EDITOR'S PROFILE of this issue

from a historical perspective …

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

March, 1974:

Cover: The Foothill Electronics Museum formally opens in January, 1974. Shown is a display of tubes, backed by radio technology. It includes old artifacts from the Perham Foundation collection, which is now housed at History San Jose in Kelly Park. More on page 8.

Page 5: John McCarthy, Stanford professor and founder of the Stanford Artificial Intelligence Lab (SAIL), speaks on the potential for computer terminals in the home.

Page 6: With unemployment being a major issue, Frank Lord convenes a panel to discuss the need for a focus on professional activities within the IEEE.

Page 8: Some trends in management and employee relations begin in our new "Silicon Valley". Ray Wilbur, of HP, will describe their new policy to allow most employees flexibility in selecting their work hours, begun in 1972.

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.

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PAC FEBRUARY REPORT

The Professional Activities Committee had an excellent report in the February GRID. Several members devoted considerable time and serious effort to the young engineers survey.

We would like to give credit to those subcommittee members, which included: Mr. Frank Lord, chairman: Mr. Frederich Beich: Mr. Bill Raukko, and Mr. O.J. Ziemelis. 109 young engineers were interviewed in 23 sessions.

Hermann F. Schmid
Chairman PAC

SAN FRANCISCO SECTION PAC SUPPORTS IEEE PENSION-LEGISLATION EFFORT

Surveys by IEEE have shown that most engineers forfeit their employer's pension-fund contribution. This loss is due primarily to the long vesting periods stipulated by most pension programs in addition to other restrictive conditions. The eligibility requirements simply do not take into account the high job mobility of engineers and, more recently, lay-offs.

The average length of employment for an engineer is six years. Most vesting periods, on the other hand, are ten years or longer. The vesting period is the time for which an employee has to be a pension-fund member in order to become eligible for the portion of the fund contributed by his employer. If the employment is terminated prior to the end of the vesting period, the employee loses all of his employer's contributions. Typically, there are also additional eligibility requirements such as a minimum service time of several years before the employee can join the pension plan and attainment of a certain minimum age, for instance, 40 years, before vesting becomes possible. The net effect of these requirements is that "four out of five engineers never get any benefits from pension plans" (see Pensions: The Big Lottery; IEEE Spectrum, June 1973).

IEEE would like to remedy this very unsatisfactory situation by offering a pension program that is portable, provides for immediate vesting, and qualifies for contributions by both the employer and the employee with pre-tax dollars. The establishment of such a pension program is, however, predicated on enabling legislation by Congress. Over the past year, IEEE has been actively engaged in a lobbying effort to bring about such legislation, as described in detail in the IEEE Professional News. This legislation is scheduled to be one of the first items on the agenda of the reconvened Congress. The prospects for the proposed bills are somewhat uncertain due in part, no doubt, to the fact that engineers are unaccustomed to acting as a cohesive group of professionals.

In its last meeting, the Professional Activities Committee (PAC) of the San Francisco Section discussed the importance of Congressional action on the propssed legislation and adopted the following position:

"The problem of an uncertain financial future has become a critical problem among engineers, particularly those involved in government contracts and defense related jobs. Contract terminations and subsequent lay-offs and job changes force most engineers to forfeit their pension rights.

The pension reform legislation currently pending in the House of Representatives and scheduled for floor debate on January 23, is a beginning to alleviate this situation. Passage of this legislation is needed as an absolute minimum. We urge support of the Ways and Means Committee's bill which will be offered as a substitute for or an amendment to H.R.2. (Dent. Bill). Specifically, we urge support of the following two provisions of the Ways and Means Bill which are of primary interest to the engineering profession.

(1) The provision on "Comparability of Plans" (Section 112(c) of the Ways and Means bill) which would allow engineers to set up their own society-run multi-employer pension plans; and
(2) The provision on "Protection for Employees under Federal Procurement, Construction, or Research Contracts of Grants" (Section 124 of the Ways and Means bill) which would provide some measure of protection for the pension rights of highly mobile employees, such as engineers, working under federal procurement contracts."

This position statement was sent to each of the thirteen Congressmen with districts in the area covered by the San Francisco Section. Engineers are very much encouraged to make their individual opinion on the subject known to their Congressmen.

If you do not know who your Congressman is, call your local newspaper, U.S. Post Office, etc.

WRITE:	The Honorable (name), U.S. House of Representatives Washington, D.C. 20515,
or	U.S. Senate, Washington, D.C. 20510,
WIRE:	You can send a 15-word, personal-opinion Western Union telegram to your Congressman for $1.25 from any location. Call your operator for assistance.

Members who would like to join the PAC roster or would like to contribute to the committees efforts, can contact Hermann F. Schmid, Telephone: (415) 364-6756.

Candidate For PAC Chairman 1974 - 1975

Mr. Bill Raukko, a member of the Young Engineers Survey Subcommittee, has been nominated as Chairman for PAC for the coming year 1974 - 1975. Bill is with Hewlitt-Packard, Palo Alto.


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MEETING CALENDAR

AEROSPACE & ELECTRONIC SYSTEMS
MAR. 21

Story on Page 4

SPREAD SPECTRUM COMMUNICATIONS. Herman Bustamante, Supervisor, Communication Techniques Develpmt, Philco-Ford, Palo Alto.

MAR. 21, Thursday, 8:00 PM, Philco-Ford WDL Auditouium, 3825 Fabian Way, Palo Alto. Dinner: 6:30 PM, Rickey's Hyatt House, El Camino & Charleston Road, Palo Alto. Reservations: Jim Welch (415) 326-4350 x 4769 by March 20th.

