections: First section is the alphabetical listing by state, including a capsule description of the firms' products and other activities. Second section lists all firms under product headings. Third section lists all California firms by city and county. Fourth section lists, for a selected number of equipment manufacturers, the names of management officers, size of plant, number of employees, year company began.

Book is 8½" x 11", contains 58 pages of data, sells for \$7.50 a copy plus tax. Order book from publisher. Mailing address is P.O. Box 5005, North Hollywood, Cal. 91605.

Vern Varenhorst Joins Watkins-Johnson

PALO ALTO, Calif., Oct. 18—Vern D. Varenhorst joined the Applications Engineering staff of Watkins-Johnson Co. assigned to customer liaison and applications engineering for W-J's power traveling-wave tubes.

Formerly he was product manager for traveling-wave tubes with the Eimac Division of Varian Associates.

Earlier he was on the marketing staff for microwave devices at Huggins Laboratories.

Varenhorst is a graduate of Pacific University and has M.S. and E.E. degrees from Stanford University.

COMPUTERS UNDERSTAND NEW ENGLISH

First the New Math. Now the New English, a new form of English that will eliminate computer confusion about the relationship of words in a sentence. The language is called FASE, for "Fundamentally Analyzable Simplified English."

Sentences in FASE can be easily parsed by a computer. For this reason, it facilitates information retrieval by machines in libraries and institutions that handle large numbers of written documents. For readers, FASE is indistinguishable from ordinary English.

FASE was devised by Dr. Lee E. McMahon, who does research in the communications sciences at the Bell Telephone Laboratories. He has reduced the English language to a strict form in which syntax is clear and sentences are easily broken into component grammatical parts to avoid ambiguity. For example, "Time flies" would be ambiguous to a computer because the roles of the noun and the verb are interchangeable. However, a sentence in FASE strictly maintains the sequence

of subject, verb, and object, while other parts of speech must fall into line. A complicated set of rules has been devised to ensure unambiguous syntax. On the other hand, problems arising from semantic ambiguity still must be overcome. For example, in "John throws a ball every night," it is not clear whether John likes athletics or parties. (Knowing John, it's probably parties. But the trouble is, the computer and John never got to know each other. *Ed.*)

Although FASE can say anything that needs saying, it cannot produce an elegant style. For this reason, its immediate application would lie in the mechanical indexing of scientific abstracts or documents. These could be written or rewritten in FASE, then punched on cards, and stored in a computer. The documents can be indexed and retrieved on the basis of grammatical units and relations that are not useful in present systems because of the syntactic ambiguity of English.

Time-Sharing Computer Translates Documents Captured From Viet Cong

A system for immediately translating captured Viet Cong documents for front-line commanders using a time-sharing computer was demonstrated at the recent 20th Annual Conference of the Association for Computing Machinery in Washington, D.C.

Information contained in documents captured from Viet Cong casualties or prisoners of war frequently loses its tactical value before it reaches the desk of an interpreter. This system, which consists of a model Vietnamese-English dictionary designed and programmed by Computing Technology Inc. and a Radio Corporation of America Spectra 70/45 time-sharing computer, performs a word-for-word, and in some cases phrase-for-phrase, look-up and supplies the English equivalent of the input sentences. The computer thus enables the linguist to translate foreign documents very quickly, because as much as 80 percent of his time is usually spent in looking up words in a dictionary.

The automated dictionary makes use of a longest match technique so that in some cases entire phrases may be translated. Since the Vietnamese language is reasonably responsive to word-for-word translation, the new technique should provide useful raw intelligence to military units.

Technical Books and Journals Are Needed By Students in Asia

With the ever-increasing need for technical and scientific books and journals in the schools of Asia, The Asia Foundation again solicits donations to its Books for Asian Students Program, and will distribute such donations free of charge.

Books must be dated 1955 or later and be in good condition. Journals must be in series of five years or more dating from 1946 or later. Shipments and inquiries may be made at any time to the program at 451 Sixth Street, San Francisco, Calif. 94013. Donations to the Asia Foundation are tax deductible.

