EDITOR'S PROFILE of this issue

from a historical perspective …

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

January 1973:

Cover: Under-sea exploration is the topic for the Santa Clara Valley Sub-Section (we're not yet a Section). More on page 2.

p. 2: IEEE dues increase from $25/year to $30/year.

p. 6: A young Robert Taylor, principal scientist at Xerox PARC, talks on the state of computer research. He directed ARPA's IP Techniques Office (with Licklider) from 1965 through 1969, funding Doug Engelbart at SRI to develop the graphical user display and the mouse, and also kicking off the ARPANET and leading to the development of inter-networking (the Internet). At PARC, his CS lab develops the Alto (the first personal computer); I helped restore and bring up an old Alto in 2014. He was famous for his weekly *Dealer* sessions.

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

JANUARY 1973

Grid

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THE COVER STORY

SCVSS – ENGINEERING AT "20,000 LEAGUES UNDER THE SEA"

Undersea exploration by divers has created new challenges for engineering because of the continuing trend to explore at greater depths. FMC has designed the Deep Dive System, MK1, an advanced system for transporting divers to and from work sites at depths of up to 1,000 feet and to provide support for the divers during the predive compression period, the diving operation, and post-dive decompression.

Mr. Fred Caterina will describe the functional requirements, system configuration and unusual design features resulting from system operation requirements and environmental factors. Particular attention will be given to the design of the electrical and electronic systems. Constraints imposed by operational requirements and environmental considerations on the selection and application of electrical system materials and components will be included. The talk will be augmented with slides taken during the fabrication, testing and operational checkout phases of the DDS program.

Mr. Fred Caterina is a graduate of California State University at San Jose and is presently doing graduate work at the University of Santa Clara.

The cover picture is an artist's conception of a diver outside the transfer capsule. The picture below is of a transfer capsule ready for lowering.

The PTC Transfer Capsule

IEEE CONSTITUTIONAL AMENDMENT PASSES

The IEEE Constitutional Amendment passed on the basis of 42,899 "Yes" votes and 6,508 "No" votes. Approximately 40% of the eligible membership cast ballots. It now appears that the membership is committed to a new trend in professional activities. For more details see future SPECTRUM.

IEEE dues were increased from $25 to $30 by action of the Board of Directors. In response to an earlier membership survey, a $5 Regional fee also was adopted. To those members who have not yet paid 1973 dues, note that you have an option to specify how your $5 is to be spent, for (1) professional, (2) non-technical, or (3) technical programs. Do not overlook this important elective on your dues statement.

ENGINEERS NEEDED FOR CAREER COUNSELLING

The San Francisco Bay Area Engineering Council provides a very worthwhile service through its Career Guidance Committee. Its purpose is to furnish factual information about the engineering profession to high school students. The pitch is to inform, not sell.

The Committee urgently needs engineers to volunteer as representatives to meet with a school counselor or preferably a science teacher, and work out a program together. Although there is need throughout the entire Bay Area, it is most acute on the Peninsula and Alameda South. The time involved is not great. Help the future of your engineering profession by volunteering for this worthy project.

Please contact: Chairman Michael C. Williams, University of California, Berkeley, 642-4525, or Vice-Chairman H. S. Fowler, Bernard Haldane Associates, San Francisco, 391-8350.

IT – A SOURCE CODING THEOREM FOR DISCRETE-TIME SOURCES

A new derivation of the source coding theorem for discrete-time sources is presented by Dr. Jim K. Omura. This proof parallels R. G. Gallager's derivation of the random coding bound for channel coding theory and shows that the classical random coding exponent also emerges as a critical quantity for source coding. The major advantage of this approach is the simplicity of the derivation and its close relationship to the more familiar channel coding theory. The source coding theorem we derive here also yields a natural bound on the rate of convergence to the rate distortion limit.

Jim K. Omura received his B.S. and M.S. degrees in Electrical Engineering from M.I.T. in 1963, and in 1966 received a Ph.D. degree from Stanford University. Dr. Omura is a member of Sigma Xi, Tau Beta Pi and Eta Kappa Nu.

See CALENDAR for Program Arrangements

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...University Dr. Omura is a member of

MEETING CALENDAR

AEROSPACE & ELECTRONIC SYSTEMS/ ENGINEERING MANAGEMENT
JANUARY 16

Story on page 8

TECHNOLOGY TRANSFER FOR MANAGER AND ENTREPRENEUR. Hyman Olken, Livermore Radiation Laboratories. JOINT MEETING.

JAN. 16, Tuesday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails: (no host) 6:00 PM; dinner 6:30 PM. For dinner reservations (New York steak @ $5.25.) call Phil Steinberg at 326-4350 x 5087 by Jan. 15, 9:00 AM.

ANTENNAS & PROPAGATION
JANUARY 14

Story on page 5

ON THE LP'S OF LP ANTENNAS. Ray DuHamel, Consulting Engineer, Los Altos Hills.

JAN. 14, Thursday, 8:00 PM, Lockheed Research Lab Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto. Cocktails 5:30 PM, dinner 6:15 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. No reservations required.

