EDITOR'S PROFILE of this issue

from a historical perspective …

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

November, 1966:

Cover: The Dish at Stanford is the largest radio telescope in the USA. It has a 400 kW radio signal probe. More about the IEEE Antennas and Propagation Symposium in Palo Alto is on page 4. It includes talks by Prof. Alan Waterman (my undergrad advisor), Prof. Ronald Bracewell, and Fred Terman, plus a tour of SRI.

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

IEEE Grid

NOVEMBER 1966

SPECIAL ISSUE

meeting reminder

Aerospace & Electronic Systems, Thursday, November 17
Antennas & Propagation, Monday, December 5
Automatic Control, Tuesday, November 15
Communication Technology, Wednesday, November 16
Computer, Tuesday, November 22
East Bay Subsection/SFS, Monday, November 28
Information Theory, Thursday, November 17
Magnetics, Tuesday, November 29
Monterey Student Branch/SCVSS, Saturday, November 12
Microwave Theory & Techniques, Wednesday, November 16
Power, Tuesday, November 15
Reliability, Wednesday, November 9
San Francisco Section/EBSS, Monday, November 28
Santa Clara Valley Subsection/Monterey St. Br., Saturday, November 12
Vehicular Communications, Thursday, November 17

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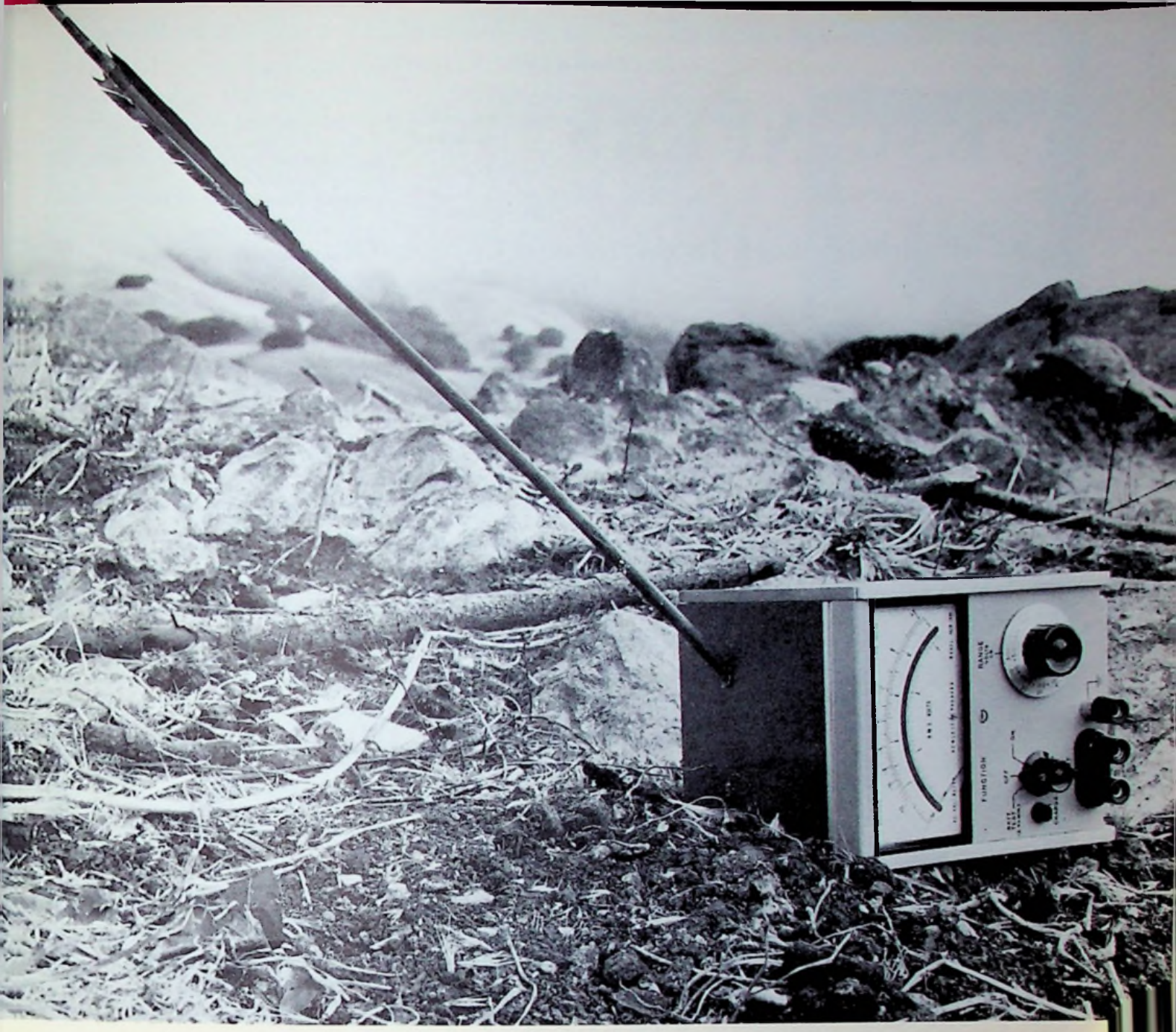

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SYLVANIA ELECTRONIC SYSTEMS

GT&E
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contents

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the section

MEMBERSHIP

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

W. J. Caldwell
R. A. Deisch
R. E. Greenan
W. Gunter, Jr.
D. D. Hansen
P. C. Harward
R. D. Keppel
W. H. Kettler, Jr.
J. H. Marshall 3rd
A. V. Sapelkin
F. M. Verduyn

o'brien ex machina

GRID MAILING PROBLEMS

Although the Grid is sent as second class mail which, by law, is supposed to receive handling as prompt as that of first class, September and October issues have been delayed in some mailing jurisdictions because of the back-up in third class mail caused by the elimination of overtime by Postmaster General Lawrence O'Brien.

As we go to press for the November issue the production schedule calls for mailing by November 3 and 4. It should be in the hands of the bulk of the membership by November 5,7 or 8. If your Grid arrives after that, please notify the section office immediately.

ieee news

ELECTRONS & LASER BEAMS

The 9th IEEE Symposium on Electron & Laser Beam Technology will be held May 9-11, 1967, at the University of California, Berkeley. Dr. Charles Susskind, School of Engineering, will be co-chairman of the meeting.

cover

Star-gazing spider web of steel and aluminum on a Stanford University hilltop stands 160 feet high. Currently America's biggest radio telescope "dish", it is used in radar astronomy research, and will be visited on the field site of the 1966 International Antennas & Propagation Symposium, December 5-7. This unusual night photograph was made with a single, handheld 65,000-candlepower light "gun" and wide-angle lens by Photographer Lloyd Provan of the Stanford Electronics Laboratories. Built by Stanford Research Institute with Air Force sponsorship, the dish is being used to explore the sun, moon, planets, and interplanetary gases with a 400-kilowatt radar probe. Peak of tripod, over the center with one leg hidden, holds receiving equipment to catch signals reflected from the huge dish surface.

1966 STEERING COMMITTEE ALL FROM SAN FRANCISCO SECTION AREA

The steering committee for the 1966 International Antenna and Propagation Symposium is headed by Raymond D. Egan, chairman. The committee began its work of planning and executing the details of the symposium in the fall of 1965.

Dr. Egan, manager of applied research for Granger Associates at their Palo Alto facility, has long been active in GAP. He is a past chairman of the San Francisco chapter of the Antenna and Propagation Group and is at present an ex-officio member of the administrative committee.

Other members of the steering committee are the symposium officers and the heads of the various committees.

Vice-chairman, Allen S. Dunbar of Lockheed Missiles and Space Company, Palo Alto Research Laboratory.

Technical program: Ray L. Leadabrand of Stanford Research Institute, Menlo Park, chairman.

Digest and printing: Charles Phillips of Granger Associates antenna and transmission division, Palo Alto.

Local arrangements: Norbert J. Gamara of Lockheed Missiles and Space Company, chairman.

Finance: Emmanuel A. Blasi of Lockheed Missiles and Space Company, chairman.

Publicity: William A. Alfano of Granger Associates antenna and transmission division, chairman.

Ladies Activities: Mrs. Norbert J. Gamara, chairman.

William J. Welch, Associate Professor of Electrical Engineering, University of California, Berkeley, is current chairman of the San Francisco chapter.

Egan

Dunbar

Leadabrand

Phillips

Blasi

Alfano

Welch

JOINT SESSION WITH URSI TO HIGHLIGHT INTERNATIONAL SYMPOSIUM

A joint session attended by both members of the International Scientific Radio Union and the Antennas and Propagation Group will be held Wednesday morning, December 7, in the Circus Maximus at the Cabana. A series of invited papers on space science will be presented.

