

JANUARY 1985

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# IEEE GRID

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MONTHLY NEWSMAGAZINE of the BAY AREA COUNCIL of the INSTITUTE of ELECTRICAL and ELECTRONICS ENGINEERS, INC.



# MEDICAL IMAGING SHORT COURSE

## February 23, 1985

### OBJECTIVE

At the conclusion of this course, participants should understand the basic principles of several types of medical diagnostic imaging techniques. Participants will also be introduced to the most current developments of such systems.

Emphasis will be placed on non-invasive techniques.

### WHO SHOULD ATTEND

Engineers, biomedical engineers, medical electronic technicians, BMETs, physicians, nurses, medical researchers and professionals in related health care interested in learning more about techniques used in diagnostic imaging.

This course is specifically designed to highlight fundamentals for technical professionals interested in gaining insight into related systems.

### DESCRIPTION

A team of leading experts will make presentations in four areas: ultrasound, computed tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET).

### PROGRAM

#### Ultrasound

Robert G. Younge  
Vice President, Engineering  
Acuson  
Mountain View, CA

#### Computed Tomography:

John Wholahan  
C.T. Product Planning Manager  
Picker International, Inc.  
Highland Heights, OH

Robert Gould, Ph.D.  
Associate Professor UCSF  
Manager of Clinical Research & Applications  
Imatron, Inc.  
Brisbane, CA

#### Magnetic Resonance Imaging:

Robert Bell, Ph.D.  
MRI Specialist, Western Region  
General Electric  
San Bruno, CA

#### Positron Emission Tomography

Stephen Derenzo, Ph.D.  
Staff Senior Scientist  
Lawrence Berkeley Labs  
Berkeley, CA

### COORDINATOR

Mr. Eben Kermit, M.S., CCE, biomedical engineer at Stanford University Medical Center is the coordinator for this short course.

### TIME AND PLACE

Check-in will be from 7:30 AM to 8:00 AM on Saturday Feb. 23, 1985 at:

Hewlett-Packard, Corporate Headquarters  
3000 Hanover Street, Palo Alto, CA



Please register me for the Medical Imaging Short Course on Saturday, Feb. 23, 1985 at HP Corporate HQ, Palo Alto

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zip \_\_\_\_\_  
Daytime Phone ( ) \_\_\_\_\_

<b>FEE</b> (check one)	before	after
	2/1/85	2/1/85
IEEE Member (Member # _____)	<input type="checkbox"/> \$55	<input type="checkbox"/> \$70
Non-Member .....	<input type="checkbox"/> \$65	<input type="checkbox"/> \$80
Student .....	<input type="checkbox"/> \$35	<input type="checkbox"/> \$45

### Make check out to "IEEE" and mail to:

IEEE/EMBS  
Medical Imaging Short Course  
701 Welch Road, Suite 2205  
Palo Alto, CA 94304  
415-327-6622

Early registration is advised to assure attendance since seating is limited; your space will be reserved when payment is received. Call the Council Office for status.

Continuing Engineering Education

# IEEE GRID

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**The  
Chairman's  
Corner**



Frank Lord  
Council Chairman

**Happy  
New  
Year**

This is the time of year when resolutions and predictions are made. I've learned by now that resolutions are not too well kept, so I'll just concentrate on predictions. I'll stick to matters relating to our Sections, the Institute and the engineering world, and I will group them by probability.

**Almost Certain**

Charlie Ostrofe and Ray Power will continue their excellent work on the WESCON board of directors, and this year's WESCON in San Francisco will be a huge success.

Fred McKenzie, Emmett Cameron and John Damonte will be as diligent as ever as our representatives on the board of ECI, and the many shows managed by ECI, including WESCON, will fare well.

The Santa Clara Valley Section will continue to grow and will continue to be the largest section in the Institute.

The San Francisco Section will continue a dynamic program under the leadership of Beth Pack.

The Redwood Empire Subsection will thrive.

The Oakland/East Bay Section will continue its growth of activity. Although Rich Cartwright will again decline to move up to chairman, he will continue his dedicated support of the Section. New volunteers will emerge, inspired by the efforts of the present leadership.

Some of the group chapters will have difficulty filling their roster of officers.

Some group chapters and their programs will show dramatic improvement due to the emergence of a few new volunteers.

Jean-Pierre Wolff will be the next Council Chairman.

The so-called Good Government Group (GGG) (Remember them?) will not be involved in any Institute elections, since behind-the-scenes sponsors have accomplished their original goals much more effectively through covert action.

**Less Certain**

No member making a speech will say, "I'm from the Santa Clara Valley Section, the largest section in the Institute" or "I'm from Region 6, the largest region in the Institute."

A member expressing himself at a meeting will say, "I'm from the academic world and so my opinions probably reflect that bias," or "I'm a manager, so my opinions are very likely influenced by the management philosophy of my employer."

The Institute will consider a dues increase of a few dollars and several astute, semi-emotional letters will be published that oppose the idea. (Who says engineers are overpaid?)

WESCON will include a career-oriented session in its professional program.

An immigration bill will once again be considered by Congress and the engineering community will present testimony that represents the engineering practitioners' point of view.

The nominees for Institute national offices will all be accomplished engineers with unquestionable credentials.

A Congressman will publicly hold up a resistor that he purchased at Radio Shack for 25¢ and cite a comparable spare part purchased by the Defense Department for \$100. He will not include the value of his time spent going to Radio Shack or his transportation expense. He will not mention the requirements imposed by DoD with respect to inspection, marking, documentation and packaging or the fact that their spares purchases are often ill-timed

and made in small quantities. He will thus enhance his political position at the expense of dedicated technical professionals. The Institute will not comment.

**More Off-The-Wall**

An officer of the Monterey Bay Subsection invited to attend a function of the Santa Clara Valley Section, the Bay Area Council or Region 6, will appear.

A woman will be nominated for president-elect of the Institute.

The American Electronics Association (AEA) will conduct a scientifically designed survey of the engineering employment situation. The principal investigators and sources of information will be cited in all public releases of the results. When the AEA is called for additional information, their response will be courteous, cooperative and professional.

