

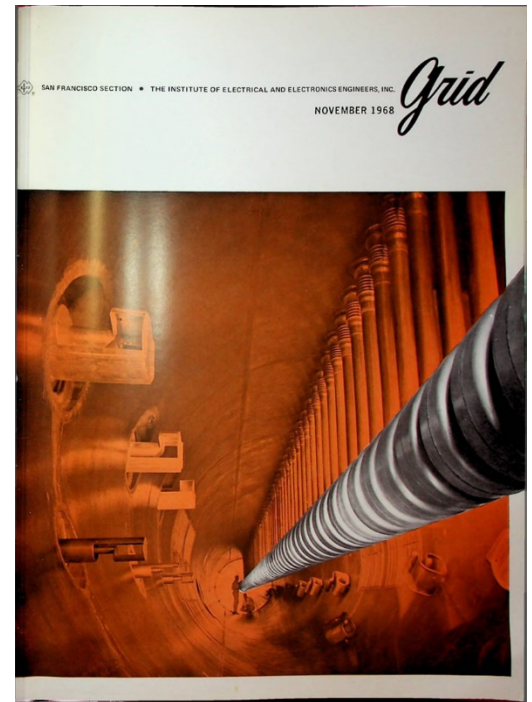
## EDITOR'S PROFILE of this issue

*from a historical perspective ...*

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

November, 1968:

Cover: The drift tubes of the 90-foot-long Hilac, at Lawrence Radiation Lab at Berkeley. Two new elements were discovered using it: Elements 102 and 103. Story on page 6; a tour has been scheduled.



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

[https://ethw.org/IEEE\\_San\\_Francisco\\_Bay\\_Area\\_Council\\_History](https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History)

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

April, 2025

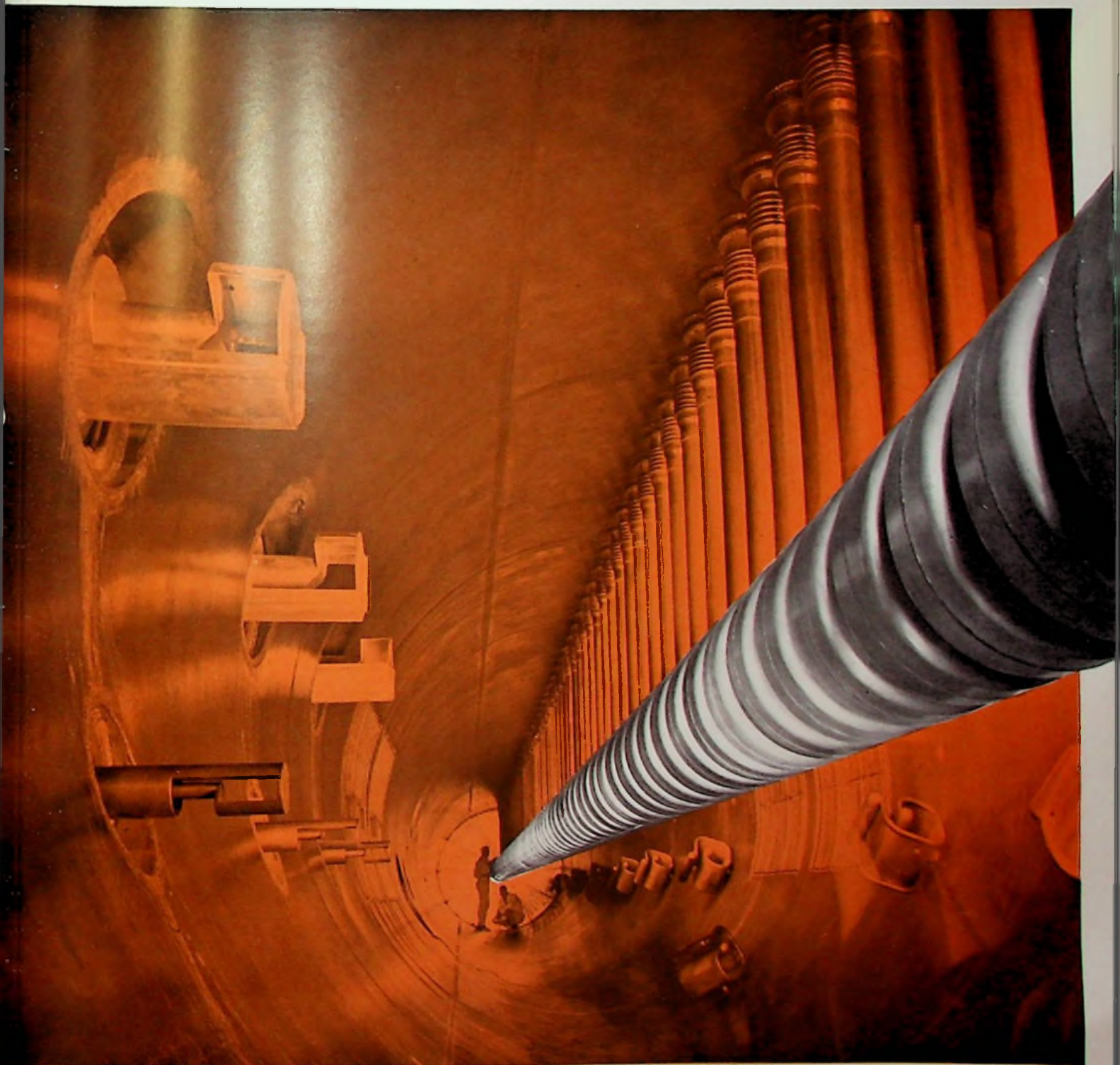
Contact [p.wesling@ieee.org](mailto:p.wesling@ieee.org)



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NOVEMBER 1968

*Grid*





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### ON THE COVER

The view below is of the interior of the 90-foot-long main section of the Hilac, showing some of the 68 drift tubes used for progressive acceleration of particles. With this machine two transuranium elements have been discovered: element 102 in 1958 and element 103, lawrencium, in 1961. The Hilac will be one of the highlights of a tour of Lawrence Radiation Laboratory, Berkeley, sponsored by the East Bay Subsection Nov. 25. Story on page 6.

*Grid*

volume 15  
number 3

NOVEMBER, 1968

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# MEETING

## AEROSPACE & ELECTRONIC SYSTEMS NOV. 21

Story on  
page 10

A BACKGROUND OF SOLID STATE RELAYS. Ed Lewis, President, Marin Controls Co., Belmont.

NOV. 21, Thursday, 8:00 p.m., Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto. No dinner. For information: Al Hastings, 742-0372.

## ANTENNAS & PROPAGATION NOV. 14

Story on  
page 16

THE ATMOSPHERE OF MARS AND VENUS. Prof. Von R. Eshleman, Co-Director, Stanford Center for Radar Astronomy.

NOV. 14, Thursday, 8:00 p.m., Lockheed Auditorium, Bldg. 202, 3251 Hanover, Palo Alto. Dinner: 6:00 p.m., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Dr. Allen Smoll, 326-4350, ext. 5854 by 11/14.

## AUDIO & ELECTROACOUSTICS NOV. 21

Story on  
page 15

SOME THOUGHTS FOR SPECIFICATIONS FOR AUDIO MAGNETIC TAPES. Nywood Wu, Ampex Corp.

NOV. 21, Thursday, 7:30 p.m., Ampex Cafeteria, 401 Broadway, Redwood City. No dinner.

## AUTOMATIC CONTROL NOV. 19

Story on  
page 11

THE BART INTEGRATED CONTROL SYSTEM. J. R. Asmus, Chief Electrical Equipment Engineer, Parsons Brinckerhoff-Tudor-Bechtel, S.F.

NOV. 19, Tuesday, 8:00 p.m. Engineering Center at University of Santa Clara, Room 551. Dinner: 6:30 p.m., Le Boeuf Restaurant near the Center. No reservations required.

## CIRCUIT THEORY NOV. 20

Story on  
page 11

SYNTHESIS OF RESISTIVE DIGITAL-TO-ANALOG CONVERTERS. Prof. Sanjit Mitra, Electrical Engineering, University of Calif. at Davis.

NOV. 20, Wednesday, 8:00 p.m., Room 134 McCullough Bldg., Stanford. Dinner: 6:00 p.m., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Jean Helmke, Section Office, 327-6622.

## COMMUNICATION TECHNOLOGY NOV. 20

Story on  
page 8

DESIGNING MICROWAVE SYSTEMS FOR TELEPHONE SERVICE. Walt Kayser, Senior Engineer, Pacific Telephone Co., San Jose. Joint meeting with San Jose State Student Branch.

NOV. 20, Wednesday, 8:00 p.m., Engineering Bldg., Room E 132, San Jose State. Cocktails at 5:45 p.m., dinner at 6:30 p.m., Paolo's, 12th St. and East Santa Clara, San Jose. Reservations: A. M. Seymour, (415) 593-8491 or Paul Ahern (408) 291-4415 by Nov. 18th.

