EDITOR'S PROFILE of this issue

from a historical perspective …

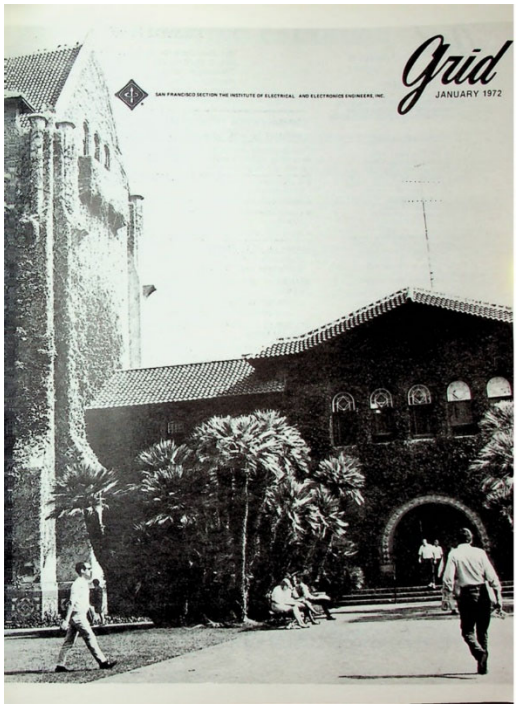
with Paul Wesling, SF Bay Area Council GRID editor (2004-2014)

January, 1972:

Cover: Tower Hall at San Jose State College (not yet a "university"). A 3-day communications technology conference is being held in their new Student Union. More on page 2.

Page 5: Charles Richter of CalTech, originator of the Richter Scale for earthquake magnitude, speaks for our Golden Gate Subsection.

Page 8: Lofti Zadeh of UC-Berleley speaks on fuzzy language and algorithms. He later oversees combining EE and CS into EECS at UC-Berkeley. He is presented with the IEEE Education Award in 1973, and the IEEE Richard Hamming Medal. the IEEE Systems, Man, and Cybernetics Society created an award in his honor.



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

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1973 FELLOW NOMINATIONS

Nominations for award of Fellow grade for 1973 are now being solicited, The assistance of all members is needed in identifying IEEE members of unusual professional distinction with "outstanding and extraordinary qualifications and experience". Candidates may be any grade in IEEE and must have been members for seven years.

Preliminary biographical information is due in the Section Office by February 15, 1972 for evaluation and Section endorsement. A handbook for nominations and draft copies of the nomination form are available in the Section Office and from all Group Chapter and Society Chairmen. Final nominations are due in New York by April 30, 1972.

Please contact Mrs. Jean Helmke at the Section Office for further information.

THE COVER STORY

San Jose State College, Tower Hall. Site of the Computer Communications Conference, January 24 – 26. The meetings, joint with Computer and Communications Technology Groups, to be held in the new College Union.

COMMUNICATION TECHNOLOGY FIRST ANNUAL CONFERENCE JANUARY 24 – 26, SAN JOSE STATE COLLEGE

Tutorial papers and workshop sessions in critical problem areas. Papers describing current research, problem solving techniques and novel applications will be presented.

- A panorama of the data aquisition, teletransmission and remote computer processing fields.
- Identification of conflicts among users, systems, and designers.
- Interdisciplinary interchange of information and problem solving techniques.
- Impact of computer communications technology.

January 24, 1972 – Monday

Registration: 8:00 AM to 12:00 Noon
Conference open: 9:00AM

SESSION #1, 10:00 AM: TRENDS: Chm: Andrew J. Lipinski, Senior Reasearch Fellow, Institute for the Future, Menlo Park

Information based utilities . . terminals . . economics . . FCC rulings . computer netting . . data base access . . coding . . new appl's.

SESSION #2, 2:30 PM: APPLICATIONS: Chm: Edgar M. Van Vleck, Systems Appl. Specialist, NASA/Ames Research Center

Banking and cashless society . . message processing . . medicine . . education . . law enforcement . . process control . . reservation systems . . environmental monitoring

January 25, 1972 – Tuesday

SESSION #3, 9:00 AM: PROBLEMS and IMPAIRMENTS Chm. David P. White, Mgr. of Terminal Services, Service Bureau Corporation, San Jose

Physical Limitations . . hardware/problem Interface . . communications software . . reliability . . terminology . . analog transmission . . human/hardware interface . . inertia in the face of new technology

SESSION #4, 2:00 PM: SOLUTIONS and TOOLS Chm: Edward J. McClusky, Prof. of Electrical Engineering, Stanford University

Languages . . networks . . education . . standards . . cooperation . . architecture for communication computers . . microelectronic technology

January 26, 1972 – Wednesday

SESSION #5, 9:00 PM: IMPACT on SOCIETY and EDUCATION Chm: Gerd D. Wallenstein, Consultant, formerly Vice–President, Planning, GTE Lenkurt, Inc.