ANTENNAS & PROPAGATION
FEBRUARY 10

Story on page 5

ONE DAY SHORT COURSE on NUMERICAL METHODS IN ELECTROMAGNETICS. Dr. Frank B. Harris, TCI, Dr. Thomas N.C. Wang, SRI, Dr. Anthony G. Jennetti, ESL and Dr. Edmund K. Miller, LLL.

FEB. 10, Saturday, 8:30 AM to 4:00 PM, Lockheed Research Lab Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto. See story for registration information. For further information contact Dr. Frank Harris (415) 961-9180.

AUDIO & ELECTROACOUSTICS
JANUARY 11

Story on page 6

THE METHODS AND STANDARDS FOR TRANSMITTING HIGH-QUALITY AUDIO OVER LONG DISTANCES. Ludwell Sibley, Senior Engineer, Pacific Telephone, San Jose.

JAN. 11, Thursday, 8:00 PM, Skilling Auditorium, Stanford University. No dinner.

COMMUNICATIONS SOCIETY/CALIF. STATE UNIVERSITY/ PEN. CHAPTER OF ACM
JANUARY 24, 25

Story on page 4

SECOND ANNUAL COMPUTER COMMUNICATION CONFERENCE. "TIME-SHARING PAST, PRESENT, FUTURE".

JAN. 24, 9:00 AM, Jan. 25, 8:30 AM, California State University, San Jose. See story for program and registration information. For further information contact Ed Carr (415) 399-4189.

COMPUTER SOCIETY
JANUARY 23

Story on page 6

COMPUTER RESEARCH: QUO VADIS? Robert W. Taylor, Principal Scientist, Xerox Research Ctr., Palo Alto.

JAN. 23, Tuesday, 8:00 PM, Skilling Auditorium, Stanford University. Dinner: Rick's Swiss Chalet, 4085 El Camino Way at 6:15 PM. Reservations: Neil Sullivan (408) 257-6550 x 320 by noon, Jan. 23.

COMPUTER SOCIETY/ UNIV. OF SANTA CLARA
JANUARY 13

Story on page 7

COMPUTER ARCHITECTURE. Harold Stone, Stanford Univ., William McKeenan, UC Santa Cruz, Herbert Schorr, IBM Corp., Donald Zacharta, Burroughs Corp.

JAN. 13, Saturday, 8:30 AM to 4 PM, Daly Science Hall, Rm. 207, University of Santa Clara. See story for registration. Further information: Peter Gise (408) 984-4482.

CONTROL SYSTEMS SOCIETY
JANUARY 24

AN APPROACH TO THE ANALYSIS OF COMPLEX SYSTEMS AND DECISION PROCESSES. Prof. L. Zadeh, UC Berkeley.

JAN. 24, Wednesday, 8:00 PM, Systems Control Inc., 260 Sheridan Ave., Palo Alto, basement Conference Room. Refreshments at the meeting.

EAST BAY SUBSECTION
JANUARY 22

Story on page 6

ELECTRIC POWER FROM COMBUSTIBLE SOLID WASTE. A. Schmid, Engineering Supervisor, Combustion Power Co., Menlo Park.

JAN. 22, Monday, 12 noon. Luncheon meeting: Tommy's Restaurant, 529 - 17th St., Oakland, between Telegraph and San Pablo. No reservations.

ELECTROMAGNETIC COMPATIBILITY
JANUARY 15

PANEL DISCUSSION: TECHNOLOGICAL FORECASTING AND ASSESSMENT. Moderator: Roy Amara, Pres. Institute of the Future. Speakers: Fred Nichols and Dr. Harold Gumbel.

JAN. 15, Monday, 8:00 PM, Bold Knight, 769 N. Mathilda, Sunnyvale, at 6:45 PM. Reservations for dinner: Erlyne Hooper (415) 326-4350 x 4310 by Jan. 12.

ELECTRON DEVICES
JANUARY 23

Story on page 7

CONSUMER ELECTRONICS – A MAJOR CHALLENGE. Norman Doyle, Fairchild Semiconductor.

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

ENGINEERING IN MEDICINE & BIOLOGY
JANUARY 9

Story on page 8

COMPUTER-ASSISTED RESPIRATORY PHYSIOLOGY AND TESTING AT HARBOR GENERAL HOSPITAL. Dr. William L. Beaver and Dr. Paul Griffith, Varian Associates, Palo Alto.

JAN. 9, Tuesday, 8:00 PM, Bldg. 7 Conference Room, Varian Associates, 611 Hansen Way, Palo Alto. Dinner: 6:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Mrs. A. L. Swenson (408) 292-4794 by Jan. 5.

GOLDEN GATE SUBSECTION
JANUARY 24

Story on page 7

ALTERNATE ENERGY SOURCES. James K.A. Harral, PG&E Co., S.F.

JAN. 24, Wednesday, 12:00 noon, PG&E Headquarters, Room 301, 77 Beale St., S.F. (Buy lunch at adjoining cafeteria). No reservations.

INDUSTRY APPLICATION SOCIETY
JANUARY 23

Story on page 6

METRIFICATION WITHOUT PAIN? James E. Hacke, Consultant on Research Methodology.