Dr. F. E. Terman, provost emeritus, Stanford University and consultant to the president, will be session chairman.

"The design of space experiments as educational process", Professor Bruce Lusignan of Stanford University.

"Space science and the scientist astronaut", Owen Garriott, scientist astronaut of NASA/Stanford University.

"Space science experiments to detect life", Professor Joshua Lederberg of Stanford University.

"Super large antennas for space experiments", Dr. Bernard Oliver of Hewlett Packard.

Following the joint meeting, the Fall URSI Meeting will be held at Rickey's Hyatt House Hotel, Palo Alto on December 8 and 9. The URSI sessions are sponsored by the U.S. National Committee of URSI and the following related IEEE Groups: Antennas and Propagation, Circuit Theory, Geoscience Electronics, Instrumentation and Measurement, Information Theory, and Microwave Theory and Techniques.

Papers will be presented in the fields of radio measurement methods and standards, radio propagation in non-ionized media, ionospheric radio, magnetospheric radio, radio and radar astronomy, radio waves and transmission of information, and radio electronics.

REGISTRATION

The registration desk in the lobby of the Cabana Hotel will be open from 1:30-9:30 p.m., Sunday, Dec. 4 and from 7:30 a.m. to 5:30 p.m. each day of the meeting. To make advance registration, fill out the registration coupon below and mail to

Registration Chairman
1966 G-AP International Symposium
C. Roger Moe
6790 Bollinger Road
San Jose, California 95129

Checks should be made out to 1966 G-AP INTERNATIONAL SYMPOSIUM. Registration rates are as indicated on the coupon below. Those rates include a copy of the symposium digest. Additional digests may be purchased at the registration desk.

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Check Appropriate Spaces	Postmarked before Nov. 21, 1966	After Nov. 21
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Student ( )	$2.00	
Additional copies Digest (Member) ( )	$3.50	
Additional copies Digest (Nonmember) ( )	$5.00	

EVENTS: Banquet-$8.50 Stanford U./SRI Tour-$1.50 Ladies Activities (transportation only)-$10.00

Total Remittance-$ _____

BIG IN 1966 TECHNICAL PROGRAM: RAY OPTICS, PLASMAS, ANTENNAS, PHASED ARRAYS

The technical program for the 1966 International Antennas and Propagation Symposium includes a joint session with URSI in addition to 12 regular sessions to be held December 5-7 at the Palo Alto Cabana Hotel. The program includes 9 papers by Canadian and overseas authors.

Ray L. Leadabrand, chairman of the technical program committee, announced the following sessions and chairmen:

"Ray optics", Alan T. Waterman Jr. of Stanford University; "Antenna theory", E.M.T. Jones of TRG-West; "Plasma effects on antennas", Tetsu Morita of Stanford Research Institute.

"Broadband antennas", C. E. Phillips of Granger Associates; "Wire antennas", Irene Peden of University of Washington; "Plasmas and dispersion characteristics", Oscar Buneman of Stanford University.

"Reflector antennas", John Damonte of LMSC; "Radio propagation", E. T. Pierce of Stanford Research Institute; "Mutual coupling", M. G. Andreasen of TRG-West.

"Astronomy antennas", R. N. Bracewell of Stanford University; "Phased arrays", D. K. Reynolds of University of Washington. "EM scattering", James E. Berke of Sylvania Electric Products, Inc.

"Space science", F. E. Terman of Stanford University.

Symposium at a Glance

	MONDAY, DECEMBER 5	TUESDAY, DECEMBER 6	WEDNESDAY, DECEMBER 7
8 am			
9 am	IA RAY OPTICS IB ANTENNA THEORY IC PLASMA EFFECTS ON ANTENNAS	IIIA REFLECTOR ANTENNAS IIIB RADIO PROPAGATION IIIC MUTUAL COUPLING	JOINT URSI/PGAP SESSION SPACE SCIENCE
10 am	*Coffee: Atrium Lobby and Poolside*	*Coffee: Atrium Lobby and Poolside*	*Coffee: Atrium Lobby and Poolside*
11 am	CIRCUS MAXIMUS NORTH / CENTRAL / SOUTH	CIRCUS MAXIMUS NORTH / CENTRAL / SOUTH	Circus Maximi
122 noon			
1 pm			
2 pm			
3 pm	IIA BROADBAND ANTENNAS IIB WIRE ANTENNAS IIC PLASMAS AND DISPERSION CHARACTERISTICS	IVA ASTRONOMY ANTENNAS IVB PHASED ARRAYS IVC EM SCATTERING	FIELD TRIP STANFORD UNIVERSITY STANFORD RESEARCH INSTITUTE Propagation Field Site Tour-Via Ticket
4 pm	*Coffee: Atrium Lobby and Poolside*	*Coffee: Atrium Lobby and Poolside*	
5 pm	CIRCUS MAXIMUS NORTH / CENTRAL / SOUTH	CIRCUS MAXIMUS NORTH / CENTRAL / SOUTH	
6 pm	PGAP ADCOM Cocktail Hour (on own) Atrium		
7 pm	PGAP ADCOM Dinner (on own) Atrium	COCKTAIL HOUR (on own) Circus MAXIMUS North	
8 pm		BANQUET Speaker and Awards Ticket Required Circus Maximus North	
9 pm			
10 pm			

ANNUAL A&P PRIZE GIVEN IN MEMORY OF LATE SECTION, SRI, GRANGER LEADER

In 1961 the IEEE Group on Antennas and Propagation named the annual prize for the best paper published in its Transactions in memory of Dr. John T. Bolljahn who died in 1960. An outline of Dr. Bolljahn's career is given in the AP Transactions for May 1961. The purpose of the award is to recognize outstanding papers in the field of antennas and propagation by the award of a substantial cash prize, and thereby to stimulate increased interest in the field. To the $200 per year awarded by G-AP, an equal amount has in the past been presented to the same individual by the John T. Bolljahn Memorial Foundation.

The John T. Bolljahn Memorial Foundation, a non-profit trust, is operated exclusively for scientific, literary or educational purposes. The foundation acts on its own behalf and not as an agent of the IEEE or G-AP. Present trustees of the foundation are Arthur Dorne, J.V.N. Granger, E. C. Jordan (chairman), Martin Katzin and L. C. Van Atta; D. C. Ports is secretary. Contributions to the Bolljahn Foundation are tax deductible and are used to further the objectives of the foundation.

Presentation of the award will be at the symposium banquet to be held on Tuesday evening, December 6, in The Circus Maximus North at the Cabana Hotel. This year's award goes to Masami Takada and Masaaki Shinji for their paper "An application of the diffractor grating to the 11-GC/S microwave system". Mr. Takada will be present to accept the award in memory of the late antenna expert and San Francisco Section leader.

FIELD SITE TOUR TO VISIT FAMOUS STANFORD ANTENNA FARM, SRI-BUILT DISHES

A bus tour of the Stanford University/Stanford Research Institute propagation field site will depart from the patio parking lot of the Cabana Hotel at 2:00 P.M. on Wednesday, December 7. Included in the tour will be visits to the radio astronomy center, the radar astronomy center, earth satellite receiving station, VLF/whistler station, and the millimeter wave experimental facility. One of the most spectacular pieces of equipment to be visited will be the 150-foot "big dish" radio-radar telescope located on the university's "antenna farm." It is one of America's three largest fully steerable dishes, all SRI-built.

Coupled with the dish is a powerful university-operated transmitter. Its million-watt input produces a 400,000-watt radar probe with which the dish is used to explore the sun, moon, planets, and plasmas of the solar system. Located atop the Stanford foothills behind the educational campus, the steel and aluminum parabola stands 160 feet high and weighs 70 tons without its mount. The surface is covered with nearly 17,000 square feet of aluminum mesh, equal to more than a third of an acre. Motorized hydraulic controls tilt or rotate the dish to aim it at any desired point in the sky. Dish and mount move together on a circular track 130 feet in diameter, turning as much as two degrees per second or one complete rotation in three minutes. Radio engineers operate the dish from a control laboratory built into the mount. One transmitter is located inside the laboratory another in a nearby building. Construction of the dish began in 1959 and it was completed in 1963. The dish has been used in Pioneer and other deep space and planetary probe experiments.

Numerous other large antennas will be seen during the tour including the "Heliopolis", a 32 dish crossed array sun scanner, several interferometers, antenna arrays ranging up to 2000 feet in length, and a new series of 60-foot dishes. An 88-foot dish used for electron scatter including associated 5 Megawatt peak power transmitter and data processing equipment will also be seen.

Tickets for the tour can be ordered at the time of advanced registration or purchased at the registration desk during the symposium. State of the art currency is well worth the time.

