# EDITOR'S PROFILE of this issue

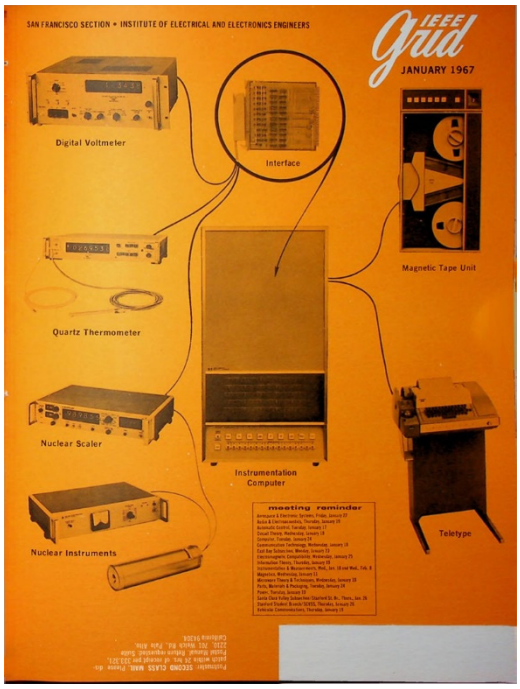
*from a historical perspective …*

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

January, 1967:

Cover: Integration of H-P instruments under the control of an HP-2116A, will be discussed at an IEEE meeting. See page 5.

Page 16: Bruce Wooley wins the IEEE Fortescue Fellowship for post-graduate work. He goes on to get his PhD from UC-Berkeley, works at Bell Labs, then is a professor at Stanford starting in 1984. He becomes a Fellow of the IEEE and president of the Solid State Circuits Society (and chair of ISSCC).




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

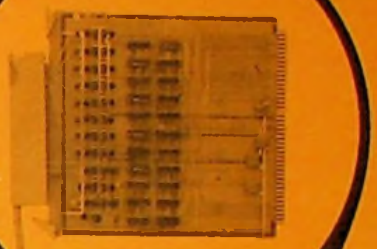
At time of scanning, the bound volumes are held by Paul Wesling. July, 2021 Contact p.wesling@ieee.org

SAN FRANCISCO SECTION • INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

# IEEE Grid

JANUARY 1967

Digital Voltmeter



Interface

Magnetic Tape Unit

Quartz Thermometer

Instrumentation Computer

Nuclear Scaler

Nuclear Instruments

Teletype

## meeting reminder

Aerospace & Electronic Systems, Friday, January 27
Audio & Electroacoustics, Thursday, January 19
Automatic Control, Tuesday, January 17
Circuit Theory, Wednesday, January 18
Computer, Tuesday, January 24
Communication Technology, Wednesday, January 18
East Bay Subsection, Monday, January 23
Electromagnetic Compatibility, Wednesday, January 25
Information Theory, Thursday, January 19
Instrumentation & Measurements, Wed., Jan. 18 and Wed., Feb. 8
Magnetics, Wednesday, January 11
Microwave Theory & Techniques, Wednesday, January 18
Parts, Materials & Packaging, Tuesday, January 24
Power, Tuesday, January 10
Santa Clara Valley Subsection/Stanford St. Br., Thurs., Jan. 26
Stanford Student Branch/SCVSS, Thursday, January 26
Vehicular Communications, Thursday, January 19

Postmaster: SECOND CLASS MAIL. Please dispatch within 24 hrs. of receipt per 333.321, Postal Manual. Return requested: Suite 2210, 701 Welch Rd., Palo Alto, California 94304.

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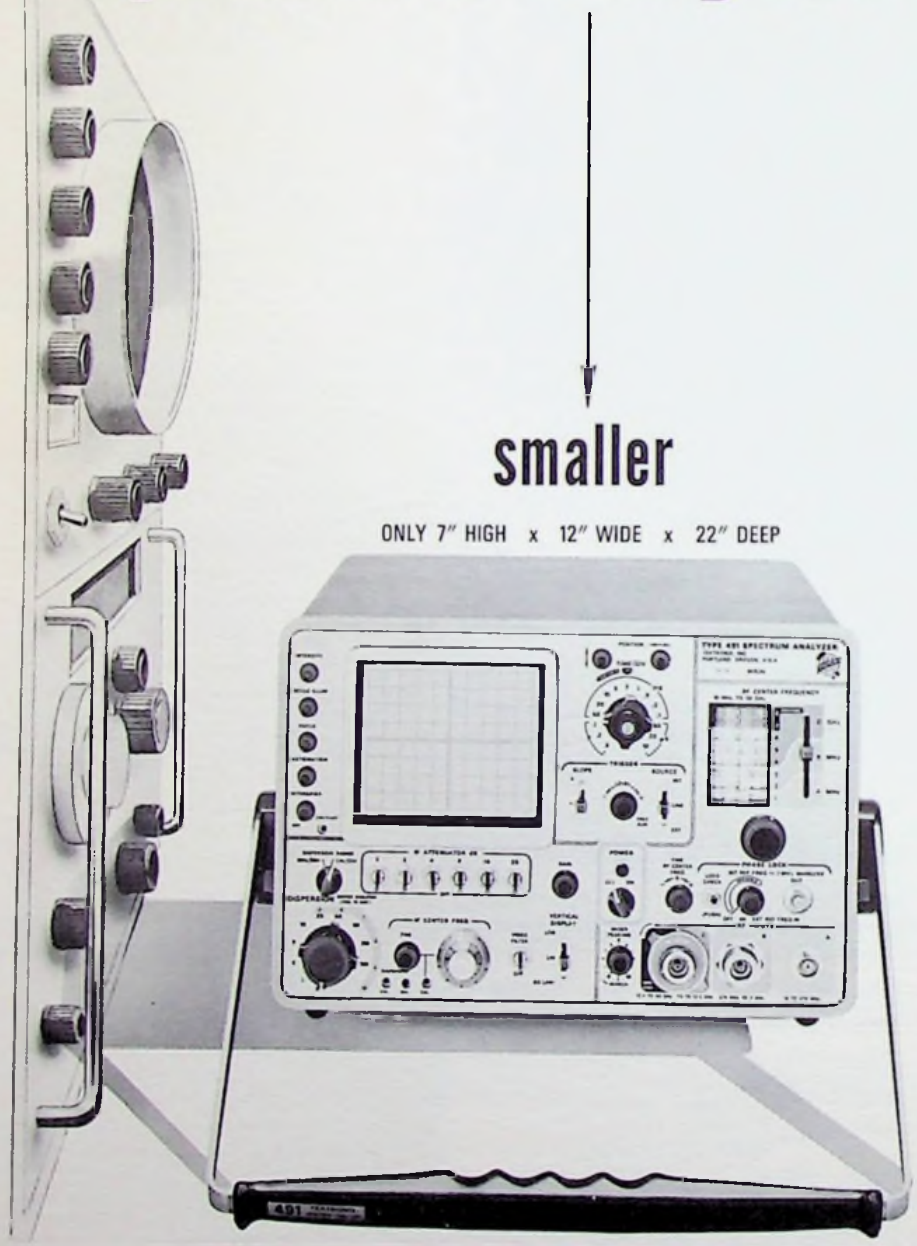