JAN. 23, Tuesday, 8:00 PM, Iron Duke, 3rd floor, 132 Bush St., S.F. Cocktails: 6 PM, dinner 6:30 PM. Reservations: Frank Trayer (415) 432-7701; Ted Bubb (415) 781-1177 or Tom Googin (415) 982-2442 by Jan. 22.

INFORMATION THEORY
JANUARY 15

Story on page 2

A SOURCE CODING THEOREM FOR DISCRETE-TIME SOURCES. Jim K. Omura, Asst. Prof., Univ. of Calif. at Los Angeles.

JAN. 15, Monday, 8:30 PM, SRI Conference Room B, Bldg. 1, 333 Ravenswood Ave., Menlo Park. Dinner: Tong's, 1037 El Camino, Menlo Park at 6:30 PM. Reservations: Robert Gray, (415) 321-2300 x 4001 by Jan. 12. (Important to reserve on time!)

MICROWAVE THEORY & TECHNIQUES
JANUARY 18

Story on page 8

SOME BROADBAND 8-18 G Hz MIC COMPONENTS. Allen Podell, Microwave circuits specialist HPA, Palo Alto.

JAN. 18, Thursday, 8:00 PM, SRI, Bldg. 44 (Laurel Street) Menlo Park. No dinner.

NUCLEAR SCIENCE
JANUARY 16

Story on page 4

AN EVENING OF PLASMA PHYSICS with Prof. Oscar Buneman, Prof. Robert H. Eustis and Dr. John M. Wilcox, all of Stanford University. Ladies welcome.

JAN. 16, Tuesday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails: 6 PM, dinner 7 PM. For dinner and meeting or meeting only reservations: Mrs. Lu Burch, (415) 854-3300 x 2401 by Jan. 15.

POWER ENGINEERING SOCIETY
JANUARY 9 and 23

Story on page 8

TWO SEMINARS: (1) HYDRO-THERMAL COORDINATION. R. H. Vierra and R. P. Thompson, PG&E. **(2) PRIMARY DISTRIBUTION ALARM AND CONTROL SYSTEM.** O. L. Hill, PG&E.

JAN. 9, Tuesday, and Jan. 23, Tuesday, 5:30 to 7:00 PM, PG&E Bldg., 77 Beale St., Room 1760, S.F. No dinner.

SANTA CLARA VALLEY SUBSECTION
JANUARY 10

Story on page 2

ENGINEERING AT "20,000 LEAGUES UNDER THE SEA". Fred J. Caterina, FMC Corp., San Jose.

JAN. 10, Wednesday, 8:00 PM, FMC Corp., Ordnance Engineering Division Auditorium, 1105 Coleman Ave., San Jose. (Adjacent to Coleman exit from Highway 17). No dinner.

SYSTEMS, MAN & CYBERNETICS
JANUARY 10

Story on page 5

JOINT MEETING WITH PENINSULA CHAPTER OF SIGART on: INDUSTRIAL AUTOMATION: PRESENT AND FUTURE. Dr. Charles Rosen, SRI, Menlo Park.

JAN. 10, Wednesday, 8:00 PM, Ness Auditorium, International Bldg., SRI, 333 Ravenswood Ave., Menlo Park. Dinner: 6:00 PM, SRI International Dining Room. Reservations: Section office (415) 327-6622 by noon, Jan. 8. Please reserve early.

NS – FUSION, MHD AND SOLAR ASTROPHYSICS

This plasma science meeting will feature three popular talks on why that state of matter making up more than 99% of the Universe might be interesting. Professor Oscar Buneman will discuss Controlled Thermonuclear Fusion: "Taming the H-bomb" may be Man's only way of getting clean and adequate power for the coming century. All proposed schemes have the fusing material in the plasma state and our lack of understanding of this state is the obstacle to control and confinement. Movies will illustrate recent computer simulation confinement studies of various hot plasma and electric/magnetic field configurations.

Professor Robert H. Eustis will discuss "MHD Energy Conversion": a conducting fluid forced through a magnetic field is used to generate electric power. MHD systems are now being built at the 25 MW level. The talk will describe how MHD generators work, potential use as a topping system, and the present state of the art.

Dr. John M. Wilcox will discuss "Solar Astrophysics": the solar wind plasma expands radially outward from the sun carrying along frozen-in solar magnetic field lines. Observations by spacecraft magnetometers have revealed large-scale structures that influence solar, geomagnetic, and probably meteorological processes.

All three speakers are members of the Stanford University Institute for Plasma Research. Professor Buneman (Ph.D.-Manchester), formerly at Cambridge University, joined the Stanford EE Department in 1960. Professor Eustis (Sc.D.-MIT), at Stanford in the ME Department since 1955, directs the High Temperature Gasdynamics Laboratory. Dr. Wilcox (Ph.D.-UC), worked at UC Berkeley for twenty years before joining Stanford last year.

SECOND ANNUAL COMPUTER COMMUNICATIONS CONFERENCE

AT CALIFORNIA STATE UNIVERSITY, SAN JOSE
JANUARY 24-25, 1973, SAN JOSE, CALIFORNIA

This conference is jointly sponsored by the San Francisco Chapter IEEE Communications Society; California State University, San Jose; and the Peninsula Chapter of the ACM.