## EAST BAY SUBSECTION NOV. 25

Story on  
page 6

TOUR OF LAWRENCE RADIATION LABORATORY, BERKELEY. Lee Davenport, Tour Director.

NOV. 25, Monday, 8:00 p.m., Lawrence Radiation Laboratory, Berkeley. Dinner: 6:00 p.m., Spenger's Fish Grotto, 1919 - 4th Street, Berkeley. Reservations: Oakland: Florence Wanser, 835-8500, Ext. 53; San Francisco: Mary Vilter, 399-4974; San Jose: Linda Jarrett, 291-4567 (AC 408). By Nov. 18, for both tour and dinner.

## ELECTROMAGNETIC COMPATIBILITY NOV. 18

Story on  
page 8

APPLICABILITY OF EMI SPECIFICATIONS. Guy L. Ottinger, Senior Staff Engineer, Lockheed M & S Co., Sunnyvale.

Nov. 18, Monday, 8:00 p.m., Hewlett-Packard Auditorium, 1501 Page Mill Road, Palo Alto. Dinner: 6:00 p.m., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Bill Swift, 326-7000, Ext. 3088.

## ELECTRON DEVICES NOV. 13

Story on  
page 18

A STATUS REPORT ON ACOUSTIC SURFACE WAVES AND THEIR APPLICATIONS. Dr. Bertram A. Auld, Senior Research Associate, Microwave Lab, Stanford.

NOV. 13, Wednesday, 8 p.m., Physics Lecture Hall, PH 101, Stanford. Meet at 6:00 p.m. Dinner at 6:30 p.m., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Glenna Morris, 327-7800, Ext. 360 by Nov. 8th.

## ENGINEERING IN MEDICINE & BIOLOGY NOV. 19

Story on  
page 10

THE NEW ELECTROTHERAPEUTICS, ELECTROANESTHESIA, ELECTROSLEEP AND ELECTROPROSTHESIS. David V. Reynolds, experimental psychologist, SRI.

NOV. 19, Tuesday, 8:00 p.m., Conference Room B, Bldg. 1, Stanford Research Institute, 333 Ravenswood Ave., Menlo Park. No dinner.



# CALENDAR

## INDUSTRY & GENERAL APPLICATIONS NOV. 14

Details not known at press time. Watch for mailing to IGA members for calendar data and story. Nov. 14, Thursday, 8:00 p.m.

## INFORMATION THEORY NOV. 21

Story on  
page 16

**THE COVARIANCE-FACTORIZATION PROBLEM AND SOME APPLICATIONS.** Thomas Kailath, Professor at Stanford University.

NOV. 21, Thursday, 8:30 p.m., Stanford Research Institute, Bldg. 1, Conference Room B, 333 Ravenswood Ave., Menlo Park. Dinner: 6:15 p.m., Red Cottage, El Camino Real, Menlo Park. Reservations: Ethel Weaver, 326-6200, ext. 2389 by Nov. 20th.

## INSTRUMENTATION & MEASUREMENTS NOV. 13

Story on  
page 12

**MEASURING CARDIAC OUTPUT IN HUMANS AND ANIMALS.** Con Rader, Applications Research Engineer, Beckman Instruments, Inc., Palo Alto.

NOV. 13, Wednesday, 8:00 p.m., Hewlett-Packard Conference Room 5M, 1501 Page Mill Road, Palo Alto. Meet the speaker dinner: 6:30 p.m., Dinah's, El Camino, Palo Alto. Reservations: Shirley Quinn, 735-5444 by Nov. 11th.

## MAGNETICS DEC. 12

Story on  
page 16

**SONIC FILM BLOCK ORIENTED RANDOM ACCESS MEMORY.** Dr. R. Shahbender, RCA Research Laboratories, Princeton, N.J.

DEC. 12, Thursday, 8:00 p.m., Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto. No dinner.

## MICROWAVE THEORY & TECHNIQUES NOV. 6

Story on  
page 12

**MEASUREMENT OF FREQUENCY AND BEARING OF RECEIVED RADAR SIGNALS.** Ralph Levy, Microwave Development Laboratory.

NOV. 6, Wednesday, 8:00 p.m., Hewlett-Packard Auditorium, 1501 Page Mill Road, Palo Alto. No Dinner.

## PARTS, MATERIALS & PACKAGING NOV. 26

Story on  
page 18

**SECOND LECTURE IN SERIES OF FIVE ON EIGHT ASPECTS OF MICROELECTRONICS.** Dr. D. A. McWilliams, Moderator. Speakers: 1. Randolph C. Early, General Electric Co. — **THICK FILM NETWORKS.** 2. Michael Ohanian, Oak Electro-Netics Corp — **HYBRID MICRO-ELECTRONIC BONDING AND PACKAGING METHODOLOGY.**

NOV. 26, Tuesday, 7:30 p.m., Hewlett-Packard Room 5 M, Bldg. 5, 1501 Page Mill Road, Palo Alto. No dinner.

## POWER NOV. 12

Story on  
page 19

**EHV TRANSMISSION.** W. S. Price, Engineering Specialist and Consultant, Bechtel Corp.

NOV. 12, Tuesday, 7:30 p.m., Engineers' Club of San Francisco, Pine and Sansome Sts., S.F. Cocktails: 5:30 p.m., Dinner: 6:30 p.m. Reservations: Engineers' Club; 421-3184 by Nov. 11th.

## RELIABILITY NOV. 21

Story on  
page 15

**INTRODUCTION TO LASER RELIABILITY.** Harold R. Caldwell, Sylvania Electronic Systems, Mt. View.

NOV. 21, Thursday, 8:00 p.m., PH 101, Stanford University. Social: 6:00 p.m.; Dinner: 6:45 p.m., Stanford View Restaurant, 1921 El Camino, Palo Alto. Barbequed Steak \$3.00 including tax and tip. Reservations: Fran Hamada, (408) 743-1577 by Nov. 19th.

## SANTA CLARA VALLEY SUBSECTION NOV. 20

Story on  
page 14

**ANALOG VS. DIGITAL — A DEBATE.** Marvin Rudin, moderator. Panelists: Norm Pobanz, EAI, Ralph Wheeler, Lockheed, Wendell Sander and John Nichols, Fairchild.

NOV. 20, Wednesday, 7:30 p.m., Philco-Ford Cafeteria, 3825 Fabian Way, Palo Alto. 6 p.m. pre-meeting gathering for cocktails at Chez Yvonne, El Camino, Mt. View. Information: Marvin Rudin, Fairchild Semiconductor, 321-7250, Ext. 2391.

## SYSTEMS, SCIENCE & CYBERNETICS NOV. 14

Story on  
page 12

**AIR POLLUTION.** Dale H. Hutchison, Asst. Vice President, Physical & Life Sciences, SRI.

NOV. 14, Thursday, 8:00 p.m., SRI Conference Room B, 333 Ravenswood Ave., Menlo Park. Dinner: 6:00 p.m., Stone Cellar, El Camino, Menlo Park. Reservations: Marge Hensley, 324-4701 by Nov. 13th.

## VEHICULAR TECHNOLOGY NOV. 18

Story on  
page 14

**MOBILE SYSTEM RELAY EVALUATION.** Art McDole, Director, Communications Dept., Monterey County.

NOV. 18, Monday, 8:00 p.m., City of San Jose Communications Center, 171 West Mission St., San Jose. Cocktails at 6:00 p.m., dinner at 6:45 p.m., at Plateau 7 Restaurant, 777 First St., San Jose. Turn off Bayshore at First St. and continue to Mission St. in San Jose. Reservations: 349-3111 or 526-1446, by Nov. 16th.

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**Engineers (2)** Perform system analysis on Electro-Optics EW systems. Requires MS/PhD Physics or Electrical Engineering, two years electro-optic systems analysis or electro-optic system design.

**Engineers (3)** Design mechanisms, structures and packaging for electro-optical devices, equipment and systems. BSME required.

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**Managers** — Responsible for organizing, directing and participating in the design and development of a variety of electronic equipment for use in electro-optical systems. BS/EE required, MS/EE preferred. Must have recent experience directly applicable to LLLTV camera design.

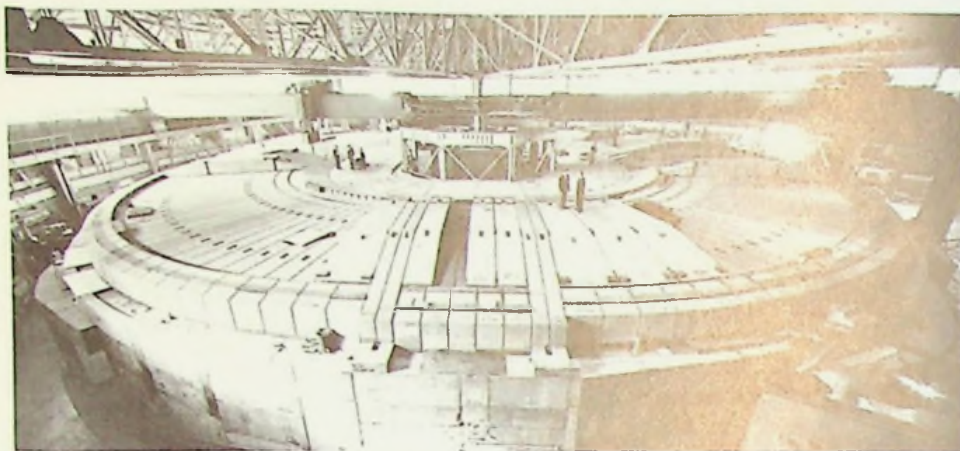
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# Lawrence Radiation Laboratory Tour



The Bevatron is a machine that accelerates protons to relativistic energies — that is, energies at which the velocity of the particles approach the velocity of light.