A&P LADIES TO VISIT SUNSET, ALLIED ARTS, CARMEL, DEL MONTE LODGE

Symposium women's activities promise to elicit keen interest on the part of the participants.

On Monday, December 5th, the ladies will enjoy a delightful cocktail luncheon in the colonnade at the Cabana starting at 11:30 a.m. This will be followed by a tour starting at 2:00 p.m. of the Sunset House and continuing at the Allied Arts Guild in Menlo Park.

Sunset House as both a publishing house and an institution holds a place dear to the heart of the woman of today. Nationally famous for its recipes the women will see kitchen compounds in actual use where exciting recipes are originated, revised, tested and retested.

The Allied Arts Guild stands on a small portion of what was once the vast Rancho de Las Pulgas, land grant from the King of Spain to Don Jose Arguello, Commandante of San Francisco in the 1800's. In more recent times the three and one-half acres of this beautiful land were purchased as a site for a guild similar to those of Europe. Today craftsmen still carry on the traditions of early California in their work in a garden environment reminiscent of those in Granada. The ladies will be treated to the fruits of the skilled efforts of those who work in metal, leather, pottery, weaving and wood. The shops are stocked with china, silver, antiques and gifts of many descriptions.

On Tuesday, December 6th, at 9:30 a.m. the ladies will board a bus at the Cabana for a tour of Carmel-by-the-Sea; a delectable luncheon at the Del Monte Lodge (one of the world's most beautiful resorts); and a singular opportunity to delight the senses in a spectacular Mediterranean-like setting.

Upon returning to Palo Alto at 4:30, the ladies will have an opportunity to prepare for the evening's festivities. At 7:00 p.m. they will join their husbands for evening cocktails to be followed by a banquet prepared by the incomparable Cabana cuisine. After dinner, awards will be made to selected rising young scientists for their contributions to society, followed by an engaging and thought provoking speaker of national prominence.

On Wednesday, December 7th, the ladies will be strictly on their own to relax at the poolside or engage in shopping at local or San Francisco shops.

HOTEL ACCOMMODATIONS

A block of 150 rooms is being held for those attending the meetings at the Cabana Motor Hotel, 4290 El Camino Real, Palo Alto, 94306 (Area Code 415-327-0800), beginning December 4th, at special conference rates: tower rooms: $13 single; $17 double; poolside rooms: $14 single; $18 double. Overflow will be handled by the Cabana Hotel by accommodations in the immediate neighborhood. (Please mention IEEE/G-AP when requesting reservations.) The hotel will confirm reservations if requested.

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Senior Electronic Engineer—BSEE, minimum three years experience. Background in military solid state circuit design, control, video, logic and/or digital.

Microwave Receiver Engineers—BS/MSEE plus strength in design and analysis of GHz receivers—broadband wide open and swept filter types. Know application of semi-conductors, YIG filters, TWT, BWO, microwave stripline techniques.

Circuit Design Engineers—BSEE, three years' minimum experience. Background in military solid state circuit design, control, video, logic and/or digital.

PALO ALTO INTERVIEWS

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A textron DIVISION

meeting ahead

HIGH POWER LASERS

Dr. Fred P. Burns, manager of operations, Korad Corp., Santa Monica, will present highlights of his paper on high power lasers—performance, limits and future, at the November 9 meeting of the Reliability chapter.

This paper discusses design of high power laser systems in terms of reliability and predictable performance. Important parameters such as brightness and intensity will be reviewed and interpreted in relationship to component life and system reliability.

As manager of operations at Korad, Dr. Burns is responsible for product development and engineering of Laser components and systems, manufacturing of Laser systems and accessories, and for all mechanical design at Korad.

Burns

Belsley

meeting ahead

MANNED SIMULATORS

Steven E. Belsley, Deputy Assistant Director for Life Sciences, Ames Research Center, NASA, will address the Automatic Control Chapter on November 15 on the research use of closed-loop manned simulators.

The use of manned simulators will be reviewed. Several examples will be given with especial interest to their use in assessory tradeoffs of function between operator and control system. The effects of reliability and pilot acceptance will be considered as well.

Following the talk, several motion simulators will be demonstrated, i.e., the "all-axis motion generator," the 5-degree-of-freedom simulator (centrifuge), and the moving-base simulator with visual flight attachment (Rediton or Dalto).

fall ursi meeting

REGISTRATION & HOURS

Registration fees for the Fall URSI Meeting will be $10 at the time of the meeting; $8 for advanced registration; and $8 for those also registered at the A & P Symposium.

Wednesday hours of the meeting will be 8:30 to noon; field trip at 2 p.m.; meeting of Commissions 2, 3 and 6 at 2 p.m.

On Thursday and Friday, hours will be 9 to 12 and 2 to 5.

Meeting Calendar

NOVEMBER 9, WEDNESDAY, 8:00 PM — Reliability

High Power Lasers — performance, limits and future

Dr. Fred P. Burns, mgr. of operation, Korad Corp., Santa Monica

Place: Sakura Gardens, 2116 N. El Camino Real, Mountain View, (between San Antonio Road and Holiday Inn)

Dinner: 6:30 PM, Teriyaki steak or Japanese dinner (chicken teriyaki, shrimp tempura, roast pork, fried rice and sesame vegetable).

Reservations: Please call in separate reservations for the meeting and dinner. Terri Beall or Sunnie Simmons, 966-3342 by 11/7/66

NOVEMBER 12, SATURDAY, 2:00 PM — Santa Clara Valley Subsection/Monterey Student Branch

Visit to PG&E Co.'s Moss Landing Steam Plant.

Members' families and friends are invited (except for small children); ladies should wear flat shoes. Followed by social gathering at USNPGS Officers Club (see below)

Place: For tour—meet at PG&E Steam Plant, Moss Landing (visitors should have had lunch before arriving at plant)

Cocktails: 6:30 PM, Officers Club, USNPGS, Highway 1 (Fremont) and Sloat Ave., main admin. bldg.

Dinner: 7:15 PM, Officers Club, (buffet: $4.25—King crab or prime rib or both)

Reservations: (408) FR2-7171, ext. 513 in Monterey; Mrs. Arca, 291-4066 in San Jose and Don McCauley at 326-4350, ext. 4757 in Palo Alto *for both tour and dinner*, no later than Nov. 10th.

NOVEMBER 15, TUESDAY, 8:00 PM — Automatic Control

Tour and talk: Research use of closed-loop manned simulators

Steven E. Belsley, deputy assistant director for life sciences, NASA, Ames Research Ctr.

Place: Ames Research Center, Moffett Field—Bldg. 210. Go to main gate and guard will direct you to building. Assemble at 7:45, as tour starts promptly at 8.

Dinner: 6:15 at Holiday Inn (just south of Lockheed on Bayshore)

Reservations: For tour and talk—Prof. Jones, 294-6414, ext. 2206 by noon, Nov. 11 (none required for dinner)

NOVEMBER 15, TUESDAY, 7:30 PM — Power

Replacement of overhead with underground distribution facilities

T. A. Bettersworth, chief electric distribution engineer, PG&E Co.

Place: Engineers Club, 160 Sansome St., San Francisco

Cocktails: 5:30 PM

Dinner: 6:30 PM

Reservations: Engineers Club, GA 1-3184

NOVEMBER 16, WEDNESDAY, 8:00 PM — Communication Technology

Steady state noise in telecommunications systems

Don Jones, PTT Co.; Donald Green, Lynch Communications Systems, Inc., Maurice Harp, Lenkurt Electric Co., Inc. and Myron Ferguson, Sylvania Electric Products.

Place: Lockheed Auditorium Bldg. 202, 3251 Hanover St., Palo Alto

Cocktails: 5:45 PM, L'Omelette, 4170 El Camino Real, Palo Alto

Dinner: 6:15 PM (same place) choice of entree: casserole of crabmeat $3.50 or Coq au Vin $3.75

Reservations: Robert Howland 291-4039, George Griffith, 591-8461 ext. 525, or Ed Combs, 397-1471 by 1:00 PM, Nov. 16

NOVEMBER 16, WEDNESDAY, 8:00 PM — Microwave Theory & Techniques

Design consideration of microwave integrated circuits

Tom Hyltin, branch manager in semiconductor R&D laboratory, Texas Instruments

Place: Hewlett-Packard conference room 5M, 1501 Page Mill Road, Palo Alto

Dinner: 5:30 PM—social hour to meet speaker, dinner at 6:00, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto

Reservations: Joan McClung, 326-7000 ext. 2028 by Nov. 14

(Continued on page 10)

Would you believe.....

