

EDITOR'S PROFILE of this issue

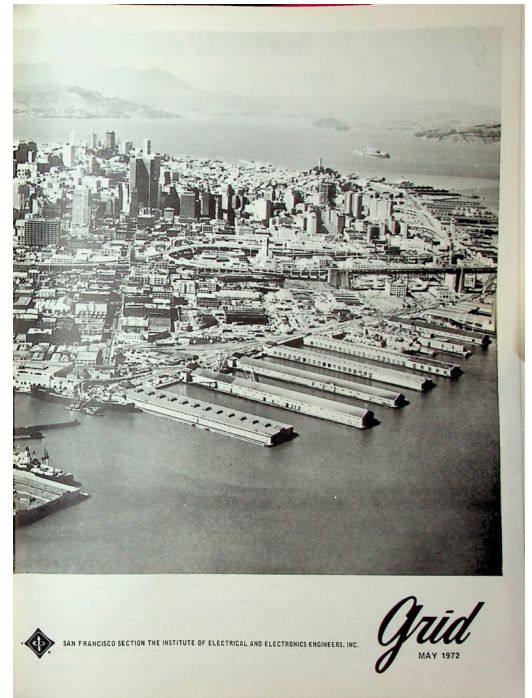
from a historical perspective ...

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

May, 1972:

Cover: San Francisco's waterfront is shown. S.F. is the site for many IEEE conferences, including the upcoming Power Engineering Summer Meeting and the Computer Conference.

Page 4: David Marsh of HP talks about the new HP-35 pocket calculator, with its 35 functions. It uses Reverse Polish Notation, favored by engineers. It sells for only \$395.



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

https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History

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

April, 2025

Contact p.wesling@ieee.org



SAN FRANCISCO SECTION THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Grid
MAY 1972

Published monthly except June, July, August and December by San Francisco Section Institute of Electrical and Electronics Engineers

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Second Class postage paid at Palo Alto, Calif.

Subscriptions:

\$4.00 (members), \$6.00 (others) overseas, \$7.00 per annum

THE COVER STORY

San Francisco plays host to many IEEE General Meetings, Technical Conferences and Committee Meetings during the year. Important future Meetings scheduled are:

IEEE Power Engineering Society Summer Meeting, July 9-14, 1972, Fairmont Hotel.
Estimated attendance - 1200

IEEE Computer Conference (COMPCON) Sept. 12-14, 1972, Jack Tar Hotel.
Estimated attendance - 1050

Those of us who live and work here like to think of the San Francisco Bay Area as a source of continuous renewal and inspiration. The Meetings' Committees work hard to insure that the visitors' attendance will not only be profitable, but also enjoyable, and that they will take home with them a renewed feeling of vitality and remembrance of the beauty of the area.

MEETING CALENDAR

AEROSPACE & ELECTRONIC SYSTEMS MAY 13

MAY 13, Saturday, 2:30 PM, Carmel Valley (see map). Meet at 1:00 PM at Naval Postgraduate School Library Parking lot, Monterey. Reservations: Pat Hoppe, (415) 326-4350 x 6143 by 5/11.

Story on page 7

ANTENNAS & PROPAGATION MAY 17

MAY 17, Wednesday, 9:00 AM to 5:00 PM, Lockheed Research Lab Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto. Registration: 8:30 to 9:00 AM, May 17th. Fee: \$1.00.

Story on page 6

CIRCUIT THEORY MAY 13

MAY 13, Saturday, 9:00 AM to 5:00 PM, SLAC Auditorium, 2575 Sand Hill Road, Menlo Park. See story for registration and other information.

Story on page 8

COMMUNICATIONS SOCIETY MAY 16

MAY 16, Tuesday, 8:00 PM, Rickøy's Hyatt House, Stanford Room, 4219 El Camino, Palo Alto. Cocktails: 5:30 and dinner 6:30 PM. Reservations: Ed Carr, (415) 399-4189 by May 12th.

Story on page 7

COMPUTER SOCIETY MAY 6

MAY 6, Saturday, 8:30 AM to 4:00 PM, Daly Science Hall, Room 207, University of Santa Clara. For information contact IEEE Short Course, Division of Continuing Education, University of Santa Clara. (408) 984-4518.

Story on page 8

COMPUTER SOCIETY MAY 23

MAY 23, Tuesday, 8:00 PM, Skilling Auditorium, Stanford. Dinner: Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Dinner reservations: Pat Fleming, (415) 321-3300 x 258, by noon, May 23rd.

Story on page 5

COMPUTER SOCIETY JUNE 3

JUNE 3, Saturday, 8:30 AM to 4:00 PM, Daly Science Hall, Room 207, University of Santa Clara. See story for registration information. For further information contact IEEE Short Course, Division of Continuing Education, University of Santa Clara. (408) 984-4518.

Story on page 5

CONTROL SYSTEMS SOCIETY MAY 16

MAY 16, Tuesday, 8:00 PM, Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto. Dinner: Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. No reservations.

Story on page 8

EAST BAY SUBSECTION, MAY 15

MAY 15, Monday, 7:30 PM, PG&E, 77 Beale St., San Francisco. No dinner. Reservations: Hadi Monsef, (415) 764-5522.

Story on page 5

ELECTROMAGNETIC COMPATIBILITY MAY 15

MAY 15, Monday, 8:00 PM, Hewlett-Packard Auditorium, 1501 Page Mill Road, Palo Alto. Dinner: 6:15 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. No reservations.