The conference theme is "Time Sharing: Past, Present, Future". Interdisciplinary sessions are planned to treat the theme in relation to trends, applications, problems and impairments, solutions and tools, and Impact on society and education. By creating an open forum for tutorials and discussion-provoking presentations the conference aims to expand and improve the dissemination of information and the quality of computer communication studies.

General Fee	$20.00 (Students $5.00)
ACM & IEEE Members	$17.50
ACM & IEEE Student Members	$2.50
Discount for advance registration	$2.50
Exhibitors	$50.00
Luncheon on January 25	$3.65

Please send your remittance to: Computer Communications Conference, Department of Electrical Engineering, California State University, 125 South 7th Street, San Jose, California 95192.

For further information: Elden Shaw, (408) 277-2456.

A copy of the Conference Proceedings is included in the registration fee and will be mailed to advanced registrants. Additional copies may be purchased at the conference.

WEDNESDAY, JANUARY 24

7:30-9:00 A.M.	Registration
9:00-9:15 A.M.	Welcome
9:30-11:45 A.M.	Morning Sessions
12:00-2:00 P.M.	Lunch
2:15-4:00 P.M.	Afternoon Sessions

SESSION I: Subjects include Solutions and Tools; Communications and Time-Sharing; Security and Privacy; Time-shared Conversational Languages; Critical Look at BASIC; Microfiche Terminal.

SESSION II: Subjects include Timesharing as Product Assurance Management Tool; Coordinated Information Services for Discipline or Mission Oriented Community; Telecomputations and Microfilm Applications; Timesharing Applications at ARC; Futures Information Storage System.

SESSION III: Subjects include Problems and Impairments; Survey of Private Line Channel Data Performance; On-Line Storage Impairments and Enhancements; Human Factor Considerations in Data Terminal Selection; Conferencing in an On-Line Environment; Communications in Computer Communications.

THURSDAY, JANUARY 25

8:30-10:45 A.M.	Morning Sessions
11:00-11:45 A.M.	Exhibits
12:00-2:00 P.M.	Luncheon - Speaker
2:00-2:30 P.M.	Exhibits
2:30-4:00 P.M.	Afternoon Sessions
4:15-5:00 P.M.	Conference Overview

SESSION IV: Subjects include State of the Art in On-Line Conferencing; Trends in Data Transmission; Some Aspects of Teleprocessing and Finance Banking; Interactive Batch Processing; University Timesharing Systems.

SESSION V: Subjects include Impact on Society and Education; Social Implications of Communications Technology; Survey of Computer User Attitudes; Technology and Value Changes; Sociological Spin-Off from Computer Communities System Engineering.

SESSION VI: Subjects include: Timesharing Contracts and Agreements; Some Recent Developments in Identification, Estimation and Forecasting of Stochastic Systems; Using Timesharing for Software Reliability Analysis; Timesharing Applications in the Construction Industry; Computer and Communications Abuse.

See CALENDAR for Program Arrangements

AP – THE LP'S OF LP ANTENNAS

During the last eighteen years the speaker has spent a major part of his efforts on wide band antennas and microwave components. His talk will be centered on his experiences with logperiodic antennas (LPA) during this time. This will include discussions of the ludicrous parentage of the first successful LPA, how lucky perseverance led to practical LPA, the limitless permutations of the concept, some of the leading pitfalls encountered along the road, the lethargic progress over the years, the reactions of lifelong pessimists, the limbo patent situation, some lasting problems and finally some lackluster predictions.

Dr. Duhamel is a consulting engineer, a Fellow of IEEE, and received the Ph.D degree from the University of Illinois in 1951. He conceived the logperiodic antenna design principles and was responsible for applying these new techniques to HF antennas, dish feeds and ELINT antennas. His research activities include LP transmission line circuits, tapered line magic-T, broad band multiple mode antenna feed networks, LP and TEM dual polarized monopulse antennas.

YOUNG ENGINEER SURVEY

The IEEE is currently determining the professional desires and needs of its non-student members under 30 by way of a project called "Societal Needs of Young Engineers". The information will be gathered from small brainstorming type sessions conducted over the next several months. Interviewers will be in contact with young members to arrange meetings. The San Francisco Section effort is being coordinated by Frank Lord. Further information or early interviews may be obtained by contacting Mr. Lord at 966-2602.

SMC – ROBOTS, PRODUCTIVITY, AND QUALITY

Will Robots take over our factories? What should our goals be, and what are the social consequences? Dr. Charles Rosen, Staff Scientist, Artificial Intelligence Center, at SRI will describe the use of robot-like machines in industry today, will discuss limitations and predict future developments. His talk will be based on an extensive survey recently completed.

Dr. Rosen established the A.I. Center at SRI 10 years ago and has worked actively in robotics and artificial intelligence since then. In recent years, he has concentrated on industrial applications of such devices. He received his B.A. at Cooper Union, his M.S. at McGill, his Ph.D. in E.E. from Syracuse.