The Santa Clara Valley Section will reject a suggestion that it be renamed the Silicon Valley Section.

The San Francisco Section will not approve a motion that it be renamed the Baghdad-by-the-Bay Section and will criticize Herb Caen for suggesting it.

The Oakland/East Bay Section will unanimously defeat a proposal that it be renamed the Mysterious East Bay Section and will ask for a formal apology from Herb Caen for influencing one of its more wistful members to introduce the idea.

Irwin Feerst will write to EE Times, Electronics Week and the Spectrum expressing admiration for the great jobs our president and board of directors are doing.

The Council will consider the question of whether the Chairman should be allowed to write a column for the GRID. In spite of that, the Chairman does not rescind his best wishes to all members for a successful and Happy New Year.

**THE  
PENINSULA  
ELECTRONICS  
STORY**



by Emmet G. Cameron

**Part Two**

Continued from December

Elwell himself left Federal in 1913 and moved to England, where he founded and was for 28 years director of the noted Mullard Radio Valve Company. Cyril Elwell lived to see the tremendous expansion of the industry he founded on the Peninsula, and was later active as a consultant for Palo Alto's Hewlett-Packard Company.

Pridham and Jensen left Federal Telegraph to invent the moving-coil loudspeaker and founded the Magnavox Company. Jensen founded the famous loudspeaker company which bore his name.

Doug Perham, who had been one of the very first "hams", moved to Iowa and founded radio station WJAM. He later returned to the Peninsula and participated in the early days of a number of other electronics firms. He operated a fascinating museum of the electronics industry in New Almaden, near San Jose, which became the nucleus of the present excellent museum of electronics at Foothill College.

Lee de Forest moved east to found his own Company and continued to contribute heavily to the industry. Holder of over 200 basic patents, he was honored by the entire industry on the occasion of his 85th birthday.

Leonard Fuller took over as chief engineer at Federal after Elwell left, and under his direction the company continued to break new ground. Radio transmitters up to 100 kilowatts in power were built in Palo Alto and installed all over the world. During World War I the company was prime contractor for the U.S. Navy.

At this time James Arthur Miller, who also had been one of the first "hams" with Elwell and Perham, as a Federal engineer helped establish the famed U.S. — France Navy radio link, with stations at Annapolis and Bordeaux. Miller, in 1919, sent the first radio message around the world from the Bordeaux station. Arthur Miller's long career included an opportunity to repeat his wartime radio service, as he directed the establishment of the top secret radio telephone link from the Pentagon to London in World War II. Miller's voice made the first test message over this link, which was to carry so many portentous talks between Roosevelt and Churchill.

An interesting sidelight of this phase of the story is that when World War I ended, Federal had two huge 1000-kilowatt arc converters, of the type used in the Annapolis and Bordeaux stations, left over as surplus. Dr. Leonard Fuller arranged to have one of these donated to the University of California, and the great magnet from this was used by E.O. Lawrence in the construction of his Nobel-prize-winning 42" cyclotron, fourteen years later, in 1931, resulting eventually in the enormous Lawrence Radiation Laboratories.

Dr. Fuller, after a number of years with Federal, served as head of the Electric Engineering Department at the University of California from 1930 to 1943. He continued to instruct and inspire young engineers at Berkeley while the same process proceeded in Stanford's engineering and physics labs. Here again we see the interaction between university and industry people which has been the basis of the electronics story.

In the early '20's the Stanford labs trained another generation of men destined for industry leadership. Four of these, among many of note, were Fred Terman, Ralph Heintz, Herbert Hoover, Jr., and Charles V. Litton. Again, as twenty years earlier, these men started as enthusiastic radio amateurs.

Fred Terman was the son of Dr. Lewis Terman, also of Stanford, a psychologist famed for his studies of gifted children. The younger Terman was a member of the Stanford faculty since 1925, except for a period of World War II service as head of the OSRD Radiation Laboratory at Harvard. Holding decorations from both the U.S. and Great Britain, a past national president of the Institute of Radio Engineers, and author of several basic textbooks, Dr. Fred Terman was later Provost of Stanford University, and is widely regarded as the father of the peninsula electronics industry.

After graduation from Stanford, Ralph Heintz founded with Jack Kaufman, a University of California engineer, the firm of Heintz and Kaufman, Ltd., which for many years pioneered in short-wave radio developments. H. & K. airborne equipment was used in the first radio transmission from a plane to the ground, and was carried in both the historic Dole races to Hawaii and in the first Byrd expedition to the South Pole. Heintz also developed, in 1937, the 400-cycle electrical system for aircraft, now universally used. When World War II came he founded, with Bill Jack, the fabulous Jack & Heintz Company to manufacture electrical equipment for U.S. aircraft. Ralph Heintz later operated a private research laboratory in Los Gatos.

Heintz and Kaufman, Ltd. began the manufacture of large vacuum tubes for radio transmitters in 1931. Two of the men employed in this operation, Bill Eitel and Jack McCullough, left in 1936 to found (in a vacant butcher-shop) their own company. Eitel-McCullough, Inc. (or "Eimac") with plants in Salt Lake City and Belmont, is now a subsidiary of Varian Associates and one of the principal world producers of power vacuum tubes.

Herbert Hoover, Jr., who had operated a "ham" radio station with Fred Terman when they were boys in 1916, had a distinguished career in geophysical engineering, and served as Undersecretary of State in the Eisenhower administration.

Charlie Litton was another of the Stanford men of the '20's. He became the leader in the vacuum-tube activities of Federal Telegraph, designing and developing many tubes as well as basic tube-manufacturing processes and equipment which affected the entire industry. When in 1931 Federal Telegraph, which had become part of the I.T.&T. system, was moved from Palo Alto to New Jersey, Litton stayed on the Peninsula to found Litton Engineering Laboratories and later Litton Industries. Charlie Litton until recently operated the Laboratories, now in Grass Valley, California, while through a series of mergers Litton Industries, headed by Tex Thornton, became one of the largest companies in the country.

As the years rolled on Stanford and California engineering and physics labs continued to turn out men who showed an amazing ability not only to pioneer in the technical sense, but to found and operate tremendously successful companies.