In addition to its uses in nuclear research, this machine is used for production of unusual radioisotopes and for investigation of new fields of research in both conventional and space biology and medicine.



This machine — the world's largest cyclotron — produced the first man-made mesons in 1948 and marked the birth of experimental high-energy physics in the laboratory.

The East Bay Subsection will sponsor a tour of Lawrence Radiation Laboratory, on Monday evening, November 25. Lawrence Radiation Laboratory contains one of the largest arrays of nuclear and high energy particle research equipment ever assembled. The laboratory, located in the Berkeley hills overlooking the University of California and San Francisco Bay, is the home of American nuclear research. It has produced seven Nobel prize winners since it was founded in 1939. Berkeley Scientists have found 7 of the 11 transuranium elements at Berkeley. (The other four were discovered or isolated by Berkeley Scientists at other locations).

The tour will start at 8 p.m. under the direction of Mr. Lee Davenport. A short film will be shown describing the laboratory and its work. After the film small groups will be escorted through the laboratory with individual guides. Dinner at Spengers Fish Grotto will precede the tour. Dinner will start at 6 p.m. with cocktails at 5:30 p.m.

This same tour was held last year but unfortunately many people were disappointed because they could not get reservations. The tour is limited to 64 people, so get your reservations in early. Upon receipt of your reservation a map will be mailed giving detailed instructions on how to get there. Reservation cutoff date is November 18. See calendar.

## Hear Floyd Erps of John Fluke speak on advanced synthesizer techniques.

John Fluke Mfg. Co., Inc. is pleased to present Mr. Floyd Erps at an in-depth seminar on advanced synthesizer techniques in San Francisco on November 22, 1968.

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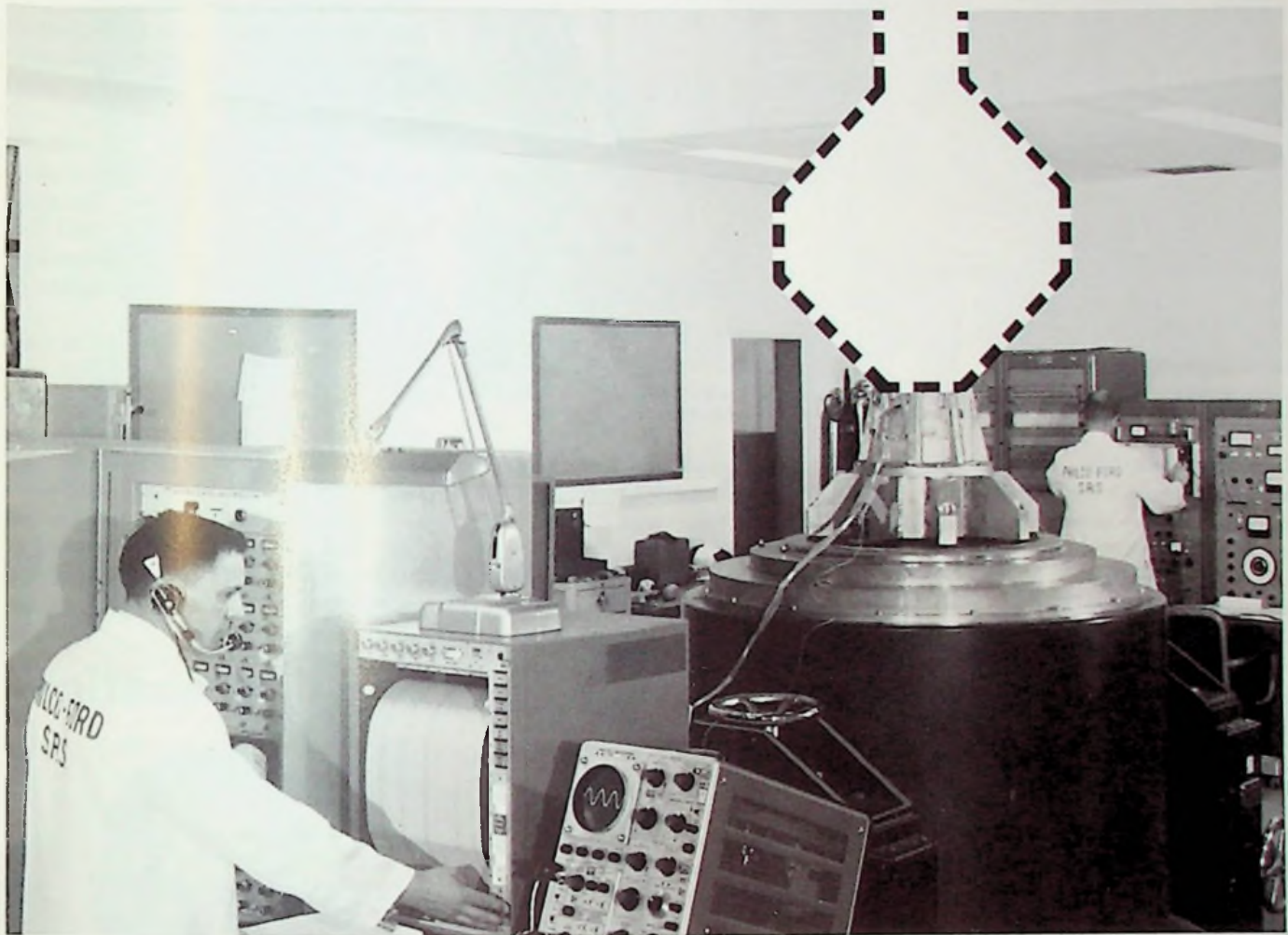
## Mountain Mirrors



Twin aluminum "billboards" atop mountain get a once-over from Burnell B. Barrick, radio chief for Lockheed Missiles & Space Co. During tests of missiles or spacecraft, reflector in the background receives microwave beam from LMSC plant in Sunnyvale, Calif., and reflects beam onto foreground reflector, which sends microwave signals on to remote Santa Cruz Test Base. New microwave system carries test data back and forth over mountains, saving engineers telephone calls, mail delays and 55-mile road trip — thus speeding trouble-shooting process.



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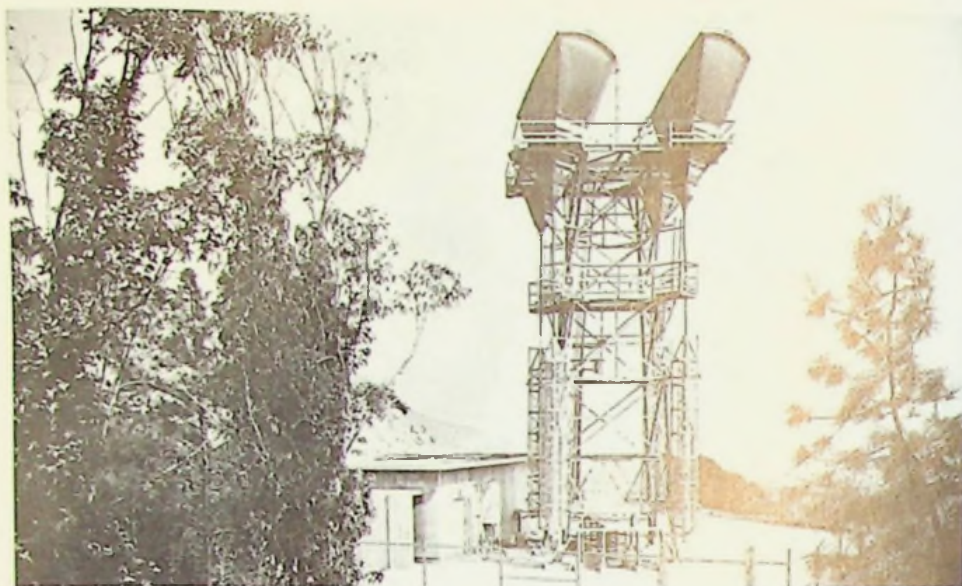
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# ComTech to Hear Walt Kayser



This is one of the many Bell System microwave antennas located in the Bay Area. It serves as part of one of the backbone microwave routes of which there are many throughout the United States.