Story on page 4

ELECTRON DEVICES, MAY 23

MAY 23, Tuesday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails: 6:00 and dinner 7:00 PM. Reservations: Section office (415) 327-6622.

Story on page 6

ENGINEERING MANAGEMENT, MAY 17

MAY 17, Wednesday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails: 6:00, dinner 6:30 PM. (Pct roast of beef \$4.95 incl. tax & tip). Dinner reservations: Judy Webb (415) 321-2300 x 3619 by May 16th.

Story on page 7

ENGINEERING IN MEDICINE & BIOLOGY MAY 9

MAY 9, Tuesday, 8:00 PM, Stanford Medical Center, Room M 114. Dinner: 6:30 PM, Red Cottage, 1706 El Camino, Menlo Park. Reservations: Bob Silligman, (415) 328-7973 by 5/8.

Story on page 8

GOLDEN GATE SUBSECTION/INDUSTRY APPLICATIONS SOCIETY MAY 17

MAY 17, Wednesday, 6:30 PM to 7:30 PM. No dinner. Meet at Richmond Field Test Station, 1301 South 46th Street, Richmond. Reservations: Molly Milan, (415) 445-2227.

Story on page 7

TOUR OF JAMESBURG EARTH STATION. John P. Scroggs, Station Manager, Communications Satellite Corp. Carmel Valley.

NORTHERN CALIFORNIA SYMPOSIUM ON ANTENNAS & PROPAGATION. A total of 21 papers will be presented during a one-day session covering practical and theoretical developments in the field of Antennas and Propagation.

ONE-DAY TUTORIAL ON DATA COMMUNICATIONS COMPONENTS, SYSTEMS AND FUTURE TRENDS. Course organizers: Randy Brandt, IEI and Dale Nielsen, Stanford Univ.

BELL SYSTEM DIGITAL DATA SERVICE. Carl B. Felien, Staff Engineer, Pacific Telephone, San Francisco.

ONE-DAY COURSE ON DIGITAL SYSTEM DESIGN TECHNIQUES. See April GRID for story.

ELECTION OF OFFICERS FOR 1972-73. TOPIC AND SPEAKER: "DATA COMMUNICATION NETWORKS - PROBLEMS AND OPPORTUNITIES" by Neil Sullivan, Manager of engineering software, Tymeshare, Inc.

ONE-DAY SHORT COURSE ON COMPUTER COMMUNICATIONS. Speakers include Dr. Frank Greene, Technology Learning Corp., and Dr. Robert Linebarger, NASA. Others to be announced.

ELECTION MEETING FOR 1972-73 OFFICERS. Topic and speaker: "CONVERSION OF SOLID WASTE INTO ELECTRICAL POWER - DEVELOPMENT OF THE CPU-400 PILOT PLANT" by Gordon Wade, Mgr., Engineering Analysis, Combustion Power Co.

TOUR OF PG&E's ENERGY CONTROL CENTER. Assemble in lobby of PG&E office building, 77 Beale St., San Francisco.

MODEL 8580A AUTOMATIC SPECTRUM ANALYZER. Richard Irwin, Applications Engineer, Hewlett-Packard Co. Palo Alto. ELECTION OF OFFICERS FOR 1972-73.

LASER COMMUNICATIONS. Dr. R. C. Ohlman, Lockheed Palo Alto Research Lab.

THE MANAGEMENT OF A HIGH TECHNOLOGY COMPANY. William C. Bennett, President, NOVAR Corp.

ELECTION OF 1972-73 OFFICERS. Topic: "TELEPHONE SERVICE TO HANDICAPPED INDIVIDUALS". Larry Prehn, Customer Service Engineer, PTT.

JOINT MEETING. TOUR OF EARTHQUAKE ENGINEERING RESEARCH CENTER. Dr. Joseph Penzien, Professor of Structural Engineering and Dr. Dixon Rea, Asst. Research Engineer, University of California.

MEETING CALENDAR

IEEE POWER ENGINEERING SOCIETY SUMMER MEETING

July 9 - 14, 1972

San Francisco, The Fairmont

INFORMATION THEORY MAY 18

Story on page 4

SHAKY: A ROBOT THAT PLANS AND LEARNS. Dr. Peter E. Hart, Sr. Research Engineer, Stanford Research Inst.

MAY 18, Thursday, 8:30 PM, SRI Bldg. 1, 333 Ravenswood Ave., Menlo Park. Dinner: The Friars, 4101 El Camino Way, Palo Alto. Reservations: Paul Shaft, (408) 734-2244 x 342 by May 17th.

MAGNETICS MAY 25

Story on page 6

ELECTION OF 1972-73 OFFICERS. TOPIC AND SPEAKER: "TRILLION BIT MEMORIES AND THE AMPEX TBM* MEMORY SYSTEM" Manny Wildmann, Mgr., Terbit Memory Systems, Ampex.

MAY 25, Thursday, 8:00 PM, Ampex Cafeteria, 401 Broadway, Redwood City. No dinner.

MICROWAVE THEORY & TECHNIQUES JUNE 7

Story on page 6

THE MICROWAVE INDUSTRY, 1972. Theodore S. Saad, President, Sage Labs, Natick, Mass.

JUNE 7, Wednesday, 8:00 PM, Hewlett-Packard Auditorium, 5301 Stevens Creek Blvd., Santa Clara. Dinner: 8:00 PM, Custom House, 26000 Stevens Creek Blvd., Cupertino. Reservations: Louise Medeiros, ATI, (415) 493-5135 x 500 by June 6th.