Dr. J.C. Palais Joins Sylvania Under Ford Grant

Dr. Joseph C. Palais, Assistant Professor of Electrical Engineering at Arizona State University, has joined Sylvania Electronic Systems, an operating group of Sylvania Electric Products Inc., as an engineering specialist under a Ford Foundation residency award. Sylvania is a subsidiary of General Telephone & Electronics Corporation.

Dr. Burton J. McMurtry, Manager of the Equipment Engineering Laboratories at the group's Western Division, said Dr. Palais will function as a senior staff member of the laboratories during his 15-month residency. His responsibilities include research, development and equipment design of antennas, signal processing devices, special purpose transmitters and receivers, and studies in the microwave and optical frequencies of the radio spectrum.

Sylvania is one of several major companies participating in the Ford Foundation "residencies in engineering practice" program, which enables educators to serve as the personal assistant or aide to a senior engineer whose position involves engineering decision-making at a high level of responsibility. Dr. McMurtry will work with Dr. Palais and serve as his preceptor.

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Power Supplies for Microwave Tubes/Microwave Sweep Oscillators

OMNI-SPECTRA Inc.
OSM Min. Coaxial Components & Inst's./OSM & OSSM Min. Coaxial Connectors/S.S. Oscillators

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ROYAL Microwave Devices
Waveguide Switches/Waveguide Terminations/Pressure Windows



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COMMUNICATION TECHNOLOGY

Full day symposium on "Digital Data Communications." 1. Techniques in high speed digital data transmission by A. Lender, Lenkurt Electric Co. 2. Adaptive equalization by R. W. Lucky, Bell Telephone Labs, Inc. 3. Error control by A. Kohlenberg, Codex Corp. 4. Designing multiple computer systems by E. T. Eiselen, IBM Corp.

January 17, 1968, Wednesday, SF Hilton Hotel, Mason & O'Farrell, San Francisco. Registration fee \$10.00 (luncheon included). Reservations: George Griffith 591-8461 ext. 549; Ed Combs 397-1471 or Milton Seymour 593-8491.

INDUSTRY & GENERAL APPLICATIONS

The correction of power system harmonics and power factor at SLAC related to megawatt size solid state power rectifiers in free-wheeling operation. Paul Edwards, Electrical Engr., Stanford.

December 5, Tues. 7:30 PM, SLAC Auditorium, Sand Hill Rd. No dinner.

INSTRUMENTATION & MEASUREMENT

The automatic measurement of parameters. Gordon Padwick, applications manager, Fairchild Systems Group.

December 12, Tues. 8:30 PM, Fairchild Instruments Div., 974 Arques, Sunnyvale. Dinner: 6:30 PM, Heritage House, 830 E. El Camino, Sunnyvale. Dinner reservations: Fred Scholes, 326-1970 ext. 321 by Dec. 11.

MICROWAVE THEORY & TECHNIQUES

Microwave quantum resonances in atomic time & frequency standards by Dr. Arthur O. McCoubrey, Mgr., R&D, Varian. New uses of microwaves in high energy physics by Dr. Joseph Murray, senior staff member, SLAC.

December 13, Wed. 8:00 PM, Hewlett-Packard Auditorium 1501 Page Mill Rd., Palo Alto. Dinner: 6:30 PM, Dinah's Shack; \$3.65 & up. "Happy Hour" 6:00 to 6:30 at Dinah's. Dinner Reservations: Doris Juric, 966-3411 by Dec. 8.

SF SECTION/ INDUSTRIAL ELECTRONICS & CONTROL INSTRUMENTATION

Centralized vs distributed control systems using small computers. Thomas Taussig, Lawrence Radiation Lab, University of California, Berkeley.

December 12, Tues. 7:30 PM, Engineers Club of San Francisco, 160 Sansome St., San Francisco. Cocktails: 5:30 PM. Dinner: 6:30 PM. Reservations: Engineers Club, 421-3184 by Dec. 11.