ANTENNAS & PROPAGATION
MAR. 9

Story on Page 7

MUSHROOM, MAN AND MOLDS. Dr. Ralph Emerson, Prof. of Botany, UC, Berkeley. Member of National Academy of Science. Spouses and children are welcome.

MAR. 9, Saturday, 2:00 PM, The Amphitheater, Lawrence Hall of Science, Berkeley. Lunch: 12:00 noon at Spenger Fish Grotto, 1919 4th St., Berkeley. Reservations: Tony Jennetti (408) 732-6643 or send the following form to Dr. Tony Jennetti, 747 Shasta Fir Drive, Sunnyvale, CA 94086. See story for form.

COMMUNICATIONS SOCIETY
MAR. 12

Story on Page 5

SEMINAR AND DEMONSTRATION: DUAL POLARIZED OPERATION OF 2 GHz DIGITAL MICROWAVE. Walt Gill, Avontek, Santa Clara.

MAR. 12, Tuesday, 8:00 PM, Rickey's Hyatt House, El Camino & Charleston Road, Palo Alto. Dinner: 6:30 PM, North Patio Room, Rickey's Hyatt House. Reservations: Lee Stephens (415) 961-1000 x 209 by Mar. 11th.

COMPUTER SOCIETY
MAR. 20

Story on Page 5

COMPUTER TERMINALS FOR THE HOME: HOW DO WE GET THERE FROM HERE? Dr. John McCarthy, Prof. of Computer Science, Stanford.

MAR. 20, Wednesday, 8:00 PM, University of Santa Clara Daly Science Hall, Room 207. Dinner: 6:15 PM, University Faculty Club on Campus. Reservations: Pat Rubin, (415) 965-6349 by Mar. 18th.

EAST BAY SUBSECTION
MAR. 21

Story on Page 5

JOINT MEETING WITH LIVERMORE VALLEY CHAPTER OF CSPE. SEMINAR: PANEL DISCUSSION, ETC. THE ROLE OF NEW TECHNOLOGIES IN INCREASING OUR ENERGY SUPPLY. Stuart Winter, Senior Staff Member, Lawrence Livermore Lab.

MAR. 21, Thursday, 8:00 PM, PG&E Engineering Research Center, 3400 Crow Canyon Road, San Ramon. Dinner: 6:30 PM, Brass Door Restaurant, San Ramon Valley Blvd., San Ramon. Reservations for dinner: Terry Rossow, (415) 447-1100 x 8936 by Mar. 18th.

ELECTROMAGNETIC COMPATIBILITY
MAR. 18

Story on Page 6

THE TEKTRONIC TRANSIENT DIGITIZER. Dr. Paul Malnate of Tektronix, Palo Alto.

MAR. 18, Monday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails: 5:30 PM, Dinner at 6:30 PM, Meeting at 8:00 PM. Reservations required. Andrew Nalbandian 742-5336 by Friday March 15.

ELECTRON DEVICES
MAR. 26

Story on Page 4

INDUSTRIAL APPLICATIONS OF LASERS. Dr. Jack Foster, GTE, Sylvania.

MAR. 26, Tuesday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails at 6 PM, dinner at 7 PM. Reservations: Section office (415) 327-6622.

ENGINEERING IN MEDICINE & BIOLOGY
MAR. 12

Story on Page 5

A NEW ULTRASONIC IMAGING SYSTEM FOR REAL TIME CARDIAC IMAGING. Dr. Janes D. Plummer, Research Associate, Stanford University.

MAR. 12, Tuesday, 8:00 PM, Room M 104, Stanford Medical Center. Dinner: 6:15 PM, Stanford View Restaurant, 1921 El Camino, Palo Alto. Reservations: Huey Lee (408) 739-8880 x 251 or Section office (415) 327-6622 by noon Mar. 12th.

ENGINEERING MANAGEMENT
MAR. 19

Story on Page 8

HP's EXPERIENCE WITH THE VOLUNTARY FLEXIBLE WORK SCHEDULE. Ray L. Wilbur, Jr., V.P. H-P Co., Palo Alto.

MAR. 19, Thursday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails at 6 and dinner at 6:30 PM. Veal Cutlet - $5.25 incl. tax & tip. Guests welcome. Reservations: Mrs. Scott (408) 243-3600 x 365 by Mar. 18th.

GOLDEN GATE SUBSECTION
MAR. 21

Story on Page 6

PANEL DISCUSSION: PROFESSIONAL ACTIVITY - WHO NEEDS IT? Frank Lord, Senior Systems Engineer, Sylvania; Hermann Schmid, Senior Research Engineer, SRI and Bill Raukko, Senior Development Engineer, H-P Co.

MAR. 21, Thursday, 12 noon, PG&E, Room 301-303, 77 Beale St., San Francisco. Lunch: PG&E Cafeteria. Reservations: Art Wells (415) 467-1880 by Mar. 18th.

INDUSTRY APPLICATION SOCIETY
MAR. 26

Story on Page 8

SPECIAL FEATURES OF THE BULK MAIL CONTROL SYSTEMS. Tim Ho, S. Venugopalan and John Carter.

MAR. 26, Tuesday, Four Seas Restaurant, 731 Grant Ave., S.F. Dinner: 6:30 - Cocktails at 6 PM. Reservations: Ted Bubb (415) 981-6440 or Wes Fenner (415) 894-4022 by noon Mar. 25th.