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*contents*





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*grid inputs*

## DEADLINE CHANGE

Effective with the February issue the closing date for Grid editorial and advertising material will be the 5th of the month preceding publication.

*section news*

## FELLOW NOMINATIONS

This is the last call for suggestions from the membership for nominations to the grade of Fellow for 1968. They should be submitted by letter to the fellows committee chairman, Larry FitzSimmons, c/o the Section Office by February 10, 1967. Information and more detailed qualifications were outlined in the December issue of the Grid.

*the section*

## MEMBERSHIP

Following are the names of individuals who have been elected to current membership:

R.D. Crowell
B.G. Fredricsson
G.I. Kitchen
E.R. Payne
N.H. Pond
M.B. Raynham
J.P. Watney

*status problem notes*

## MENLO MAILINGS

Because the HQ computer and Menlo Park post office consider Atherton, Ladera, Portola Valley, and Menlo Park one zip code area or mailing unit, town addresses have been interchanged recently for members in those areas, apparently without delay in mail delivery. The problem has been discussed at length with HQ and will probably be solved by feeding the computer 4-line addresses for these members, including their name, street, actual town of residence, and Menlo Park.

*cover*

Use of computers in instrumentation systems will be the subject when Kay Magleby, head, computer engineering, and William Davidow, computer marketing manager, Hewlett-Packard Dymec Division, address the Instrumentation & Measurement chapter on January 18. Shown is the HP-2116A, a versatile, general-purpose, digital computer, particularly suited in computational power and input-output flexibility to scientific and industrial measurement applications.

*meeting ahead*

### FILM MEMORIES

Prof. A. V. Pohm of the department of electrical engineering, Iowa State University, Ames, will discuss magnetic film memories at the January 11 meeting of the Magnetics chapter at Stanford Research Institute. His talk will also interest computer-oriented members.

The various types of magnetic film memories will be examined. Factors that affect the design, performance, and cost of film memories will be discussed. Speculation will be made about their future.

*meeting ahead*

### DIRECT DIGITAL CONTROL

Roger Bakke, staff engineer, IBM's control systems development center, will discuss direct digital control at the January 17 meeting of the Automatic Control chapter at the University of Santa Clara.

This talk will discuss what direct digital control is and how DDC relates to other types of process control. Some of the hardware and programming tools required to implement DDC will be discussed. Examples of some DDC applications will be presented.

Roger Bakke has worked developing and applying both flight and industrial control systems since 1958. Since 1963, he has specialized in the development and application of direct digital control systems. At the 1966 Joint Automatic Control Conference he was the recipient of the American Automatic Control Council's D. P. Eckman Award. He was given this award for his work in applying advanced direct digital control techniques.

*Wright*

*Bakke*

*meeting ahead*

### LASER POTENTIAL

David L. Wright, manager of laser advance development, Spectra Physics, Inc., Mountain View, will describe the laser potential, real and imaginary, at the January 18 meeting of the Communication Technology chapter.

There has been much talk of the

*(Continued on page 11)*

## Meeting Calendar

**JANUARY 10, TUESDAY, 7:30 PM** — Power

**BART progress report**

*Deane N. Aboudara, electronic and equipment design engineer, Bay Area Rapid Transit District*

Place Engineers' Club of San Francisco, Hong Kong Bank Bldg., Pine and Sansome St., San Francisco
Cocktails: 5:30 PM — Engineers' Club
Dinner: 6:30 PM — Engineers' Club
Reservations: Engineers' Club — GA 1-3184 by January 9

**JANUARY 11, WEDNESDAY, 8:00 PM** — Magnetics

**Magnetic film memories**

*Prof. A. V. Pohm, EE Dept., Iowa State University*

Place: SRI main building — Conference Room B
No dinner

**JANUARY 17, TUESDAY, 8:00 PM** — Automatic Control

**Direct digital control**

*Roger M. Bakke, staff engineer, control systems development center, IBM, San Jose*

Place: Univ. of Santa Clara, engineering center, Room 551
Dinner: 6:30 PM, Lucca's, Santa Clara (across from the university)
Reservations: none required

**JANUARY 18, WEDNESDAY, 8:00 PM** — Circuit Theory

**The practical aspects of active filter design**

*Gunnar Hurtig III, manager of module products engineering, Fairchild Semiconductor, Mountain View*

Place: SRI Conf. Room B, Bldg. 1
Dinner: 6 PM — Red Cottage, El Camino, Atherton
Reservations: Molly Stanley, 739-7700 by Jan. 17