Designing Microwave Systems for Telephone Services is the subject of the ComTech Chapter meeting, November 20, at which Walt Kayser will speak. Mr. Kayser is a Senior Engineer in the Radio Transmission Microwave Design & Elec-

tromagnetic Compatibility Department at Pacific Telephone & Telegraph Company. He has been with the company since 1946 having assignments in all technical phases of telephone communications for 21 years, including micro-

wave, mobile radio, and telephone carrier equipment. He is presently working in microwave-system design and frequency coordination.

Mr. Kayser will give a general description of our Comsat microwave system that inter-connects with the Earth Station at Jamesburg, Calif., the Jamesburg Earth Antenna and Equipment, other Bell systems microwave routes, current message and TV capabilities and problems in frequency coordination (microwave interference in the 4-6-11 6Hz common carrier band). He will also discuss the responsibilities and duties of the Transmission Engineer, Equipment Engineer (PT&T and WECO) and Plant Department in the overall undertaking. Slides, photographs and some equipment display will be used.

This joint meeting with the San Jose Student Branch is called for 8:00 p.m., November 20, at the Engineering Building, Room E 132 at San Jose State College. A no-host dinner and cocktails will precede the meeting at Paolo's. Cocktails at 5:45 and dinner at 6:30 p.m. Call Paul Ahern or A. M. Seymour by November 18 for reservations. See calendar.

## Applicability of EMI Specifications

One of the primary tools for controlling electromagnetic interference (EMI) on government contracts is the specification. Through usage it has been found that many requirements of these specifications are not applicable to specific applications. This can be expected for a specification having general applicability; however, there are areas of EMI control within these specifications which are covered improperly, if covered at all. Guy Ottinger will discuss some of these problem areas and suggest possible solutions during the Electromagnetic Compatibility meeting scheduled for 8:00 p.m. Monday, November 18.

In the talk several EMI specifications shall be used to illustrate the nature of the problem. These specifications are MIL-STD-826A, NASA MSC-ASPO-EMI-10A, LMSC-447969B, MIL-STD-461, and MIL-E-6051C. Using these specifications' limits the relationship between generation and susceptibility limits will be examined. Mr. Ottinger will conclude by stating that this analysis shows that a thorough study and test program is needed to establish the proper relationship between equipment EMI requirements and system performance.

Guy L. Ottinger, Senior Staff Engineer, Electrical Systems, Space System



Division, joined Lockheed Missiles and Space Company in 1960. He has been engaged in Electromagnetic Compatibility and Interference Control activities since 1961, having organized and managed the Space Systems EMC Group since that time. He has been active in IEEE, having been Chairman of the 1965 IEEE EMC Symposium, Vice-Chairman of the 1968 IEEE EMC Symposium, and past chairman of the San Francisco Chapter of the G-EMC. His B.S. and M.S. Degrees in the field of Electrical Engineering were awarded by M.I.T.

Rick's Swiss Chalet will serve dinner at 6:00 p.m. Meeting location is the Hewlett-Packard Auditorium. Reservations. See calendar for details.

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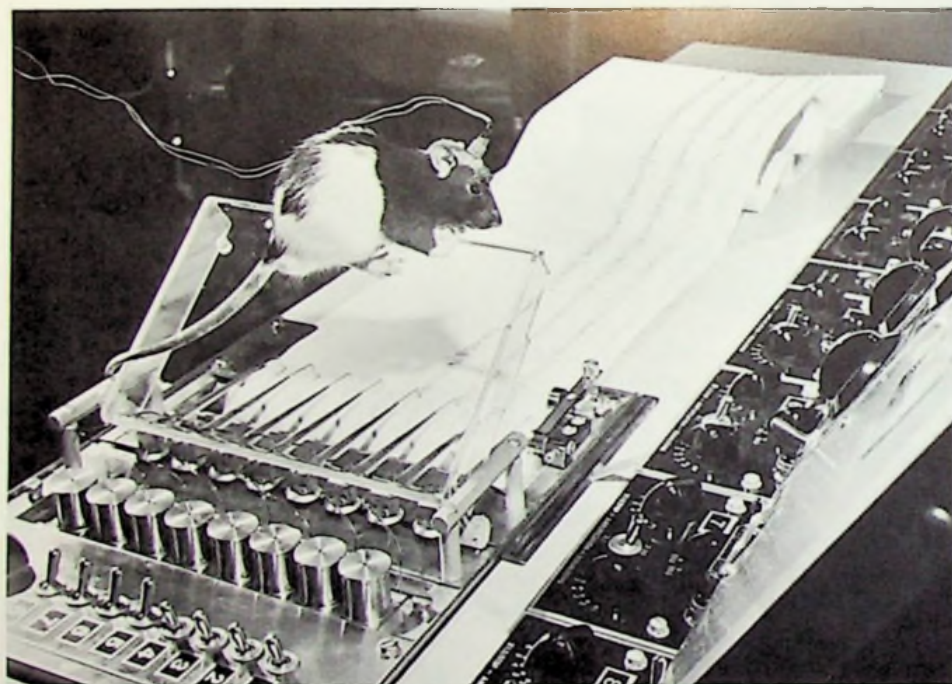
Fil-Shield Division Filtron Co., Inc., 3643 Lenawee Avenue, Los Angeles, California 90016



# The New Electrotherapeutics



Details of rat with implanted EEG and impedance electrodes.



Rat with in-dwelling electrode which permits both brain stimulation and recording of brain activity.

The Engineering in Medicine and Biology Chapter will have as a guest speaker David V. Reynolds at their Tuesday, November 19 meeting. Dr. Reynolds is an Experimental Psychologist, Stanford Research Institute, an Assistant Professor, University of California Extension, and Conference Chairman of the Neuroelectric Conference to be held in San Francisco in February. His work has been primarily in the investigation of brain structures and neuroanatomical study of pain systems. His present research interests include Neuroanatomical substrates

of electrical anesthesia.

After a brief discussion of the rather long history of Electrotherapeutics, Dr. Reynolds will describe his own work in this area. A question period will allow expansion on the areas that may be of special interest.

The meeting place, at 8:00 p.m., is Conference Room "B", Building 1, Stanford Research Institute. Building 1 is the main entrance building, directions to Conference Room B will be available in the lobby. No dinner. See Calendar.

The idea of anesthetizing by electrical means instead of with chemicals has intrigued physicians ever since the turn of the century. Such a technique, if it could be perfected and had no side effects, has obvious advantages. The body would not have to contend with the anesthetizing chemicals the period of unconsciousness would be reduced; and recovery would be hastened.

Considerable research on electrical anesthesia has been conducted for many years.

Under National Institutes of Health sponsorship, physiological psychologists at SRI have been taking a more direct approach to searching out the missing information. The method of experimentation is to use animals (generally squirrel monkeys) with electrodes implanted in various systems of the brain.

In this research the scientists are effectively mapping for the first time the areas where continuous stimulation results in anesthesia. There is the possibility that, with this knowledge, chronic pain can be eliminated or reduced by electrical stimulation. While techniques for routine electrical anesthesia are a considerable distance away, the foundations are being laid.

## Solid State Relays

"A Background on Solid State Relays" will be discussed at the Aerospace & Electronics Systems Chapter meeting, Thursday, November 21.

Since the advent of semiconductor devices, the inevitable trend has been toward completely solid-state systems. The advantages, both obvious and subtle, are attractive and profound.

Solid state relays represent a highly intriguing but little understood component. Their many advantages over the more conventional electro mechanical type are of special interest to the Aerospace systems engineer.

Marin Controls Company headed by Mr. Ed Lewis, the speaker of the occasion, is a small and rapidly growing manufacturer of solid state relays, solid state temperature controllers, and specialized equipment for major semiconductor device manufacturers. Mr. Lewis is especially qualified to present a comprehensive overview of solid state relays, their advantages and limitations, and their applications in the contemporary systems design. Examples of typical products will be shown.

The meeting is scheduled for 8:00 p.m., Lockheed Auditorium. No dinner.



## Resistive Digital-to-Analog Converters



S. K. Mitra

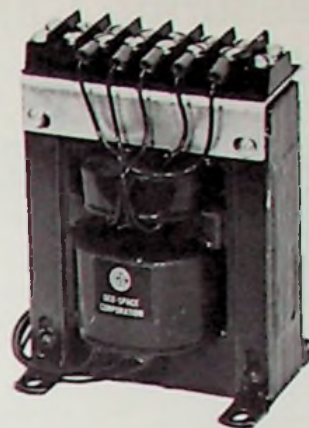
Mitra, Department of Electrical Engineering, University of California, Davis, at the Circuit Theory Chapter meeting Wednesday, November 20, at 8:00 p.m. The meeting will be held at Stanford University with dinner before at Rick's Swiss Chalet. See calendar for details.

Dr. Mitra was born in Calcutta, India and received the B.Sc. (Hons.) degree in physics in 1953 from Utkal University, Cuttack, India, the M.Sc. (Tech.) degree in radio physics and electronics in 1956 from Calcutta University, the M.S. Degree in 1960 and the Ph.D. degree in 1962 in electrical engineering from the University of California, Berkeley.