INFORMATION THEORY
MAR. 18

Story on Page 5

APPLIED PATTERN RECOGNITION: Dr. Dennis L. Wilson, Engineering Specialist, GTE Sylvania, Mt. View.

MAR. 18, Monday, 8:30 PM, SRI Bldg. 1, Conference Room B, 333 Ravenswood Ave., Menlo Park. Dinner: 6:15 PM, Ming's, 1700 Embarcadero Road, Palo Alto. Reservations: D. Wilson (415) 966-2595 or Mrs. J. Brewer (415) 966-3286 by Mar. 18th.

MAGNETICS
MAR. 28

Story on Page 4

APPLICATION OF MEMORY HIERACHIES. Don Senzig, H-P Labs.

MAR. 28, Thursday, 8:00 PM, Hewlett-Packard Auditorium, Santa Clara. Hyway 280 at Lawrence Expressway. No dinner.

MICROWAVE THEORY & TECHNIQUES
MAR. 14

Story on Page 7

GENERALIZED DESIGN OF FILTERS, COUPLERS AND PHASE EQUALIZERS BY COMPUTER OPTIMIZATION. Dr. S.B. Cohn, S.F. Cohn Assoc., Tarzana, Calif.

MAR. 14, Thursday, 8:00 PM, Hewlett-Packard Auditorium, 5301 Stevens Creek, Blvd., Santa Clara. No dinner.

POWER ENGINEERING SOCIETY
MAR. 12

Story on Page 4

FLYWHEELS. Dr. Richard F. Post, Lawrence Livermore Laboratory.

MAR. 12, Tuesday, 7:00 PM, PG&E Restaurant (3rd floor), 77 Beale St., S.F. Dinner: 6:00 PM. Reservations: (necessary for dinner and/or meeting): Molly Milan (415) 445-2227 by Mar. 8th.

RELIABILITY
MAR. 13

ACCELERATION FACTORS IN SEMICONDUCTOR DEVICE TESTING. Dr. D. Stewart Peck, Director Device Reliability, Bell Telephone Labs., Allentown, Pa.

MAR. 13, Wednesday, 8:00 PM, Physics Lecture Hall, Stanford University - PH 101. Dinner: 6:30 PM, Stanford View Restaurant, 1921 El Camino, Palo Alto. Reservations: Section office (415) 327-6622 by noon Mar. 13th.

SANTA CLARA VALLEY SUBSECTION
MAR. 16

TOUR OF ALMADEN RADAR STATION. Take Almaden Expressway past New Almaden to Hicks Road. Right on Hicks Road, then follow the signs.

MAR. 16, Saturday, 10 AM. Meet in parking lot at north end of Almaden Radar Station. No dinner. Reservations for tour: Gerry Embray (408) 291-5380.

SYSTEMS MAN & CYBERNETICS
MAR. 18

Story on Page 8

APPLICATIONS OF OPERATION RESEARCH TO IMPORTANT SOCIO-ECONOMIC PROBLEMS. Prof. Frederick Hillier, Stanford University.

MAR. 18, Wednesday, 8:00 PM, SRI Bldg. 1, Conference Room B, 333 Ravenswood Ave., Menlo Park. Dinner: 6:15 PM, Red Cottage, 1706 El Camino, Menlo Park. Reservations: Section office (415) 327-6622 by noon Mar. 18th.

VEHICULAR TECHNOLOGY
MAR. 18

Story on Page 6

PG&E's CENTRALIZED ENERGY CONTROL SYSTEM. Robert H. Vierra, Senior Power Systems Engineer, PG&E Co.

MAR. 18, Monday, 8:00 PM, International Inn, 326 So. Airport Blvd., South San Francisco. Cocktails at 6:30 and dinner at 7:00 PM. Reservations: Bonnie or Karen (415) 349-3111 x 222 by Mar. 15th.

AES - SPREAD SPECTRUM COMMUNICATIONS

The Aerospace and Electronics Systems Group will hold a technical meeting on March 21, at the main Philco-Ford Auditorium, 3825 Fabian Way, Palo Alto, at 8:00 P.M. Featured speaker of the evening will be Herman Bustamante, Supervisor of the Communications Techniques Development Section, Philco-Ford WDL, speaking on "Spread Spectrum Communications." This is a subject of growing importance which has many remarkable properties. Signals are transmitted below the noise background, effectively hiding them from detection by receivers not adapted to their reception. It also makes possible the reception of any selected signal of a group of signals all working on the same carrier frequency, and it greatly improves immunity to jamming. The technique generates signals which can be received only by a receiver intended to decode them, affording secrecy of communication. Dinner will be at Rickey's Hyatt House, El Camino and Charleston in Palo Alto, starting at 6:30 P.M. Reservations can be made with Jim Welch at 326-4350, extension 4769, by Wednesday, March 20.

1974-75 SECTION TREASURER CANDIDATE AN OMISSION

An editorial error resulted in the omission of the name of one of the candidates for treasurer in the February GRID. The report of the Nominating Committee also included the nomination of Dr. Thomas Magill, Stanford Research Institute.

Biographies and photos of all candidates will appear in the April GRID, along with the ballots. Our apologies to Dr. Magill.

E.W. Morris, Editor

PES - "FLYWHEELS"

Giant flywheels for storage of energy in electric power systems? Smaller flywheels to drive automobiles, trucks, and buses?