AP – ONE DAY SHORT COURSE: NUMERICAL METHODS IN ELECTROMAGNETICS

The IEEE Antenna and Propagation Chapter will present a one day short course, "Numerical Methods in Electromagnetics" at Lockheed Research Lab. Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto, on Sat., Feb. 11, from 8:30 am to 4:00 pm.

"Foundations of Numerical Methods"
Dr. Frank B. Harris, TCI

"Linear Wire Antennas"
Dr. Thomas N.C. Wang, SRI

"Optimization of Arrays"
Dr. Anthony G. Jennetti, ESL

"Transient Electromagnetics"
Dr. Edmund K. Miller, Lawrence Livermore Laboratory

Certificate of Completion will be awarded to each participant.

Mail this form and payment to:
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1625 Stierlin Road
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IEEE G–AP
February 11, 1973 Short Course on
Numerical Methods in Electromagnetics

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Check One: Member____ Non-Member_____

Deadline for preregistration, Feb. 1st, 1973.

Fees: IEEE Member $10.00, Non-member and late registration (after Feb. 1st) $15.00
Fees include notes and lunch (lunches provided for pre-registered participants only)

See CALENDAR for Program Arrangements

C – COMPUTER RESEARCH: Quo Vadis?

Robert W. Taylor, a principal scientist of the Xerox Palo Alto Research Center's Computer Science Laboratory, will give a talk at the January 23rd meeting of the Computer Society. The talk will focus upon Computing research, some recent history, and some guesses about its future, particularly with regard to shifting emphasis over the past and future decades.

Although Mr. Taylor is a local resident, he is speaking to us as a member of the IEEE Distinguished Visitors Program. He was Director of Computing Research for the Advanced Research Projects Agency of the Office of the Secretary of Defense from 1965 to 1969. Of the total computing systems research carried out in the United States during that period, under both government and industry funding, roughly two-thirds was supported by ARPA. Those research efforts are probably best known for pioneering interactive computing in general and time-sharing and graphics in particular. Before leaving ARPA, Mr. Taylor initiated the planning and development of the ARPA computer network which now interconnects approximately 30 nodes consisting primarily of communities of people carrying out computing research.

Two years ago he was among the first computer scientists to join the newly formed Xerox Corporate Research Center where his principal activities have consisted of staffing the Computer Science Laboratory and formulating its research plans and programs. He has authored a number of papers in the general areas of interactive computing and computer networks, has served on several government, university, and industry advisory committees.

AE – LONG DISTANCE HIGH QUALITY AUDIO TRANSMISSION

Methods and Standards for Transmitting High Quality Audio over Long Distances will be discussed by Mr. Ludwell Sibley, Senior Engineer, P.T. and T. Mr. Sibley supervises the design of all audio program circuits for central California.

Transmission media for this purpose range from simple equalized cable pairs to time-division pulse coding used in conjunction with video systems. Major present emphasis is on sharing coaxial and microwave facilities with voice circuits.

A variety of techniques have evolved for assuring the performance of medium and high fidelity audio services in the presence of noise and other distortions. Companding and pre-emphasis/de-emphasis are effective against noise, even at transcontinental distances. It is frequently necessary to equalize group delay to prevent impairment of quality. Stereo services require additional attention to phasing in order to maintain good performance.

AIME – ELECTRONICS MATERIALS SYMPOSIUM

The Northern California Metallurgical Section of AIME has organized a special all day Symposium on Electronic Materials at Hotel Cabana, Palo Alto, on Friday, March 23, 1973. For information contact: Dr. K. S. Sree Harsha, 212 Eng. Bldg., Calif. State Univ., San Jose, Ca. 95192, phone (408) 277-2437, or leave message at (408) 277-2446.

DID YOU KNOW THAT –

President Nixon's request to Congress last March for a broad application of our technological resources to the challenge of our domestic economy in the 1970's was the first presidential message on science and technology in our nation's history? (Source: Honorable William M. Magruder, Special Consultant to the President, "Technology and the Professional Societies," Mechanical Engineering, vol. 94, no. 9, Sept. 1972, pp. 9-15.

IAS – METRIFICATION WITHOUT PAIN

With the conversion in the United Kingdom to the Metric System, the United States is almost the only remaining major industrial nation using English units. Conversion to the metric system can never be entirely painless, but there are ways to minimize the effort and expense involved. James Hacke will discuss some of the problems, pitfalls and opportunities.

There are ways of simplifying the task considerably, involving the pace at which metrification takes place, the sequence of industries in which it takes place, the sequence of metrification within each industry.

The electrical energy and electronics industries are in a peculiar position, since a large part of their markets always has been international, and the incentive for metrification always has been present. Current industrial catalogs in the two allied industries commonly give physical dimensions and weights in metric as well as English units.

Electrical units, e.g., volts, amperes, ohms, and watts, are metrical units. Radio antenna and propagation calculations are carried out almost entirely in metric units.