He was with the Bell Telephone Laboratories, Holmdel, N.J., 1965-67. At present he is an Associate Professor of electrical engineering at U.C. Davis.

Dr. Mitra has published a number of papers in the field of active and passive networks and is the author of a forthcoming book entitled, "Analysis and Synthesis of Linear Active Networks" to be published by John Wiley and Sons, New York, N.Y.

Dr. Mitra is a member of Sigma Xi and Eta Kappa Nu.



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J. R. Asmus

and assumed the additional duties in charge of the Equipment Section in 1966. Before joining the Joint Venture he was employed by Bechtel Corporation in the Power and Industrial Division.

The meeting is set for 8:00 p.m. in Room 551 of the Santa Clara University Engineering Center. Dinner at 6:30 p.m. at Le Boeuf's across from the University. No reservations required.

## IBART's Integrated Control System

The objectives of the San Francisco Bay Area Rapid Transit system, now under construction, place particular requirements upon the design of the transit vehicle, its power supply system and the control system.

The control system for BART is unique in the rapid transit industry in that for the first time it brings together in one system all the functions required for the operation of trains. The BART control system integrates train control, electrification control, and the support facilities control. The paper on BART Integrated Control System will cover the significant features of this coordinated operational facility at the Tuesday, November 19 meeting of the Automatic Control Chapter.

The featured speaker, Mr. J. R. Asmus, is the Chief Electrical/Equipment Engineer of Parsons Brinckerhoff-Tudor-Bechtel, the Joint Venture engineering firm responsible for the detail design and management of construction of the San Francisco Bay Area Rapid Transit system. He was appointed Chief Electrical Engineer of the Joint Venture in 1963



## Measuring Cardiac Output in Humans and Animals



Flow-through cuvette used with dye dilution cardiac output instrument.

Numerous methods for determining the blood flow rate through the heart have been attempted. Not all have been successful! Various historical approaches to the measurement of cardiac output will be reviewed by Con D. Rader during the November 13 meeting of the Instrumentation & Measurement Group.

The direct method, utilizing probes mounted on major vessels, will be described and the limitations of this technique from a medical standpoint will be indicated.

The indirect methods, now widely used, will be outlined. Instrumentation requirements for doing both Fick and indicator dilution cardiac output determinations will be presented. Special attention will be given to the dye dilution method.

Areas where engineering efforts can be applied to advance this important medical measurement will be presented.

Opportunity will be provided for questions and discussion.

Mr. Con Rader received his B.S. degree in 1959 and M.S. degree in 1960 at the University of Nebraska. From 1960 to the present he has been employed by the Spingo Division of Beckman Instruments. At the Palo Alto-based division he served as project engineer from 1960 to 1963, developing medical instruments. Since 1963 he has worked as an applications research engineer in the area of physiological instrumentation. In this position he evaluates and uses newly-developed instruments in a medical environment. Mr. Rader is a member of IEEE, AAAS and recently taught a bio-instrumentation course at the University of Santa Clara.



The meeting will be held Wednesday, November 13 at 8:00 p.m. in Conference Room 5M at Hewlett-Packard. Dinner at Dinah's 6:30 p.m. Reservation by November 11. See calendar.

## Dale Hutchison Reviews Air Pollution

A review will be given of the variety of air pollution problems in the United States to those attending the Systems Science and Cybernetics meeting on Thursday, November 14. Emphasis will be given to the complex problem of Los Angeles smog. A discussion will be given of the remedial measures which can be taken and of the inter-relationships of these remedial steps. Problems yet to be solved will be discussed.

Dale H. Hutchison received his B.S. in 1938 at Tarkio College, Tarkio, Mo. and attended Graduate Schools as follows: Kansas University, Washington University, St. Louis, New York University and Stanford University. Mr. Hutchison has been with SRI since 1951. During this

period he has moved from Atmospheric Physicist, Mgr., Air Research Laboratories, Assistant Director Physical & Life Sciences, General Manager, Physical Sciences, to Assistant Vice President, Physical & Life Sciences. He has worked on and directed Air Pollution research for many years. He has been a member of the Advisory Committee to the Director of the California Department of Public Health and of the Advisory Committee of the Bay Area Air Pollution Control District.

SRI Conference Room B is to be the meeting place with dinner at 6:00 p.m. at the Stone Cellar. Reservations by November 13. Meeting time—8:00 p.m. See calendar for details.

## Measuring Received Radar Signals

The development of wide band coaxial and strip transmission line hybrids has enabled phase discriminators to be constructed which will operate over extremely wide frequency ranges, e.g. 3 or 4 octaves. The techniques to be described for accurate and instantaneous frequency and/or bearing measurement, with 100% probability, are all dependent on the phase discriminator as a basic module.

Essentially the discriminator is a device giving video outputs proportional to the sine and cosine of some electrical length which is either a path within the discriminator itself, or a path difference between signals received by a pair of antennas. In the former case the electrical length of the path within the discriminator is proportional to frequency, and in the latter instance the phase difference between signals received by the antennas is dependent on both frequency and bearing. In either case the electrical length may be varied to give different degrees of discrimination.

Although the accuracy of a single discriminator with its associated detectors and amplifiers is limited, the error may be reduced by a factor of 10 or even 100 by paralleling two or more discriminators with different amounts of discrimination (or slope). Using this principle a wide variety of systems have been proposed, and some developed, for several applications.

The speaker, Dr. Ralph Levy, will describe the wide variety of systems proposed and developed to the Microwave Theory & techniques Chapter meeting Wednesday, November 6 at 8:00 p.m.



Dr. Ralph Levy is Research Coordinator at Microwave Development Laboratories, Natick, Massachusetts. His research interests are mainly in microwave components and the circuit

theory of distributed networks, but is in the past also concerned countermeasures systems, broadband amplifiers, and matching theory.

He was for three years a faculty member of the Electrical and Electronics Engineering Department of Leeds University, England.

He is a graduate of the University of Cambridge and received his Ph.D. from London University.

The meeting locale is Hewlett-Packard Auditorium, 1501 Page Mill Road, Palo Alto. No dinner.



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## ANALOG vs. DIGITAL – A Debate!

The November 20 meeting of the Santa Clara Valley Subsection will feature all facets of Analog vs. Digital including systems use, design, and hardware implications. A panel format will be used with a 5-minute introduction by the moderator and 4 ten-minute talks by the panelists, followed by a one-hour debate, which will be open to members of the audience who wish to join in. Controversy and controversial viewpoints will be encouraged. It is intended that this be both a rewarding technical meeting, and an experiment in achieving greater stimulation and participation of the audience.



Marvin Rudin



Ralph Wheeler



Wendell Sander



John Nichols

The session organizers are Marvin B. Rudin, Fairchild Semiconductor R&D and Andrew F. Leon, IBM, of the SCVSS Executive Committee. Mr. Rudin will be Panel Moderator, and the panelists will be Norm Pobanz, B.S. Engineering, 1958, UCLA, with 10 years in application of analog and hybrid computers and solution of scientific problems: 1958-60 at Marquardt, 1960 to present at EAI Computer Center (Palo Alto); Ralph Wheeler, B.A. Math, 1956, University of Denver, Graduate work at Stanford in 1961; 1957 to present, at Analog and Hybrid Computer Department of Lockheed, supervising 1 of 2 large hybrid facilities; Wendell Sander, BSEE, 1956, PhDEE, 1964, Iowa State: Gilfillan in telemetry, Tasker Instruments in Special Projects in Hybrid Computers and computer displays, presently at Fairchild Semiconductor, manager of Digital Systems and LSI, R&D and heads San Francisco IEEE Computer Group; John Nichols, B.S., 1960, Math, California

State Polytechnic College: 1960-65, Philco Western Development Labs (Palo Alto) where he participated in both the design of special computer input and output equipment and the computer programming for real time control of satellite ground station operation, 1965 to present, Systems Engineering section of Fairchild Semiconductor where he has been working on the application of digital integrated circuits to present and future system applications; and Marvin Rudin, BSEE, 1949, MSEE, 1951, California Institute of Technology: 19 years in various electronics development – magnetic components, servo mechanisms, radar, microwave stalos, telemetry analysis and design, digital computers, aerospace systems – and presently Manager, Linear Integrated Circuits, R&D at Fairchild Semiconductor.

The meeting will be at the Philco-Ford Cafeteria at 7:30 p.m. and 6:00 p.m. pre-meeting gathering for cocktails at Chez Yvonne. See calendar for details.

## Evaluation of Mobile Relay Systems



Art McDole

At the Vehicular Technology meeting Monday, November 18, Art McDole, Director of Communications for Monterey County, Chairman, Frequency Advisory Committee Northern APCO, will discuss the advantages and disadvantages

of mobile relay systems as compared to other types of two-way systems. This will include both operational and technical considerations. He will cover various engineering requirements of mobile relay type operation including tone coding and antenna design. F.C.C. rules and regulations for mobile relay operation in various types of service and other similar subjects will be included in open discussion to follow the paper.