The principle of the flywheel as an inertial energy storage device must have been recognized early in history. Only recent developments in materials and mechanical design suggest the flywheel as a solution to two contemporary problems:

(1) an efficient means for providing storage for electric utility peaking power needs, and (2) a compact unit to power electric vehicles having range and performance similar to vehicles on today's roads.

Flywheels have traditionally been made of metal, particularly of high-strength steel. Dr. Richard Post and his son, Stephen Post, have applied fibre composites originally developed for the aerospace industry to new mechanical designs. They are lower in density and some are far stronger in tension than steel.

Dr. Post's presentation will be made at P.G.&E.'s 3rd floor restaurant. Please be sure to make reservations for dinner and/or for the presentation alone. Building security requires preregistration. Call Molly Milan at 445-2227 for reservations by Friday, March 8.

MAG - APPLICATION OF MEMORY HIERARCHIES

One of the major innovations in computer design in the last five years has been the incorporation of "automatic" mechanisms to swap data between memories of different performance and cost characteristics. The characteristics of these memory hierarchies, e.g., the cache memory, will be discussed. This will include hardware implementation, effect on system performance, and the technology characteristics that makes a hierarchy cost effective. The emphasis will be on main memory but applications to bulk memory devices will be discussed.

Don Senzig is currently a Section Manager at HP Laboratories. He was previously with RCA, IBM, and Varadyne. He is a member of the IEEE Computer Group and the SCM and is also currently Vice Chairman and Secretary of the Western Area Committee of the IEEE Computer Group. He has presented and published a number of papers on computer architecture.

ED-INDUSTRIAL APPLICATIONS OF LASERS

Lasers offer unique capabilities for material processing. Their ability to process workpieces without contact and without toolwear make them useful for many industrial applications. Uses of lasers for cutting, heating and welding and the laser characteristics required for these and other applications will be discussed. GTE Sylvania's high power industrial laser efforts will be described.

Dr. Jack D. Foster is the Manager of the Industrial Applications Department at GTE Sylvania's Electro-Optics Organization, Mountain View, California. He received the Ph.D. degree in engineering science from the University of California, Berkeley in 1965. In January 1966 he joined Sylvania where he had been concerned with research and development in solid-state and gas lasers, nonlinear optics, and various electro-optical devices before his recent concentration on industrial applications.

IEEE RELEASES MANPOWER REPORT

The Manpower Committee of the IEEE has released its 1973 report, "Career Outlook in Engineering (Region 1 through 6, USA)." The report states that generally "career opportunities in electronics will continue to grow (however) . . . it will be necessary to remain flexible and ever ready to transfer to another area as activity changes in focus and grows in turn to meet market demands."

The report urges engineers to keep abreast of new developments so that it is possible to adjust with the market. It also warns of over-specializing your education during your college career. The Committee members observed that "employment problems are seldom encountered where the individual has maintained a regular program of study to update and broaden his background."

The 225 page report is divided into four sections: the industry picture; the manpower picture; careers in engineering; and the engineering challenge. The cost for IEEE members is $10; non-members $15.

See CALENDAR for Program Arrangements

EBSS - THE ROLE OF NEW TECHNOLOGIES IN INCREASING OUR ENERGY SUPPLY

It is clear that the U.S. can no longer simultaneously continue its rapid growth in energy use, maintain low energy prices, protect the environment, and remain independent of foreign suppliers. One approach to finding a satisfactory compromise between these contradictory goals, to be presented by Mr. Stuart Winter of the LLL Energy Research Group, is the development and use of new technologies to increase our present energy resources.

Development of these technologies would approximatley double the commercially available fossil fuel reserves, assuming an energy price increase (in 1973 dollars) of about 30% over 1973 prices. Non-fossil reserves would also be greatly increased. Addition of energy supplies produced by these new technologies to the supplies derived through conventional means could lead to self-sufficiency in energy by the mid-1980's.

To get to PG&E's new Research Center, take Interstate 680 south from Walnut Creek or north from Hayward (via 580) to the Crow Canyon Road interchange. The center is ½ mile east of the interchange; the Brass Door restaurant is ¼ mile west of the interchange, then ½ mile north on San Ramon Valley Blvd.

1973 IEEE MEMBERSHIP DIRECTORY

The 1973 IEEE Membership Directory now is available, and may be obtained from the Order Department. Price to members: $9.00. If cash with order, this saves $2.00 billing charges. Non-members price $35.00.

EMB - A NEW ULTRASONIC IMAGING SYSTEM FOR REAL TIME CARDIAC IMAGING

A new Ultrasonic Imaging System (ULISYS) has been designed to provide realtime high resolution ultrasonic images of many of the body's internal organs. In particular, the system has been used for cardiac imaging with a frame rate sufficient to follow wall and valve motion. The versatility and operational characteristics of this system are possible only because of the use of custom integrated circuits and novel assembly techniques for these circuits. This talk will describe the various modes of operation of this system (A, TM, B, and C), with particular emphasis on the engineering aspects of the system.

Our guest lecturer, James D. Plummer was born in Toronto, Canada. He received the B.S. degree in 1966 from the University of California, Los Angeles, and the M.S. (EE) and Ph.D. (EE) degrees from Stanford University in 1967 and 1s71. He is presently a research associate at Stanford University.

At Stanford he has worked on the multiplexing electronics for a reading aid for the blind and has engaged in research in the field of self-scanned MOS image sensing arrays and high voltage MOS integrated circuits. He is currently involved in research in the areas of integrated electronics, device physics and the applications of integrated circuits to medical electronics.