Continued Next Month

SCV/AES

## Digital Signal Processing

In the evolution from analog to digital signal processing along with developing optical technology, a new horizon has been opened to the signal processing engineer. Mr. Myles Berg, of Lockheed, will address this subject at the January 17 meeting of the Santa Clara Valley Aerospace and Electronic Systems Society.

In his presentation, Mr. Berg will give a survey of digital signal techniques from both hardware and software perspectives. A few examples of present techniques and future growth areas will be discussed. The major emphasis will be on signal processing architecture with dedicated processing. Techniques for determining applications for associated processors and general purpose computers will also be covered.

See the calendar of events for dinner and meeting details.

SCV/CHMT

## Controls for DC Motors Subject of Short Course

The Santa Clara Valley Components, Hybrids, & Manufacturing Technology Society will offer a short course on five evenings starting January 15. Dr. Jacob Tal will teach this course. A similar course last winter was completely filled a week before it started, so register early.

The course will cover the characteristics of brushless and step motors; analog and digital control; analysis and compensation; and implementation using microprocessors. The emphasis will be on practical approaches and useful results, with mathematical discussions reduced to the minimum required.

The course is intended for the practicing circuit or system design engineer, and should also benefit electrical and mechanical engineers, project leaders, managers, and technicians who are involved in motion-control systems or have a need to understand and work with them.

Seating is limited, so register early. See the calendar of events or call the council office for more information.

OEB/PES

## Windpower Cogeneration

Rob Sims, Engineering Manager at the Livermore facility of U.S. Windpower, Inc. will be the featured speaker at the January 22 meeting of the Oakland/East Bay Power Engineering Society. Sims, who has been involved in the installation and startup of over 1400 50KW wind powered induction generators situated in the Altamont Pass area, will discuss the monitoring and control arrangements currently in use on the wind power installation.

Mr. Sims has a background relating to electrical measurement and telemetering together with distribution line and substation application and design.

Along with a general overview of U.S. Windpower, Inc., a 15 minute video film describing the overall installation is scheduled.

See the calendar of events for further information and details.

SCV/CHMT

## Components Engineering Workshop Scheduled

Components engineers will meet for an afternoon workshop on January 17. The workshop is in response to a questionnaire which appeared in the September issue of the GRID. The format is a discussion led by a moderator. There will be no lecture. Participants will be asked to share examples of how components engineering functions at their own companies. Topics include:

- Component documentation systems
- Qualification tests
- Test fixturing
- Alternate source strategy
- Sole source strategy
- Working with design engineers
- Working with sales reps

This seminar is planned to meet the needs of components engineers, however, component sales engineers are welcome. See the calendar of events for location and other details.

SCV/AES/CHMT

## Venture Capital: A Perspective

Venture capital has become an important variable in the development of America's high technology businesses. It has grown from a small club of investors to a significant community of investment groups with multi-billion dollar yearly outlays.

Pete Thomas of Technology Venture Investors will be the featured speaker at the February 21 joint meeting of the Santa Clara Valley Aerospace & Electronics Systems and CHMT Societies. Mr. Thomas is a leading high technology expert in both the technical and business aspects of venture capital.

The process of raising venture capital is a tedious one, challenging the patience of any entrepreneur. The criteria used to evaluate the team and business opportunity, although variable among venture firms, has some generic elements. In his presentation Mr. Thomas will discuss the details of the venture capital process.

SCV/S&U

## Low Frequency Acoustic Microscopy

Acoustic microscopy is used as a quantitative tool for the nondestructive evaluation of structural materials. B.T. Khuri-Yakub of Stanford University will speak on this subject at the January 16 meeting of the Santa Clara Valley Sonics and Ultrasonics Society.

He says: we are addressing the problem of detecting and characterizing near-surface defects. For this purpose, we have constructed an acoustic microscope operating at a frequency of 3 MHz, and used it to detect defects within 1 mm from the surface of the sample.

In the research project, fused quartz samples were made with seeded defects; horizontal cracks, vertical cracks and spherical voids. Defects can be detected with a feature size of about 200  $\mu\text{m}$  located up to 1 mm below the surface. It is also possible to determine the depth below the surface at which the sample is located by defocusing the microscope.

SCV/MTT

## March Short Course Offered

The Santa Clara Valley Chapter of the Microwave Theory and Techniques Society will sponsor a one day short course March 23, 1985, at the Stanford Linear Accelerator Center (SLAC) in Palo Alto entitled "Advances in Hybrid MIC Design and Fabrication". The program will include CAD synthesis techniques, hybrid materials and process technology, and examples of state-of-the-art MIC design.

The final program will be available next month. The cost for this seminar is \$50 for IEEE members, \$60 for non-IEEE members, and \$20 for students. Enrollment is limited to 250 people.

## SCV/MTT & CS Digital Modulation Techniques for Satellite and Microwave Systems

A new family of power/spectral efficient modulation techniques, which may enable up to 50 percent reduction of the satellite earth station antenna diameter has been developed. This dramatic system efficiency improvement over conventional QPSK systems is achieved by low-cost modems known as IJF-OQPSK, NLF-OQPSK or FEHER's OPSK.

The new modems may operate through fully saturated HPAs without the need for postmodulation filtering. The principles, design, applications and field test results over the 14/12 GHz 5-meter antenna transmit/receive earth station of the University of Ottawa, and Telesat's ANIK-B satellite will be presented.

Dr. Kamilo Feher, professor at the University of Ottawa, Canada, and visiting professor at Stanford, will be the distinguished speaker at the January 10 joint meeting of the Santa Clara Valley Microwave Theory and Techniques and Communications Societies. He is the author of 3 books, namely: "Digital Communications: Satellite/Earth Station Engineering," "Digital Communications: Microwave Applications," and "Digital Modulations Techniques in an Interference Environment."

SF/IAS

## Economic Analysis and Specification Writing

A key aspect of the consulting engineer's job is to be able to provide clients with well designed projects having the most economical costs. This task is becoming increasingly more challenging today because of the dynamic and competitive market.