THAT AN ANTENNA SYSTEM WITH THIS PERFORMANCE:

Azimuth Motion: Continuous

Elevation Motion: −30° to +185°

Cross-Axis Motion (optional): ±30°

Velocity Range: 0.005 to 40 deg/sec

Acceleration: maximum 60 deg/sec

Dynamic Tracking Error (under steady wind conditions):

Elevation: Maximum 3.0 mils RMS

Azimuth: Maximum 0.5 mils RMS

Velocity Constant: Infinite

Acceleration Constant: 100/sec²

AND THESE FEATURES:

- All fiberglass construction solves corrosion problems, provides damping, allowing stable, wide bandwidth operation
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meeting ahead

UNDERGROUND POWER

T. A. Bettersworth, chief electric distribution engineer, PG & E Company, will discuss replacement of overhead with underground distribution facilities at the November 15th meeting of the Power Group. He will talk on the need for utilities to update their conversion policies and programs and for the industry to devote adequate research and development efforts toward reducing the cost of conversion.

He will tell of the current Calif. PUC hearings and the proposal made by the California Utilities regarding conversion policies and programs.

He will discuss why conversion costs are relatively high compared to the cost of new underground extensions and describe the progress made toward reducing these costs and suggest other potential cost-reducing techniques that should be studied.

meeting ahead

STEADY STATE NOISE

A panel of four speakers will provide a one-hour presentation of basic concepts involved in an understanding of steady-state noise in telecommunications systems at the November 16 meeting of the Communication Technology chapter.

First, Don Jones, staff engineer of PT&T, San Jose, will discuss message channel noise in the telephone plant.

Donald Green, manager of development engineering, Lynch Communications Systems, Inc. San Francisco, will talk about carrier system noise.

Maurice Harp, senior staff engineer, Lenkurt Electric Co., Inc., San Carlos, will discuss noise in the microwave radio system.

Myron Ferguson senior engineering specialist, EDL, Sylvania, Mountain View, will conclude the series with a discussion of communication satellite noise considerations. Following the four fifteen-minute talks, the floor will be open for questions.

meeting ahead

MICROWAVE INTEGRATED CIRCUITS

Tom Hyltin, branch manager in the semiconductor lab of Texas Instruments, Dallas, will discuss design considerations of microwave integrated circuits at the November 16 meeting of the Microwave Theory & Techniques chapter.

Recent interest in the application of semiconductor devices for high power microwave generation and research has stimulated a great deal of research in the development of technologies necessary

(Continued on page 12)

Jones

Harp

Ferguson

Hyltin

NOVEMBER 17, THURSDAY, 6:45 PM — Aerospace & Electronics Systems

Tour of Fremont General Motors plant

Place: Main lobby of General Motors plant, Highway 17 at Fremont Blvd. turnoff, Fremont
Dinner: 6:15 PM meet in lobby for 6:30 dinner in cafeteria ($1.50)
Reservations: R. Franks, 743-0525 by Nov. 15

NOVEMBER 17, THURSDAY, 8:30 PM — Information Theory

Brains, machines and automata

Prof. Michael A. Arbib, Stanford University
Place: SRI 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 Nov. 16

NOVEMBER 17, THURSDAY, 7:30 PM — Vehicular Communications

Alameda County Communication Center

Capt. C. B. McMurphy, Sheriff's Office, Alameda County
Place: Sheriff's Civil Defense Center, 2000-150th Ave., San Leandro
Dinner: 6:30 PM, Pring's Restaurant, 150th & E. 14th Street, San Leandro
No reservations required.

NOVEMBER 22, TUESDAY, 8:00 PM — Computer

Digital communications

Louis Feldner, Lockheed Information Systems, Sunnyvale
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, Nov. 21

NOVEMBER 28, MONDAY, 7:30 PM — East Bay Subsection/ San Francisco Section

Tour of ARTCC-FAA, Fremont (limited to 100 — "first come first served" basis)

Tour conductor: Frank Happy, chief controller, Oakland ARTCC
Place: Air Route Traffic Control Center, 5125 Central Ave., Fremont
Dinner: 6:00 PM, International Kitchen, 555 Peralta Blvd., Fremont (Niles) $4.00
Reservations: For dinner and tour: Layne Winkle, San Jose — 291-4567, Ruth Emerson, Oakland — 835-8500, SF Section office, Palo Alto — 327-6622 by Nov. 22

NOVEMBER 29, TUESDAY, 8:00 PM — Magnetics

A review of the second International Magnetic Conference, Budapest, Oct. 1966

Don F. Eldridge, consultant
Place: Ampex Corp., 401 Broadway, Redwood City — Cafeteria, Bldg. 3A (north of fountain)
No dinner

DECEMBER 5, MONDAY, 8:00 PM — Antennas & Propagation

Wave propagation studies in Antarctica

University of Washington research staff headed by Dr. D. K. Reynolds
Place: PH 101, Stanford University
Dinner: 6:30 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
Reservations: Wilbert Chang, 591-1414, ext. 223 by noon, Dec. 5

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• Microwave Solid State Engineers
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• Applications Engineers
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• Technical Support Personnel
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meeting ahead

BRAINS & AUTOMATA

Prof. Michael A. Arbib, department of electrical engineering, Stanford University, will talk on brains, machines, and automata at the November 17 meeting of the Information Theory chapter.

In his talk he will discuss information processing in the brain and will try to give an overall impression of current attempts to use mathematics, computers, and hardware to make models of thought and the cellular machinery which underlies it. The models to be discussed include a scheme to use coding theory to increase the reliability of neural networks, a distributed information processing model which accounts for some effects of brain injury, and some statistical models of neural interaction.

Dr. Arbib received a bachelors degree in pure mathematics from Sydney University, and a Ph.D. from Massachusetts Institute of Technology working in stochastic processes. During his research program at M.I.T. he spent four months in Sydney delivering a series of lectures on brain machines and mathematics, subsequently published by McGraw-Hill. After receiving his Ph.D., Dr. Arbib toured the United States, Europe and the Soviet Union. Since June, 1965, he has been at Stanford where he is now working on a rapprochement between automata theory and control theory, as well as pursuing work on brain modelling. He has written a book, with Kalman and Falb, on topics in modern systems theory which will be published by McGraw-Hill. Another book on theories of abstract automata is expected to follow shortly.

meeting ahead

AIR TRAFFIC CONTROL

A tour of the air route traffic control center of the Federal Aviation Agency, 5125 Central Ave., Fremont, is planned by the East Bay Sub-section on November 28. The program will include a picture story of a controlled transcontinental flight as well as a tour of the control center. Wives will enjoy the program and tour as well as the preceding dinner at the International Kitchen, Fremont.

To reach the center, head east on Thornton off Highway 17. You will see the tower with reflector antennas.

MORE MICROWAVE CIRCUITS

to realize integrated circuits that will operate at X-band and higher frequencies. In general, microwave circuits differ from conventional integrated circuits in that they contain transmission line components such as couplers, filters and transforming section. In addition, these circuits contain thin film components such as resistors, capacitors, and transistors. In order to realize these devices advances in the substrate material technology, interconnections, design of active devices and design of passive components must be made.

Arbib

Eldridge

meeting ahead

A & ES TO TOUR GM

IEEE members with families, including children over 12, will be conducted on tours aboard an electric train (not BART) through 1.5 miles of one of the largest General Motors auto-truck assembly plants in the nation, when the Aerospace & Electronic Systems chapters meet at the Fremont GM assembly plant on November 17. Dinner in the cafeteria, preceding the tour, is optional.

meeting ahead

DIGITAL COMMUNICATIONS

Digital communications will be discussed by Louis Feldner at the November 22 meeting of the Computer chapter. A market in the billions of dollars by 1970 has been forecast for the suppliers of data communication equipment and services. To capitalize on this potential market, computer people must understand the forces which will shape it. This talk will give a brief overview and summary of those forces.

Highlights in the discussion will be:

- the influence of the FCC and state regulatory agencies on the services and roles of the common carriers
- the need for a compatible voice plant for business and defense
- the historic role of the "4Kc" voice channel
- the development of carrier systems based on the "4Kc" voice channel
- communication standards, both domestic and international.

The conclusion will offer a brief orientation on some current developments leading to wideband data transmission. In addition, a list of information sources related to data transmission will be presented.

The speaker has been employed in various aspects of communication problems with several companies since 1953. Until recently he was with General Electric computer department as a manager in the engineering department. He is presently with Lockheed information systems in Sunnyvale.

meeting ahead

NEW MAGNETICS CHAPTER

A review of the second international magnetic recording conference, Budapest, October, 1966, will be presented by Donald F. Eldridge at the November 29 meeting of the newly-formed Magnetics chapter.

Mr. Eldridge has been a well known technical leader in magnetic recording for the last ten years and has directed programs in high resolution and high frequency recording and in developments of magnetic recording components at Ampex and at Memorex Corporation. He is presently an independent consultant in the technical and management field.