IT - APPLIED PATTERN RECOGNITION

Pattern recognition has been much talked about but little applied, since most pattern recognition procedures are too complicated for practical application. A procedure has been devised for applying pattern recognition techniques to design of simple devices that can be used in many practical applications. Among the applications to be described will be the detection of intruders (burglars) and the verification of identification.

Dr. Dennis L. Wilson is an engineering specialist employed at GTE Sylvania in Mountain View, California. Dr. Wilson has been active in the area of extracting information from signals for more than ten years. His doctoral work in nearest neighbor pattern recognition was completed in 1970. Since that time much of his effort has been applied to pattern recognition.

COM-DUAL POLARIZED OPERATION OF 2 GHz DIGITAL MICROWAVE

This talk will describe propagation measurements made using dual polarized operation of 2 GHz digital microwave equipment. Cross polarization discrimination, fading and bit error rate results will be presented. Basic operation of digital microwave equipment will be discussed as an introduction to why cross polarization operation is feasible. In addition, a summary of digital microwave application, FCC Proceedings and typical modulation methods will be covered.

Walt Gill is a BSEE Graduate of the University of Notre Dame and holds a MSEE Degree from Southern California and an Engineer Degree from Stanford University. Since 1970 he has been with Avontek as Manager of Digital Communications Engineering. Prior to joining Avontek he was with Philco-Ford WDL five years and Lockheed Research Laboratories for five years.

C-COMPUTER TERMINALS FOR THE HOME: HOW DO WE GET THERE FROM HERE?

Home computer terminals will give us immediate access to the world's literature, teach us, help us pay bills, bargain with stores to get good buys, and give us decent mail service. The immediate problem is to get a worthwhile accumulation of applications that don't require institutional changes.

Dr. John McCarthy is Professor of Computer Science and Director of the Artificial Intelligence Laboratory at Stanford University. He holds a PhD from Princeton, 1951 in Mathematics and has taught at Princeton, Dartmouth, MIT, and Stanford. He is the originator of LISP and has worked on artificial intelligence, time-sharing, and mathematical theory of computation.

SUBSECTION NOMINATIONS

East Bay

For Chairman James A. St. Arnaud Engineer, Pacific Telephone, San Francisco. Now serving as Vice Chairman, EBSS.

For Vice Chairman A. Dale Johnson Division Electric Engineer, East Bay Division-Pacific Gas & Electric. Now serving as Treasurer, EBSS.

For Treasurer Terry L. Rossou Electronics Engineer, Lawrence Livermore Laboratory. Now serving as Secretary.

For Secretary Allan G. Jones District Engineer, Pacific Gas and Electric.

Golden Gate

For Chairman Leon C. Glahn Chief Electrical Engineer, Mining & Metals Division, Bechtel Corp., San Francisco. Present Vice Chairman.

For Vice Chairman Charles L. Ostrofe District Manager, Pacific Telephone, S.F. Present Secretary.

For Secretary Kon G. Zaharoff Senior Electrical Engineer, PG&E Co., S.F. Present Treasurer.

For Treasurer Fred G. Doell Staff Engineer, Pacific Telephone, S.F.

Santa Clara Valley

For Chairman Phillip H. Simpson Regional Staff Supervisor, Pacific Telephone, San Jose. Present Vice Chairman.

For Vice Chairman Clint R. Gilliland Project Engineer, Barry Research, Palo Alto. Present Secretary.

For Secretary John A. Kirtland Senior Staff Electrical Engineer, FMC Corp., Santa Clara. Present Treasurer.

For Treasurer Steve Roll Project Engineer, Underwriters Laboratories, Santa Clara.

EMC - THE TEKTRONIX TRANSIENT DIGITIZER

Mr. Paul Malnate of Tektronix will discuss applications of the Transient Digitizer. Discussion of applications will be followed by demonstrations of equipment. Meeting March 18 at Rick's Swiss Chalet. Cocktails: 5:30 PM, Dinner at 6:30 PM, Meeting at 8:00 PM. Reservations required. Call Andrew Nalbandian, 742-5336 by Friday March 15.

VT-PG&E'S CENTRALIZED ENERGY CONTROL SYSTEM

An overview of how PG&E controls the operation of approximately 100 hydro and thermal plants located throughout northern and central California. The presentation will include color slides of the PG&E Energy Control Center, showing how on-line computers interface with numerous remote terminals through PG&E's vast communications network and what techniques are employed daily to optimize PG&E's generation.

The Energy Control Center went into initial operation in 1969 with two complete digital computer systems. It is presently being updated to reflect the addition of more powerful computer capability and more advanced operator-machine interfaces. Communication data speeds are being upgraded to obtain increased sampling rates of the information gathered by the central computers. Advanced software techniques are being investigated to filter this data to attain increased accuracies.

The speaker, Robert H. Vierra, is Senior Power Systems Engineer in the Power Control Department of the Pacific Gas and Electric Company, San Francisco, Calif.

UC BERKELEY EXTENSION

Energy: Resources, Conversion and Utilization

An intensive five-day course, "Energy: Resources, Conversion and Utilization," will be given June 17 to 21, 1974 at the University of California at Berkeley under joint sponsorship of the UC College of Engineering and Continuing Education in Engineering, UC Extension. Some of the university's top engineering faculty and scientists from the Lawrence Berkeley and Livermore laboratories will make up the roster of speakers, headed by Allan J. Lichtenberg, professor of electrical engineering and computer sciences at Berkeley and a recognized authority of plasma fusion.

Two panel sessions will be held, one taking a critical look at past and present energy policies and discussing future responses, the other surveying global and U.S. energy needs and the implications for a steady-state economy.