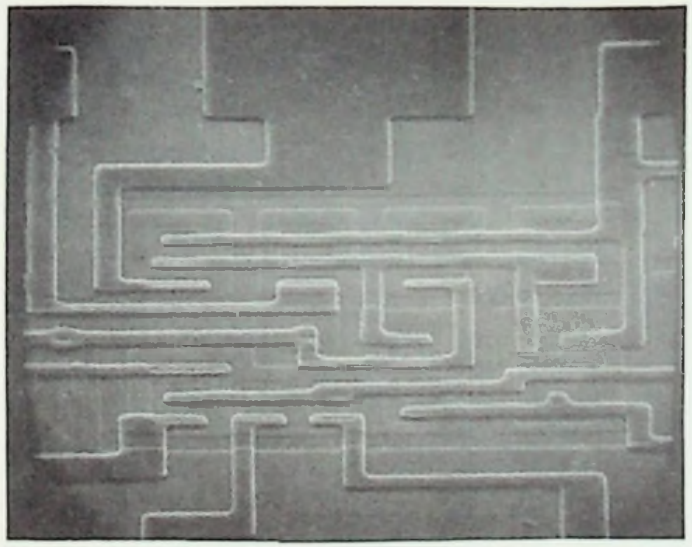
EBSS – ELECTRIC POWER FROM COMBUSTIBLE SOLID WASTE

Obtaining usable heat, electric power and compact fill from combustible waste is a desirable objective from both ecological and conservation standpoints. However, to do these things economically and on a large scale presents a host of challenging engineering problems – separating, shredding, gas generation, gas turbine conversion and electrical generation.

Combustion Power Company is designing, developing and building a one-megawatt pilot model combustion power unit on a government R & D contract. The second planned phase is a 15 megawatt prototype capable of processing 400 tons per day.

Mr. Al Schmid, Engineering Supervisor, Combustion Power Company, Menlo Park, will describe the process and show film and or slides at the January luncheon meeting of the East Bay Subsection.

See CALENDAR for Program Arrangements



INTEGRATED CIRCUITS: PHYSICS, MODELS AND COMPLEMENTARY TECHNOLOGY

A ONE-DAY SHORT COURSE ☐ FEBRUARY 3, 1973 ☐ AT SLAC ☐ PRESENTED BY THE IEEE CIRCUIT THEORY GROUP, SAN FRANCISCO CHAPTER IN COOPERATION WITH THE ENTREPRENEUR PRESS

WHEN

February 3, 1973
Saturday 9:00 a.m. - 5:00 p.m.

WHERE

Main Auditorium

Stanford Linear Accelerator Center
2575 Sand Hill Road
Palo Alto, California

COURSE DESCRIPTION

The purpose of this course is to give the interested electronics engineer an insight into the specifics of integrated circuit design with emphasis on large signal applications.

Lack of realistic breadboarding capabilities and inadequacy of mathematical tools for dealing with non-linearities encountered in semiconductor junctions are responsible for the difficulties in design and analysis of integrated circuits for large signal swings. Computer modeling of such circuits offers a valuable solution to this problem but it carries along the need for appropriate models of active devices. The present state of bipolar and MOS transistor models for large signal applications will therefore be discussed and illustrated with results of actual circuit simulations. Furthermore complementary technologies for both the bipolar and the MOS transistors will be covered and will give the designer not only a link between the geometries and the corresponding electrical models but also a proper perspective of recent advances and present day capabilities.

INTEGRATED CIRCUITS: PHYSICS, MODELS AND COMPLEMENTARY TECHNOLOGY

February 3, 1973

Main Auditorium
Stanford Linear Accelerator
2575 Sand Hill Road
Palo Alto, California

COURSE SCHEDULE

Morning:

1. Physics of Semiconductor Devices Found in Modern Integrated Circuits.
   Dr. Alpert Yu, Intel Corp.

2. Complementary bipolar transistor technology.
   Prof. Jim Meindl, Stanford University

3. Complementary MOS transistor technology
   Dick Swanson, Stanford University

Lunch:

SLAC Cafeteria. Cost included in registration fee

Afternoon:

4. Modeling of bipolar transistors for CAD. Evolution of models, extension of the Gummel-Poon model, parameter determination, accuracy vs. complexity considerations.
   Dr. Larry McBride, Hewlett-Packard Co.

5. Modeling of MOS transistors. Performance of large signal model in switching circuits.
   David Farrington, Hewlett-Packard Co.

6. Integrated circuits today and tomorrow. An overview of the present state of art and projections for the future.
   David Hilbiber, Consultant.

FEE

The fee for the course is $15.00 for IEEE regular members, $10.00 for student members and $20.00 for non-members. The fee also includes the lunch at SLAC and any lecture notes to be handed out.

REGISTRATION

The enrollment for this course is limited. Therefore, persons interested in taking this course are urged to enroll early by completing and mailing the registration form below. Companies may enroll for any given number of individuals, supplying names later. **To ensure enrollment individual names must be received before January 20, 1973.** For additional applications, use separate sheet giving information requested on enrollment form.