Low cost information . . privacy . . economics . . garbage/in garbage out . . technological obsolescence . . value and the utility of information

SESSION #6, 2:00 PM: PANEL DISCUSSION Chm: Abou–Taleb, Lipinski, White, McClusky, Wallenstein

Unsolved problems . . alternatives . . agenda for cooperative action . . plans for future conferences

REGISTRATION and ALL SESSIONS will be held in the SAN JOSE STATE COLLEGE STUDENT UNION.

MEETING CALENDAR

AEROSPACE & ELECTRONIC SYSTEMS
JAN. 20

Story on page 7

SHORT LECTURE AND TOUR OF STANFORD RADIO ASTRONOMY INSTITUTE. Dr. Roger S. Colvin, Sr. Research Associate, EE Dept., Stanford University.

Jan. 20, Thursday, 6:45PM., meet at Rickey's Hyatt House for short lecture and chartered bus to Stanford Radio Astronomy Field Facility and return. 5:30 PM dinner at Rickey's Hyatt House, 4219 El Camino, Palo Alto. Lecture and tour (first 50 only due to facility limitations). $1.50 fee for bus fare; dinner optional, reservations: Pat Hoppe, (415) 326–4350 x 6143 by Jan. 18th.

ANTENNAS & PROPAGATION
JAN. 13

Story on page 5

THOUGHTS AND REFLECTIONS. Prof. Samuel Silver, Dept. of Electrical Engrg. and Computer Sciences, UC, Berkeley.

JAN. 13, Thursday, 8:00 PM, Room 277, Cory Hall, UC, Berkeley. Cocktails at 5:30 and dinner at 6:15 PM, Spenger's Fish Grotto, 1919 4th St., Berkeley. Take the University Ave. exit of East Shore. No reservations.

CIRCUIT THEORY
JAN. 15

Story on page 8

ONE DAY COURSE ON ESTIMATION AND PREDICTION THEORY AND ITS APPLICATIONS. Organizer and Lecturer: Dr. L. A. Wan, Pres. of Sycom, Inc. and former Prof. of Engineering at UC, Santa Barbara, and at Calif. State College at Long Beach.

JAN. 15, Saturday, 9:00 AM to 5:00 PM, SLAC Auditorium, 2275 Sand Hill Road, Menlo Park. Enrollment is limited – register early. See registration form with story.

COMMUNICATION TECHNOLOGY
JAN. 24, 25, 26

Story on PAGE 3

JOINT MEETING WITH COMPUTER SOCIETY AND SAN JOSE STATE STUDENT BRANCH. COMPUTER COMMUNICATIONS CONFERENCE. DATA COMMUNICATIONS – COOPERATION OR CONFUSION?

JAN. 24, 25, 26, 9:00 AM to 5:00 PM at Student Union, San Jose State College. Students $10.00; IEEE members $15.00; non–members $20.00. For additional information: Ed Carr, (415) 399–5550. Registration 8:00 AM Jan. 24th. Sessions 1,2 Jan. 25 & 26, Sessions 3 thru 6.

COMPUTER SOCIETY
JAN. 25

Story on page 7

LSI MEMORY FOR ILLIAC COMPUTER. Frank S. Greene, Pres. Technology Learning Corp.

JAN. 25, Tuesday, 8:00 PM, Skilling Auditorium, Stanford. Dinner: 6:15 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Reservations: Pat Fleming, (415) 321–3300 x 258 by Jan. 24th.

ELECTROMAGNETIC COMPATIBILITY
JAN. 17

Story on page 7

FCC REQUIREMENTS AND THE FUNCTIONS OF THE 12th DISTRICT. Ney Landry, Engineer in charge Federal Communication Commission, San Francisco.

JAN. 17, Monday, 8:00 PM, Hewlett–Packard Auditorium, 5301 Stevens Creek Blvd. Santa Clara. Dinner: 6:15 PM, Customhouse, 20080 Stevens Creek Blvd., Cupertino. No reservations.

ELECTRON DEVICES
JAN. 11

Story on page 7

RECENT ADVANCES IN LOW NOISE MICROWAVE TRANSISTOR DEVELOPMENT. G. Bechtel.

JAN. 11, Tuesday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino, Palo Alto. Dinner: 6:00 PM – Prime Rib $5.80. Reservations: Section Office (415) 327–6622 by Jan. 10th.