One tool available to aid consultants in the selection between alternative designs is economic analysis, which will be the first subject addressed at the January 22 meeting of the San Francisco Industry Applications Society.

William Pfeifer, the first speaker for the evening, has many insights for today's engineers on the subject of economic analysis. He is senior economic advisor on alternate energy in Bechtel's research and engineering division. Some of the topics to be covered are: How important is economic analysis? Is a trade-off study worth the cost and effort? What should you know about the economy if your project lasts six months, one year, three years?

The second speaker of the evening is Beth Pack of Sverdrup and Parcel, and

ExCom Committee Chair for the San Francisco Section of IEEE. Her talk on specification writing for electrical work was first delivered in October at the annual Industry Application Society's meeting in Chicago.

The talk will focus on techniques for writing specifications in the imperative, or so-called indicative mode, using the three-part format prescribed by the Construction Specifications Institute (CSI). She will demonstrate how your format and style of writing aid you in developing clear, concise documents. She will also discuss various page formats, coordinating with related work elsewhere in your specification, guide specifications, and industry standards. Her talk will conclude with methods of automating your specification on the computer.

Dinner at the meeting is optional, however, those who reserve early for dinner will be eligible for a raffle prize of an IEEE color reference book. See the calendar of events for details.

SCV/EMB

## Patient Stimulation Devices

Kenneth Levin, president of NTRON, will discuss the particulars of designing and producing medical devices used for patient stimulation at the January 17 meeting of the Santa Clara Valley Engineering in Medicine and Biology Society.

Transcutaneous Electrical Nerve Stimulators (TENS) are used to treat patients with constant pain who either can not or should not use drug therapy. Functional Electrical Stimulation (FES) is used to activate muscle contractions in skeletal muscles.

In his presentation Mr. Levin will include all facets of design through production of these devices. A special emphasis will be placed on FDA requirements and Good Manufacturing Practices.

SCV/Communications

## Integrated Services Digital Network

Donald Simpson from Pacific Bell, will be the featured speaker at the January 30 meeting of the Santa Clara Valley Communications Society. Topics to be discussed are the Integrated Services Network, the CCITT International Standards, and the ANSI T1D1 National Standards for the ISDN.

Also covered in the presentation will be a discussion of the three parts of the hardware system; the local C.O. equipment, the local loop equipment, and the customer premise equipment. Simpson will also talk about the software system, including a description of the protocol models, plus a discussion of the legal and regulatory issues.

The talk will conclude with a description of the various services including both basic and enhanced versions.

SCV/EMB

**Medical Imaging Short Course in February**

The Santa Clara Valley Engineering in Medicine and Biology Society will offer a short course beginning Saturday February

23, 1985, on Medical Imaging Systems. Six experts will present tutorials that cover basic concepts through new developmental systems. Find out what is going on in the areas of: Ultrasound, Magnetic Resonance Imaging, Computer Aided Tomography, and Positron Emission Tomography.

Call the Council Office for more information. More details in next month's GRID.

**A FIVE-WEEK COURSE**

**ELECTRICAL POWER SYSTEM VOLTAGE AND LOAD CONTROL**

Presented by the San Francisco Industry Applications Society

Thursday evenings from 6:00 to 9:00 pm

Jan. 30 — Feb. 6, 13, 20, 27

The Bechtel Building, Room 2D/E, 50 Beale Street, San Francisco

**COURSE FOCUS:**

This five session course provides the student with a solid understanding of reactive power concepts and its application to power systems. Ratings of electrical equipment, fundamentals and applications of reactive power, voltage requirements and control and load flow studies are also topics covered.

**INSTRUCTORS:**

Instructors for the course are Thomas J. Brogan, PE and Glyn J. Lewis, PE, partners in Applied Power, a consulting electrical engineering company specializing in all aspects of power system studies, analysis and design. Both partners have over 20 years experience in power system analysis and design.

**REGISTRATION:**

Member: \$65  
Member No. \_\_\_\_\_  
Non member \$90

Make check payable to IEEE/IAS  
Mail with this form to:  
Jennifer Chiodo  
Syska & Hennessey  
575 Mission St.  
San Francisco, CA 94105  
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SCV/Reliability

**Dynamic Fault Imaging**

Tim May, currently Principal Engineer in Intel's Technology Development group, will be the featured speaker for the January 16 meeting of the Santa Clara Valley Reliability Society.

A new technique for the physical isolation of faults in complex VLSI chips will be described. This technique combines the power of voltage contrast SEM's with that of image processing to provide the random logic analog of the well-known raster or bit map techniques used in array diagnostics. Applications to NMOS microprocessor design development and fault identification will be described, as well as an overview of the equipment and principles of operation.

SCV/EMS/Computer

**Personal Computing: Reality or Mirage**

Over the past several years, industry observers forecasted ever-increasing growth in the personal computer industry. The picture included visions of personal computers in the office, on every manager's desk; computers in the home, being used by all members of the family for education and running the home; and computers being the basis of the new cottage industry called software development. Recently, however, the picture has become very distorted, with companies consolidating, merging, and simply going out of business.

Manny Fernandez, senior vice-president of strategic executive services for Dataquest, will present his views on the personal computer industry at the joint Santa Clara Valley Engineering Management and Computer Societies meeting to be held January 16. Mr. Fernandez' presentation will cover industry trends and his past experiences in managing a company in the personal computer marketplace.

Mr. Fernandez, who was founder and president of Gavilan Computer Corporation before joining Dataquest earlier this year, is a veteran in the computer business. Prior to founding Gavilan, he was president of Zilog, a very successful semiconductor company headquartered in Cupertino.

SCV/APS

**PC Applications in Electromagnetics**

It is barely ten years since the introduction of the HP 35 scientific hand calculator, and six years since the first non-hobbyist, personal computers made their appearance. Now, second and third generation PCs are becoming available including the IBM PC and Apple LISA. These personal computers are advancing well beyond the role of arcade-game players, providing the computing power necessary for solving significant scientific and engineering problems.