NUCLEAR SCIENCE MAY 9

Story on page 8

THE NUCLEAR SCIENCE GROUP PROPOSAL FOR CONTINUING PROFESSIONAL EDUCATION. Ray S. Larsen, SLAC.

MAY 9, Tuesday, 8:00 PM, SLAC Auditorium, 2575 Sand Hill Road, Menlo Park. To facilitate entry at main gate, leave name with Mrs. L. Burch, (415) 854-3300 x 2401. No dinner.

NUCLEAR SCIENCE JUNE 6

ANNUAL SPRING MEETING. Introducing new officers. Wine tasting at Concannon Vineyards. Speaker to be announced by mailing to members.

JUNE 6, Tuesday. Wine tasting at 6:00 PM, Concannon Vineyards, Livermore. Dinner and meeting at 7:45 PM, Hap's Restaurant in Pleasanton. Reservations: Mrs. L. Burch, SLAC, (415) 854-3300 x 2401 by June 5th.

POWER ENGINEERING SOCIETY MAY 9

Story on page 3

LADIES' NIGHT. THE PSYCHOBIOLOGY OF CONSCIOUSNESS AND TRANSCENDENTAL MEDITATION. Dr. Demetri P. Kanellakos, Stanford Research Institute.

MAY 9, Tuesday, 8:00 PM, Engineers' Club, 160 Sansome St., San Francisco. Cocktail hour 6:00 PM, dinner 7:00 PM. For dinner reservations call The Engineers' Club, (415) 421-3184.

RELIABILITY MAY 17

Story on page 4

DESIGN AND PRODUCTION OF A SHIRT-POCKET CALCULATOR. David Marsh, Computer/Production Engineer, Hewlett-Packard Co., Cupertino.

MAY 17, Wednesday, 8:00 PM, Stanford University Physics Lecture Hall PH 104. Dinner: 6:30 PM, Stanford View Restaurant, El Camino & Stanford Ave., Palo Alto. Reservations: Dick Cornwell, (415) 966-3877 by May 16th.

SANTA CLARA VALLEY SUBSECTION MAY 10

Story on page 7

PANEL DISCUSSION: THE WORLD FUTURE FOR ELECTRONICS ENGINEERS. Kenneth Taylor, SRI, Moderator. **ELECTION OF SUBSECTION OFFICERS FOR 1972-73.**

MAY 10, Wednesday, 8:00 PM to 9:30 PM, SRI Conference Rooms A & B, Building 1 (main building), 333 Ravenswood Ave., Menlo Park. No dinner.

SANTA CLARA VALLEY SUBSECTION MAY 26

Story on page 5

DINNER MEETING AT MIRASSOU WINERY.

MAY 26, Friday, 7:00 PM. Tour of winery followed by wine tasting. Dinner 8:30 PM. Mirassou Winery, Aborn Rd. (Take Capital Expressway east of 101 to Aborn, then 2 mi. east), San Jose. Reservations: Ray Power (408) 227-7100 x 6574. Must be confirmed by check at \$7.50 per person to Ray Power, IBM, Dept. H87, Monterey & Cottle Rds., San Jose, 95114.

SYSTEMS, MAN & CYBERNETICS SOCIETY MAY 8

Story on page 4

Special Interest Group on **ARTIFICIAL INTELLIGENCE, HUMAN SPEECH IN RECOGNITION OF THE PROBLEMS INVOLVED IN ITS UNDERSTANDING.** Dr. Donald E. Walker, Senior Research Linguist, SRI.

MAY 8, Monday, 8:00 PM, Conference Room B, Bldg. 1, SRI, 333 Ravenswood Ave., Menlo Park. Dinner: 6:00 PM, Red Cottage, 1706 El Camino Real, Menlo Park. Reservations: Section office (415) 327-6622 by noon, May 5th.

VEHICULAR TECHNOLOGY MAY 15

Story on page 4

TOUR OF USAF SAGE SITE NEAR SAN JOSE.

MAY 15, Monday, 7:30 PM, USAF, Mt. Umunhum, near Almaden. See story for direction. Dinner: 6:00 PM, Cafe del Rio, New Almaden. Reservations: Ben Wright (415) 588-5315 by 5:00 PM May 12th.

THE SAN FRANCISCO SECTION ANNUAL DINNER DANCE MEETING will be held on Friday, June 9th at the Engineers Club, 160 Sansome St., San Francisco. No-host cocktails and hors d'oeuvres at 6:30 PM, dinner at 7:30 PM and dancing till midnight. Tickets may be obtained at the Section office at \$8.00 per person. Price includes hors d'oeuvres and wine with dinner. Call the Section office (415) 327-6622, or in San Francisco call the Engineers Club (415) 421-3184. Reservations should be made no later than June 5th. This meeting will honor our 1972 Fellows and introduce the Section Officers for 1972-73.

Opening with a Sunday Afternoon Get Acquainted Tea, this Meeting continues through five more days of program including some 50 technical sessions with worldwide participation. Six key inspection trips are offered, to PG&E's Energy Control Center, Geysers Power Plant, Vaca-Dixon 500 KV Substation, Diablo Canyon Nuclear Plant, and to SMUD's Rancho Seco Nuclear Plant, and the BART facilities. For the women visitors, a diverse schedule of activities has been planned to include many of the unique cosmopolitan features of our city.