ENGINEERING MANAGEMENT
JAN. 19

Story on page 6

A BETTER ECONOMY IN '72? George E. Carden, Associate Economist, UC, Berkeley.

JAN. 19, Wednesday, 8:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto. Cocktails – 6:00 PM, dinner 6:30 – $4.50 includding tax and tip. Reservations: Sue Mendell, (415) 321–2300 x 3619 by Jan. 18th.

ENGINEERING IN MEDICINE & BIOLOGY
JAN. 11

Story on page 6

THE ROLE OF ADVANCED INSTRUMENTATION TECHNOLOGY IN A MODERN PREVENTIVE MEDICINE PROGRAM. Charles J. Martell, M.D., Preventive Medicine Center, Palo Alto.

JAN. 11, Tuesday, 8:00 PM, Preventive Medicine Center, 730 Welch Road, Palo Alto. Dinner: 6:00 PM, Red Cottage, 1706 El Camino, Menlo Park. Reservations: Bob Silligman, (415) 493–3400 by Jan. 10th.

GOLDEN GATE SUBSECTION
JAN. 10

Story on page 5

JOINT MEETING WITH THE ELECTRIC CLUB OF SAN FRANCISCO. EARTHQUAKE NATURE AND EARTHQUAKE RISK. Dr. Charles F. Richter, Prof. of Seismology at CIT. Ladies invited.

JAN. 10, Monday, 12 noon. Luncheon meeting at the Sheraton Palace Hotel, San Francisco. Reservations: Martin McLaren, (415) 764–5294 or Jack Shulman (415) 327–8919 by Jan. 7th.

INDUSTRY & GENERAL APPLICATIONS
JAN. 25

Story on page 4

MAGNETIC LEVITATION IN HIGH SPEED VEHICLES. Dr. Frank Chilton, Stanford Research Institute.

JAN. 25, Tuesday, 7:30 PM, Marconi's Restaurant, 122 Battery St., San Francisco. Dinner: 6:30 PM. Reservations: Ted Bubb, (415) 781–1177 or Frank Trayer 431–7701 by Jan. 24.

INFORMATION THEORY
JAN. 20

Story on page 5

SOURCE CODING FOR SIMPLE NETWORKS. Dr. Robert M. Gray, Asst. Prof., EE Dept., Stanford University.

JAN. 20, Thursday, 8:30 PM, SRI Bldg. 1, 333 Ravenswood Ave., Menlo Park. Dinner: 6:30 PM, Tong's, 1037 El Camino, Menlo Park. Resrvations: Paul Shaft (408) 734–2244 x 342 by Jan. 19.

MAGNETICS
JAN. 27

Story on page 4

THEORY OF MAGNETIC RECORDING. J. C. Mallison, Ampex Corp. Redwood City

JAN. 27, Thursday, 8:00 PM, Ampex Corp. Caleteria, 401 Broadway, Redwood City. No dinner.

MICROWAVE THEORY & TECHNIQUES
JAN. 20

Story on page 8

SOLID STATE MICROWAVE CIRCUITS FOR A RADIO LINK SYSTEM. Yngvar Kvarna, Farion Microwave, Mt. View.

JAN. 20, Thursday, 8:00 PM, Hewlett–Packard Auditorium, 5301 Stevens Creek Blvd., Santa Clara. No dinner.

POWER ENGINEERING SOCIETY/EAST BAY SS
JAN. 12

Story on page 5

JOINT MEETING STATIC ELECTRICITY. A 50–minute demonstration by Alvin Lords and Jay Rodrigues, Mine Safety Instructors, U.S. Bureau of Mines, Reno.

JAN. 12, Wednesday, 7:30 PM, PG&E Service Center, 4801 Oakport St., Oakland. No dinner.

RELIABILITY
JAN. 27

STORY ON PAGE 6

1. THE IIT RESEARCH INSTITUTE'S RELIABILITY CENTER. J. M. Schramp, RAC Project Monitor, Rome Air Dev. Center, NY.
2. RELIABILITY CONSIDERATIONS IN PLASTIC ENCAPSULATED MICROCIRCUITS. H. C. Edfors, Research Engr., Reliability Analysis Center, Chicago, Ill.

JAN. 27, 8:00 PM, Stanford University Lecture Hall PH 104. Dinner: 6:30 PM, Stanford View Restaurant, Palo Alto. Reservations: Dick Cornwell, (415) 966–3877 by Jan. 26.