The City of San Jose Communications Center will be the meeting location at 8:00 p.m. Cocktails at 6:00 p.m. with dinner at 6:45 p.m. at Plateau 7 Restaurant. Reservations. See calendar for details.



## Specs for Audio Magnetic Tapes by Wu

The Audio & Electroacoustics chapter will hold a meeting November 21 at 7:30 p.m. in the cafeteria of Ampex Corporation, 401 Broadway, Redwood City. No dinner is planned. Mr. Nywood Wu will present a talk entitled "SOME THOUGHTS ON SPECIFICATIONS FOR AUDIO MAGNETIC TAPES."

Although there are U.S. Government specifications for magnetic tapes for audio applications, the requirements are not realistic for most of the present consumer and professional applications. One of the manufacturing organizations (the EIA) has made some progress in specifying test methods and physical requirements, but nothing exists which approaches the type of specifications available for audio amplifiers or other electronic equipment. Another stumbling block to specifications is the lack of universally acceptable methods of specifying the recorded signal in absolute terms. An alternative or a necessary adjunct to absolute measurements would be the easy availability of calibrated recording alignment tapes. These are not generally available, though tapes for standardizing playback systems have been available for some time. A thorny problem from the manufacturer's viewpoint is that he must test tapes in his QC operation with only one standard test system, using a single type of head stack. Since there is a strong interaction between the tape characteristics and the system on which the tape is used, a set of specifications based on the manufacturer's test system may be nearly meaningless to the customer.



Mr. Wu will discuss these problems, and explore some of the methods now being used to approach solutions. An outline of some information gathering projects now underway will be presented. The purpose of these projects is to allow the creation of meaningful specifications, possibly by the creation of universally applicable curves or constants, such as are available for active electronic devices.

Mr. Wu received his BS in Electrical Engineering from Stanford University in 1968. Since graduation he has been employed by Ampex Corporation in the Magnetic Tape Laboratory in Redwood City. At present, he is Group Supervisor of the Audio Evaluation Group in the Test and Appraisal Section of the Magnetic Tape Laboratory.

## Introduction to Laser Reliability



H. R. Caldwell



R. S. Cazanjan

On Thursday night, November 21, 1968, the Reliability Chapter will promote a section meeting in which H. R. Caldwell will review a paper entitled "Introduction to Laser Reliability." This paper is to be presented at the National Reliability Symposium in January 1969 and is co-authored by Mr. Caldwell and Mr. R. S. Cazanjan (Sylvania Electronic Systems, Western Division).

The paper will provide engineers with a background in current laser technology and will, hopefully, stimulate people in the Reliability profession to begin examining methods of affecting the orderly development of this challenging device.

Specifically, a laser reliability block diagram will be discussed in concert with the basic theory underlying laser action. Probable failure modes of three types of

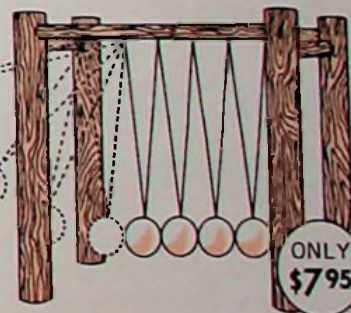
laser systems; solid-state, semiconductor and gas will be examined.

Hal Caldwell is currently a Reliability/Maintainability technical specialist. Previously, he was engaged for several years in electron tube application engineering. He has acted as junior past chairman of the San Francisco Chapter of the Reliability Group. He holds a BSEE degree from California State Polytechnic College and is presently enrolled in the Stanford University Graduate School.

Rudy Cazanjan is Manager of Reliability and Maintainability at Sylvania. Mr. Cazanjan, also, has been a past San Francisco Reliability Group chairman and has presented several papers at various IEEE and MIL/Industry symposia. In 1964 he co-authored the book "Reliability Engineering for Electronic Systems." He holds a BSEE degree from City College of New York and an MBA degree from Hofstra University.

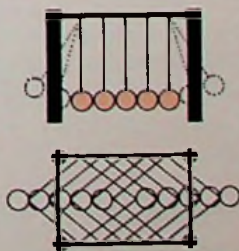
The meeting will be held at Stanford University, Room PH 101, with cocktails at 6:00 p.m. and dinner at 6:45 p.m. at the Stanford View Restaurant. Reservations by November 19th. Meeting at 8:00 p.m. See calendar.

## Any number can play!



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## The Covariance-Factorization Problem and Some Applications

Thomas Kailath of Stanford University will be the featured speaker at the Information Theory meeting on Thursday, November 21, at 8:30 p.m.

Given a covariance  $R(t,s)$ ,  $a \leq t,s \leq b$ , the factorization problem is to determine a causal linear filter which when driven by a white noise process, say  $v(\cdot)$ , yields an output process, say  $y(\cdot)$ , with the given covariance. There may be no such representation for a general "nonstationary" covariance function. However, if there are causal linear representations there is an essentially unique causally invertible linear representation, which has been called by Levy the proper canonical representation (PCR).

Cramer has posed [PROC. FIFTH BERKELEY SYMPOSIUM ON MATH. STAT. AND PROBABILITY, University of California Press, 1967] the problem of defining classes of processes that have such representations. In this paper we shall describe a fairly large class of solutions to this problem and in doing so we shall also answer a question raised by Shepp [ANN. MATH. STAT., 1967]. We shall also present procedures, based on certain Riccati differential equations, for obtaining finite-dimensional factorizations when they exist.



Results on factorization have applications in diverse fields of systems theory. We shall discuss some applications in estimation, detection and control problems.

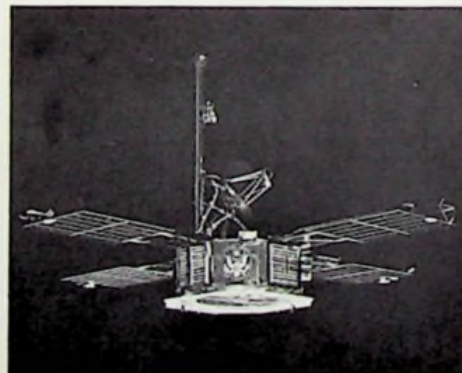
Thomas Kailath was born in Poona, India and obtained his bachelor's degree in Telecommunications Engineering at the University of Poona in June 1956, and his S.M. and Sc.D. degrees at M.I.T. He worked at the Jet Propulsion Laboratories, Pasadena, until January 1963. He is now a Professor in the Department of Electrical Engineering, Stanford University. His research interests are in communication through time-variant channels, continuous-time detection and estimation problems, feedback communication systems and the modeling of stochastic dynamical systems.

He is a member of the IEEE, The Institute for Mathematical Statistics, The Society for Industrial and Applied Mathematics, The American Mathematical Society, URSI and Sigma Xi.

The meeting location is SRI, dinner at The Red Cottage at 6:15 p.m. Reservations by November 20. See calendar.

## Atmosphere of Mars and Venus by Eshleman

Great strides have been made in our understanding of the atmospheres of our nearest planetary neighbors, based on U.S. and Soviet spacecraft measurements. Mars has a tenuous  $\text{CO}_2$  atmosphere, at less than one percent Earth's pressure, which is so cold that it may freeze and snow to the surface. Venus has a dense  $\text{CO}_2$  atmosphere, at one hundred times Earth's pressure, which is so hot it would melt lead. Despite these differences, there are a number of similarities and both atmospheres may have been strongly influenced by the solar wind in their evolutionary history. The experiments, the results, and their implications will be discussed at the Antennas and Propagation meeting Thursday, November 14, at 8:00 p.m. by Professor Von R. Eshleman, Professor Electrical Engineering, Stanford University, and Co-Director, Stanford Center for Radar Astronomy. Prof. Eshleman was the experimenter aboard Mariner spacecraft projects for



Mariner 67

the exploration of Mars and Venus, and aboard the Pioneer series of spacecraft. His work and interest also have been associated with radar astronomy, propagation, electromagnetic theory. He is a Fellow of IEEE.

The meeting will be held at Lockheed Auditorium, Building 202. Dinner — Rick's Swiss Chalet at 6:00 p.m. Reservations. See calendar.

## Sonic Film BORAM

The topic of the Magnetics Chapter meeting on December 12 will be "Sonic Film Block Oriented Random Access Memory." In the sonic film memory, thin magnetic films and propagating strain pulses are combined to realize a nonvolatile block oriented random access memory. The interaction of the strain pulses with the thin magnetic films is used to obtain serial accessing and nondestructive read-out signals.

Experimental data showing coincident selection and nondestructive read operation is presented.

Ternary alloy (Ni-Fe-Co) strain sensitive thin magnetic films have been developed for use in the memory. The magnetic and magnetostrictive properties of these films are described.

Strain pulse generation and propagation in fused quartz substrates is discussed. Experimental data correlating between the strain amplitude at the surface of the substrate and the transducer exciting voltage is presented.

Dr. R. Shahbender, RCA Laboratories, Princeton, New Jersey is the speaker. Dr. Shahbender received a B.E.E. from Cairo University in 1946, an M.S. in Electrical Engineering from Washington University in 1949, and a Ph.D. in Electrical Engineering from the University of Illinois in 1951.