THE PSYCHOBIOLOGY OF CONSCIOUSNESS AND TRANSCENDENTAL MEDITATION



This unusual subject to be presented to Power Engineers and their ladies May 9 can be interpreted loosely to mean "What makes one dream what he dreams?" Dr. D. P. Kanellakos recently has led a study of this subject at Stanford Research Institute. Major states of human existence are wakefulness, sleep and dreaming. Does a fourth exist - Transcendental Meditation? A wakeful subject has thoughts and experiences and is aware that he is having them. A sleeping subject is unaware of either his existence or his thoughts. A dreaming subject is aware of his thoughts and experiences but is unaware of his existence. Sounds exciting, doesn't it?

Dr. Kanellakos received his early education in Greece, attended the University of Illinois, and was awarded his PH.D. in Electrical Engineering by Illinois Institute of Technology in 1963. He is a Senior Research Engineer at SRI.

This will be the official annual meeting, as well as ladies night. Plan to attend.

SHAKY, THE ROBOT



One of the hallmarks of "intelligence" is said to be the ability to learn from experience. SHAKEY, the Stanford Research Institute robot, is showing the bare beginnings of this sort of ability; it can use generalized forms of solutions to early problems to aid it in solving later problems. SHAKEY also can recover from a variety of errors that may occur as it executes its plans in a simple experimental environment. This talk will describe some of the principles underlying the implementation of these abilities.

Peter E. Hart received a Ph.D. degree in Electrical Engineering from Stanford University in 1966. Since that time he has been at Stanford Research Institute, where he has performed and led research in the areas of pattern recognition and artificial intelligence.



EMC – AUTOMATIC SPECTRUM ANALYZER

Mr. Richard Irwin, Microwave Division, Hewlett-Packard will discuss the recently developed Model 858A Automatic Spectrum Analyzer. Several configurations of this system are possible, covering all or part of the frequency range 10 kHz – 18 GHz (40 GHz with external waveguide mixers). A flexible input control system allows program control of the system RF front-end configuration, for the selection of antennas and signal-conditioning paths such as preselector filters and preamplifiers. Both hardware and soft-aspects of the system will be discussed, with emphasis on the practical applications of the system's measurement capabilities. An RF version (10 kHz – 110 MHz) of the system will be demonstrated with the Model 8500A Graphics Terminal.

Mr. Irwin received the BAEE degree from Rice Institute in 1958. Since 1961 he has been with Hewlett-Pack-

BOTHERED BY EMPTY SHIRT POCKETS SINCE YOU KICKED THE HABIT?

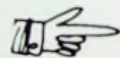
Another step in the solid-state electronics, or computer, or LSI revolution (depending on how big a circle you revolve in) was publicized late last year by Hewlett-Packard when their shirt-pocket-sized calculator was announced. While a step into the personal/consumer market, the HP-35 calculator (not computer) is an engineer's tool that goes far beyond the shopper's needs for figuring cost/ounce of beans. The design and production of the device will be described at the May meeting of the Reliability Group, with emphasis on the reliability/quality aspects.

A general description of the electrical design, packaging, manufacturing, and test will be given, followed by more detailed coverage of parts types, incoming inspection, reliability/warranty estimates, and failure-data collection. The use of the HP-35 will be demonstrated, including some redundancy reliability calculations.

The speaker will be David Marsh of the Advanced Products organization. Mr. Marsh has been associated with production of the HP-35 from prior to the pilot run, and is experienced in computer design. He has BS and MS degrees in EE, the latter from Stanford. He has worked 2½ years at HP and before that for 1½ years at Bell Telephone Laboratories in New Jersey.

ard, primarily in the Microwave Division. For the past six years, he has been associated with spectrum analysis applications relating to communications systems. Presently, he is an Application Engineer for the Automatic Spectrum Analyzer, specializing in applications to spectrum monitoring, surveillance, and EMC.

Election of new officers for 1972-73 will be held from the floor during this meeting.



To reach the Cafe del Rio, take the Capital Expressway West from San Jose; turn left onto the Almaden Expressway. Go past the Emporium and 8 miles further into New Almaden. Cross the bridge; the restaurant is on the left side. Family dinner will be \$4.75 including tax and tip.

SMC – HUMAN SPEECH: IN RECOGNITION OF THE PROBLEMS INVOLVED IN ITS UNDERSTANDING



Dr. Donald E. Walker, Senior Research Linguist at Stanford Research Institute, will discuss a new concerted attack on the processing of the information content of human speech by computer. It differs from previous work in that it attempts to "understand" rather than to "recognize" what is being spoken. The significance of that distinction will be explained, and a description will be presented of the activities toward speech understanding underway at S.R.I.

Dr. Walker received his Ph.D. in Psychology from the University of Chicago in 1955. Before joining S.R.I. last August, he served as Head of the Language and Text Processing Group at The MITRE Corporation in Bedford, Massachusetts. He has served as editor of numerous technical journals and is author of more than 25 papers and reports on computer and information science, linguistics, psychology, and anthropology.

VEHICULAR TECHNOLOGY TO TOUR USAF SAGE SITE

On May 15th this Chapter will tour the U. S. Air Force Radar and Communication facility at Mt. Umunhum, near San Jose. This station is part of the U. S. Coastal Defense surveillance system. On display will be the search radar, part of the SAGE automatic warning system. One of the most powerful transmitters in the U.S. is part of the base station facility for ground-to-air communications of both data and voice. Air Force Technical NCO's will conduct the group thru these facilities and explain the communications systems and operation.

The tour will start after dinner at the Cafe del Rio in New Almaden. Dinner will be at 6:00 PM; the group will then drive to the SAGE site where the tour will start at 7:30 PM.