Dr. Edmund K. Miller will be the guest speaker at the January 23 meeting of the Santa Clara Valley Antennas & Propagation Society. The purpose of this lecture is to review briefly the capabilities of present PCs, and to illustrate their use for solving three kinds of electromagnetic problems.

First, a version of Mini-NEC will be outlined. This code, written in BASIC for an Apple II+ will be discussed. This is a time-domain code for modeling impulsively excited wire objects such as antennas or scatterers. Finally, the use of a PC for Prony type signal processing including SEM pole calculation and eigen-value analysis will be considered.

Dinner reservation information and meeting details are contained in the calendar of events.

**Eminent Engineer Award Nominees**

The California Alpha Chapter of Tau Beta Pi, the national engineering honor society, requests nominees for its ninth annual citation of the engineer deemed the most outstanding member of the Bay Area engineering community. Nominees must not be a member of Tau Beta Pi, and should reside in the Bay Area. Detailed criteria will be furnished with nomination forms.

January 27 is the absolute closing date for receipt of nominations. To receive materials, write to Mr. Kent M. David, Chairman, Selection Committee, Tau Beta Pi/Alpha Chapter, 220 Bechtel Center, College of Engineering, University of California, Berkeley, CA 94720.

**INSTITUTE FOR INFORMATION STORAGE TECHNOLOGY UNIVERSITY OF SANTA CLARA**

IN COOPERATION WITH THE IEEE IS SPONSORING AN UPDATED FOUR-DAY COURSE ON **INFORMATION STORAGE TECHNOLOGY**

Topics and speakers include:

- Magnetism and magnetic materials - G. Bate
- Physics of magnetic recording - N. Bertram
- Recording Heads - F. Jeffers
- Magnetic films and processes - R. White
- Recording systems and noise - J. Mallinson
- Digital recording channel - M. Haynes
- Optical recording and storage media - A. Bell
- Systems and applications — future trends - A. Hoagland

**LOCATION:**

UNIVERSITY OF SANTA CLARA  
SANTA CLARA, CALIFORNIA

**DATES:**

SESSION I—MARCH 25 - 28, 1985  
SESSION II—MARCH 26 - 29, 1985

**COST:**

\$650 (includes course notes & lunches)  
Make checks payable to University of Santa Clara

For further information contact:  
INSTITUTE FOR INFORMATION STORAGE TECHNOLOGY  
University of Santa Clara, Santa Clara, CA 95053  
Telephone: (408) 984-4294

**REGISTRATION FORM**

**INSTITUTE FOR INFORMATION STORAGE TECHNOLOGY**  
FOUR-DAY COURSE ON INFORMATION STORAGE TECHNOLOGY

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
PHONE \_\_\_\_\_

Session Desired: I MARCH 25-28, 1985 \_\_\_\_ II MARCH 26-29, 1985 \_\_\_\_

Please send registration form with check in the amount of \$650 made out to University of Santa Clara to:

**INSTITUTE FOR INFORMATION STORAGE TECHNOLOGY**  
**SCHOOL OF ENGINEERING**  
UNIVERSITY OF SANTA CLARA  
SANTA CLARA, CA 95053  
Telephone: (408) 984-4294

# Calendar of Events

## January 1985

### THURSDAY JANUARY 10

#### SCV Microwave Theory and Techniques and Communications Societies

Subject: Digital Modulation Technologies for Satellite and Microwave Systems  
 Speaker: Dr. Kamilo Feher (Stanford)  
 Time: Dinner (\$14) at 6:00 pm, presentation at 8:00  
 Location: Dinner at Sundance Mining Company, 1921 El Camino, Palo Alto, presentation at Hewlett-Packard, Main Auditorium, 3000 Hanover, Palo Alto  
 Reservations: Chuck Holmes, 415-326-6231  
 Article: Page 7

### TUESDAYS JANUARY 15 - FEBRUARY 12

#### SCV/CHMT

Subject: Short Course — Digital Motion Control Systems  
 Speaker: Dr. Jacob Tal  
 Time: 5 consecutive Tuesday evenings, 7:00 to 9:30 pm  
 Location: Terman Engineering Center, Stanford  
 Registration: Council Office, 415-327-6622 for course flyer and map  
 Cost: \$45 for members, \$60 non-members and \$25 students  
 Article: Page 6

### WEDNESDAY JANUARY 16

#### SCV Reliability Group

Subject: Dynamic Fault Imaging  
 Speaker: Tim May (Intel)  
 Time: Cocktails at 6:00 pm, dinner (\$20) at 6:30, presentation at 7:30  
 Location: Rolm Corporation, Santa Clara  
 Reservations: Council Office, 415-327-6622  
 Article: Page 8

### WEDNESDAY JANUARY 16

#### SCV Sonics and Ultrasonics

Subject: Low Frequency Acoustic Microscopy  
 Speaker: B.T. (Pierre) Khuri-Yakub (Stanford)  
 Time: Presentation at 8:00 pm  
 Location: Hewlett-Packard, Bldg. 20, Auditorium, 3000 Hanover Street, Palo Alto  
 Reservations: Not required  
 Article: Page 6

### WEDNESDAY JANUARY 16

#### SCV Engineering Management Society

Subject: Personal Computing: Reality or Mirage  
 Speaker: Manny Fernandez (Dataquest)  
 Time: Presentation at 7:30 pm  
 Location: Hewlett-Packard, Oak Room Auditorium, 19477 Pruneridge Avenue, Cupertino  
 Reservations: Not required  
 Article: Page 8

### WEDNESDAY JANUARY 16

#### SCV Computer Society

Subject: Personal Computing: Reality or Mirage  
 Speaker: Manny Fernandez (Dataquest)  
 Time: Presentation at 7:30 pm  
 Location: Hewlett-Packard, Oak Room Auditorium, 19477 Pruneridge Avenue, Cupertino  
 Reservations: Not required  
 Article: Page 8

### THURSDAY JANUARY 17

#### SCV Information Theory Group

Subject: Optimal Direction Finding and Emitter Location  
 Speaker: Steve Stearns (GTE)  
 Time: Dinner at 6:00 pm, presentation at 8:00  
 Location: Dinner at China First Restaurant, Palo Alto, presentation in Durand 450, Stanford  
 Reservations: Sara, 415-494-8811