**JANUARY 18, WEDNESDAY, 8:00 PM** — Communication Technology

**Laser potential, real and imaginary**

*David L. Wright, manager of laser advance development, Spectra-Physics, Inc., Mountain View*

Place: Pacific Telephone auditorium, 140 New Montgomery, S.F. (between 2nd & 3rd)
No host cocktails at Bardelli's at 5:45 PM, 243 O'Farrell, SF
Dinner: 6:15
Reservations: Robert Howland, (408) 291-4039, Ed Combs (415) 397-1471 or George Griffith, (415) 591-8461 ext. 525 by Jan. 17

**JANUARY 18, WEDNESDAY, 8:00 PM** — Instrumentation & Measurement

**Instrumentation computers**

*Tom Tisch, project engineer, Kay B. Magleby, engineering manager, Hewlett-Packard Co., Dymec Div.*

Place: Hewlett-Packard Co., 1501 Page Mill Road, Palo Alto
Dinner: 6:30 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
No reservations required

**JANUARY 18, WEDNESDAY, 8:00 PM** — Microwave Theory & Techniques

**Microwaves & communication satellite technology**

*James Rahilly, manager, advanced systems requirements, Philco WDL*
*C. Louis Cuccia, manager, advance developments, Philco*

Place: Hewlett-Packard conf. room 5 M, 1501 Page Mill Rd., Palo Alto
Social Hour: 5:30 to 6 PM
Dinner: 6 PM (prompt), Rick's Swiss Chalet, 4085 El Camino Way, Palo Steak dinner $3.85 (incl. tax & tip)
Reservations: Joan McClung, 326-7000, ext. 2028 by Jan. 16

*(Continued on page 6)*

*meeting ahead*

## I&M COMPUTERS

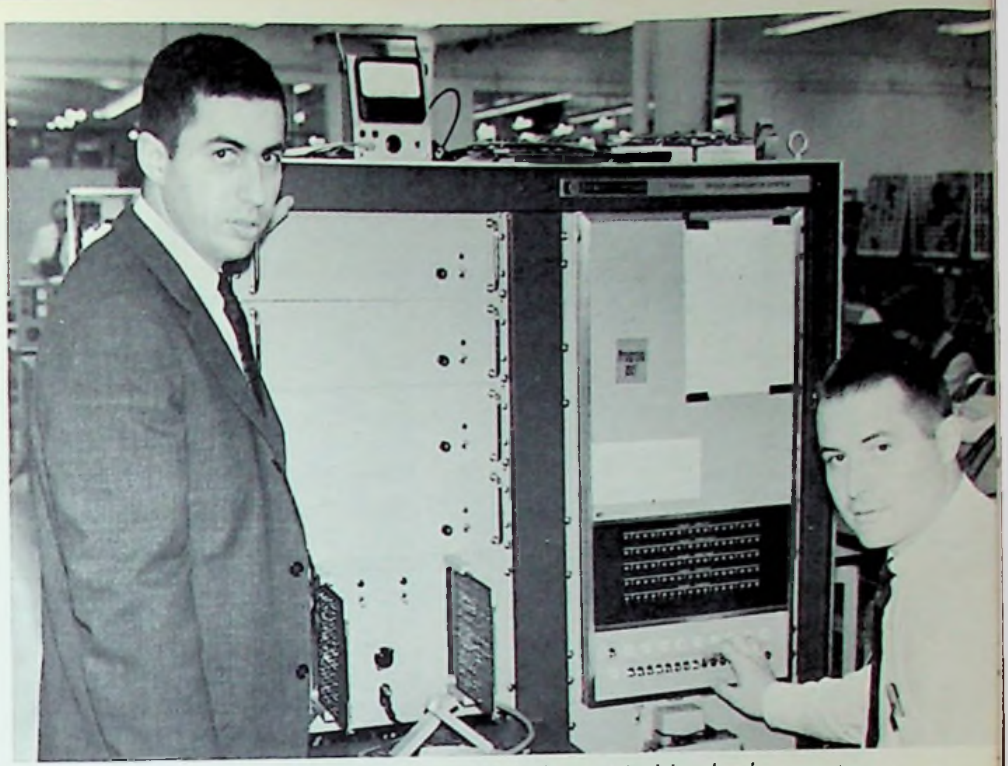
Kay B. Magleby, engineering manager, and Tom Tisch, project engineer, Dymec division, Hewlett-Packard Co., Palo Alto, will cover instrumentation computers at the January 18 meeting of the Instrumentation & Measurement chapter.

In recent years computer technology has advanced rapidly, making it economical to utilize computers in many new applications. In instrumentation work the results of a measurement often need processing to obtain the desired data. In many cases a large amount of raw data is taken to obtain a few desired results. This work can be done using a small scale general purpose instrumentation computer.

A computer designed for real time data processing and instrumentation work requires a very flexible input/output system and a fast interrupt system. These requirements for instrumentation work will be described and the design of a computer to meet these requirements will be presented.

Dr. Magleby worked for Hughes Aircraft from 1957-1958. He has been with Hewlett-Packard since 1958. He worked for the oscilloscope division when he developed the basic sampling system used in many HP instruments. In 1963 he joined the advanced research labs, where he started work on instrumentation computer systems. He has directed the development of the -hp-2116 in the Dymec division.

Mr. Tisch has been in Dymec division of HP since 1964 and participated in the design of the -hp-2116.



*Bill Davidow, computer marketing manager, and Kay Magleby, head, computer engineering, HP Dymec Division with the HP-2116A.*

*professional notes*

## STABILIZATION OF PROFESSIONAL EMPLOYMENT RECOMMENDATIONS GIVEN AT SYMPOSIUM

The mass layoffs that shake the nation every three to four years when large defense contracts are cancelled were the subject of the symposium held on November 19 at San Jose State College. Highlighting the conference, which dealt with engineering and scientific employment, were reports by five researchers who recently completed studies of mass layoffs in the San Francisco, Long Island, Boston, Seattle, and Denver areas during 1963-1964. The afternoon session included discussion by a panel consisting of Dr. Guy Black, executive secretary, President Johnson's committee on the economic impacts of defense and disarmament; John Alden, executive secretary, engineering manpower commission of the Engineers Joint Council in New York; and three other national experts on engineering and scientific layoffs.