Flight Path Control Designed For Helicopters

A flight path control designed for antisubmarine warfare (ASW) helicopters has successfully passed preliminary flight tests conducted by the U.S. Navy. The new system automatically guides an ASW helicopter through a complete submarine search mission, including hovers for dunking the submarine-detecting sonar transducer.

To operate the new flight control, which was developed by Hamilton Standard, the pilot before an ASW mission feeds the system's airborne computer such information as first sonar dip point, distances between subsequent dip stops, cruise altitude and speed, and hover altitude. After takeoff, the system is engaged and automatically flies the helicopter through the programmed flight plan.

On arrival at the search area the control system turns the helicopter into

the wind and automatically lowers it from cruise altitude to the preselected hover altitude. Following sonar search, the system automatically returns the helicopter to cruise altitude, then flies it to successive dip locations. The pilot can reprogram the computer during flight to meet any change in tactical situations.

Region Six Conference

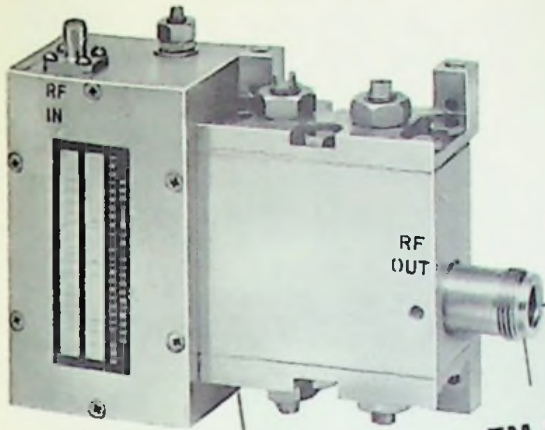
The IEEE Region Six Conference will be held in Portland, Oregon on May 20 to 22, 1968. Theme is "Electronics Serving Mankind" and papers are invited from all fields of IEEE activity. Session topics will include: energy sources, biomedical engineering, education, simulation, transportation, computers, aerospace, communications, lasers, and oceanography. Prospective authors should send 500-word abstracts by January 5, 1968 to: Program Chairman, IEEE Region 6 Conference, P.O. Box 831, Portland, Oregon 97207.

Electronic Watches Will Aid Apollo Astronauts

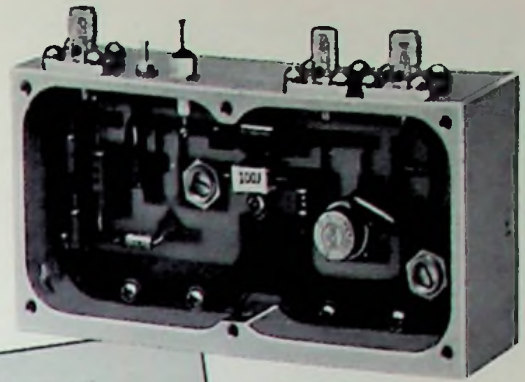
Electronic stop watches will be used by Apollo astronauts to time their activities before and after landing on the moon.

The precision devices will be utilized aboard a landing craft (Lunar module) in which two spacemen will descend onto the moon while a third astronaut remains aboard a command ship in a lunar orbit. The instruments, which are currently being tested by Sylvania Electric Products Inc., will enable the astronauts to measure their experiments by displaying minutes and seconds on a 5- by 10-cm flat surface.

The clocks employ electroluminescence, a phenomenon in which light is created through the excitation of phosphors in an electrical field. Such displays can withstand extreme shock and vibration and, unlike electromechanical instruments, are not affected by the irregular gravity fields of outer space.



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CATALOG 67b

 A graphic for 'RHG TRANSMITTER COMPONENTS' featuring a diagram of a waveguide with a double-headed arrow. The text lists features for Series 'OS' and Series 'MX' components.