The course fee is $300 and advance registration is required. Further details may be obtained from Continuing Education in Engineering, University of California Extension, Berkeley, CA 94720; phone (415) 642-4151.

GGSS - PROFESSIONAL ACTIVITY WHO NEEDS IT?

A panel of Professional Activity Committee (PAC) members will consist of: Frank Lord, Section Head, Sylvania Electronic Systems, Hermann Schmid, Senior Research Engineer, Stanford Research Institute, Bill Raukko, Senior Development Engineer, Hewlett Packard.

The panel will discuss the place of professional activity within the IEEE, including undertaking at the local level. Among topics to be discussed will be pensions, legislative activity, special needs of young engineers and improved communications.

The discussion will conclude with an indication of future direction and plans for the benefit of the membership. Come and bring your questions concerning professional activity in general and PAC survey of young engineers in the Bay Area as reported inside cover of February GRID.

AIME SECOND ANNUAL SYMPOSIUM ON ELECTRONICS MATERIALS PROCESSING

Thursday March 21, 1974
Cabana Hotel, Palo Alto

This one day symposium features presentations on advanced semiconductor processing techniques and device fabrication technologies by seven speakers:

Prof. J. Gibbons - Stanford, "Ion Implantation"
Dr. E. Wolf - Hughes, "Electron Beam Processing"
Dr. D.W. Shaw - Texas Inst. - "Vapor Phase Epitaxy"
Dr. G. Cullen - RCA Labs: "Silicon-on-Saphire"
Dr. J.M. Woodall - IBM Labs: "Processing of Hetero-junction Devices"
Dr. E.E. Gordon - Bell Labs: "Microcircuit Fabrication"
Dr. P. Chaudhari - IBM Labs: "Amorphous Materials and Devices"

Preregistration $10 for AIME members, $15 for nonmembers, and $5 for students if received before March 15. Thereafter add $5. Fee covers registration, luncheon, abstracts, vendor's show and cocktail hour.

Preregistration, payable to Amer. Mining, Metallurgical and Petroleum Engineers, to Dr. K.S. Sree Harsha, 215 Engineering Building, Dept. of Materials Science, San Jose State University, San Jose, CA 95192

IEEE Symposium "1974 Frontiers in Education" LONDON, July 15-19,

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"1974 FRONTIERS IN EDUCATION" is sponsored by IEEE, IEEE United Kingdom and Ireland, the Institute of Electrical Engineering, IEE Science Education and Management Division, ASEE, and ERM.

The conference will be the 1974 Annual Meeting of IEEE's Educational Group (G25). The primary aim is to increase understanding of the role of Educational Technology through discussions of its application, scope, and potential, with particular reference to Engineering Education and Training.

Charterflights

If you are interested in a flight ONLY: Charter flights are scheduled on Overseas National Airways from the West Coast to London and Amsterdam departing each Wednesday, and to Brussels departing each Friday, from May through September. Length of stay is from two to six weeks.

PRICE: $375.00 ROUNDTRIP.

For applications, schedules, and booking details, contact ASTrA.

Tours

A variety of short programs have been specifically designed for those who want to see Europe as well as attend the symposium in London. Tours may be purchased with or without the flight, should you prefer different flight dates.

PROGRAM DIRECTOR: DR. R.E. OWEN, PROFESSOR, CSU SAN LUIS OBISPO

PROGRAM 1:
July 3, leave Los Angeles. July 4-6, Amsterdam. July 7, Amsterdam-Koblenz-Ruedesheim. July 8, Ruedesheim-Munich. July 9, Munich. July 10, Munich-Zurich. July 11, Zurich-Dijon. July 12, Dijon-Paris. July 13-14, Paris. July 15, London, start Convention.

PRICE: TOUR ONLY $396. PLUS FLIGHT $375. TOTAL: $771.00

PROGRAM 2:
July 3, leave Los Angeles. July 4-5, Amsterdam. July 6, fly Amsterdam-Rome. July 7-8 Rome. July 9 Rome-Florence. July 10 Florence. July 11 Florence-Grenoble. July 12 Grenoble-Paris. July 13-14 Paris. July 15 London, start of Convention.

PRICE: TOUR ONLY $451. PLUS FLIGHT $375. TOTAL: $826.00

PROGRAM 3:
July 3 leave Los Angeles. July 4-5 Amsterdam. July 6 Amsterdam-Ancona. July 6-13 Cruise through Aegean Islands with stops in Corfu, Patras, Kata Kolon, Pyreaus (Athens), Kusadasi and Patmos (Turkey). Excursions to Mt. Olympus, Turkish bazaars, Ephesus, cloisters, city tours. July 13-Ancona-Rome. July 14 Rome. July 15 London, start of convention.

PRICE: TOUR PLUS CRUISE $620. PLUS FLIGHT $375. TOTAL: $995.00

PROGRAM 4:
July 20 London-Stratford-on-Avon. July 21 Manchester. July 22-23 Edinburgh. July 24 York. July 25 York-London-West Coast.

PRICE: TOUR ONLY $156. PLUS FLIGHT $375. TOTAL: $531.00

SERVICES:
Included in the total price are jet roundtrip from the West Coast, all ground transportation, transfers, accommodations in tourist class hotels with breakfast and dinner (all meals during cruise), sightseeing and excursions per itinerary, entrance fees, multi-lingual guide.