During the period 1963-1964, approximately one-quarter million workers were laid off by the nation's defense companies, according the the Manpower Research Group of the San Jose Center for Interdisciplinary Studies, the symposium's sponsoring group. About 30,000 of the laid-off individuals were engineers and scientists. Contrary to the commonly-held belief, the San Francisco study showed that when educational background and technical competence are considered, the laid-off engineers are no different from the working engineers. According to Dr. R. P. Loomba, director of the center, the laid-off engineers by no means were "dead wood" or "less competent."

Robert Brandwein of the United Research Inc., Cambridge, Massachusetts, who presented results of his study of layoffs in the Seattle area, commented, "there is every likelihood that after the Vietnam war we will have mass layoffs throughout the country." He emphasized that, "now is the time we should start making plans to deal with this forthcoming problem."

One of the major findings which was reported by all five investigators is that, irrespective of educational background, area of specialization, pre-layoff salary, technical competence, and intensity of job search efforts, individuals who were older remained unemployed for a relatively longer period of time. "It seems to me that for some reason other than their technical competence, companies are showing reluctance towards hiring engineers over forty years of age," said Dr. R. P. Loomba, who recently completed his study of layoffs from 62 companies in the San Francisco Bay Area. He further pointed out that "there has been a myth among people that engineers constitute one of the most mobile groups of our society. These five studies presented here today have shown that engineers, like other segments of the society, have a strong tendency against relocating in jobs in other geographical regions. In the past, engineers have changed jobs more often mainly because they were forced to do so due to the policies of the Department of Defense and those of large defense contractors."

"These periodic defense layoffs," according to Dr. Leslie Fishman, director of the Denver study, "result in serious losses to the nation. These losses can be measured in terms of professional man-days lost due to unemployment, multiplier losses to the community, and other losses incurred by society due to over-building of schools, government facilities, houses, water systems, etc. Also there is the immeasurable loss incurred from breaking up scientific teams." It was further pointed out that about 90 percent of the 30,000 engineers were re-employed within a period of one year. Most of this rehiring was

*(Continued on page 13)*

*Cuccia*

*Rahilly*

*meeting ahead*

### MICROWAVE SATELLITES

C. Louis Cuccia, manager, advanced development, and James Rahilly, manager, advanced systems and requirements, Philco-Ford WDL division, Palo Alto, will review microwaves and communication satellite technology at the January 18 meeting of the Microwave Theory & Techniques chapter.

This presentation will discuss the microwave and technology aspects of both commercial and military communication satellite earth terminals, including the nature of the up and down links between the satellite and the terminal. The philosophy characteristics and requirements of the ground interconnections and the satellite links will be discussed. These system aspects will be illustrated by related aspects of the earth station presently under construction at Fucino, Italy for Telespazio, and the Philco MASCOT tactical military terminal, including a movie of the latter.

Microwave aspects to be discussed include sensitivity and effective radiated power requirements including the G/T factor, the various ultra low noise antennas, feeds, and microwave amplifiers now used, and the different types of microwave transmitters used to provide various radiated powers depending upon channel capacity requirements.

The joint presentation will conclude with operational aspects of earth terminals, including system employment, reliability and maintenance, and future applications.

*meeting ahead*

### FILTER DESIGN

Gunnar Hurtig III, manager of module products engineering for Fairchild Semiconductor, Mountain View, will discuss the practical aspects of active filter design at the January 18 meeting of the Circuit Theory chapter.

The presentation is intended to bring together several of the well-known active filter design techniques and the practical aspects of implementing them. This is based on several years of the

*(Continued on page 16)*

**JANUARY 19, THURSDAY, 8:00 PM** — Audio & Electroacoustics

**A method for determining the characteristics of the stereo phonograph cartridge**

*James W. Daniels, district manager, B & K Instruments, Inc., Los Altos*

Place: SRI, Conf. Room B, Bldg. 1
Cocktails: 6 PM — Atherton Key Club, El Camino, Atherton
Dinner: 6:30 PM — same place
Reservations: 948-9519 by Jan. 18

**JANUARY 19, THURSDAY, 8:30 PM** — Information Theory

**Random walks and electric circuits**

*Dr. Douglas G. Lampard, chairman, electrical engineering dept., Monash University, Melbourne*

Place: Stanford Research Institute, Bldg. 1, Conf. Room B
Dinner: 6:30 PM, L'Auberge, 2826 El Camino Real, Redwood City
Reservations: Mrs. Deane Saltzman, 326-4350, ext. 4101 by Jan. 18

**JANUARY 19, THURSDAY, 7:30 PM** — Vehicular Communications

**The art and the state of single-sideband**

*M. A. Robbins, chief engineer of marine and land communications division, Canadian Marconi Co. (Kaar) Montreal, Canada*

Place: San Mateo College, 1700 W. Hillsdale Blvd., San Mateo
Dinner: 6:30 PM, San Mateo College cafeteria
No reservations required

**JANUARY 23, MONDAY, 7:30 PM** — East Bay Subsection

**Underground engineering & the plowshare program**

*Dr. Alfred Holzer, physicist, Lawrence Radiation Lab, Livermore*

Place: PG&E Oakland service center, 4801 Oak Port Road, Oakland
Dinner: 5:30 PM at Oakland Airport Inn
No reservations required

**JANUARY 24, TUESDAY, 8:00 PM** — Computer

**Real-time recognition of handprinted text**

*G. F. Groner, computer sciences department, the RAND Corp.*

Place: Room 134, McCullough Bldg., Stanford
Dinner: 6:15 PM — Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
Steak dinner $3.85
Reservations: Mrs. Chris Jensen, 324-3311, ext. 45034 by noon Jan. 23