INFORMATION

For additional information concerning the program, write or call:

Les Besser, Farinon Electric
935 Washington Street
San Carlos, Calif. 94070 (415) 593-8491

Zvonko Fazarinc, Hewlett-Packard Co.
1501 Page Mill Road
Pal[illegible] Calif. 94304 (415) 493-1501

INTEGRATED CIRCUITS

REGISTRATION FORM

(Should be received before January 20, 1973)

Mail to: **Zvonko Fazarinc**
c/o IEEE San Francisco Section Office
Suite 2210
701 Welch Road
Palo Alto, California 94304

Enclosed is check (payable to San Francisco Circuit Theory Group) in the amount of $..... to cover the enrollment fee.

Name: .....
(please print full name)

Home Address: .....
(Street)

.....
(City and State) (Zip)

Business Address: .....
(Street)

.....
(City and State) (Zip)

Position or Title: .....

Business Phone: .....

IEEE Affiliation (Check One)

- ☐ Member
- ☐ Student Member
- ☐ Non-Member

IEEE Membership No.: .....

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econd								
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DRIVER INFORMATION: Married ☐ Single ☐

Names of All Drivers including self	Relationship	Age	Driver is principal user of Car No.	Driver is occasional user of Car No.	No. of at fault accidents over $100 damage last 3 years	No. of moving violations last 3 years
	(Self)					

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FELLOW NOMINATIONS

Nominations for award of Fellow grade for 1974 now are being solicited. The San Francisco Section Fellow Committee is organizing its efforts to propose for Fellow prominent members of the engineering community. Assistance of all members, Group/Society Chapters and present Fellows are welcome in identifying IEEE members of unusual professional distinction with "outstanding and extraordinary qualifications and experience". They may be of any grade in IEEE and must have been members for seven years.

Nominations will be processed for submission in April, 1973 and should be in the Section office by February 15, 1973. For forms and instructive packets, contact Mrs. Jean Helmke at the Section office (phone (415) 327-6622). Preliminary biographical information may be sent in by letter to the Section office for committee assistance in preparing the proposal.

The Fellow Committee Chairman is Hugh Webber, who may be reached daytime at (408) 255-6200 or evenings at (415) 324-3055.

ED – CONSUMER ELECTRONICS – A MAJOR CHALLENGE

There was a time when the Consumer Market was the place where semiconductor manufacturers disposed of their "no-value" inventory. Today it promises to be the largest and most exacting customer that the semiconductor industry as a whole can envisage. The possibilities are enormous – not only in terms of volume but in terms of the sophistication of the requirements. Light emitting displays for calculators, light sensing devices for cameras, pressure transducers for automotive electronics, MOS LSI for a myriad of control functions, from watches to seat-belt interlocks, these are but a few of the semiconductor devices which the consumer industry is demanding.

Can we meet the challenge of greater complexity, improved reliability and lower cost which consumer electronics offers to every area of the semiconductor industry, from CMOS to LED's?

Norman Doyle, Manager of Systems Applications Engineering of the Analog Division of Fairchild Semiconductor received his education at Dublin College of Technology, and Bradford College of Advanced Technology, Prior to joining Fairchild in 1966, he worked in applications and consumer electronics in England and Canada.

GOLDEN GATE SUBSECTION ALTERNATE ENERGY SOURCES

Golden Gate Subsection, Wednesday, Jan. 24, 1973, Noon, at PG&E Co. Headquarters 77 Beale St., San Francisco, 3rd Floor, follow the sign to Room 301 with your choice of lunch.

(A modern cafeteria is available for your convenience on the same floor.)

Have you ever given a thought (while drinking your morning coffee in a nice warm house heated by natural gas) to what alternate energy source could keep you in that comfort for any length of time?

James K. A. Harral is one, whose job it is to evaluate and study alternate energy sources.

Mr. Harral is our speaker at our next Golden Gate Subsection Luncheon Meeting. A Mechanical Engineer with PG&E Co. working in the GAS SUPPLY DIVISION.

Jim will give us a realistic picture how alternate energy sources will fit into our life, and that of the utilities.

Guests are invited, no reservations required, take the first to third floor elevator, select your lunch at the PG&E Co. cafeteria and bring it to the meeting, if you are on a diet, come without your lunch.

C – A ONE DAY SHORT COURSE IN COMPUTER ARCHITECTURE

The IEEE Computer Society and the Division of Continuing Education University of Santa Clara, jointly will present a one day short course on "Computer Architecture" at Daly Science Hall, Room 207, University of Santa Clara on January 13, 1973, from 8:30 A.M. to 4:00 P.M.

This is the second in a series of one day short courses to be presented in 1972-73, to provide the practicing engineer and scientist with recent developments in the continually changing field of computer technology. Program chairman and organizer of the January 13 course is Harold Stone, Stanford University.

Speakers: Harold Stone: Parallel Computation, Herbert Schoor, IBM: Design Principles for a High Performance System, Donald Zacharta, Burroughs: Array Processing Techniques, William McKeeman, U.C. Santa Cruz: Computers for Banking Applications.

Co-organizers of the short courses throughout the year will be: Frank Greene, President of Technology Learning Corporation, William Dunn, Professor of Electr. Engnr. Univ. of Santa Clara and Peter Gise, Instructor of Electr. Engr. Univ. of Santa Clara.

Fees: IEEE or ACM members $20.00. Non-members $25.00. Fees include notes and lunch on campus. Student Members or Unemployed Members $4.00 without lunch, or $6.00 with lunch.