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Output Frequency	to 4 watts
Output Power	to 30%
Efficiency	

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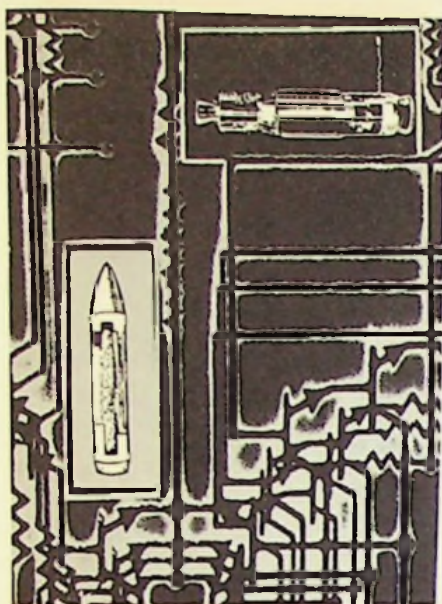
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Presidential Commission Urges Patent Reforms

A presidential commission, in a report released recently, urged many reforms for the patent system, including some designed to reduce the time and expense needed to get a patent and the cost of defending it in court.

The report of the President's commission on the patent system was based on more than a year's research. Many of its 35 recommendations would require legislation.

The average time for getting a patent is now about two and a half years; until the patent is issued the technology it contains is secret. The commission's recommendations would require publication of the information in an application not more than two years from the date the application was filed.

J. Herbert Holloman, Assistant Secretary of Commerce for science and technology, described the commission's report as "extraordinarily important".

"It is the first time in over a hundred years that a group of knowledgeable people has suggested that our patent system needs revision and that great benefits to the Nation would flow from the changes proposed," Holloman said.

"We here are not in a position to say at this time whether all the recommendations in the report should be carried out. But certainly they deserve all the consideration we can give them," he said.

President Johnson, in releasing the report in Texas said he was turning it over to the Secretary of Commerce, the Attorney General and Mr. Johnson's science adviser, Dr. Donald Hornig, for careful review.

The patent system has undergone no basic change since 1836.

One commission recommendation would extend the life of a patent from the present 17 years after its issuance to 20 years from the date its application was filed.

Another recommendation would permit the patent owner—such as a corporation employing the inventor—to file the patent application. The rights of the inventor, who at present must sign the application, would be protected.

Co-chairmen of the commission were Dr. Harry Hunt Ransom, chancellor of the University of Texas, and former Judge Simon H. Rifkind, a New York lawyer. The other members represented government industry, education and the patent bar.

New York Times

News Briefs

R&D budgets of industry, now \$16.6 billion, are expected to rise through 1970 when they will reach \$21 billion.

To take over from radar when ships are maneuvering in congested areas such as locks and canals, Marconi Marine has designed a new navigational closed-circuit television system. Full range and bearing indications are given on the bridge monitor screen.

What is probably the fastest impact type line printer in the world—printing 2,700 lines of numerical data a minute—has been produced by English Electric-Leo-Marconi Computers.

The National Academy of Engineering has established an Aeronautics and Space Engineering Board to advise NASA and other agencies of the Federal government.

Litton Industries' Electron Tube Division, San Carlos, California, and English Electric Valve Company have entered into a technical and patent license agreement which includes an interchange of information on tube development and production techniques.

IEEE Standards for Electrical and Electronic Clinical Medicine Instrumentation—Write Dr. G. Sinclair, University of Toronto—Galbraith Building—Toronto, Ontario, Canada.

The 1968 IEEE International Convention Program will tentatively include "New Technical Activities," "Interdisciplinary Topics," "Tutorial—State of the Art," "Special Microwave," "Tutorial Courses," "Film Theater" and "Highlight" sessions.

National Headquarters has a Speaker's Directory reporting successful programs that have been implemented by other Groups or Sections.

A recent U.S.O.E. Bureau of Research shakeup "puts more emphasis on Information Technology."

The University of California, Berkeley, and the International Laboratory of Genetics and Biophysics in Naples will establish a graduate school of molecular biology in Europe with financial support from the U.S. and the Italian governments. A three-year course will lead to a Ph.D.

Oceanology activity is intensifying at a rate near that of the space effort five years ago.

Two thirds of all steel melted in this country will use computer controls to regulate melting within the next decade.