**JANUARY 24, TUESDAY, 8:00 PM** — Parts, Materials & Packaging

**The role of the industrial design in the electronics industry**

*Thomas C. Lauhon, manager, industrial design microwave division, Hewlett-Packard*

Place: Conference Room 5A, Hewlett-Packard Co., 1501 Page Mill Rd., Palo Alto
No dinner

**JANUARY 25, WEDNESDAY, 8:00 PM** — Electromagnetic Compatibility

**Automating EMI measurements**

*Dr. J. White, president, White Electromagnetics, Inc., Rockville, Maryland*

Place: Hewlett-Packard (meet in lobby at main entrance)
1501 Page Mill Road, Palo Alto
Dinner: 6 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
Reservations: Victor M. Turesin, 742-3921 by Jan. 23

**JANUARY 26, THURSDAY, 7:45 PM** — Santa Clara Valley Subsection/Stanford Student Branch

**Finding your place in industry**

*Panel discussion by three speakers from the areas of solid-state, heavy power and contracting*

Place: Student Union, Room 270
Refreshments will be served during intermission
Reservations: Elaine Derbenwick, 321-2300, ext. 2331 by Jan. 25

## EMI MEASUREMENTS

D. R. J. White, president of White Electromagnetics, Rockville, Maryland, will discuss test methods and procedures for automating EMI measurements at the January 25 meeting of the Electromagnetic Compatibility chapter. Emphasis will be placed on applications fulfilling MIL-STD-826 and -462 test requirements and on measurements of transient EMI.

For over 18 years Mr. White has been engaged in systems analysis and in research, design, and development of electronic-communications systems, and related instrumentation. He is author of the *Handbook on Electrical Filters: Synthesis, Design, and Applications*, which is now in its fourth printing, and a new book on methods and procedures for automating RFI/EMI measurements. He has published seventy papers on such topics as electromagnetic compatibility, interference instrumentation and measurement techniques, computer simulation, mathematical modeling, and gaming applications to electromagnetic warfare and electronic systems.

A registered professional engineer and Senior Member of IEEE, Don White has served as national chairman for the IEEE's Group on Electromagnetic Compatibility, and as chairman of the third national symposium on Radio Frequency Interference. He received his MS and BS degrees in electrical engineering from the University of Maryland.

**JANUARY 27, FRIDAY, 6:45 PM** — Aerospace & Electronic Systems
**Repeat by popular demand — Tour of General Motors plant, Fremont**

Place: General Motors plant (meet in lobby) Highway 17 and Fremont Road, Fremont
Dinner: 6:15 PM — GM cafe
Reservations: Ralph Franks, 743-0525 by Jan. 20 (For tour and/or dinner, limited capacity)

**FEBRUARY 8, WEDNESDAY, 8:00 PM** — Instrumentation & Measurements
**Instrumentation at SLAC**
*Dr. Ken Mallory, SLAC*
Place: Hewlett-Packard Co., 1501 Page Mill Rd., Palo Alto
Dinner: 6:30 PM — Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
No reservations required

*meeting ahead*

### SINGLE-SIDEBAND

M. A. Robbins, chief engineer of the marine and land communications division of the Canadian Marconi Company, will discuss the art and the state of single-sideband at the January 19 meeting of the Vehicular Communications chapter at College of San Mateo.

In deference to the FM-minded, a brief history of SSB will be presented along with its key technical terms.

A look at the considerable advantages of SSB will explain its desirability, while its few limitations will help to explain its slow growth up to the mid-1950's. The principal uses of SSB equipment will be reviewed, from the ham station to the police station in the U.S. and elsewhere. Modern SSB equipment will be discussed, with emphasis on low and medium power needs in the land and marine services. The spectrum advantages of SSB and the growing compatability problem will lead to a cautious look at possible future trends in the industry.

Mr. Robbins assisted in the design of ionospheric sounders, VHF 2-Way radios and marine radios. In 1955, he was project engineer of Marconi's first UHF mobile radio. In 1958, he became responsible for managing their mobile radio design section.

When 1962 brought the formation of the marine and land communications division, he was appointed chief engineer of that division. In assisting their expansion, until now, he has been actively involved in the planning and the engineering of their tri-band mobile radios, marine VHF, HF-SSB and marine radar products and accessories. Throughout 1966, he was actively involved in the re-orientation of Kaar's products and engineering facilities.

*meeting ahead*

### STEREO CARTRIDGES

At the January 19 Audio and Electroacoustics chapter joint meeting with ASA and AES, J. W. Daniels, branch manager for B & K Instruments, will discuss a technique for determining the electrical properties for stereo phonograph cartridges. An automatic system for plotting frequency response, channel separation, vertical and lateral response will be described.

Mr. Daniels has been district manager for B & K for the past four years and is a member of IEEE, ASA and AIHA. He attended San Jose State College and graduated with an AB., Phys. Sci.

The meeting will feature a cartridge clinic after coffee break for those interested.