RELIABILITY SYMPOSIUM
JAN. 25–27, 1972

Story on page 6

1972 ANNUAL SYMPOSIUM ON RELIABILITY. SHERATON PALACE HOTEL, SAN FRANCISCO.

SYSTEMS, MAN & CYBERNETICS
JAN. 10

Story on page 8

FUZZY LANGUAGES AND ALGORITHMS. Prof. Lofti A. Zadeh, EE Dept. and Computer Sciences, UC Berkeley.

JAN. 10, Monday, 8:00 PM, SRI Bldg. 44, Laurel St. entrance, Menlo Park. Dinner 6:00 PM, Red Cottage, 1706 El Camino, Menlo Park. Reservations: Section Office (415) 327–6622 by noon, Jan. 7th.

MAGNETIC LEVITATION IN HIGH SPEED VEHICLES

The I.G.A. Group will sponsor a talk by Dr. Frank Chilton, a Stanford Research Institute titled "Magnetic Levitation in High Speed Vehicles" on January 25, 1972.

High–speed vibration free transit is possible using railway cars supported and guided by the forces of magnetic repulsion. Superconducting magnets would supply the forces necessary to lift the weight of the vehicle and to propel it to extremely high speeds, meeanwhile guiding it around curves meanwhile guiding it around curves – – all without mechanical contact between vehicle and rail.

Pushed by linear induction motors the vehicle could travel at high speed in virtual silence at over 300 miles per hour. A trip between downtown San Francisco and downtown Los Angeles could be made in 1½ hours. By eliminating the time consuming auto trip between airport and downtown destinations, this new transit system could compete with airliners operating in high density travel corridors, and, as a bonus, be free of weather caused travel delays.

Dr. Frank Chilton and Dr. Howard Coffey of the Stanford Research Institute Low Temperature Laboratory in Menlo Park have theoretically proved the design feasibility and are now working out details with an operable model. They hope to carry their transit concept through to the stage of an actual vehicle operating on a full–scale test track.

Dr. Chilton received his S.B. and M.S. (1958) and Ph.D. (1960) in physics, at the University of Chicago. He is a National Science Foundation Fellow, Woodrow Wilson Fellow, and a Phi Beta Kappa. He has authored more than 25 papers and has edited two books on Superconductivity, Electromagnetic Theory, Elementary Particles, Physics of Nuclear Explosions, Optical Oceanography, and Biophysics.

For arrangements see Calendar.

THEORY OF MAGNETIC RECORDING

The subject of magnetic recording theory has received great attention over the last decade as evidenced by the appearance of several hundred research papers. Very significant advances in our understanding of the factors limiting the performance of recording systems have been made. Mr. J. C. Mallinson, Ampex Corporation, Redwood City, will review the theoretical status of all the major physical processes involved. Particular emphasis will be placed upon analysis of the noise sources in recording systems. The signal–to–noise ratio attained on several types of recorder will be compared with the maximum values theoretically possible. Finally, several areas where significant improvements in theoretical understanding and recording system performance seem to be possible will be discussed.

J. C. Mallinson received the M.A. degree in natural philosophy (physics) from University College, Oxford, England.

Following military service, he joined Amp Inc., Harrisburg, Pa., where he was principally interested in the theory and design of all magnetic logic elements. He is the holder of several issued and pending patents in this field. In 1962 he joined Corporate Research Division, Ampex Corporation, where he is the Manager of the Magnetics Section. His studies in micromagnetics, magnetic recording and communications theory have resulted in the publication of over one dozen papers. He is co–author of "Magnetic Properties of Materials", McGraw–Hill 1971.

IEEE SEMINAR ON MANAGEMENT DECISION MAKING

The seminar moderator, Dr. Roger K. Summit of Lockheed Palo Alto Research Laboratory first developed this business environment model in 1963, and has been used as a laboratory device in numerous management development courses.

Dr. Summit received his Ph.D. from Stanford Business School and is a consultant to IBM and The Industrial College of the Armed Forces in management and development. Dr. Summit formerly was an Associate Professor of Business Management at San Jose State College.

The seminar fee is $30, which includes the cost of the seminar handbook, notes, and reports.

Early registration is desirable, since seminar enrollment will be limited to 25 persons.

For additional information and registration form write or call John Oblanas, Stanford Research Institute, 333 Ravenswood Ave., Menlo Park CA 94025. Telephone (415) 326–6200 ext. 3191.

An eight week seminar on Management Decision Making will be presented starting February 26, 1972 by the San Francisco Chapter of the IEEE Engineering Management Group.

This seminar is divided into eight working sessions, the February 26 session of six hours, and the remain- seven weekly sessions of three to four hours each beginning February 29, and successive Tuesdays.