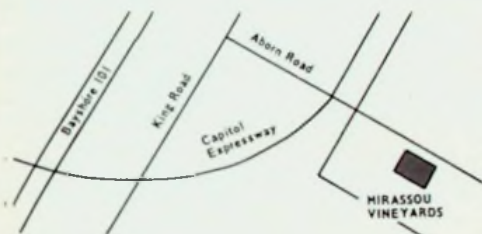
SVSS – DINNER MEETING AT MIRASSOU

One of California's premium wineries will be the scene of a dinner meeting on Friday, May 26, closing the Santa Clara Valley Subsection's 71-72 meeting series. Wives and guests are cordially invited.

This is an opportunity to visit the winery considered by many to be the area's finest. Mirassou has been making wine since 1854, but only in 1966 did they begin to label a select part of their production. Mirassou will conduct a tour of the winery followed by tasting of a selection of wines.

The dinner will be served at 8:30 p.m. under the stars in the new outdoor patio area. Featured at dinner will be a barbecued Sirloin steak with tossed salad, carrots Vichy, French bread and dessert. Mirassou wines will be served during dinner.

Reservations for the May 26 tour, wine tasting, and dinner will be limited to 75 and may be made by calling Ray Power (408) 227-7100 Ext. 6574. Reservations must be confirmed by a check for \$7.50 per person payable to the SCVSS by May 22. Mail to Ray Power, IBM, Dept. H87, Monterey and Cottle Rds., San Jose, 95114.



ANNUAL DINNER DANCE

Honoring
Our 1972 Fellows
and Introducing
New Section Officers

Friday, June 9, 1972
Engineers Club of
San Francisco

160 Sansome Street
Cocktails – 6:30 PM
Dinner – 7:30 PM
Dancing 'til Midnight

Reservations and tickets at \$8 per person. Tables can be arranged thru Mrs. Jean Helmke, Palo Alto Section Office. Phone (415) 327-6622. In San Francisco call the Engineer's Club, (415) 421-3184. Tickets available at Section Office only

ONE DAY SHORT COURSE – COMPUTER COMMUNICATIONS

The University of Santa Clara Continuing Education Division and IEEE Computer Society will present a one day short course on Computer Communications at Daly Science Center on June 3, 1972. The course will provide a basic review of the regulatory aspects and hardware and software characteristics of computer networks. Trends in computer communications in the 1970's as they will effect manufacturers and users of terminals, peripherals, and large systems, will be explored. A session is planned on intelligent terminals.

Speakers will include Dr. Frank S. Greene of Technology Learning Corp; Dr. Robert N. Linebarger of NASA Ames Research Center, and other speakers to be announced.

Fees: IEEE Members \$20.00, Student Members \$15.00, Non-Members \$25.00. Cost includes course notes and lunch on the Santa Clara Campus.

For more information, write or telephone IEEE Short Course, Division of Continuing Education, University of Santa Clara, Santa Clara, California 95053, (408) 984-4518.

To register, complete and mail the accompanying form and payment to: IEEE Computer Society Seminar, Div. of Continuing Education, University of Santa Clara, Santa Clara, California 95053.

EBSS – TOUR OF PG&E ENERGY CONTROL CENTER

Members of the East Bay Subsection of the IEEE will be given an explanation and tour of Pacific Gas and Electric Company's Energy Control Center, including its electric dispatch, gas dispatch, meteorology and communications facilities. This facility, completed in 1970, incorporates some of the most modern techniques used in energy dispatch, employing extensive data collection systems and on-line digital computer control.

The tour is scheduled for Monday, May 15, 1972 at 7:30 p.m. Members of the IEEE and their guests who are planning to participate in the tour are requested to assemble in the lobby of PG&E's high-rise General Office building at 77 Beale Street, San Francisco.

The number of participants is needed in advance, therefore, we are asking you to make reservations by calling Hadi Monsef at 764-5522 Bechtel Corporation.

IEEE Computer Society
June 3, 1972 Symposium on
Computer Communications
(Must be received by May 26, 1972)

Enclosed is check (Payable to University of Santa Clara) in amount of \$ _____

Name: _____

Address: _____
(Street)

_____ (City, State, Zip)

Telephone: _____

Check One: _____ Regular Member

_____ Student Member _____ Non-member



DATA COMMUNICATION NETWORKS – PROBLEMS & OPPORTUNITIES

The importance of data communications networks to remote computing has resulted in the development of ten public networks by remote computing vendors. These networks range from a simple collection of in-watts lines and hardware multiplexors to very complex networks allowing the individual user access to many computers.

The characteristics that are desirable in such a network and some of the problems that were encountered in the development of the network, will be discussed with examples taken from the existing and planned commercial networks.

Neil Sullivan received his BSEE from Newark College of Engineering, Newark, New Jersey, in 1961, and continued his studies in the field of meteorology at the University of Washington, Seattle. From 1962 to 1963 he was a numerical meteorologist for the U.S. Air Force. In 1963 he joined Control Data Corp. and worked on the development of message switching systems. In 1966 he joined Tymshare, Inc., as the manager of field support. He is presently the manager of engineering software.

Elections of officers for 1972-1973 will also be held at the meeting of May 23.

Additional copies of the 65 page text for the Digital Components Symposium are available for \$3.00 each. Contact University of Santa Clara, Continuing Education Division.

MTT – THE MICROWAVE INDUSTRY IN 1972



The Microwave Industry recently has experienced the most difficult period in its history. Business has decreased. Microwave engineers are out of work. Investors have lost interest.