*Robbins*

*Daniels*

*meeting ahead*

### RANDOM WALKS & CIRCUITS

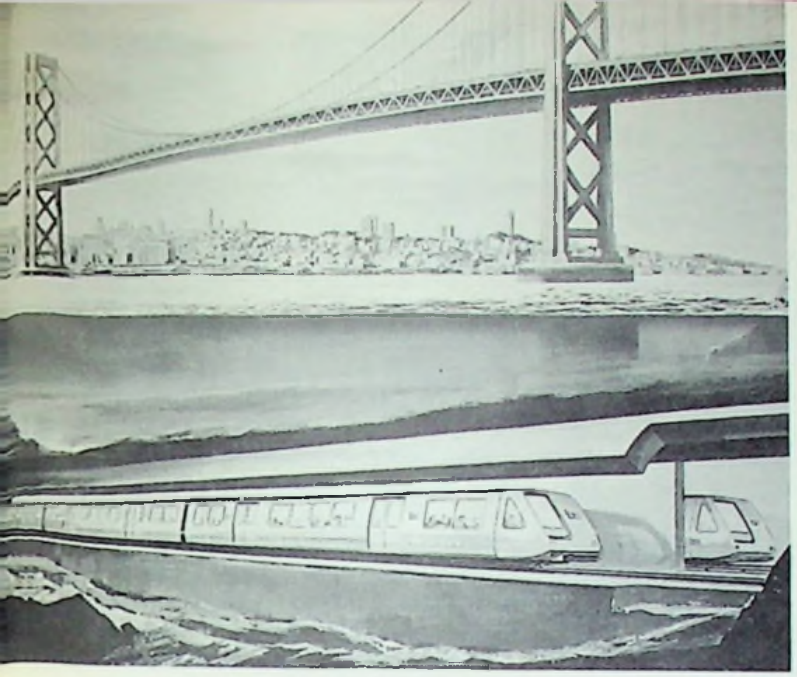
Dr. Douglas G. Lampard, Monash University, Melbourne, will address the Information Theory chapter on random walks and electric circuits at its January 19 meeting.

Random walks arise frequently in problems of statistical physics, communication, genetics, etc. Certain nonlinear statistical problems arising in neurophysiology can be approximately modelled as inhomogeneous random walks.

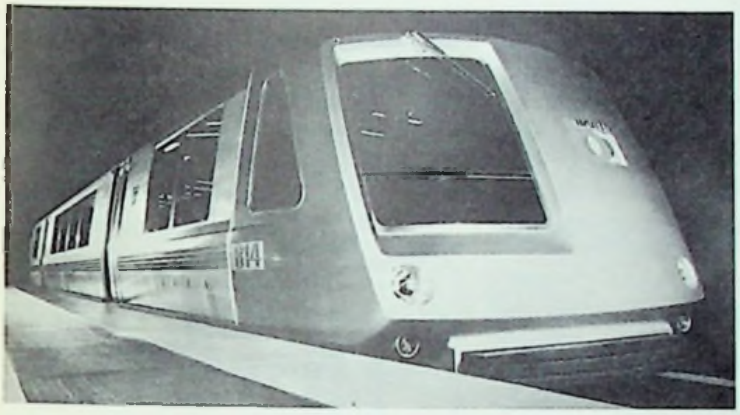
A discussion will be given of (inhomogeneous) random walks in which the steps are being taken at the time instants of given renewal process. It will be shown then that to each such random walk there is a corresponding deterministic electric circuit such that all transition probabilities, first passage and recurrence time probability densities, etc., have simple interpretations directly in terms of the time domain transfer responses of the network to impulsive current and voltage stimuli.

Dr. Lampard received a bachelor's degree and master's degree in physics from Sydney University and a Ph.D in electrical engineering from Cambridge University. For many years he was a research scientist in Australia's Commonwealth Scientific and Industrial Research Organization. He has held visiting appointments in the electrical engineering departments at Columbia and Purdue Universities. He was awarded the Heaviside prize of the Institution of Electrical Engineers (London) in 1957 and was a co-recipient of the Sperry Distinguished Achievement award of the Instrument Society of America in 1965 for the enunciation of a new theorem in electrostatics which has enabled an ultra precise calculable capacitor to be constructed.

In 1962, Dr. Lampard was appointed foundation professor of electrical engineering and chairman of that department at Monash University in Melbourne. His current research interests are in stochastic processes, circuit theory and neurophysiology.



*BART's four-mile, trans-bay tube is a key link in the 75-mile rapid transit network, will rest at a maximum depth of 130 ft. below the surface of the bay. Full-scale model of 70-foot car was viewed by thousands last summer.*



*meeting ahead*

## BART PROGRESS

*Aboudara*

Deane Aboudara, electronic and equipment design engineer, BART, will discuss BART progress at the January 10th meeting of the Power chapter. He will give an up-to-date presentation, with slides, of the many aspects of BART's ultra modern electrification system which represents approximately 10% of BART's total cost. These will include testing on automatic train control and fare collection, propulsion aspects and power supply problems.

Born in Los Angeles, Mr. Aboudara graduated from Santa Cruz High School and from California State Polytechnic College. He joined BART in 1964, following a career which included design work with FMC Corporation and transportation railroad and automatic material handling responsibilities with General Electric Co.

Mr. Aboudara has been a member of IEEE since 1953, is a member of many civic organizations and is a professional engineer in California, Oregon and Virginia.

*meeting ahead*

## HAND PRINTING RECOGNITION

Dr. Gabriel F. Groner, RAND Corp., Santa Monica, will discuss real-time recognition of hand-printed text at the January 20 meeting of the Computer chapter.

The speaker will describe a scheme which permits an on-line computer user to print text naturally, and have it recognized accurately. This scheme, which recognizes 52 symbols, enables a user to communicate all data and directives to a computer by using only a RAND tablet with its pen as an input device.

The tablet provides the recognition scheme with high resolution point-by-point pen location data which it analyzes as a symbol is being drawn. This analysis describes a hand-printed symbol primarily as a time sequence of features. Identification is based on a data-dependent sequence of tests. The scheme separates symbols from one another according to their identifications and relative positions.

The presentation will emphasize the use of this recognition scheme in a graphical I/O environment rather than the details of the scheme itself. A film showing user interaction will be presented.

Dr. Groner is with the computer sciences department of RAND, where he is currently conducting research in real-time, hand-drawn symbol recognition as part of the GRAIL (GRaphical Input Language) project. He is also a Lecturer in Engineering at U.C.L.A.

*section news*

## SYMPOSIUM PLANNED

The International Microwave Power Institute, a newly formed international technical society, announces its second annual symposium to be held at Stanford University on March 29-31.

The symposium is designed to present a comprehensive survey of the scientific and industrial fields which are using or studying microwave energy.

Papers surveying European and United States activities are being planned as well as presentations on chemical processes, biological effects, operational case histories, and equipment design.