He joined RCA in Camden, N.J., in 1955, and worked in the areas of adaptive systems, nonlinear filters, electron beam devices, ultrasonic devices and airborne fire control systems.

He transferred to RCA Laboratories, Princeton, N.J., in 1959, and has been active in the area of high-speed digital memory systems. He is presently Head of the Computer Digital Devices Research in the Data Processing Research Laboratory.

Dr. Shahbender is a Senior Member of the IEEE, and a Member of Sigma Xi, and Eta Kappa Nu. He has published a number of papers relating to his work and he holds several U.S. Patents.

The meeting time is 8:00 p.m. Thursday, December 12 at Lockheed Palo Alto Research Laboratories, Building 202 Auditorium, 3251 Hanover Street. No dinner.



Von R. Eshleman



R. Shahbender



# 1968 VTG CONFERENCE

VEHICULAR TECHNOLOGY GROUP IEEE  
San Francisco Hilton Hotel, San Francisco, California  
DECEMBER 3-4, 1968

San Francisco is preparing for the 1968 VTG Conference December 3-4 to be held in the Hilton Hotel. Advance programs are being printed now. Registration cards and advance programs will be mailed from IEEE Headquarters to all Vehicular Technology Group members. In addition, the package will be mailed to all Communications Technology Group members located in the San Francisco, Los Angeles, and Portland areas respectively. Others interested in receiving an advance program and registration card may contact any member of the Conference Committee, or in general to the Conference Publicity Chairman, Mr. R. B. Pearce, Room 530, 225 Bush Street, San Francisco, 94120.

We hope you will participate with speakers and even debate where necessary to provide a rewarding exchange of information. There will be more than 20 top-line exhibitors. Also, the ladies will find exciting shopping tours, sightseeing tours and colorful activities, which we feel will enhance their stay. The December 3 banquet speaker will be General Andrew R. Lolli, Director, Department of General Services, State of California. At the luncheon on December 4, Dr. Daniel E. Noble, Vice Chairman of the Board and Group Executive, Technical Divisions, Motorola, Inc. will give the address.

## DECEMBER 3 SESSION I

### DIGITAL TRANSMISSION TECHNIQUES AND VEHICLE LOCATION METHODS.

9:00 A.M. to 12:00 Noon — Session Chairman: R. J. Evans, Michigan State Police

A NEW CONCEPT IN MOBILE TELEPRINTER COMMUNICATION — William Borman, Motorola, Inc.

FIELD TESTING MOBILE TELEPRINTING DEVICES — George E. Mithos, Kleinschmidt Division of SCM Corp.

ALARM AND IDENTIFICATION FEATURES OF THE SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT BUS RADIO SYSTEM — Chandos A. Rypinski, C. A. Rypinski Co.

VEHICLE LOCATOR TECHNIQUES — Walter Loewenstern, Jr., Sylvania Electronic Systems Div. of Sylvania Electric Products Inc.

VEHICLE LOCATION BY A SIGNAL ATTENUATION METHOD — W. G. Figel, N. H. Shepherd, and W. F. Trammell, General Electric Co.

## SESSION II

### LAND MOBILE CHANNEL UTILIZATION AND MARITIME MOBILE COMMUNICATION

1:30 P.M. to 5:00 P.M. — Session Chairman: Walter Darnell, Bell Telephone Company of Pennsylvania

RANDOM TIME SHARING OF A DIGITAL COMMUNICATION CHANNEL — T. J. Hutton, WABCO

EVALUATION TRUNKING FOR LAND MOBILE RADIO SYSTEMS — Dr. Jona Cohn, William Braun, and Eugene Bruckert, Motorola, Inc.

THE EFFECT OF CO-CHANNEL INTERFERENCE ON THE PARAMETERS OF A SMALL CELL MOBILE TELEPHONE SYSTEM — Joel S. Engel — Bell Telephone Laboratories.

VHF MARITIME SERVICE — Cdr. A. A. Kirchner, USN (Ret).

SATELLITE REPEATER ARRANGEMENT IN A NEW MARITIME MOBILE TELEPHONE SYSTEM — Moriji Kuwabara, Kohei Nishino, and Hiroshi Sugihara, Nippon Tel. & Tel.

DIRECT PRINTING TELEGRAPH EQUIPMENT WITH FORWARD ERROR CORRECTION FOR USE IN THE MARITIME MOBILE SERVICE — Moriji Kuwabara, Kohei Nishino, and Yutaka Yoneoka, Nippon Tel. & Tel.

## DECEMBER 4 SESSION III

### ELECTRONIC DESIGN

8:30 A.M. to 12:00 Noon — Session Chairman: William Elder, American Trucking Association

MOBILE RADIO PROPAGATION IN TUNNELS — D. O. Reudink, Bell Telephone Laboratories.

APPLICATION AND USE OF HIGH STABILITY OSCILLATORS — Robert Munn, Motorola, Inc.

TODAY'S MONITORING DILEMMA—TWO CHANNELS AT ONCE — O. S. Giles and S. Paul, General Electric Co.

TRANSMITTER INTERMODULATION—CAUSE OF AND REMEDIES FOR — Edwin S. Oxner and F. Jack Gorry, Melabs.

RECEIVER IM—ENFORCING THE SQUARE LAW — Thomas A. McKee, General Electric Co.

THE EVALUATION AND DESIGN OF MOBILE GAIN ANTENNAS BY COMPUTER SIMULATION — Richard S. Komrmusch, Motorola, Inc.

## SESSION IV

### ELECTRIC PROPULSION AND VEHICLE GUIDANCE

1:30 P.M. to 4:30 P.M. — Session Chairman: Klaus Haase, County of Los Angeles

10 YEARS IN THE TOWER OF SASEL

— F. M. Smith, National Association of Manufacturers.

AN EXPERIMENTAL ROUTE GUIDANCE SYSTEM BY MEANS OF ELECTRONIC ROAD-VEHICLE COMMUNICATIONS — W. G. Trabold and T. A. Prewitt, Delco Radio Division, General Motors Corporation

A STUDY OF AUTOMATIC CAR FOLLOWING — James G. Bender and Robert E. Fenton, Ohio State University.

THE MARS II ELECTRIC CAR — Robert R. Aronson, Electric Fuel Propulsion Inc.

HYBRID ELECTRIC VEHICLE DRIVES — Paul E. Pulliam, Electric Auto Associates.

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# A Report on Acoustic Surface Waves



Bertram A. Auld

Acoustic surface waves on single crystal substrates offer attractive possibilities for miniature devices in the VHF and low microwave frequency regions. Since the energy in a surface wave is confined close to the surface it is particularly suitable for tapped delay line applications, and also for distributed

interactions with thin films deposited on a surface. The latter property has recently been exploited in a simple surface wave acoustic amplifier with 7 dB net terminal gain at 100 MHz. Guiding of acoustic waves by deposited metal strips has also been demonstrated and opens possibilities for realizing microsound transmission lines, hybrids, isolators, phase shifters etc. A report will be given on the present status of acoustic surface wave technology, including a review of relevant papers presented at the September 1968 Ultrasonics Symposium by B. A. Auld, at the Electron Devices Chapter meeting Wednesday, November 13.

The speaker has been at the Microwave Laboratory, W. W. Hansen Laboratories of Physics since 1958, where he is currently a Senior Research Associate in Applied Physics. His research activities are concerned with interactions of electromagnetic and acoustic waves in solids.

Bertram A. Auld received the B.S.

Degree in electrical engineering from the University of British Columbia, Vancouver, B.C., Canada, in 1946. In 1949 he received the M.S. Degree, and in 1952, the Ph.D. degree in electrical engineering from Stanford University, Stanford, California. During the year 1963-64 he was a Visiting Fellow at Bell Telephone Laboratories, Murray Hill, New Jersey. In more recent years he has become concerned with microwave acoustics and has worked extensively in the field of magnetoacoustic and electroacoustic interactions.

He was awarded the 1959 IRE Microwave Prize for a paper on symmetrical ferrite circulators, and has been a consultant with Melabs, Microwave Electronics Corporation and Lockheed Research Laboratory, Palo Alto, Calif.

The meeting will be held at the Physics Lecture Hall, PH 101, Stanford University, dinner at Rick's Swiss Chalet at 6:30 p.m. Reservations by November 8. Meeting at 8:00 p.m. See calendar.

## Are You Technically Obsolete?

During the past two decades, technology has advanced at a fantastic rate. The engineer has been all but inundated with a flood of technical literature that he does not have the time to read or digest. As a result, the number of engineers who are technically obsolete continues to rise at ever-increasing rates. One solution to this problem is organized continuing education. Our local colleges and universities have made an attempt at providing courses for graduate engineers, but we suspect that these reach only a small percentage of our membership. This is the reason for this survey of your interest in continuing education. By means of the reply form

below, we would like to determine:

1. How many of you are interested in participating in an organized program of continuing education?
2. Are you interested in academic courses, professional courses, or both?
3. Which specific courses would be of most value to you now?