### THURSDAY JANUARY 17

#### SCV Engineering in Medicine and Biology

Subject: Muscle and Transcutaneous Neural Stimulators  
 Speaker: Kenneth Levin (Ntron Electronics)  
 Time: Dinner at 6:00 pm, presentation at 7:30  
 Location: Dinner at Su Hong Restaurant, 1039 El Camino, Menlo Park, presentation at Falk Cardiovascular Center Laboratory, Stanford campus  
 Reservations: Council Office, 415-327-6622  
 Article: Page 7

### THURSDAY JANUARY 17

#### SCV Aerospace & Electronic Systems

Subject: Digital Signal Processing: Past, Present and Future  
 Speaker: Myles Berg (Lockheed)  
 Time: Dinner (\$15) at 6:00 pm, presentation at 8:00  
 Location: Dinner at Charlie Brown's, 1116 North Mathilda, Sunnyvale, presentation at Lockheed, Bldg. 160, Mathilda at 3rd Avenue, Sunnyvale  
 Reservations: Bill Robertson, 408-988-6100-X5153, or Ann Shen, 408-942-5815  
 Article: Page 6

### THURSDAY JANUARY 17

#### SCV/CHMT

Subject: Components Engineering Workshop  
 Moderator: Terry Chappell (Plantronics)  
 Time: 1:30 pm to 5:00 pm  
 Location: Amdahl World Headquarters, 1270 East Arques Avenue, Sunnyvale  
 Reservations: Terry Chappell, 408-426-5858-x220  
 Article: Page 6

### TUESDAY JANUARY 22

#### OEB Power Engineering Society

Subject: Cogeneration  
 Speaker: Rob Sims (U.S. Windpower, Inc.)  
 Time: Cocktails at 5:30 pm, dinner (\$13) at 6:30, presentation at 7:30  
 Location: Concord Inn, Concord  
 Reservations: Lisa, 415-283-7066  
 Article: Page 6

### TUESDAY JANUARY 22

#### OEB Engineering in Medicine and Biology

Subject: Biofeedback Stress Reduction on Your PC  
 Speaker: Roxanne Wolosenko (Synapse Software)  
 Time: Dinner at 7:00 pm, presentation at 8:00  
 Location: Blue Dolphin Restaurant, San Leandro Marina  
 Reservations: Jeanne Green, 415-887-2731  
 Article: Page 12

### TUESDAY JANUARY 22

#### SCV Magnetism Society

Subject: Revolution in Magnetic Materials — Will the U.S. Be Left Behind?  
 Speaker: Robert M. White (Control Data Corporation)  
 Time: Coffee and conversation at 7:30 pm, presentation at 8:00 pm  
 Location: Hewlett-Packard Auditorium, Stevens Creek and Lawrence Expressway, Santa Clara  
 Reservations: Not required

### TUESDAY JANUARY 22

#### SF Industry Applications Society

Subject: First presentation — Economic Analysis for Alternative Designs, second presentation — Specification Writing for Electrical Work  
 Speaker: 1. William Pfeifer (Bechtel), 2. Beth Pack (Sverdrup & Parcel)  
 Time: Presentation at 5:45 pm, dinner (\$14.50) at 7:00, presentation at 8:00 pm  
 Location: The Engineers' Club, 160 Sansome Street, San Francisco  
 Reservations: Elizabeth Wilson, 415-428-4666

### WEDNESDAY JANUARY 23

#### SCV Antennas & Propagation Society

Subject: Personal Computer Applications in Electromagnetics  
 Speaker: Dr. E.K. Miller (LLNL)  
 Time: Cocktails at 5:30 pm, dinner at 6:00, presentation at 8:00  
 Location: Dinner at Acapulco Restaurant, 2515 El Camino, Palo Alto, presentation in Auditorium, Bldg. 202, Lockheed Research Laboratory, 3251 Hanover Street, Palo Alto  
 Reservations: Don Rucker, 408-738-2888-X6735  
 Article: Page 9

### TUESDAY JANUARY 29

#### SCB Geoscience & Remote Sensing Society

Subject: Remote Sensing with Airborne Electromagnetics  
 Speaker: Professor A. Becker (UC Berkeley)  
 Time: Dinner at 6:00 pm, presentation at 7:30  
 Location: Dinner at the Good Earth Restaurant, Palo Alto, presentation at the Palo Alto Scientific Center, 1530 Page Mill Road, Palo Alto  
 Reservations: Ralph Bernstein, 415-855-3261  
 Article: Page 14

### WEDNESDAY JANUARY 30

#### SCV Communications

Subject: Integrated Services Digital Network (ISDN)  
 Speaker: Donald Simpson (Pacific Bell)  
 Time: Dinner at 6:00 pm, presentation at 7:30  
 Location: Dinner at the Golden Spike (Stanford Barn), 700 Welch Road, Palo Alto, presentation in the Physics Lecture Hall, Stanford campus  
 Reservations: Jerry Mille, 408-943-7815  
 Article: Page 7

### WEDNESDAY JANUARY 30

#### SF Industry Applications Society

Subject: 5-Week Course — Electrical Power System Voltage and Load Control  
 Instructors: Glyn Lewis and Thomas Brogan (Applied Power) 6:00 to 9:00 pm, 5 consecutive Wednesdays  
 Location: Bechtel Building, 50 Beale Street, Room 2 D/E, San Francisco  
 Registration: Form on page 8, or call Jennifer Chiodo, 415-495-7711 or Charles Sayle, 415-864-5999 for additional information  
 Article: Page 12, Ad on page 8

### THURSDAY FEBRUARY 21

#### SCV Aerospace & Electronic Systems, and CHMT

Subject: Venture Capital: A Perspective  
 Speaker: Pete Thomas (Technology Venture Investors)  
 Time: Cocktails at 6:00 pm, dinner (\$12) at 6:30, presentation at 8:00  
 Location: Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto  
 Reservations: Council Office, 415-327-6622  
 Article: Page 6

### SATURDAY MARCH 23

#### SCV Microwave Theory & Techniques Society

Subject: One-day short course — Advances in MIC Design and Fabrication  
 Instructor: To be announced  
 Time: To be announced  
 Location: Stanford Linear Accelerator Center, Palo Alto  
 Registration: Council Office, 415-327-6622  
 Article: Page 7

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From the Editor

**Annual Admonition**

We publish the following message each year for the benefit of new chapter volunteers and the membership they serve. It has to do with making timely reservations for dinner meetings and following through. First of all, when you see the name of a person to contact and a phone number for reservations in the calendar of events, that normally means you need to call for dinner reservations only. If you plan to just attend the meeting and not join the others for dinner, reservations are not required in most cases. This may not be true if the meeting involves a facility tour or other first-come, first-served event, but typical technical presentations do not require advance reservations.