The seminar is structured around a business environment computer simulation model. Seminar participants are divided into management teams representing competing companies. At each meeting, the teams develop decisions involving company strategy and operations. The competing decisions interact with each other and the results of the interaction are printed in the form of financial and operating reports. The management teams use the reports to evaluate the effectiveness of their past decisions and to plan a course of operations for the next fiscal period. The teams will guide their companies throughout eight fiscal periods representing two calendar years.

POWER ENGINEERING SOCIETY and EBSS JOINT MEETING

Static Electricity will be the subject of an instructive meeting Wednesday, January 12, 1972 at 7:30 p.m. It will be a live show, complete with sights, sounds and colors.

The U.S. Bureau of Mines developed this 50–minute demonstration showing how static electricity is caused, and hazards it creates. Alvin Lords and Jay Rodrigues, Mine Safety Instructors with the U.S. Bureau of Mines Training Center at Reno, Nevada, will use an array of specially designed equipment to bring a forceful message on how to prevent the accumulation of static electricity, and thus avoid loss of property and injury.

This will be a rare opportunity to become informed about a serious industrial problem from an authorative source presented in a way to make it easy for the audience to receive and to remember.

This meeting will be at the Pacific Gas and Electric Service Center, 4801 Oakport Street, Oakland. This location is near the Oakland Coliseum.

Power Engineering Society has also scheduled fine programs for later this year. Dr. Edward Teller will discuss Nuclear Fusion Power at a dinner meeting on February 8 and Ladies Night will be a dinner meeting on May 9.

Four technical seminars are planned for March and April. The subjects will be:

System Modeling for Stability Studies.
Investigation of Deterioration of Polyethelene Insulated Cables.
Evaluation of Generation and Transmission Reliability.
The Power Engineering Program at Iowa State University.

When You Move

When you move, please send your new address at once to IEEE headquarters, attention Miss Emily Sirjane. Mailing labels are prepared at IEEE Headquarters and delays are costly. Each month that we use an incorrect label costs ten cents in postage due charges when your Newsletter is returned to the editor.

GOLDEN GATE SS MEETS WITH ELECTRIC CLUB

Subject – EARTHQUAKE RISK

Dr. Charles F. Richter, Professor of Seismology at California Institute of Technology, and originator of the Richter Scale widely used to guage earthquake magnitudes, will be guest speaker at a joint luncheon meeting of the Golden Gate Subsection of IEEE and the Electric Club of San Francisco, Monday Jan. 10, 1972. The meeting will be held at the Sheraton Palace Hotel in San Francisco, beginning at 12:00 noon.

Of particular interest to engineers, he will have comments on the aspects of earthquakes relating to the design of buildings and equipment, and on the proper content of specifications to assure that they will safely withstand earthquake forces.

Ladies are cordially invited, as it will be Ladies Day at the Electric Club. Reservations for IEEE members and their guests, phone Martin McLaren, 764–5294, or Jack Shulman, 327–8919.

POWER ENGINEERING SOCIETY CHANGES OFFICERS

Due to job changes, Joel Kitchens and Edgar L. Bledsoe have resigned their positions of Chairman and Secretary–Treasurer, respectively, of the San Francisco Chapter, IEEE Power Engineering Society. Elwyn G. Lambert, Vice Chairman, has become the Chairman and Gordon Sparrowe the Secretary–Treasurer for the remainder of the fiscal year.

T. J. HEALY ELECTED PRESIDENT OF SANTA CLARA FACULTY SENATE

Dr. Timothy J. Healy, associate professor of electrical engineering at the University of Santa Clara, has been elected president of the university's Faculty Senate.

The Faculty Senate is the voice of the full-time faculty of the university, which numbers about 200 this year.

Dr. Healy Is Chairman, Student Activities Committee, San Francisco Section IEEE.

INFORMATION THEORY

Source Coding for Simple Networks

by Robert M. Gray

The problem of simultaneous communication from one transmitter to several receivers over a simple network is formulated from the source coding viewpoint. We wish to find the set of attainable rates over the separate channels of the network such that the receivers each receive their desired "piece" of the transmitted information within some average fidelity requirement. This approach suggests performance bounds for data compression over such networks and possible converses to coding theorems for broadcast channels.

Dr. Robert M. Gray received the BS and MS degrees in electrical engineering from MIT and the PhD from U. S. C. Since September 1969, he has been an Assistant Professor of Electrical Engineering at Stanford University engaged in teaching and research in communication and information theory.