The 1966 Budapest Conference on magnetic recording is the second meeting of this type to be held in eastern Europe. Its objective is to be a truly international conference, and it includes participation from most European countries active in recording development, and to a lesser degree, from the U.S.A. Due to the expected small U.S.A. attendance, this review will represent a unique opportunity for first hand information on the conference proceedings.

meeting ahead

SCVSS/USNPGS

The Santa Clara Valley Subsection and U. S. Naval Postgraduate School, Monterey, Student Branch, will jointly sponsor a tour of the PG&E power plant at Moss Landing, followed by cocktails and dinner at the school's officers' club on Saturday, Nov. 12.

meeting ahead

ALAMEDA COUNTY VC

Capt. Brower McMurphy, Alameda County Sheriff's Office, will conduct a tour of the county communication system on November 17 for the Vehicular Communication chapter.

Captain McMurphy, one of the pioneers in the vehicular communication field, has been with the sheriff's office as communication engineer for over 30 years. He has been instrumental in designing and engineering the system as one of the finest in the United States.

The tour will include the latest and largest civil defense underground facilities of any local jurisdiction in the United States, also the county's complete communication center, its radio service center and many related facilities.

Type RM564 TEKTRONIX general-purpose oscilloscope

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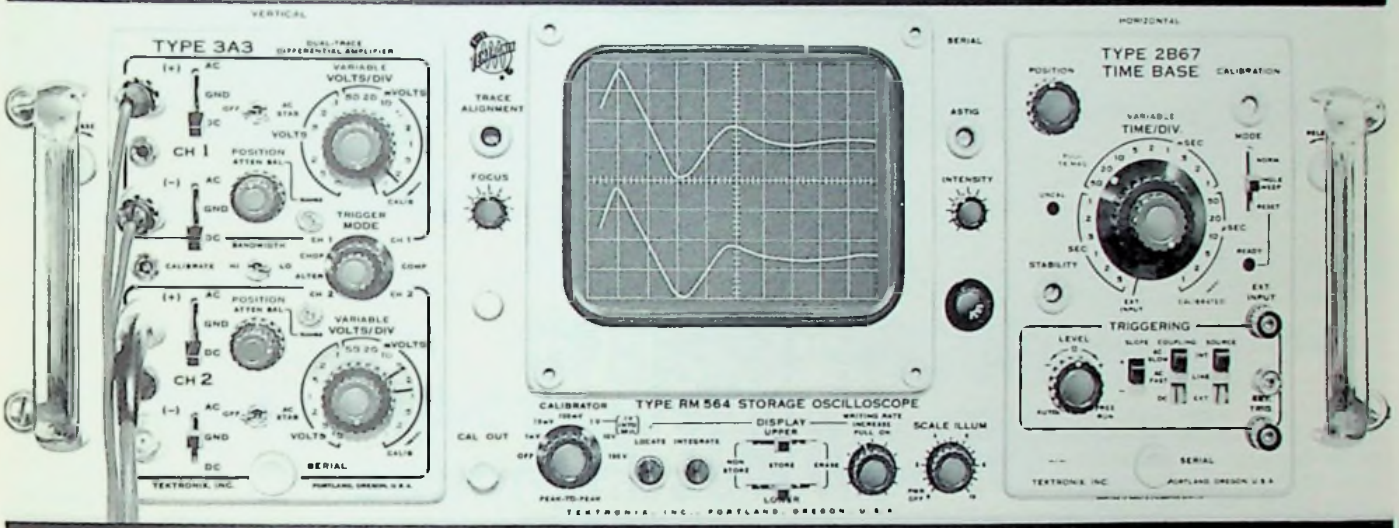
SPLIT-SCREEN / permits simultaneous operation as a storage oscilloscope and as a conventional oscilloscope



■ **presents stored or conventional displays**—The Type RM564 presents full-screen stored displays or full-screen conventional displays. Or—with the split-screen—stored displays can be presented on either the upper or lower half of the crt with conventional displays on the other half.

■ **saves film**—The Type RM564 permits detailed waveform analysis and simplified waveform comparisons, in many instances, without resorting to photography. Just store and analyze—for periods up to one hour, with quick erase in less than one-fourth second.

■ **trace photography is easier and can cost less**—Stored displays can be recorded at one's convenience, without the need for high-speed lens or film.

■ **accepts combinations of 20 plug-in units**—The Type RM564 adapts easily to such applications as multi-trace, low level differential, sampling, spectrum analysis, others—including matched X-Y displays using the same type amplifier units in both the amplifier and time-base channels.
Plug-in units offer capabilities from 100μV/cm sensitivity (3A3) and 10MHz passband (3A1, 3A6), to 0.5 μsec/cm sweep rate (3B1, 3B3) and sweep-delay applications (3B1, 3B2, 3B3).

■ **saves space**—The Type RM564 occupies **only 7 inches** of standard **rack height**, yet has a full 8-cm by 10-cm display area.

■ **operates simply and reliably**—Although capable of many sophisticated measurements, the Type RM564 retains the operating convenience of a conventional oscilloscope.

Display shows ability of the Type RM564 to store single-shot events. Waveforms represent displacement of leaf springs due to imparted shocks given them during test. Split-Screen Facility—with independent storage and erase of upper and lower half of the crt—permits easy comparison of test waveforms to a reference display.

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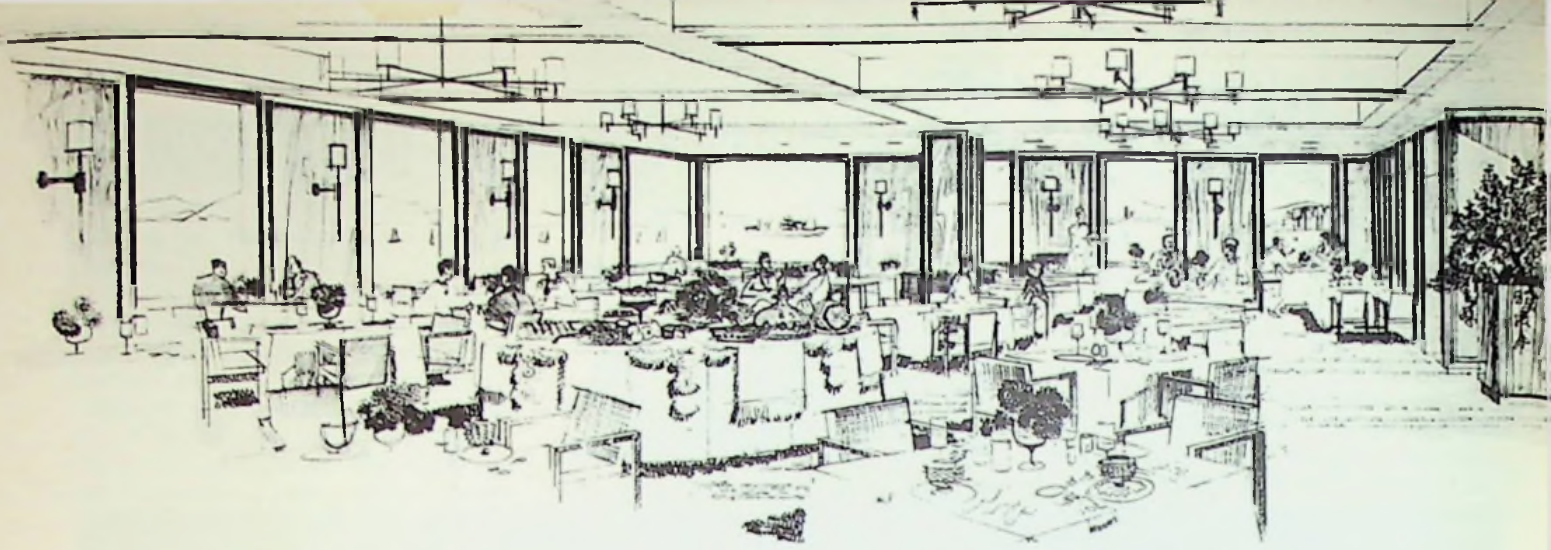
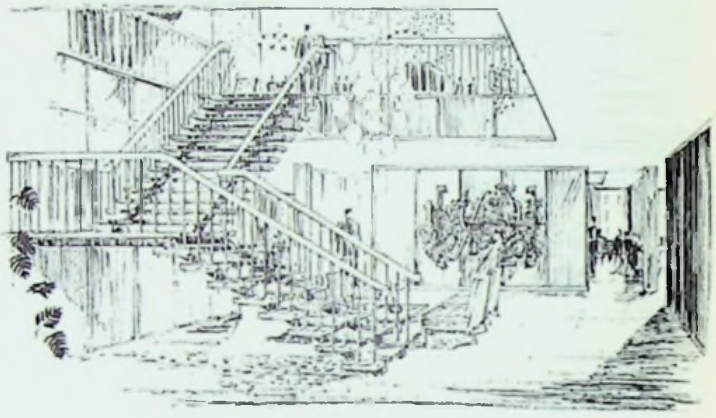