The National Academy of Engineering has established a United States National Committee on Engineering in Medicine and Biology.

december 1967

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A. D. Data Systems	W. K. Geist Co.	Kepeco, Inc.	V. T. Rupp Co.
Accutronics, Inc.	Frauman Associates	Korad Corp.	O'Halloran Assoc.
Adret Electronics	W. K. Geist Co.	Krohn-Hite Corporation	L & M Engineering, Inc.
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Bacteria May Soon Be Identified by "Fingerprints"

A "fingerprinting" technique has been devised that may lead to a method of detecting and identifying bacteria.

In an investigation of pure stains of bacteria, scientists at the General Electric Electronics Laboratory and Cornell University found that the pattern of metabolic products of each of the 32 stains examined is distinct, thus providing an identifying fingerprint.

Using a gas-liquid chromatography technique, researchers were able to distinguish not only one species of bacteria from another but also one strain from another within a species. The metabolic products released by the micro-organism were measured and a unique mixture of metabolic products was observed for each stain studied. The approach was to analyze the metabolic products of the bacteria, measuring the molecules that are excreted in the life process. A standard laboratory chromatograph is used for this purpose. The volatile products are collected, processed, and injected into the device. Each product requires a different time to pass through the column in the chromatograph. When each product reaches the end of the column, it is sensed by highly sensitive detectors and the results are displayed graphically as a chromatogram.

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Data Disc, Inc. Forms Three Divisions

Data Disc, Inc., Palo Alto manufacturer of computer memories, has formed three divisions to handle expanding operations: the Standard Products Division, the Disc Division, headed by Vice President Murray Shaw, and the Special Products Division, headed by Vice President William Stevens.

According to Armin Miller, President of Data Disc, the divisional organization will enable the company to serve three well-defined markets efficiently. The Standard Products Division will supply complete disc memories, with permanent or interchangeable discs, for immediate use with computers now in the field. The Disc Division will supply magnetic discs 8" to 24" in diameter for computer memories and video recorders built by Data Disc and other manufacturers. The Special Products Division is developing digital and video systems such as CRT refresh memories.

Data Disc "in-contact" memories employ a proprietary recording technique to store approximately twice as much information per inch of track as conventional "floating head" memories.

MEMBERSHIP

The San Francisco Section welcomes the following new members:

L. H. Chasson	P. Moody
J. B. Clark	J. Ronchetto, Jr.
T. R. La Basco	M. Srinivasan
R. C. Mc Coy	R. Stettiner
D. Mischynski	P. W. Weaver

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Fellow Nominations

Larry FitzSimmons, chairman of the section committee on Fellow nominations, invites suggestions from the membership for nominations for the grade of Fellow for 1969.

Suggestions for nominations should be submitted by letter to Mr. FitzSimmons, c/o the section office by February 15, 1968. This letter should include a biography of the candidate and an indication that you would serve as sponsor. A telephone call to Mr. FitzSimmons in San Jose on 291-4005 or at home in Palo Alto on 324-2411 will get more details on what should be covered in this biography.

Nominees must meet the requirements for Senior Member as stated in the by-laws (even though they may hold the present grade of Member) and must have been a member in any grade for a period of seven years preceding nomination, other than in exceptional cases. The principal criterion is the nominee's technical contribution.

Hewlett-Packard Establishes Six New Sales Subsidiaries

PALO ALTO, California, Nov. 1—Hewlett-Packard Company today established six wholly owned sales subsidiaries.

The new subsidiaries, headquarters and managers are: Denmark: Hewlett-Packard A/S, Copenhagen, John Beyerholm. Finland: Hewlett-Packard O.Y., Helsinki, Pentti Halinen. Norway: Hewlett-Packard Norge A/S, Oslo, Ian McGeorge. Argentina: Hewlett-Packard Argentina S.A.C.e.I., Buenos Aires, Luis Brennan. Brazil: Hewlett-Packard do Brasil Ltda., Sao Paulo, Carlos Barbosa (HP Brazil also has an office in Rio de Janeiro). Venezuela: Hewlett-Packard Venezuela C.A., Caracas, Mauricio Groshaus.



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