Mr. Theodore S. Saad, President, Sage Laboratories, will discuss some of the changes taking place, present conditions of the market, and future industry potential. Industrial and commercial applications of microwave uses will be discussed.

Mr. Saad has been active in the microwave industry for thirty years. He has held important positions with M.I.T. Radiation Lab., Submarine Signal Co., Microwave Development Labs., and Sylvania. He founded Sage Laboratories in 1955. He helped establish Horizon House Microwave, Inc., publisher of the Microwave Journal, and Telecommunications. He has been editor-in-chief since 1958. He is a Fellow of IEEE, and was a member of MTT AdCom from 1953 to 1969.

TRILLION BIT MEMORIES

Manny Wildmann to talk on Trillion Bit Memories and the Ampex Corporation TBM* memory system. He will discuss trillion bit memories, where they stand at present and where they will be in the next 10 years. The Ampex TBM* memory system will be described in detail.

M. Wildmann is presently Manager, Terbit Memory Systems Department, Ampex Corporation. He received his B.A. degree in Mechanical Engineering from New York City College in 1954, and his M.S. degree from UCLA in 1954. Mr. Wildmann has held important engineering, research and management positions with Autohetics, Inertial Instruments, North American Rockwell and Ampex.

Election of Chapter officers will be held at this meeting.

NORTHERN CALIFORNIA SYMPOSIUM ON ANTENNAS AND PROPAGATION WEDNESDAY, MAY 17, 1972 – LOCKHEED AUDITORIUM

(See Announcement in Calendar)

- 8:30 REGISTRATION
- 9:00 WELCOMING REMARKS – John Damonte
- 9:15 DIGITAL MEASUREMENT OF IONOSPHERIC DOPPLER VERSUS ANGLE-OF-ARRIVAL AND WAVEFRONT LINEARITY FOR OBLIQUELY-PROPAGATED HF CW SIGNALS – R. T. Bly, Jr., and L. E. Sweeney, Jr. (SRI)
- A SWEEPED FREQUENCY, TWO LOOP METHOD FOR DETERMINING HF GROUND PARAMETERS. – R. J. Lytle and D. L. Lager (Lawrence Radiation Lab)
- ORIENTATION INDEPENDENT RADAR TARGETS – J. Richard Huynen (Lockheed)
- THE "J" TRANSFORMATION – F. B. Harris, Jr. (TCI)
- NUMERICAL INVERSION OF LAPLACE TRANSFORMATION – APPLICATION TO TRANSIENT ANALYSIS OF TRANSMISSION LINES. – S. Darriki (SRI)
- 10:30 COFFEE BREAK
- 10:45 SOME ASPECTS OF DC PULSE PERFORMANCE OF ANTENNAS – G. August and W. E. Scharfman (SRI)
- AN RF TIME DOMAIN REFLECTOMETER NOT IN REAL TIME. – L. A. Robinson, W. B. Weir, and L. Young (SRI)
- A DUAL-BAND COAXIAL FEED. – N. L. Exum and T. M. Skiver (Philco)
- MEASUREMENT OF FIELDS NEAR A VERTICLE MONOPOLE – A. L. Whitson (SRI)
- ANTENNA MEASUREMENT ERROR ANALYSIS. – R. H. Grace (Philco)
- PLASTIC ANTENNA FABRICATION TECHNIQUES. – C. A. Hacking (STI)
- 12:00 LUNCH BREAK
- 1:30 HINTS FOR EXPERIMENTAL ANTENNA DESIGNS – M. L. Wahl (ATI)
- A NOVEL VHF TURNSTILE ANTENNA FOR THE SYNCHRONOUS METEOROLOGICAL SATELLITE – W. S. Gregorwich (Philco)
- AN AMPLITUDE-STEERED ELECTRONICALLY-DESPUN ANTENNA FOR SYNCHRONOUS METEOROLOGICAL SATELLITE (SMS). – F. J. Dietrich (Philco)
- A NEAR-ISOTROPIC MICROWAVE ANTENNA FOR COMMUNICATION SATELLITES – W. S. Gregorwich and C. W. Westerman (Philco)
- MULTIFACTOR DISCHARGE ON SATELLITE ANTENNAS AND OTHER POWER-STREAM COMPONENTS. – W. C. Taylor, G. August and J. B. Chown (SRI)
- 2:50 COFFEE BREAK
- 3:10 DESIGN OF A HIGH-FREQUENCY, BROAD-BAND, CIRCULARLY-POLARIZED ANTENNA WITH WIDE-ANGLE COVERAGE. – R. J. Lytle and D. L. Lager (Lawrence Radiation Lab)
- FREQUENCY-INDEPENDENT LOG-PERIODIC ANTENNA ARRAYS WITH INCREASED DIRECTIVITY AND GAIN. – S. Kuo (Sylvania)
- A 3:1 BANDWIDTH MONOPULSE INTERFEROMETER INCORPORATING A DUAL-MODE SPIRAL RESOLVER ANTENNA ELEMENT – G. R. Oeh (Sylvania)
- ON THE BANDWIDTH OF MONOPOLE ANTENNAS WITH SERIES REACTIVE LOADING. – M. N. Cobb (Lockheed) and R. H. DuHamel (Consultant)
- THE "TALL-WHIP" ... BROADBANDING A CONVENTIONAL WHIP. – J. M. Lomasney (SRI)

LASER COMMUNICATIONS

The potential for extremely wide communication bandwidths has been one motivation for pursuing laser communication research. This potential can now be practically realized at information rates up to 1000 Mbits/sec because of technological advances, particularly in electro-optic modulators and associated electronics, as well as in lasers. A review of the techniques and the devices required to accomplish this will be presented by Dr. Robert C. Ohlmann at the May 23rd Electron Devices Group Meeting.