ANTENNAS & PROPAGATION THOUGHTS & REFLECTIONS

Professor Samuel Silver of the Department of Electrical Engineering and Computer Sciences, at UC, Berkeley, received the PH.D degree from MIT in 1940. He became a Fellow of IEEE in 1954. He has been a major contributor to geometrical optics as applied to reflector antennas, to diffraction theory and physical optics analysis of reflectors and scatterers, to feed–reflector impedence mismatch and corrective techniques, to the design of doubly curved and shaped beam reflectors, to offset and tilted feed antennas, to the general theory of aperture distributions and to the radiation from sources on spherical and conical surfaces.

He has been a statesman, as well as a scholar in electromagnetics, with major contributions to the progress of the International Scientific Radio Un- (URSI). He is a recipient of the John T. Bolljahn Memorial Award of 1970.

Dr. Silver will talk about his experiences during the past 25 years with reflectors.

ENG. MGMT. MEETING

A BETTER ECONOMY IN '72?

What are the prospects for '72? Further declines in business with continuing layoffs, high unemployment, and continued inflation. Or will the Gross National Product increase, unemployment decreases, and inflation be slowed? Mr. George E. Carden, Associate Economist in the Research and Planning Division of United California Bank, will present the Economic forecast for '72 at the EM January Meeting.

He will assess the outlook for science, industry and aerospace in California and compare California's economic prospect with the national economy.

Mr. Carden has worked in the banking field for more than 15 years, with extensive experience in: business and economic analysis and forecasting; and long–range planning.

He obtained an A.B. degree from San Francisco State College in 1954 and an MBA from U.C. Berkeley in 1957. He did graduate work in economics at the University of Southern California.

He wrote the economic and financial column for Western Machinery and Steel World Magazine and has lectured at the A.I.B. (American Institute of Banking). See calendar for arrangement details. Ladies invited.

RELIABILITY ANALYSIS CENTER AND PLASTIC MICROCIRCUITS

The January meeting of the Reliability Group will feature two speakers on related topics. The first presentation will be by J. R. Schramp of the Rome Air Development Center, who will describe the Reliability Analysis Center (RAC) of the Illinois Institute of Technology Research Institute (would you believe IITRIRAC?). The RAC, supported by DOD and administered by RADC, operates principally to collect and disseminate reliability and experience information on microcircuit devices. A number of publications are issued. These include periodically updated failure rates, environmental test results and a bibliography, as well as technical monographs on individual manufacturing processes, such as metallization and surface passivations, and on screening methods.

The second speaker will be H. C. Edfors, a staff member of the RAC, who will speak on "Reliability Considerations in Plastic Encapsulated Microcircuits". Mr. Edfors will describe the materials, desgin, and performance capability achievable with current industry practices. He will discuss the predominant failure modes and mechanisms inherent with plastic encapsulation and the environments to which they are particularly susceptible. He will offer guidelines for determining the suitability of plastic packages for particular applications, and for adequately specifying materials, screening, and Quality Control procedures.

Mr. Edfors has been with ITT Research Institute since 1965 and his primary responsibility is the retrieval and analysis of information collected at RAC. He holds a BS degree in Industrial Engineering and an MS in Mechanical Engineering, both from the University of Illinois.

If you wish to attend the meet–the–speaker at the Standford View Restaurant, call Dick Cornwell at 966–3877.

EMB – COMPUTERIZED DIAGNOSTIC SYSTEM

The G–EMB program on Tuesday, Jan. 11th will provide an in depth look at a computerized Cardio–Pulmonary Stress Test System which is currently being used at the Preventive Medicine Center in Palo Alto.

This computerized diagnostic system allows the medical staff to assess most cardio–pulmonary parameters on a real time basis, while the subject is being excercised at various stress levels. This data assists in early detection of coronary heart disease and allows the medical staff to develop a therapy program which is best suited to the patient.

Dr. Charles J. Martell will discuss the development of their system and describe the basis for their tests. Dr. Martell will also demonstrate their exercise stress test program during a tour of the Preventive Medicine Center.

The meeting will be held at the Preventive Medicine Center. See calendar for details.

1972 ANNUAL SYMPOSIUM ON RELIABILITY JANUARY 25 – 27, 1972 SAN FRANCISCO

Two of the largest national forums for engineering information have merged. The previously known Reliability and Maintainability Conference, held annually for the past ten years in the Summer, and the Annual Symposium on Reliability, held annually for the past seventeen years in the Winter, will hold their first combined meeting in San Francisco under the new name.