Although

your fellow conventioneers would love to have you join the frolics prior to the symposium in London; if the tours are not convenient and you still plan to visit Europe we have many low-cost alternatives including rail passes, low-cost accommodations, cabins, chalets, car rentals, etc. Let us know your basic plans, and we'll send you the info to put Europe back in your budget! And if you can swing by the symposium, then (as you know) the whole trip will be tax-exempt.

This is the first time that IEEE's G25 group has attempted to offer travel services to their members. We encourage you to take advantage of the low-cost, group benefits. Europe isn't getting any cheaper. There are no eligability requirements. This is the only time this announcement will appear.

I THINK I'M GOING!
Please reserve ___ place(s) on program #___;
Charter flight only from _____ to _____;
and bill me:
Name _____

Address _____

City _____ State _____ Zip _____

Please send more info on _____

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For info on the symposium ONLY, contact:
Dr. R.E. Owen, EL-EE Dept.
California Polytechnic State University
San Luis Obispo CA 93407

ASTrA
American Student Travel Association
924 Westwood Boulevard, Los Angeles
Calif. 90024 (213) 479-4445 at UCLA

MTT-GENERALIZED DESIGN OF FILTERS, COUPLERS, AND PHASE EQUALIZERS BY COMPUTER OPTIMIZATION

IExact synthesis of microwave circuits ssuch as filters, directional couplers, and pphase equalizers is feasible only when tthe circuit consists entirely of equal or ccommensurate line lengths. However, mmost filters, such as low-pass, waveguide aand comb-line filters, do not meet this ccondition. Also, multi-octave couplers aand phase equalizers are usually made mmow with tapered lines. Approximate mmethods available for commonly used ffilters usually give good results, but in wwide, band-pass designs, errors can be cquite large.

AAn efficient and fast optimization method yyielding equal-ripple response is ddescribed briefly, and then its wide apppplicability and power are discussed. Circcuits can contain lumped as well as ddistributed elements, and discontinuity eeffects can be included. Among the ddesign examples are a 15-resonator ccomb-line filter having tapped termminations and a 30-resonator interdigital ffilter. In both cases, the filter parameters wwere computed that yield a 1.10 VSWR rripple within ± 0.000005 at each peak aand band edge.

TThe speaker, Seymour B. Cohn, an IEEE FFellow, received his Ph.D. degree from HHarvard. In 1967 he formed S.B. Cohn AAssociates, Inc. and since that date has ppracticed as an independent consultant tto various companies in the microwave inddustry. He is the recipient of many awarddds, including the Annual Award for the AAdvancement of Basic and Applied SScience given by the Yale Engineering AAssociation, and will be awarded the 11974 Lamme Medal on March 27 this yyear in New York. Dr. Cohn is an exccchairman of the G-MTT Administrative CCommittee and an Associate Editor of the MMicrowave Journal and a member of the EEditoral Board of the Advances in MMicrowaves series published by the AAcademic Press.

1974 IEEE INTERNATIONAL SYMPOSIUM ON CIRCUITS & SYSTEMS (ISCAS/74)

Sir Francis Drake Hote, San Francisco
April 22-25, 1974

The IEEE International Symposium on Circuits & Systems (ISCAS) is an annual international conference sponsored by the IEEE Circuits & Systems Society. This year's symposium, the seventh in the series, will be held in San Francisco.

Features will include:

Three and one half days of Technical Sessions, including 18 regular sessions and 10 special invited sessions.

Three one-day short courses.

Panel discussion on "New Directions and Policies of the IEEE Transactions on Circuits and Systems."

Symposium Colloquium on "Application of Lie Group Theory to Nonlinear Network Problems."

Information: Contact Sanjit K. Mitra, General Chairman ISCAS/74, UC Davis College of Engineering, Davis, CA 95616

BOOK ON COMPUTER - AIDED FILTER DESIGN PUBLISHED BY IEEE PRESS

Computer-Aided Filter Design, a volume of selected reprints edited by George Szentirmai of Cornell University, has been published by the IEEE PRESS. The availability of solid-state devices and fast digital computers has had a major impact on filter design and realization, and it is important that the filter designer and user keep abreast of the latest developments. The 45 papers reprinted in Computer-Aided Filter Design were carefully selected with this need in mind. In a tutorial introduction, the editor discusses the design fundamentals of filters for analog signals and comments on each of the reprinted papers. The major topics covered by the papers are approximation, synthesis, optimization, sensitivity, the time-domain design. An extensive bibliography and author and subject indexes are included.

This 448-page book, sponsored by the IEEE Circuits and Systems Society, is priced at $7.00 for the paperbound member edition. A clothbound edition is available for $13.95 (discounted to $10.45 for IEEE members.) Besides being available from the Institute, IEEE Books of Selected Reprints are distributed worldwide by John Wiley & Sons, Inc.

APS-MUSHROOMS, MAN AND MOLDS

Picture courtesy Publishers - Hall Syndicate. All rights reserved.

A Saturday PM meeting of interest to the family. Children welcome. Lunch at Spenger Fish Grotto in Berkeley. Reservations necessary - see below. Then a short trip to The Amphitheater, Lawrence Hall of Science, Berkeley, where there are many other interesting exhibits.

Dr. Ralph Emerson is a professor of Botany at the University of California at Berkeley. In 1967-71 he was chairman of the department, and was elected to the National Academy of Science in 1970. Dr. Emerson got his Ph.D. degree in Biology at Harvard University in 1937, and came to Berkeley as an assistant professor of Botany in 1944.