The microwave subcarrier technique requires the use of a single-mode laser whose beam is modulated in a microwave bandpass electro-optic modulator. The electronic subsystem at both transmitter and receiver uses 1-GHz-bandwidth QPSK microwave electronics and two 500 Mbits/sec bit synchronizers. The pulse modulation

technique requires a stable mode-locked laser and baseband optical modulators. Its electronic subsystem consists primarily of high speed digital electronics.

Dr. Ohlmann joined Lockheed Missiles and Space Company in 1967 after spending several years at Westinghouse Research Laboratories. As a Senior Member of the Lockheed Palo Alto Research Laboratory, his primary responsibility has been the technical direction of a group studying many aspects of wideband laser communications, including laser and modulator research, electronic devices, and optical acquisition and tracking. He received his B.E.E. degree from Cooper Union and his PhD in physics from the University of California at Berkeley.

GGSS - SEISMIC TESTING

Like the weather, everybody is talking about the need for seismic testing. The University of California is doing something about it. It has built the largest seismic test table in the nation for use in research into the behavior of structures during earthquakes. It has begun testing equipment and structures at full scale or large scale on a service to industry basis.

The table is 20 feet square, weighs 90,000 pounds and is capable of testing loads up to 150,000 pounds. It can be programmed to move plus or minus six inches horizontally and 2-1/2 inches vertically, at frequencies from a fraction of a hertz to 20 hertz. Input programming can be in the form of actual ground motion time history of prior earthquakes, or sine-beat earthquake simulations which take into account magnification of forces due to mechanical resonances.

Dr. Penzien and Dr. Rea will describe the features of the table and demonstrate its operation at this meeting on May 17 at 6:30 p.m. See Calendar for address of the Richmond Test Station and reservation information.

SCVSS - "THE WORLD FUTURE FOR ELECTRONIC ENGINEERS"

- What Will Engineers Be Doing in 1980?
- How Many Will be Required?
- Where in the World Will They be Located?
- With Whom Will They Interface?
- How Should Engineers Prepare for Their Future?

A panel of international electronics experts will tackle these questions and others from the audience at the May 10, 1972, meeting of the Santa Clara Valley Subsection of the IEEE at Stanford Research Institute in Menlo Park. This meeting will be preceded by a brief election of officers for the subsection's 1972-73 year, and then an introductory speech by the panel moderator, Mr. Kenneth W. Taylor, senior industrial economist of Stanford Research Institute. His panelists will be Mr. Osamu Hayama, Nomura Research Institute, Kamakura City, Japan; Dr. Werner C. Maurer, European Principal; William E. Hill International, Inc., Basel, Switzerland; Mr. C. Bruce Clark, senior research engineer, Stanford Research Institute; and Dr. Karl N. Levitt, senior research engineer, Stanford Research Institute.

THE MANAGEMENT OF A HIGH TECHNOLOGY COMPANY



There is no business venture more prone to suffer corporate difficulties than a company founded on a technological product developed by an engineer who then goes on to assume the company's management. The scientific education and resulting thought processes of technically trained persons are not necessarily the views of today's corporate administration.

Following World War II, many technologically oriented companies were successful because of the market for their new products. Marketing and corporate administration have become the key to success for new ventures.

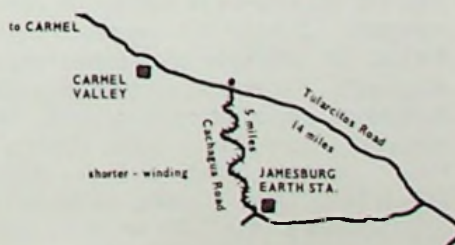
Another dangerous aspect of high technology companies is over-engineering. Ideally management should be technically competent to know when the product has been refined enough to be marketable, and in addition know when and how to sell it.

Mr. William C. Bennett is president of NOVAR Corporation, one of the companies having succeeded in the highly competitive field of computer terminal manufacture. Formed in 1968, NOVAR has shown exceptional growth in plant area, facilities and personnel. Mr. Bennett obtained his BSEE from Marquette University, and has held managerial positions with many nationally known organizations.

A-ES TO TOUR JAMESBURG EARTH STATION

The Aerospace and Electronic Systems Group will sponsor a tour of the Jamesburg Earth Station at Carmel Valley (See Map). The large 80 ft. diameter dish antenna and the associated electronics equipment used by the Communications Satellite Corporation for receiving live telecasts of the Olympic Games at Munich, Germany next summer will be seen.

Mr. John P. Scroggs, Station Manager for the Jamesburg Earth Station will present station highlights and a system description prior to the tour. Due to station requirements, the tour will be limited to 30 people (age 16 or over). The tour group will meet at 1:00 PM on May 13, in the parking lot of the Naval Postgraduate School off Del Monte Ave., in Monterey. A car caravan will then form to go up to the Earth Station.



BELL SYSTEM DIGITAL DATA SERVICE

A new end-to-end digital data service is being planned by the Bell System for introduction in early 1974 with rapid expansion to 96 interconnected major metropolitan areas in a three year period. The Bell System Digital Data Service does away with customary modems and makes use of digital technology end-to-end to provide synchronous, full duplex, two point and multipoint channels at 2.4, 4.8, 9.6, 56 kb/s.