IEEE Computer Society
January 13, 1973, One Day Short Course on "Computer Architecture".

(If possible, mail before January 9)

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 _____Unemployed Member

_____Non-Member

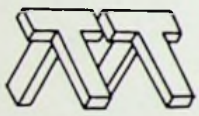
Mail this form and payment to:
IEEE Computer Society Short Course
Division of Continued Education
University of Santa Clara
Santa Clara, California 95053

See CALENDAR for Program Arrangements

PES – TWO JANUARY SEMINARS

On January 9, Messrs R. H. Vierra and R. P. Thompson will discuss PG&E's experience with operational coordination of hydro and thermal generation resources to minimize overall system fuel consumption. Mr. Vierra, a Senior Power Systems Engineer with PG&E, received a BSEE degree from San Jose State College. Mr. Thompson received BSES and MBA degrees from San Francisco State College. He is presently a Power System Engineer with PG&E. Both speakers are members of the Company's Power Control Department.

On January 23, Mr. O. L. Hill will discuss a new system developed by PG&E and PT&T to remotely monitor and control switching on electric distribution circuits. The Primary Distribution Alarm and Control System (PDACS) is designed to minimize customer outage times and to reduce future costs of distribution facilities. Mr. Hill received a BSEE degree from the University of California and is a Senior Electrical Engineer with PG&E's Department of Electric Distribution Engineering.



MTT – SOME BROADBAND 8-18 GHz MIC COMPONENTS

A 3dB quadrature coupler, a 20 dB coupler, a 3 bit phase shifter, and other components are described which cover at least the 8-18 GHz frequency range. Some of the problems encountered in obtaining 15 dB directivity from the couplers and broadband phase shifts of 45, 90, and 180° from the phase shifter are discussed.

Mr. Podell was Senior Research Engineer at Stanford Research Institute where the work on these components was carried out. He has also worked on microwave negative impedance converters, active filters, microwave acoustic transducers, and broadband matching circuits. Mr. Podell has recently become the Microwave Circuits Specialist at HPA.

AES – EM – TECHNOLOGY TRANSFER FOR MANAGER AND ENTREPRENEUR

"Technology Transfer: How to Make it Work" is the title of a new book by Hyman Olken. The contents of the book and how it will be useful for the Manager and Entrepreneur will be discussed at the January 16 meeting of AES and EM groups. The book was written to help the engineer who wishes to find information on unclassified technological developments that are available from the Federal government and that can be transferred to non-government products, processes and services. The book was very favorably reviewed in the October, 1972 IEEE Spectrum. Mr. Olken, who has BS and MS degrees in electronic engineering from Harvard, has had fourteen years experience in the evolution of new technology and its conversion to profitable new commercial products (i.e. Technology Transfer). He has had experience in technology transfer operations of the Federal government through former employment in the Office of Technical Services and has written extensively on technology transfer. For a number of years he was a development engineer on automatic control systems and he holds several patents.

NEW MEMBERSHIP DIRECTORY

A new IEEE MEMBERSHIP DIRECTORY is in the making for 1973. The last issue was 1970. You will be advised through these columns when it is available, and how it may be ordered.

ONE DAY TUTORIAL

ENERGY, RESOURCES, AND MAN

The degree to which society is dependent on the energy that sustains its technology is clear. The temporary shortages of electrical power, the frantic searches for more fossil fuel sources, the realization that such resources may be exhausted in the next century, the resulting waste products of energy conversion systems—these factors have caused man to speak of an energy and resource crisis. This one day symposium addresses these topics and other questions, including: how does our society reconcile the need for energy and the finiteness of the earth; what should be the energy use policy of the U.S.A. in the last twenty-eight years of this century? Textbooks to be read before attendance: Energy and Power, W. H. Freeman and Co., San Francisco, 1971 (A Scientific American book, paperback, $3.25); Energy, Holdren and Herrera, Sierra Club, San Francisco, 1972. This one day symposium will be held in Davis, California on February 15, 1973. The cost is $35. Enrollment is limited and requested by February 8, 1973.

EMB – COMPUTER ASSISTED RESPIRATORY PHYSIOLOGY AND TESTING AT HARBOR GENERAL HOSPITAL

Drs. William Beaver and Paul Griffith of Varian Associates' Systems and Techniques Laboratory, will discuss the establishment and use of a Varian 620/i minicomputer system for on-line processing of respiratory data at Harbor General Hospital located in Torrance, California.

Dr. Beaver will describe respiratory physiology research which is carried out in the Respiratory Division of the Hospital and will comment on how the computer is used for on-line, real-time data acquisition, reduction and presentation. Dr. Griffith will describe and illustrate some of the patient tests which are performed routinely in the Respiratory Function Laboratory of the Hospital with the assistance of the computer system. He will include remarks regarding the system development procedure and integration of the computer system and existing Laboratory procedures and equipment.

A question period will conclude the meeting, to be held in the Building 7 Conference Room, Varian Associates, 611 Hansen Way, Palo Alto (mid-way between Page Mill Road and El Camino Real).