The International Microwave Power Institute was formed to promote the exchange of information on the applications of microwave power for industrial and scientific processes.

---

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

*Groner*

*Glover*

*meeting ahead*

## JOINT SCVSS/STANFORD

At the joint meeting of the Santa Clara Valley Subsection and the Stanford Student Branch on January 26, there will be a panel discussion on the problem of "finding your place in industry". Professor Ed Glover of San Jose State College will be the chairman for the evening.

Three speakers from the areas of solid-state, heavy power and contracting will make introductory remarks. Eighteen practising electrical engineers from the Bay Area will be introduced. A printed sheet will be distributed listing their names and specialties. The meeting will be adjourned to a social hour, including refreshments, so that students can talk personally with one or more of these practising electrical engineers. The objective is for students to get a person-to-person feeling for work in industry.

*papers call*

**IMPI**

The 1967 symposium on microwave power sponsored by the International Microwave Power Institute will be held at Stanford University on March 29-31.

Papers are being solicited on chemical processes, biological effects, equipment design, microwave properties of materials, energy conversion, power transmission, and other facets of industrial and scientific processes utilizing microwave energy.

Five hundred word abstracts should be sent no later than January 16, to: Dr. Donald A. Dunn, Chairman, 1967 Symposium on Microwave Power, International Microwave Power Institute, P.O. Box 2335, Stanford, California.

**MORE LASER POTENTIAL**

laser entering the communications field as a carrier, because its high frequncy will permit huge modulation bandwidths and great directivity. The negative aspects of quantum noise and atmospheric propagation are sometimes ignored. Long distance communication is not where the first significant applications of lasers are being found. There are already available, other high frequency communication carriers that are going begging—surprisingly enough because the demand for bandwidth is not yet great enough.

There are, however, certain fundamental characteristics of lasers which are unique and it is these properties that are being applied. Lasers are measuring microinches, guiding BART'S tunnel across the bay, doing bloodless surgery, and outperforming the fastest digital computer on special problems. And, unfortunately, the "death ray" laser—which has been manufactured only in Hollywood to date—may soon be made elsewhere.

Mr. Wright will review the fundamental properties of laser radiation as a guide toward real applications. A few of these are unusual communications jobs. Many more lie in the areas of high-density data handling and precision measurements.

The speaker joined the Raytheon missile systems division, Bedford, Mass., in 1954 and worked on airborne FM CW radar development with particular effort on optimum detection. From 1958 to 1963 he was associated with Varian Associates.

*computer news*

## STANFORD TEACHING PROJECT

Starting this fall, over 100 first graders at the Brentwood School in East Palo Alto are spending a half-hour each day learning math or reading with the assistance of a computer—the first such program in an American elementary school, organized in cooperation with Stanford University.

Each student will work at one of 16 individual stations consisting mainly of a television-type screen, a typewriter keyboard and a speaker system—all linked to the computer. Problems in mathematics or sentences for reading are flashed on the screen. The student responds by touching a "light pen" to the screen, marking his answer; or he may type out the answer or answer audibly. The computer will keep track of each student's work, feed new material as his skills increase, and analyze the data so that teachers and school officials can keep a day-to-day check on each student's progress.

The entire system—built by IBM—is housed in a specially-designed building adjacent to the Brentwood School. The Brentwood project is an outgrowth of extensive research by Stanford Prof. Patrick Suppes, director of the Institute for Mathematical Studies in the Social Sciences, and his staff, who have operated a smaller model of the system in the Stanford Computation Center for the past three years. The project will continue for two years under a $1,000,000 grant from the U.S. Office of Education.

*Naomi Castillo of Brentwood School uses light pencil to register her wrong answer to reading test in the computer project.*

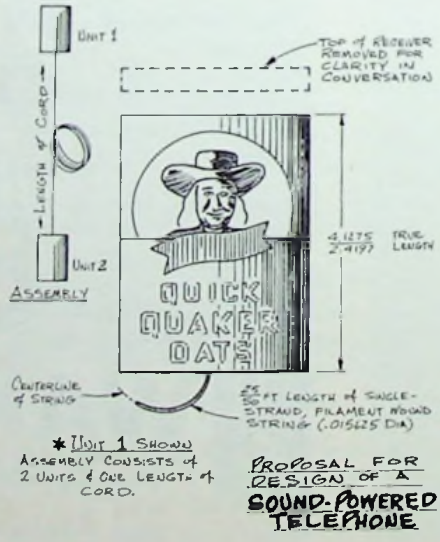
*grid erratum*

### PHILLIPS FOR WELCH

William J. Welch, chairman emeritus of the Antennas & Propagation chapter, was incorrectly described as current chairman in the November issue. Charles Phillips, Granger Associates, is 1966-67 A&P chairman, as correctly listed in the September directory issue.

## PATENTS PENDING

by Zamzow



done either by the same or by different defense companies. Each cycle of mass layoffs followed by frantic rehiring results in additional losses in terms of severence pay, re-recruitment expenses, relocation allowances, etc. Such losses can run into hundreds of millions of dollars and are eventually paid by the Department of Defense. "This loss," according to Dr. Loomba, "is a waste of our tax dollars and can be avoided by long-range planning on the part of the Department of Defense."

Dr. Guy Black suggested that diversification of highly defense-oriented companies would prove to be of immense value in reducing short term fluctuations in defense employment. John Alden of the Engineers Joint Council commented that a national job placement system such as the Western Union's PICS is one of the practical ways of reducing unemployment among professionally trained engineers and scientists.

Robert Leventhal, who is the executive secretary of the Southern California Professional Engineering Association, the bargaining agency for 6000 engineers and scientists at Douglas Aircraft Corporation, mentioned some of the contributions which collective bargaining can make towards stabilization of engineering and scientific employment in industry. Commenting on the rather modest popularity of unions among engineers, Levanthal said that, "this failure can be largely attributed to the basic attitude of engineers for subscribing to the philosophy that concerted economic activity is unprofessional. As a student of the collective bargaining process," Levanthal continued, "I find this attitude of great interest and in contradiction with reality."