As a courtesy to those who are responsible for arranging dinner meetings, you should always make reservations as early as possible to help determine the seating arrangements and the number of meals required. If you subsequently have to cancel your reservations, please be sure to make that second call and inform the contact person you will not be attending. This is very important because most restaurants require the chapter to pay for all meals requested whether they are eaten or not.

The editor and staff of the GRID are pleased to take this opportunity to wish each and all a very successful IEEE New Year.

SF/IAS

**Power Systems Course Offered**

The San Francisco Industry Applications Society is offering a five-session course beginning January 30 entitled, "Electrical Power Systems Voltage and Load Control." The instructors, Thomas Brogan and Glyn Lewis of Applied Power, are professional engineers, each with more than twenty years in power system analysis and design.

The course will begin with an introduction and review of electrical equipment ratings of motors, transformers and conductors, and will continue in the second

and third sessions with a detailed review of reactive power fundamentals and applications. The fourth session deals with codes and standards associated with voltage requirements and voltage control of equipment; namely, the causes of overvoltage or voltage drop and the application of voltage regulators to system design. The final session presents the method and test instruments required for performing a load flow analysis on a distribution system.

The course will be of interest to electrical engineers involved in the design of power distribution systems, as well as plant engineers who need to have a better understanding of these important principles. The advance registration fee for the entire series of seminars is just \$65. (Student fees are one-half price.) Also, 1.5 CEUs credit is issued to enrollees taking and passing an exam at the end of the course. A nominal fee is charged to cover administration of the CEUs.

See the advertisement on page 8 of this issue of the GRID for additional information and registration form.

OEB/EMB

**Biofeedback Stress Reduction on Your PC**

Is your personal computer (PC) giving you fits? Got you tied up in knots? If the answer is yes (or no), then listen up. Roxanne Wolosenko, Product Manager at Synapse Software, will give a presentation and demonstration of the company's "Relax" software product at the January 22 Oakland/East Bay Engineering in Medicine and Biology Society meeting.

Also on the agenda is Dick Mangum, the Bay Area PACE representative, who will discuss how the IEEE is supporting engineers as a special interest group in Washington as well as locally. Age discrimination, retirement benefits, and the Legal Defense System (LDS), a program available only in the Bay Area, will be described. Find out how the IEEE can become an "expert witness" on your behalf in liability suits, discrimination cases, etc.

See the calendar of events for dinner reservations and meeting details.

New York

**32nd Annual ISSCC**

Diversification in IC design, now a major trend in R&D, will be accentuated at the forthcoming ISSCC/85 to be held February 13-15 at the New York Hilton.

Over 100 papers will emphasize this continuing changing pattern of the technology, with contributions by more than 400 professionals from the U.S., Europe and the Far East. Subjects covered include microprocessors and floating point processors, consumer ICs, special application memories, high density SRAMs, signal processors, image sensors, flexible digital arrays, analog techniques, communication links, nonvolatile memories, megabit DEAM and monolithic filters.

Eleven evening sessions will be held where industry experts will debate such controversial topics as video signal processing, scaling effects, CAE work stations, fault tolerance, submicron MOS, A/D architecture for the future, and custom/semicustom design approaches.

Dr. Raj Reddy, director of the Robotics Institute at Carnegie-Mellon University, will be the keynote speaker. He will address new emerging technology, artificial intelligence and its alliance with the super chip.

The IEEE Cleo Brunetti and the Fredrik Phillips awards will be presented during ISSCC/85, and the Solid State Circuits Council will honor one of its members.

Advance registration is \$60 for members, while the fee will be \$100 at the conference. Programs and registration forms can be obtained from IEEE, 345 East 47th Street, New York, NY 10017.

January 23-25

**Software Productivity Metrics**

The IEEE Working Group on Software Productivity Metrics will meet January 23-25 in the English Room at the Sheraton Palace Hotel. The speaker for the meeting is Barry Boehm of TRW. His presentation will take place at 9:00 am on Jan. 23 in the Regency Room. Reservations for Dr. Boehm's talk may be made by calling 408-257-7000-X2045.

**Bud Eldon, 1985 IEEE President**

Charles A. "Bud" Eldon was elected 1984 president-elect of the IEEE at a special meeting of the Assembly on May 17, 1984. He thus assumed the position left vacant by the death of Donald King.

In electing Bud Eldon, the Assembly chose a person who, in the 1982 general election, gathered a broad base of support by winning 9 out of 10 IEEE Regions in his bid for executive vice-president, the second highest IEEE office.

On January 1 this year, Bud Eldon, a man with IEEE experience ranging from being a chapter founder to 1983 executive vice president, took over the reins of the Institute as its president.

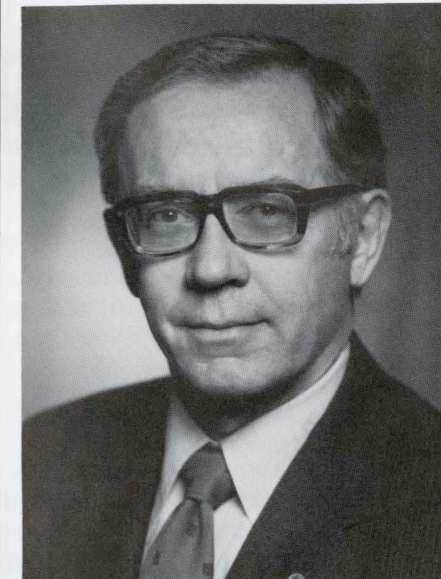
He has held a variety of positions in the IEEE. In 1956 he founded a chapter of what is now the Components, Hybrids and Manufacturing Technology. He went on to become the president of that society, and served on the Technical Activities Board from 1963 to 1965. Bud served the San Francisco Section as its treasurer, secretary, vice chairman and chairman in the early 1970s, then moved on to Region 6 to serve as vice-chairman in 1977-78 and chairman in 1979-80. He became treasurer of National IEEE in 1981-82, executive vice president in 1983, executive vice president in 1984, then on to president-elect and finally president.