The Engineers' Club of San Francisco recently moved across Pine street to new quarters at 160 Sansome St., on the 16th and 17th floors of the Hongkong Bank Building. The accomodations for dining, recreation and meetings are equal to the finest in San Francisco, as shown in the drawing of the dining room above and the lobby to the right. Four private dining rooms, accomodating up to 80 persons are available for conferences. A special table is reserved every Tuesday for IEEE members.



book notes

BOOKS FOR ASIAN STUDENTS

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

Books must be dated 1955 or later and be in good condition. Journals must be in series of five years or more dating from 1946 or later. Shipments and inquiries may be made at any time to the program at 451 Sixth Street, San Francisco, Calif. 94103. Donations to the Asia Foundation are tax deductible.

new grid feature

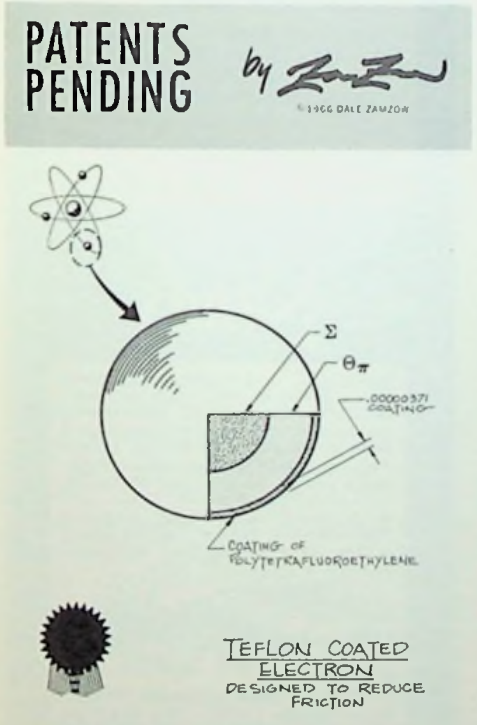
GOOFY PATENTS

Beginning in this issue is a new cartoon series: "Patents Pending by Zamzow" which readers will find far-out, off-beat and amusing.

The artist, Dale Zamzow, is a technical illustrator with United Technology Center, Sunnyvale, and, along with his wife, Claudia, a freelance artist and designer. Large colored versions of the cartoons in the series and others are available framed for office display.

N. B. Editors of other section publications, Student Journal, Group Newsletters, etc.: the series is available to other publications at a modest fee. Contact Mr. Zamzow at his home, 174 Brooklyn Ave., San Jose, Calif. 95128; telephone (408) 298-5838.

"Patents Pending" is copyrighted by Mr. Zamzow and may not be reprinted or copied in any manner without his permission.



new laser trick

MORE HOLOGRAM WIZARDRY

A new trick done with lasers by a team of Stanford University engineers may let earthlings watch space-walking astronauts go through their paces in orbit.

The two main obstacles to direct viewing from the ground—atmospheric distortion and telescope "jiggle"—would be eliminated by their new technique, the Stanford engineers explained. A telescope would not even be needed, and they should be able to discern clearly small objects as high as 200 miles.

Such a viewing system might have told Gemini 9 astronauts, for example, that the orbiting target vehicle for their mission's docking plans had turned into an "alligator."

Though instruments indicated something wrong, Stafford and Cernan had to go aloft to find out what it was. Telescopes couldn't resolve it.

They discovered the target's fiberglass nose shrouds snagged and hanging open from the vehicle in a kind of reptilian grin. The docking operation was cancelled.

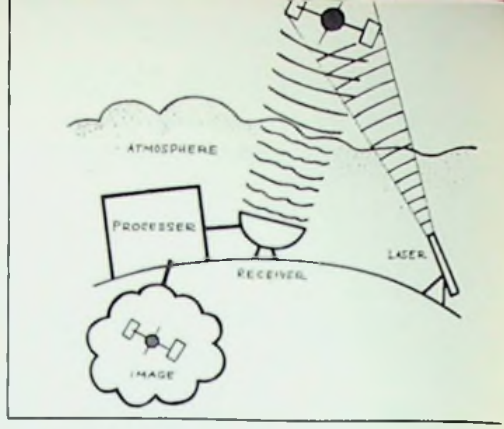
The Stanford viewing trick takes advantage of the "vellum effect," a phenomenon observed in photographs of earth taken from heights well above the atmosphere. Such photos are phenomenally sharp and far more detailed than the aerial photos taken at much closer range by planes flying through earth's atmosphere.

The vellum effect can be demonstrated by holding a sheet of artist's tracing paper above a drawing—it fogs or blots out the image beneath. But when the paper is placed flat on the drawing, the image is clearly seen. In the same way, astronauts get a much clearer view of us on earth than we get of them.

The Stanford engineering team proposes using the laser's "coherent" light—one-color (single-wavelength), non-spreading, and far brighter than the sun—to illuminate the satellite. The reflected light rays would be caught in a hologram—a film record of the reflected light patterns from the satellite.

Holograms bear no visible resemblance to the scenes they record. They look rather like a fogged piece of film. But when laser light is shone through a hologram, the original scene it recorded reappears as if by magic.

Similarly the hologram of satellite reflections would bear no resemblance to the satellite itself. Instead it would faithfully record the interference pattern of reflected laser light rays. The distortions caused by the atmosphere do not affect the interference pattern.



Laser viewing technique proposed by a group of Stanford engineers may be able to overcome optical distortions caused by the earth's atmosphere and produce clear pictures of satellites as high as 200 miles. The technique has worked at short distances within the laboratory, but has yet to be proved in a fully developed system of the type shown in this drawing.

Then, by laser illumination of the hologram and use of a lens to "reconstruct" or focus the rays properly, a clear image of the satellite could be obtained.

What happens is a reversal of the vellum effect. The technique produces the clearest pictures when the apparatus is closest to the distorting medium—the very point at which the vellum effect

HUMAN FACTORS

The 8th Annual IEEE Symposium on Human Factors in Electronics is planned for May 3-5, 1967, at the Cabana, Palo Alto, under the theme: "Automation-Performance-Acceptance: Compromises in System Design."

Contributed and invited papers and

The deadline for paper abstracts is December 15, 1966, by which date a 100-word program abstract and a 500-word selection abstract should be submitted to Dr. James C. Bliss, Electrical Engineering Dept., Stanford University, Stanford, Calif., 94305. Authors will be notified regarding acceptance by February 1, 1967.

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causes the worst fogging with conventional viewing methods.

It's as if one could put ground beef backwards into a meat grinder and produce a steak.

The Stanford engineers—Dr. Joseph Goodman and research engineers Wright Huntley, David Jackson and Matt Lehmann of the systems techniques laboratory—have proved the system will work in the laboratory.

Though the laboratory distance was short, and a piece of wavy shower glass was used instead of the atmosphere, their "wavefront reconstruction imaging" technique produced astonishingly clear pictures.

"It should work exactly the same with a satellite," says Huntley, "but we will try it first over long distances at ground level. It could be used to see small distant objects on the ground, too, with the same improvement of resolution over telescope viewing."

He added that in a fully developed system, foil-lined parabolas and television cameras might replace the film. The reflections would be recorded by the TV camera and fed directly into a computer for processing.

"In this way we could produce a much more refined picture than with film," he said, "just as was done with Surveyor's moonscapes and the Mariner shots of Mars.

"Furthermore, bigger parabolas would pick up more reflections to produce still better pictures. The parabolas would be cheap to make. Wrinkles in the foil surface could be ignored, since they would not affect the final image any more than the atmosphere."

The maximum viewing range one could expect to achieve using today's pulsed, high-power lasers (about 1000 million watts) would be around 200 miles, Dr. Goodman said. If lasers with high enough power could be developed, he suggested, the range might even be extended to the moon.

NEW SOCIETY FORMED

The organization of a new international technical society for the exchange of information on the applications of microwave power for industrial processes was announced recently in Palo Alto by a group of Canadian and U.S. scientists.

The new group, known as the International Microwave Power Institute (IMPI), was incorporated in Canada last July, following a successful symposium on the subject of industrial applications of microwave energy, held at the University of Alberta, Edmonton, Alberta, Canada.