The underlying theme of the conference was that periodic massive disruption of family lives and economic stability of various communities are both unnecessary and avoidable and that responsible individuals, in the federal government and in the management of large defense companies, should start their plans now if another massive layoff is to be avoided following a lessening of the Vietnam conflict.

A copy of the detailed proceedings of the conference is available from the Center for Interdisciplinary Studies, San Jose State College, for $2.50.

**HELP THE SECTION GROW**
**BRING IN A NEW MEMBER**

## IT IS REPORTED:

**James J. Halloran** has retired as general manager of Electro Engineering Works, San Leandro transformer manufacturing firm with which he has been associated since its inception in 1945, also serving as partner and co-founder. Halloran spent 26 years in the electrical manufacturing business and is a recognized authority in the design and manufacture of high voltage, high power rectifier transformers and direct current power supplies. He has served IEEE and WEMA in various capacities.

**John B. Damonte** has been named manager of the antennas and microwaves electrical dept. at Lockheed Missiles & Space Co., Sunnyvale, formerly serving Dalmo Victor, Belmont, since 1950.

**Dalmo Victor,** a Textron division, Belmont, will supply communication antenna systems for the command service module of NASA's Apollo spacecraft as part of a $4.9 million production contract recently received from North American Aviation's space division, principal contractor.

**Tranex, Inc.,** Mountain View, has added 3000 square feet to its production facility to handle current monthly shipments of specialty transformers of $70,000 and an expected increase of 40% in shipments.

**Dietrich-Heffner Associates,** Palo Alto, has been appointed representative for Associated Testing Laboratories, Inc., manufacturers of environmental chambers and test systems, ATL to open a warehouse facility in Los Angeles in 1967.

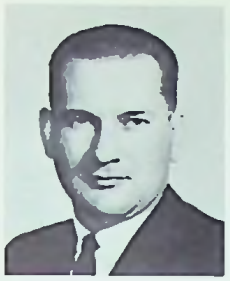
**John W. Davenport** has joined Walter Associates, electronic manufacturers' representative firm, Los Altos, and will cover the northern California area.

**Tung-Sol Division** of Wagner Electric Corp. has announced its western distributor representatives: Western Electronics Components, Newport Beach; Fortune Electronics, San Francisco.

**Dean E. Armann** has been appointed sales manager of Pacific Measurements, Inc., Palo Alto.

**Martin E. Cooper** has joined Union Carbide Electronics, Mountain View, as product engineer in the semiconductor marketing department.

**John C. Keyes** has been appointed systems operator director, microelectronics division, Philco-Ford Corp., Santa Clara.



*Segal*

*Pappas*

**Carl M. Segal** has been appointed advertising manager for the semiconductor product group of Union Carbide Electronics, Mountain View.

**Robert L. Pappas,** formerly vice-president-general manager, Ampex magnetic tape division, has been appointed vice-president-general manager of the company's instrumentation division.

**Menlo Research Laboratory, Inc.,** offering contract technical services since 1949, has moved its corporate headquarters to 355 W. Olive St., Sunnyvale. Walter H. Jones has been promoted to engineering manager, David Carlson to technical services manager, Gary A. Redding to field services manager, and John Eells to personnel assistant.

**Leonard L. Bulger** has been named distributor sales manager of Signetics Corp., Sunnyvale.

# Manufacturer / Representative Index

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| The Nortronics Co. | Nickerson-Gray & Assoc. |
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| Pastoriza Electronics | W. K. Geist Co. |
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| Polarad Electronic Instruments | T. Louis Snitzer |
| Precision Mechanisms Corp. | Components Sales |
| Quan-Tech Labs | Jay Stone & Assoc. |
| Reeves-Hoffman Div. of Dynamics Corp. of America | L & M Engineering |
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| Wiltron Co. | O'Halloran Assoc. |
| Wyle Laboratories | V. T. Rupp Co. |

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P. O. Box 1383
San Carlos; 593-6057

**Components Sales California**
Palo Alto; 326-5317

**Dietrich-Heffner Associates**
2555 Park Blvd.,
Palo Alto; 321-4321

**Dynamic Associates**
1011 Industrial Way,
Burlingame; 344-2521

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

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

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

**Nickerson-Gray & Assoc., Inc.**
P. O. Box 11295
Palo Alto; 326-0152

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

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

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

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

**Walter Associates**
175 S. San Antonio Road,
Los Altos; 941-3141

**Wadsworth-Pacific Mfg. Assoc., Inc.**
71 Parker Avenue, Atherton;
321-3619

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

*student branch news*

### CAL STUDENT WINS FORTESCUE

Bruce A. Wooley, 22, University of California, Berkeley, has been named to receive the 1966-67 Charles LeGeyt Fortescue Fellowship of $2,500 for post-graduate work which he has begun at UC in the areas of electronic circuits and solid-state electronics, following graduation in June with the BSEE. His plans include a master's degree and PhD in electrical engineering.

The fellowship is awarded annually by the IEEE board of directors on the recommendation of the scholarship awards committee and the awards board to a student of electrical engineering who has received a degree from a recognized college or university. Nominations are made by student branch counselors supported by faculty recommendations and close January 15.

### MORE FILTER DESIGN

author's experience of building active filters. As illustration of some of the subtle points of active filter design and construction, a detailed example will be given describing:

- relating a desired response function to the required pole zero locations;
- selecting an efficient structure that realizes the pole zero locations in (1) above; and . . .
- discussion of the sensitivity problem in a military environment.

A graduate of Cornell University, where he majored in systems theory and earned the master's degree, the speaker was the co-founder, in 1964, of the Ninic Corp. In 1966 Fairchild acquired the corporation and the active filter patented process which evolved out of his thesis and hired Hurtig and Donald Mitchell, the other co-founder.

### ADVERTISERS INDEX



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