Dr. Emerson will give a descriptive talk, with beautiful slides, on the daily impact of fungi on mankind (womankind or personkind). Much though we have learned to control our environment, the fungi still threaten our health, destroy our food and manufactured goods, and played tricks with our minds. Yet from them also come our finest gourmet delicacies, our most potent life saving drugs, and possibly even the ancient origin of our religion.

This meeting is organized for our members and their spouses. The Lawrence Hall Science has many interesting exhibits. Children are welcome. For reservations call Tony Jennette (408) 732-6643 or send the following form to Dr. Tony Jennette, 747 Shasta Fir Drive, Sunnvale, CA 94086

Reservation for AP-S March meeting:

Name _____
Number of persons _____

See CALENDAR for Program Arrangements

SMC-APPLICATIONS OF OPERATIONS RESEARCH TO IMPORTANT SOCIO-ECONOMIC PROBLEMS

How can the disciplines of Operations Research contribute to the solution of our manifold social problems? Frederick Hillier, co-author of the widely used textbook *Introduction to Operations Research,* will present his views of several particularly interesting potential contributions in his talk at the March SMC meeting.

Professor Hillier recently developed a new course for undergraduates in the social sciences and pre-engineering on "Models and Applications of Operations Research in Society," and his talk will summarize his findings on such applications as those concerned with the environment, health care, and urban planning.

Professor Hillier received his Ph.D. in Industrial Engineering from Stanford University in 1961, and was appointed to the Stanford faculty the same year. In addition to *Introduction to Operations Research,* he has written another book and over 25 research papers in such areas as integer programming queueing theory, and capital budgeting.

IAS - SPECIAL FEATURES OF THE USPS BULK MAIL CONTROL SYSTEMS

Under their non-preferential mail program, the USPS is currently constructing 21 bulk mail centers (BMC'S), two large, five medium and fourteen small in size. Kaiser Engineers with A.T. Kearney was responsible for the concept and design of one large BMC - Chicago, and five medium BMC'S - Pittsburgh, Dallas, Springfield, Philadelphia and Los Angeles.

The non-preferential mails are collected locally in each area. Each BMC will receive mail from and send mail to other BMC's. The large BMC is designed to process 950,000 parcels and 100,000 sacks per day. To handle this huge volume of bulk mail, 576 conveyors totaling 52,000 linear feet and 7 sorting machines totaling 9,700 feet and an underground towline totaling 15,400 feet are required. Likewise, each medium size BMC is designed to process 547,000 parcels and 90,000 sacks per day. This requires 344 conveyors totaling 25,000 feet, 6 sorting machines totaling 6,700 feet and 7,130 feet of underground towline.

The speakers, Messrs. Ho, Venugopalan and Carter, from Kaiser Engineers will describe the special features of the control systems for the bulk mail centers. The control systems consist of very elaborate sequential interlocks, computerized towveyor systems. They will also describe the communication system and closed circuit T-V's for the operation of the facilities.

Mr. Ho is the Chief Electrical Engineer, Mr. Venugopalan is the electrical supervisor and Mr. Carter is the control system supervisor. They were responsible for the concept and design of the control systems. The systems are currently under procurement and construction stage.

EM - H-P's VOLUNTARY FLEXIBLE WORK SCHEDULE, AND HOW IT WORKS

This unique and important topic for today's engineering management and engineers will be discussed by Ray L. Wilbur, Jr., Vice President of the Hewlett-Packard Company with responsibility for corporate personnel and organization. Mr. Wilbur has been actively engaged in industrial relations for more than 30 years. He joined H-P in 1957 as Director of Personnel.

A program permitting employees new flexibility in selecting their work hours was initiated in the U.S. by Hewlett-Packard Company in June 1972, since then the program has been adopted by HP plants at more than 11 U.S. locations with over 12,000 employees operating under the flexible schedule. The program covers all job classifications and includes swing-shift workers as well as those who work the day shift.

Ray L. Wilbur, Jr., was graduated from Stanford University in 1933 with a bachelor's degree in Political Science, and in 1936 he received his master's degree from Syracuse University in Public Administration. Prior to joining Hewlett-Packard, Mr. Wilbur was engaged in public administration, industrial relations and later as deputy regional director of the 12th U.S. Civil Service Region. Mr. Wilbur has had a long and very effective career in public relations work in many areas of California.

September 10-12 fall COMPCON 74
Ninth Annual IEEE Computer Society International Conference
Mayflower Hotel, Washington, D.C.

MICROS AND MINIS CALL FOR PAPERS

1000-2000 word abstract by April 1, 1974
200-300 word Forum abstracts by August 1
(Sales pitches prohibited)
Micro/Mini Tutorial, Monday September 9.
Information: Thomas N. Pike, Jr., Tech. Program Chm., Institute of Computer Sciences and Technology, National Bureau of Standards, Washington D.C. 20234. Phone (301) 921-3436

THE COVER STORY

Over 60,000 persons have visited the Foothill Electronics Museum since its opening to the public last year. January 27, 1974 marked the anniversary of the Museum's dedication and formal opening on the Foothill Community College campus in Los Altos Hills. In addition to new displays on early broadcasting, electronic instrumentation and microwave tubes, Mr. Jack Mullin's outstanding exhibit "Eighty Years of Recording" will be featured during the months of February, March, and April.

Admission to the Museum is free, hours are:

Wednesday, Thursday 9AM to 5PM
Friday 9AM to 10PM
Saturday, Sunday and Holidays that do not fall on Monday and Tuesday when the Museum is normally closed, 1PM to 5PM.

See CALENDAR for Program Arrangements