The industrial applications of radio-frequency energy in microwave spectra (generally 915 MHz or 2450 MHz) are among the most important fundamental technologies to have been developed in recent years. Microwave energy presently serves such diverse fields as volume food preparation; the cooking of chicken; potato chip heating and drying; bakery products preparation; removal of solvents from drugs; wood gluing, drying, and curing; and the accelerated polymerization of epoxy resins.

The IMPI informational program will provide economic analyses on microwave power versus conventional fossil fuel applications, and combinations of both. Details of particular microwave heating systems also will be made available. Other present applications of microwave energy transfer are the drying of foundry sand core molds; drying paper coatings; sterilization and pasteurization of wine, beer, and milk; freeze drying of food; the drying of printing inks; and in such advanced areas as the generation of plasmas for electronics manufacturing techniques and medical uses.

World-wide in scope, the institute plans its next annual symposium at Stanford University, Palo Alto, California, March 29-31, 1967. The technical proceedings will be published and distributed to all members—the fees for which are $12.00 (U.S.) annually.

In addition to technical proceedings, the institute plans an information program to broaden the awareness of microwave power applications among all process industries.

Voss

Gerling

DIAMOND, CARLTON AWARDS

Two engineers who have contributed greatly to the nation's scientific and engineering programs were honored at the IEEE 1966 Aerospace and Electronics Systems convention held in Washington, D. C. in October.

The Harry Diamond memorial prize award was presented to Dr. Rudolph A. Stampfl of the Goddard Space Flight Center. The award is given to a person in government service for outstanding contributions in the field of radio or electronics.

The M. Barry Carlton award was presented to Raymond L. Robbiani of the U. S. Army Electronics Command.

Elected to head the new technical group as chairman of the board of governors is Dr. W. A. Geoffrey Voss, University of Alberta. Other board members include W. C. Brown, Raytheon Co., Burlington, Mass.; Dr. D. A. Dunn, Stanford University, past section chairman; J. E. Gerling, Litton Industries, Palo Alto; J. A. Jolly, EIMAC Division of Varian Associates, San Carlos; A. E. Supplee, Cryodry Corporation, San Ramon; and L. C. Bancroft, E. I. DuPont, Wilmington, Delaware.

san jose state symposium

STABILIZING EE EMPLOYMENT

During 1963-64 approximately 30,000 professional engineers and scientists lost their jobs because of mass layoffs by firms throughout the country.

The possibility that this will recur if the Viet Nam War ends or NASA contracts are cut back or whenever major changes occur in industry is the motivation of the national symposium on stabilization of engineering and scientific employment in industry to be held on Saturday, November 19, from 9 to 5:45 in the Morris Dailey Auditorium at San Jose State College.

Sponsored by the Manpower Research Group, Center for Interdisciplinary Studies of the college, the symposium will include reports on layoff studies in the Bay Area, Boston area, and at Boeing, respectively, by Prof. R. P. Loomba, director of the center, Prof. Joseph D. Mooney, Princeton University, and Robert Brandwein, United Research, Inc., Cambridge, together with their recommendations for the future.

This will be followed by luncheon and afternoon reports by Dr. Walter E. Langway, N. Y. State Dept. of Employment, on a Long Island layoff study, and Prof. Leslie Fishman, University of

(Continued on page 20)

TELEMETERING CONFERENCE

The 17th annual meeting of the National Telemetering Conference will be held in the San Francisco Hilton, May 16-18, 1967.

The host sponsoring society of NTC 67 is the American Institute of Aeronautics and Astronautics. Cosponsors include the ISA and the IEEE.

The conference will feature several program innovations. For the first time, educational and management seminars will be held, in addition to special sessions on the state of the art.

The educational portion of the program will be conducted daily during the conference in two-hour segments during morning and afternoon sessions. Subject areas to be covered include: a survey of telemetering, transducers and signal conditioning; time multiplexing; encoding techniques; modulation and detection theory and application; data store; and system techniques, stressing applications. Typical problems will be posed and analyzed during workshop periods.

Seven topical areas will be surveyed during the state of the art sessions: tape recording; transmission techniques; data encoding; treatment of dynamic information; antennas; reception and decoding; and information retrieval and presentation.

The management seminar will offer papers on project engineering, marketing, procurement, R and D plans, small engineering firm operation, corporate problems, management in the government, and manpower controls.

Additionally, NTC 67 will underscore telemetering applications in biomedicine, industry, oceanography and aerospace. Sessions will also be devoted to adaptive techniques and the computer, and new technology developments.

Papers describing significant contributions in the foregoing and related fields that have not been previously published or presented are invited for NTC 67.

Authors are requested to submit *both* a 35-word abstract and 200-word summary of their paper. Since papers will be chosen on the basis of summaries, they should include concise statements outlining what new and significant results have been obtained. Inclusion of key illustrations will facilitate selection.

The 35-work abstract, suitable for publication in an advance program, should be typed on a separate sheet, and include title of talk, author's name, affiliation, complete return address and telephone contact. Abstracts longer than 35 words will arbitrarily shortened by the program committee.

Summaries should be submitted in single-side, black-on-white, double-spaced typewritten form suitable for immediate reproduction and screening purposes. The author's name, affiliation, complete return address and telephone contact should appear on the first page, and additionally, the author's name and abbreviated title on each subsequent page.

Both the summary and the abstract—in duplicate—should be forwarded on or before December 9, 1966, to the program chairman: Max A. Lowy—General Electric Co.—P.O. Box 8048—Philadelphia, Pennsylvania. Authors of accepted papers will be asked to submit a complete version for publication in the conference proceedings that will be available at the meeting.

The general chairman of NTC 67 is Richard W. Towle, advanced technology division/American Standard, Mountain View.

SMALL BUSINESS CONFERENCE

A small business subcontracting conference will be held at the San Francisco Hilton on December 7.

Purpose of the conference is to promote a better understanding of the role of small business in government subcontracting. Nationally known speakers from industry and government will present an informative program. A question and answer panel period with local prime contractors and government agencies serving as panelists is also scheduled. Though the conference is slanted toward small business, large business representatives will find the program worthwhile.

The conference is jointly sponsored by the San Francisco regional office of the Small Business Administration and the following area prime contractors: Aerojet-General; Ampex; Dalmo Victor; Hewlett-Packard; Kaiser Aerospace & Electronics; Lenkurt Electric; Litton Industries; Lockheed Missiles & Space; Philco; Sylvania Electric Products; United Technology Center; and Westinghouse.

MORE EE STABILIZING

Colorado, on the Denver Martin study.

A panel, moderated by Dr. Loomba, will include Guy Black, President Johnson's committee on the economic impact of defense and disarmament; John Alden, Engineering Manpower Commission, Engineers Joint Council; Paul W. Crapuchettes, vice president, electron tube division, Litton Industries; Geoffrey Faux, U. S. Arms Control and Disarmament Agency; and Paul Harris, L. A. County Employees Assn.

Registration fee is $15. To determine if reservations are still available, call Dr. Loomba's office immediately at 408-294-6414, Ext. 2468.

SECTION PARTICIPANTS

Forty-five Bay Area engineers, most of them members of the San Francisco Section, participated in the contributed technical sessions of WESCON/66 in August.

Their session numbers, subjects, names and companies:

1. Circuit Engineering by Digital Computation: F. G. Fisher, D. W. Cooper, Kenneth Lock, K. L. Deckert, E. T. Johnson, and D. B. Gasich, all of IBM Systems Development, San Jose.

2. Solid-state Devices and Integrated Circuits: M. M. Atalla, Hewlett-Packard Co., Palo Alto.

4. Satellite Communications: Ward Ellis, Frank Druding, and Morton D. Lenske, all of Litton Mellonics Systems, Sunnyvale, and J. M. Rosenberg, G. R. Hickcox, and C. D. Sordal, of Philco WDL, Palo Alto.

6. Electron Devices: William R. Luebke, and T. Moreno, of Varian Associates, Palo Alto.

7. Signal Optimization for Additive Noise Channels with Feedback: Jim K. Omura, Stanford University.

9. Advanced Spaceborne Computer Concepts: Jack Goldberg, Stanford Research Institute, Menlo Park.

10. Large Scale Integration: Leslie Vadasz, Fairchild Semiconductor, Palo Alto.

11. Field Effect Transistors: James Sherwin, Siliconix, Sunnyvale, Carroll Perkins, Raytheon Semiconductor, Mountain View and Michael Dix, General Microelectronics, Santa Clara.

12. Millimeter Wave Techniques and Applications: William J. Welch, University of California, Berkeley.

15. Engineering Education for Student and Professional (Panel): Dean Joseph Pettit, Stanford University.

16. Electronic Systems for Urban Rapid Transportation: Deane Aboudara, Bay Area Rapid Transit, San Francisco, and John C. Beckett, Hewlett-Packard Co., Palo Alto.