The conference is being planned around the theme "Practical Application – Today". Workshops on key areas of Reliability and Maintainability will be featured. Sponsoring organizations include:

Institute of Electrical and Electronics Engineers
American Society for Quality Control
American Society of Mechanical Engineers
Society of Automotive Engineers
American Institute of Aeronautics and Astronautics
Institute of Environmental Sciences
American Institute of Industrial Engineers

A & ES TOUR OF STANFORD RADIO ASTRONOMY INSTITUTE

The new Stanford high resolution 2.8 cm radio telescope will be the subject of a lecture followed by a tour provided by staff members of the Stanford Radio Astronomy Institute. Of particular interest are the uses to which the instrument is being devoted and the novel aspects of an instrument of this size which has been constructed on–site by Stanford people Search for intelligent life in outer space is a potential use for the antenna array. Planning for utilization of numerous antenna installations either existing or to be constructed for the outer space listening project will be discussed.

During the tour, participants will have a chance to see the facilities for antenna fabrication, the complete array and the control, receiving and data processing equipment. Questions and discussions of the many aspects of this instrument and of radio astronomy at Stanford will be encouraged.

Dr. Roger S. Colvin will be giving the preliminary talk preceding the tour. He is a Senior Research Associate in the Electrical Engineering Department at Stanford University. Since receiving his Ph.D. in 1962 at Stanford, he has been a member of the Radio Astronomy Institute. Radiotelescope instrumentation is his major responsibility. He is a member of URSI, Commission V (Radio Astronomy).

For photo and description of the radio telescope, and information regarding Mr. Larry R. D'Addario, who has devoted the major portion of his time to design of the equipment for the past two years, refer to page 7 of the GRID for November.

LOW NOISE MICROWAVE TRANSISTOR DEVELOPMENT

Recent advances in transistor technology have led to the development of two competing devices for low noise amplification at microwave frequencies—the arsenic emitter silicon bipolar transistor and the gallium arsenide–effect transistor.

Arsenic emitter silicon transistors exhibit lower base transit times as compared to phosphorus emitters, resulting in improved gain and noise figure. By suitable choice of collector thickness f_{max} of 26 GHz has been obtained. Typical devices exhibit a noise figure of 3.6 dB at 4 GHz.

A comparison of the two devices indicates that the FET offers better performance for frequencies above 4 GHz where its gain and noise figure make it attractive for low power amplification in the 4–8 GHz range and possibly to 12 GHz. Below 4 GHz the silicon transistor can compete effectively with its lower cost and comparable performance.

Dr. George Bechtel is manager of the Advanced Devices Section of Fairchild Research and Developemnt Laboratory, Palo Alto, California. He is responsible for the development of low noise microwave transistor technology. He received the Ph.D. in Electrical Engineering from Stanford University in 1963.

G–EMC TO HEAR ABOUT FCC REQUIREMENTS AND FUNCTIONS

The G–EMC Group will hear Mr. Ney Landry discuss the general requirements of the Federal Communication and functions performed by the 12th District with headquarters in San Francisco. The Meeting will then be thrown open for questions.

Mr. Landry began his career in communications as a Navy radio operator. In 1940 he joined Radio Inteligence and became Engineer–in–charge of the San Diego Sub–Office in 1950. In 1955 he became Assistant Engineer –in–Charge of the San Francisco Office and assumed the Engineer–in–Charge duties in 1965. Mr. Landry is therefore well qualified to speak on FCC regulations.

COMPUTER SOCIETY LSI MEMORY FOR ILLIAC IV

The ILLIAC IV computer represents a large step in the evolution of computer development. To realize that development, an LSI memory was chosen for each of the 64 parallel processors called PE's (process elements). This talk will describe the organization, characteristics, and some of the design considerations for the 2K word by 64 bit, 5 MHz memory in each PE. The performance results obtained from building and completely testing 70 o these memories will also be discussed

Dr. Frank Greene, Jr. participated in development of high–speed magnetic film memory systems during his U.S. A.F. (NSA) service, 1962–'65. His other experience in this field includes Fairchild Research and Development Laboratory, where he was project engineer for the ILLIAC IV LSI memory systems. He now is president of Technology Learning Corporation, which develops customized group and individualized programs of instruction. Dr. Greene also is part–time lecturer at Santa Clara University.

WINCON, 1972

with Air Force Systems Command Classified Symposium

"New Initiatives in the 70's"

An opportunity to learn from key men in Government and industry what is likely to unfold in the 70's and to assess how it will affect us. Distinguished speakers include the Assistant Secretaries for R & D of the Air Force, Army, and Navy. (AFSC Symposium requires security clearance form by January 22, 1972.)

Advance program and registration forms, contact: IEEE Office, 3600 Wilshire Blvd., Rm 1926, Los Angeles, Calif. 90010, Phone: (213) 387–1203.