Mr. Carl B. Felien, Staff Engineer with Pacific Telephone, will describe the transmission plan for the Bell System Digital Data Service and some responsive maintenance features that customers can expect. Mr. Felien is currently assigned to the Engineering Department at Pacific Telephone Company Headquarters in San Francisco. He is the Wideband Data Specialist for Pacific Telephone involved in wideband data, PICTUREPHONE, and digital data service activities in California and Nevada. Mr. Felien graduated with a BSEE degree from California State College, Los Angeles in 1965.

Election results will be announced at this meeting.



An overall concept for solid waste management known as the CPU-400 is currently under development at Combustion Power Company, under contract to the Environmental Protection Agency. The CPU-400 will utilize a fluidized bed combustor in a gas turbine cycle to convert the heating value of municipal solid waste into electricity. A movie will be presented to describe initial results of experiments conducted on a pilot plant combustor in Menlo Park.

Pilot plant process control concepts will also be discussed. The integrated solid waste handling, combustor and turbo-electric subsystems will be controlled in a supervisory manner by a contemporary digital process controller.

Mr. Wade had a total of 16 years of engineering experience in the aerospace industry before joining Combustion Power Co. in 1970 as manager of engineering analysis. He was involved in liquid rocket engine controls for five years at Rocketdyne, earning an MS degree at UCLA during this period. He then joined United Technology Center for seven years, where he supervised analysis activities in the 120 inch solid rocket motor thrust vector control development. Following additional post graduate work at Stanford, he joined Lockheed M & S Co. to work for three years in the field of spacecraft attitude control analysis.

This will be an election meeting.

**CT ONE-DAY COURSE ON DATA COMMUNICATIONS:
COMPONENTS, SYSTEMS AND FUTURE TRENDS.**

A one-day short course on data communications: components, systems and future trends will be offered by the SF Chapter of the IEEE Circuit Theory Group on Saturday, May 13, 1972, at the SLAC Auditorium, 2575 Sand Hill Road, Menlo Park. The purpose of the course is to familiarize the practicing engineer with low speed applications and component comparisons for data communications, and the

results of some significant market projection studies for the future of this new industry.

Lecturers for the seminar are: Dick Aldrich, Anderson Jacobson, Andrew Lipinski, Institute for the Future, Tom Mills, National Semiconductor and the course organizers: Randy Brandt, IEL and Dale Nielsen, Stanford University.

Topics to be covered are:

- Introduction and history.
- Use of discrete, IC and Analog components in modern design, terminals and phone line interaction.
- IC's for FSK data transmission.
- Hybrid Active Resonators; a unified approach to FSK modern design.
- Projections for future of data services for a local area, bandwidth considerations, regulatory constraints, competitive environment.
- Panel discussion on the topics discussed.

Fee for the course is \$25.00 for non-members, \$15.00 for members and \$10.00 for students and unemployed engineers. To ensure enrollment, the completed registration form must be received before May 6, 1972. Information: contact Randy Brandt, (408) 268-2410 or Dale Nielsen, (415) 321-2300 x 4994 or 4997. To register, use the accompanying form.

Telephone service to individuals who have a physical or physiological handicap which will not permit them to use standard telephone instruments or services is a question frequently faced by the telephone companies. The solution to some of these unusual applications will be discussed by Mr. Larry Prehn, customer service engineer of the Pacific Telephone and Telegraph Company. He also will discuss the data communication of transmitting and receiving physiological information via telephone channels from a patient located at a remote site to a central data analysis facility. Equipment will be demonstrated.

Election of officers for the year 1972-73 will be held at this May meeting. The following candidates are presented for consideration. Nominations also will be accepted from the floor. CHAIRMAN: Larry D. Prehn, Customer service engineer, Pacific Telephone; VICE-CHAIRMAN: Alex Shalaby, engineer, PTH Customer Serv, Eng, Dept., and Ron Siegrist, Telemetry Systems engineer, Control Data Corp., Sunnyvale Systems Division; SECRETARY: Huey K. Lee, Technical Documentation Engineer Gould ISD Corbin Farnsworth medical products group; TREASURER: Paul Griffith, Biomedical Instrumentation Research Engineer Varian Central Research Operation.



**NSG: CONTINUING
PROFESSIONAL EDUCATION**

The current engineering unemployment crisis has raised the question of need for some form of continuing education for Professionals. The Nuclear Science Group, with the cooperation of the IEEE Educational Activities Board, proposes a pilot program in which the practicing professional conveniently can gain competence in related fields within his primary specialty. This type of continuing education should provide improved long-term employment stability by virtue of improved transferrability of job skills into other technical areas. The purpose of this meeting is to invite discussion of the proposal.

Ray Larsen is the NSG Administrative Committee member for Continuing Professional Development. He heads a Nuclear Instrumentation group at SLAC, and is a Deputy Head of the Experimental Facilities Department.

**CIRCUIT THEORY GROUP SHORT COURSE
ON DATA COMMUNICATION
REGISTRATION**

(Should be received before May 13, 1972)
Mail to William Dunn, c/o IEEE San Francisco Section Office, 701 Welch Road - Suite 2210 Palo Alto, Calif. 94304

Enclosed is check (payable to San Francisco G-CT Chapter) in amount of \$ _____ to cover enrollment fee.

Name _____

Home or Bus. Address _____
(Street)

(City, State and Zip) _____

Bus. Phone _____

IEEE Affiliation, _____ Member

_____ Student Member _____ Non-Member

IEEE Memb. No. _____