Your replies will be carefully reviewed and they will form the basis of our plan for implementing a program to satisfy the continuing education needs of our members. Won't you take a few minutes NOW to help us plan for your future education?

John B. Damonte  
Vice Chairman-S.F. Section

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Name and address \_\_\_\_\_  
optional \_\_\_\_\_

## 2nd PMP Series on Microelectronics

The second meeting of a series of five on the subject of Microelectronics will be held by the Parts, Materials & Packaging Chapter on November 26 at 7:30 p.m. at Hewlett-Packard Co., Palo Alto.

Dr. Donald A. McWilliams will again be the moderator. The subject of Thick Film Networks will be covered by Randolph C. Early of General Electric Company, and Michael Ohanian of Oak Electro-Netics Corp. will speak on Hybrid Microelectronic Bonding and Packaging Methodology.

Each lecture is self-contained and does not require attendance at previous lectures for background material. Non-members of IEEE are welcome.

More information can be obtained from Clyde Coombs, Hewlett-Packard Company (Phone: 326-1755, ext. 316). Full story in October GRID.

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# Call for Papers

Papers are invited for the 1969 CARNAHAN CONFERENCE ON ELECTRONIC CRIME COUNTERMEASURES. This conference will be held at Lexington, Kentucky, April 24-26, and is jointly sponsored by the Lexington Section IEEE and the Electrical Engineering Department of the University of Kentucky.

Fields of interest to the participants will include computer use in dispatching, and data processing; security devices whose nature may be electronic, ultrasonic, microwave, or infrared; pattern recognition techniques in fingerprint identification; area security techniques for banks, factories and retail stores communication systems, personal or vehicular; secure power systems; and devices for rapid identification of personnel or property.

Authors are requested to submit a brief summary of the paper. Please include name, address, affiliation and telephone number. Summary should be sent to John Jackson, Electrical Engineering Department, University of Kentucky, Lexington, Kentucky 40506, in time to be received by December 15.

The IEEE Region 6 Conference will be held April 16-18, 1969 at the Del Webb's TowneHouse in Phoenix, Arizona.

The conference theme is to be "Resources Roundup" — Electrical and Electronics Engineering Resources. The session topics are Human Resources — Education, Personnel Development, Management; Energy Resources — Generation, Distribution, Systems Configuration and Control, Power Conversion; Earth and Space Resources — Electronic Exploration, Aerospace, Radio Astronomy, Atmospheric Physics, Oceanography; Electronic Resources — Solid State, Integrated Circuits, Computers, Microwaves, Servo, Navigation, Guidance, Biomedical Electronics; and Electromagnetic Spectral Resources — Communications, Satellite, Optical, Military, Aeronautical.

Papers are invited from all fields of IEEE activity related to the Conference

Theme. These papers should report on new research, development concepts, techniques, systems, and components. Authors of accepted papers will be expected to give a 20-minute oral presentation followed by a 10-minute discussion period. All accepted papers will be published in the Conference Record.

Authors are invited to submit 300-500 word abstracts in any of the above categories. The closing date for abstracts is December 9. Notification to Authors of Abstract acceptance is January 6, and the closing date for final manuscripts is February 17. Submit abstracts and papers to Sloan D. Robertson, Program Chairman, 1969 IEEE Region Six Conference, 722 West Frier Drive, Phoenix, Arizona 85021.

A special issue of the TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES is planned for publication in the Summer of 1969. The title of the issue will be "Computer-Oriented Microwave Practices." Typical areas of interest are computer-aided or directed microwave measurements, Microwave-circuit simulation, Microwave-design automation, general analysis programs for microwave networks, computer techniques for solution of electromagnetic field problems, modeling of passive or active structures, optimization and other numerical synthesis techniques suitable for microwave networks.

Papers are invited for this special issue. Length and style for papers should be in accordance with "Information for Authors" published in the Transactions.

Prospective authors are requested to write to the Guest Editor as soon as possible, but not later than December 30, 1968, describing the subject and probable length of their contribution. Upon notification of conditional acceptance of their papers, authors will be requested to submit by February 15, 1969, three complete manuscripts for review.

Communications and papers should be directed to W. J. Getsinger, Guest Editor, C-Penthouse-East, M.I.T., Lincoln Laboratory, Lexington, Massachusetts 02173.

## Power Group: 'EHV Transmission'

Generation in the U.S.A. now amounts to twelve hundred billion kilowatt-hours per year, and this load is expected to double by 1978. As a result, voltages required to transmit this ever-increasing amount of power are going up everywhere. 345 kV was introduced in 1953, and 500 kV and 750 kV within the past few years. 1,000 kV systems are on the drawing boards, and preliminary studies are under way for 1500 kV systems.

With each voltage increase, transmission line engineers have been faced with new problems, and have had to increase their knowledge and understanding of old problems. The guest speaker, Mr. W. S. Price, will present an informal, non-technical discussion of some of these problems, and describe what has been done to solve them for the efficient design and operation of present and future transmission lines, at the Tuesday, November 12 meeting of the Power Group.



Mr. Price was born in Mt. Vernon, Illinois and received the B.S. Degree in Electrical Engineering from the University of Illinois in 1939.

From 1953 to 1963, he was head of the Electrical Research Section of the American Electric Power Company in New York, responsible for research and advanced development work. Since 1963, he has been EHV Transmission Consultant for the Bechtel Corporation in San Francisco. Major projects during this period include consultation on the electrical design of the 500 kV transmission system of the State Electricity Commission of Victoria, Australia, and electrical design of the Churchill Falls, Labrador 735 kV transmission system. He is co-author of sixteen IEEE papers, four CIGRE papers, and five magazine articles, all on EHV transmission problems. He is past-Chairman and current member of the IEEE Protective Devices Committee, and Chairman of the Lightning Arresters Standards Working Group for that committee.

The meeting is called for 7:30 p.m. November 12, with cocktails at 5:30 p.m. and dinner at 6:30 p.m., at the Engineers Club in San Francisco. Reservations by November 11. See calendar for details.



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The Section welcomes the following new members:

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W. R. Kayser	Nywood Wu
J. A. Kilpatrick	

Congratulations to these members who have recently advanced to the grade of Senior Member:

A. Barna	P. D. Shaft
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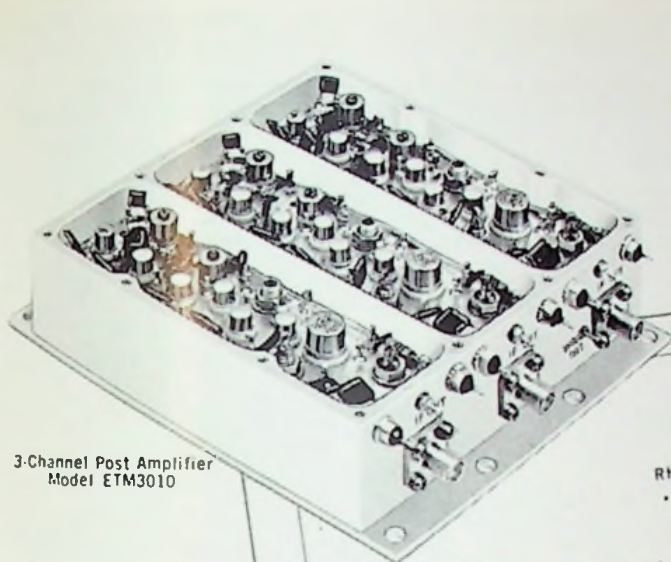
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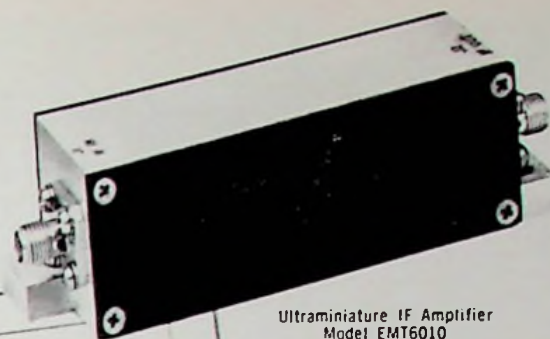
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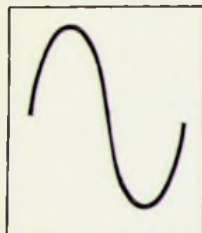
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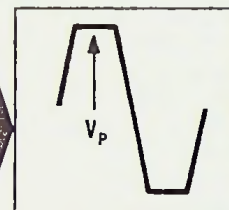
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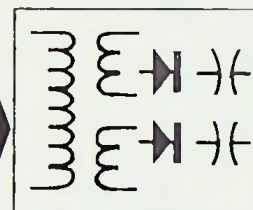


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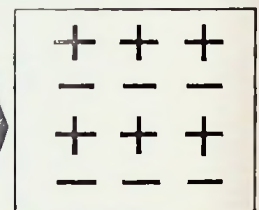
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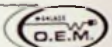


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