FUZZY LANGUAGES and ALGORITHMS

A fuzzy language is defined as a quadruple L = (U,T,E,N) in which U is a non–fuzzy universe of discourse; T (called term set) is a fuzzy set of terms which serve as names of fuzzy subsets of U; E (called an embedding set for T) is a collection of symbols and their combinations from which the terms are drawn, i.e., T is a fuzzy subset of E; and N is a fuzzy relation from E (or the support of T) to U called a naming relation.

As a fuzzy subset of E, T is characterized by a membership function $u_T : E - [0,1]$, with $u_T(x)$ representing the grade of membership of a term x in T. Similarly, the naming relation N is characterized by a bivariate membership function $u_N : E \times U - [0,1]$ in which $u_N(x,y)$ represents the strength of the relation between a term x and an object y in U.

The syntax and semantics of L are viewed as collections of rules for the computation of u_T and u_N, respectively.

Prof. Zadeh received both his Masters and Doctors degrees in Electrical Engineering from MIT and Columbia University respectively. He served on the faculties of Columbia, the Institute for Advanced Study in Princeton, and the University of California at Berkeley. He was Chairman of the Department of Electrical Engineering and Computer Science at Berkeley from 1963 to 1968. He is co–author of several books in the area of systems theory, author of numerous papers, and editorial consultant to several journals. His research interests center on systems theory and computing, while his recent work has been concerned mainly with the development of a theory of fuzziness and its application to decisionmaking, systems analysis, and languages.

For Arrangements see Calendar.

CT OFFERS ONE–DAY COURSE ON ESTIMATION AND PREDICTION THEORY AND ITS APPLICATIONS

A one–day short course on estimation and prediction theory, techniques and applications will be offered by the SF Chapter of the IEEE Circuit Theory Group, scheduled for January 15, 1972 at the SLAC Auditorium. (See calendar for details).

Organizer and lecturer; Dr. L. A. Wan, is president of Sycom, Inc. He has authored numerous papers in the area of systems theory, signal processing, waveform design, simulations and estimation. He was also a professor of engineering at the University of California, Santa Barbara, and later at California State College at Long Beach, California. Dr. Wan received his B.E., M.E. and Ph.D. degrees from Yale University.

The outline of four lecture topics to be covered in the course are: (1) Fundamentals of the estimation process: System modeling; (2) A survey of estimation and prediction techniques; (3) Applications of estimation and prediction techniques: System design, economic forcasting, etc.; (4) Practical considerations: estimator selection, design trade–offs.

The fee for this course is $15.00 for IEEE members, $10.00 for student members, and $25.00 for non–members and one–half price to unemployed engineers. Fee includes text for this course and lunch at SLAC cafeteria. To ensure enrollment, the completed registration form must be received before Jan. 7, 1972. For additional information concerning this program, write or call Les Besser, Fairchild MOD, 3500 Deer Creek Rd., Palo Alto 94303. Phone: (415)493–3100.

CIRCUIT THEORY GROUP
ESTIMATION AND PREDICTION
THEORY COURSE REGISTRATION

(Should be received before January 7, 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–Menber

IEEE Memb. No. _____

CT GROUP TO PRESENT ONE DAY SEMINAR, "OPTIMIZATION; THEORY AND APPLICATIONS"

The Circuit Theory Group also will present another one–day seminar on February 12, 1972, titled "Optimization; Theory and Application". The program is not yet completed, but the lecturers will include Professor Temes of UCLA, Professor Wilde of Stanford, and Professor Bandler of McMaster University. Due to the expected large turnout, early registration is recommended. For information call Les Besser, (415) 493–3100.

SOLID–STATE MICROWAVE CIRCUITS FOR A RADIO LINK SYSTEM

Yngvar Kvarna will discuss the design and performance of active microwave elements in a remodulating radiolink system using the Farinon SS6000 equipment as an example. Special emphasis is given to description of a high power X18 multiplier chain which is capable of passing a signal modulated with up to 1200 channels without noticeable distortion. Good margin against parametric oscillations is achieved without the use of isolators between the stages. The receiver uses a high Q Gunn local oscillator which is so stable that no AFC or phaselock loop is needed. Other elements of the system are also described, and a summary of system performance is given. Finally, some of the aspects of employing Gunn and IMPATT diodes in radiolink transmitters are discussed from a systems point of view.

Mr. Yngvar Kvarna is a graduate of the Norwegian Technical University. He was with Nera Bergen, a radiolink company in Norway, for several years, and has been with Farinon Microwave since the company was founded in 1967.