18. Plastic Transistors—Their Impact on the Industry: John S. MacDougall, Fairchild Semiconductor.

(Continued on page 22)

education notes

TWO FROM CAL EXTENSION

Courses on reliability, Monday-Saturday, December 5-10, and statistical time series analysis for engineers, Monday-Saturday, March 20-25, are offered by UC Engineering Extension and the College of Engineering. Fees are $175 and $180 respectively. For detailed brochure, write Engineering Extension, UC, 2223 Fulton St., Berkeley, Calif., 94720, or phone 415-845-6000, Ext. 4151.

Stoddard

Enderby

grid swings

IT IS REPORTED:

Don J. Stoddard, Jr., has been named manager of aerospace antenna engineering at Dalmo Victor, a Textron division, Belmont, including the advanced Rotodome early warning airborne radar antenna, various missile antenna design projects, and the communications antennas for both the lunar excursion and command service modules of NASA's Apollo spacecraft.

Charles E. Enderby has been elected a vice-president of Electro Optics Associates, Palo Alto. Dr. Enderby, previously with the General Electric Microwave Laboratory at Stanford, is in charge of R&D efforts.

George Nelson has been named communications manager by the Western Electronic Manufacturers Assn., and will headquarter in the Palo Alto office.

Coherent Radiation Laboratories, a recently-formed Palo Alto laser manufacturing firm, has been awarded a research contract by E. I. du Pont de Nemours to investigate the applicability of various types of existing laser devices to holography.

Cyclotron Corporation, Berkeley, has signed a $362,000 contract with Duke University and the U.S. Atomic Energy Commission for the construction of a 15 million electron volt isochronous cyclotron to be installed in combination with a 15 million electron volt tandem Van de Graaff accelerator, the new combination called a "Cyclo-Graaff."

D. E. Merrill has been named personnel manager of MELABS, Palo Alto, after management development, personal and labor relations experience at Microwave Electronics, Hewlett-Packard Co., and Lenkurt Electric.

Merrill

Thinger

Zilliacus

Parker

Energy Systems, Inc. recently announced the election of Patrick W. Zilliacus as president of the company and chairman of the board, formerly associated with Jefferson Electric Company, Bellwood, Illinois as executive vice-president and as president of a subsidiary company, Jefferson Electronics, Inc. Also elected to the board of directors was Daniel E. Murphy who has been the acting chief executive officer of the company since the resignation of Albert J. Morris, co-founder and former president. Mr. Morris continues to serve the company in the capacity of consultant and member of the board.

Dr. Sydney R. Parker, formerly professor of electrical engineering at the University of Houston, has joined the faculty of the Naval Postgraduate School in Monterey.

MORE WESCON SESSIONS

19. The Parameters to be Considered in Choosing Sophisticated Microwave Devices in the Design of New Microwave Receiver Systems: Wayne H. Robinson, Bruno Kaiser, B. P. Istaelsen, K. B. Niclas, L. B. Fletcher, and C. C. Billat, all of Watkins-Johnson Co., Palo Alto, and V. E. Dunn, R. W. Roberts, Jr., George E. Traille of Melabs, Palo Alto.

22. High-frequency Amplifier Design: Richard Q. Lane, Fairchild Semiconductors, Palo Alto, J. B. Compton, Siliconix, Sunnyvale, and John Moll, Stanford University.

23. The Impact of Ultra Wideband Sampling and Associated Developments on Electronic Instrumentation: Robert H. Brunner, Bernard M. Oliver, Gerald Alonzo, and Richard W. Anderson, all of Hewlett-Packard Co., Palo Alto.

7th IEC Packaging Symposium; VII. New Approaches to Modular Electronics: W. J. Prise, Lockheed Missiles & Space Co., Sunnyvale.

S.A.V.E.; IV. John Chartz, Dalmo Victor Co., Belmont.

grid erratum

THORRY ABOUT THAT

In some mysterious way known only to that Big Computer in the Sky, a photograph of Prof. J. R. Singer, University of California, appeared in the September directory issue along with the correct data for Prof. Byron E. Thinger, San Francisco State College Student Branch Counselor, whose correct photo hopefully appears herewith.

Manufacturer / Representative Index

Representative Directory

Burkhart *Elspas*

the section

MEMBERSHIP

The following members have recently been transferred to the grade of Senior Member:

R. N. Burkhart J. A. Holly
B. Elspas S. H. Marx

Holly *Marx*

MORE GRID SWINGS

Mellonics Systems development division of Litton Industries has opened a new data processing center at its Sunnyvale headquarters to serve the needs of its customers and other users of scientific, administrative and business data processing in northern and central California.

ADVERTISERS INDEX

Classified Advertising

CLASSIFIED ADVERTISING RATES

Members: $15 for 1st col.-inch, $10 for 2nd, $5 for each additional. Non-members: $20 for 1st col.-inch, $15 for 2nd, $10 for each additional. 10% frequency discount for 10 consecutive ads. None to exceed total of 4 col.-inches. Non-commissionable. Deadline 15th of month.

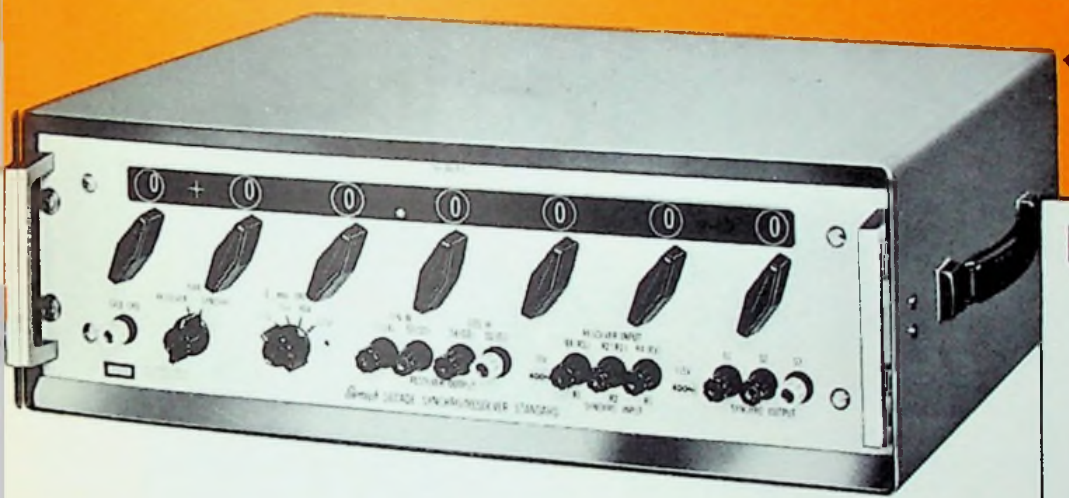
Write or call: Ernesto A. Montano, IEEE Grid, Suite 2210, 701 Welch Rd., Palo Alto, Telephone (415) 327-6622.

PRODUCTS

Spectra-Physics, Inc., Mountain View, has announced the appointment of Robert L. Mortenson as marketing manager; John P. Goldsborough as manager of applied research; Richard E. Stark as production manager; Wayne C. Lockhart as manager of the company's newly-formed optics division; and Richard H. Moore as president of Spectra-Physics, S.A.

You get unvarying accuracy with *Gertsch** synchro and resolver standards

—consistent 2 seconds-of-arc tolerance is unaffected by loading, external errors, or time



Decade Synchro / Resolver Standards Compact combination instrument tests both synchros and resolvers. 2 seconds-of-arc accuracy. Rapid quadrant switching. Available in .001° and .0001° resolution... 115, 90, 26, and 11.8 volts output... 115 or 26 volts excitation.

Synchro Standards or Resolver Standards. One-knob or two-knob models available as either synchro or resolver standard, in half rack or full-rack size. Continuous angular rotation from 355° to 0°, in 5° increments. 2 seconds-of-arc accuracy.

Coaxial Synchro Standards. Ideal where panel space is limited. Occupies only 2⅛" square panel area. Outer dial switches in 60° increments; inner dial in 5° increments. Zero to 360° range. 2 seconds-of-arc accuracy.

Due to exceptionally low output impedance, and low output impedance unbalance, *Gertsch* standards will operate continuously under load with no degradation of accuracy. This high degree of internal stability results from the time-proven design techniques originally developed for *Gertsch* RatioTran* precision voltage dividers. Effects of external errors, such as operator, hookup, readout, and associated equipment errors are also minimized.

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In addition to the standards listed, *Gertsch* also supplies rotary solenoid, and relay (programmable) models, dividing heads, phase angle voltmeters, null indicators, and a full line of synchro and resolver bridges.

For complete information, request Catalog 11—a valuable reference source for engineers.

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