Along the way, Bud served the Institute in many other ways, including committee work on the Regional Activities Board, Technical Activities Board, and United States Activities Board. He also served as a representative to Electronic Conventions Inc. (ECI) in 1981 and as a director in 1982.

As president, Eldon has strong interests in member benefits, particularly continuing education where he has worked on the Individual Benefits and Services Committee of the IEEE Executive Committee.

Bud Eldon is corporate manager of capital equipment at Hewlett-Packard, responsible for capital equipment acquisition for manufacturing processes for the company worldwide, as well as for processing engineering studies, corporate purchase

agreements and vendor relations. He joined H-P in 1951, working as a production engineer, planner, marketing engineer, manufacturing manager, and as director of corporate systems/EDP. He left H-P in 1969 and became president of Ness Industries, Inc., a subsidiary of Ness Pacific, an electronic components manufacturer. He rejoined H-P in 1972, first as a management consultant, then as manufacturing manager of the integrated circuits department in Santa Clara, and then to his present position as corporate manager of capital equipment. He attended Stanford University where he received his BS in Physics (1948), and an MBA in 1950.



Charles A. "Bud" Eldon  
President of the Institute

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SCV/GRS

## Remote Sensing with Airborne Electromagnetics

A. Becker, professor of applied geophysics at UC Berkeley, will be the featured speaker at the January 29 meeting of the Santa Clara Valley Geoscience and Remote Sensing Society. His topic is remote sensing with airborne electromagnetics (AEM).

The recent past has witnessed a number of major technical advances in the art of AEM surveying. Multifrequency and multicomponent operation have been introduced, reduced noise and drift levels have been achieved and recording bandwidth of AEM equipment has been increased.

Professor Becker's presentation recounts a number of these advances and leads to the conclusion that much progress has been made in recognition and automated interpretation of the observed responses to the point where airborne electromagnetics can be used for such diverse purposes as determining the thickness of sea ice or airborne coastal bathymetry.

SCV/Magnetics

## Revolution in Magnetic Materials

Discoveries of new magnetic materials over the past few years promise to greatly improve the performance of devices employing such materials. Entirely new applications could be forthcoming. For example, new boron-based ternary compounds for permanent magnets make new compact motor designs practical. New amorphous materials show greatly reduced losses at high frequencies.

Robert M. White, featured speaker at the January 22 meeting of the Santa Clara Valley Magnetics Society, says that despite all this activity, the U.S. has shown an alarming disinterest in these new applications. Ferrites, for example, are used in a variety of applications from permanent magnets to recording heads. Yet at a recent Ferrite Conference in San Francisco, the U.S. presented only 13% of the papers or posters.

Dr. White is currently vice president of engineering and technology at Control Data Corporation. He chaired the National Materials Advisory Board study on which his presentation is based.

### Positions in Electrical Engineering and Computer Science Engineering Departments

Tenure-Track-Positions are available in computer design, computer software, micro and minicomputers, computer graphics/applications, digital systems, electronics or electron devices.

Earned doctorate with an excellent record of teaching, scholarship, and research is desirable. Master degree with industrial experience acceptable for full-time and part-time non-tenure-track positions. Rank and salary are open. Research, consulting and summer employment opportunities are available. Positions are limited to U.S. citizens or permanent residents. Resume, names and addresses of three references should be submitted to Dr. James Freeman, Chair, Electrical Engineering Department, San Jose State University, San Jose, California, 95192.

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If interested, please call (408) 277-3303 or write Dept. of Computer Science & General Engineering, San Jose State University, San Jose, Ca 95192.

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IEEE

## MEMO AND REPORT WRITING FOR ENGINEERS A workshop sponsored by the Santa Clara Valley IEEE Section

### PURPOSE

Given chalk and a blackboard, most engineers diagram their ideas quickly and clearly.

Asked to put their ideas in writing, however, these same engineers often compose hesitantly, revise repeatedly and still aren't sure how well the reader will understand what has been said.

Generally, engineers would rather solve problems than write about solutions.

This intensive, two-day memo and report writing workshop will help engineers manage their writing as well as they manage their schematics.

### WHO SHOULD ATTEND

Managers who write, who are responsible for the writing of others, and who want a complete set of writing strategies to pass on to their engineers.

Engineers who frequently write memos or reports - and who want to write quickly and effectively.

### FEATURES

- Samples of your writing will be critiqued by the instructor BEFORE the workshop and returned to you as the workshop begins.
- The text used in the workshop, A WORKBOOK OF WRITING MODELS FOR ENGINEERS, contains the writing concepts and skills which engineers need to write effectively. Examples are taken from engineers' writing.
- Samples of your writing also will be critiqued by the instructor AFTER the workshop and returned to you. This strengthening of the skills you learned in the workshop offers valuable support and reinforcement.

### REGISTRATION INFORMATION

Workshop Location: San Jose Hyatt

Dates/Time: February 12-13, 1984; 9:00 a.m. - 4:30 p.m.

Registration deadline: February 1 (Writing samples of participants are critiqued before the workshop).

Fee: \$165 for IEEE members. \$195 for non-members. 10% discount for additional registrations from the same company. The fee includes all materials, lunches, and breaks.

Full refund of fee if cancellation is received by February 1. Substitutions welcome.

Registrations will be confirmed by mail. At that time, participants will be asked to submit samples of their writing for the pre-workshop critique.

Call Gerry Helmke at 415-327-6622 if you have questions.

- Certificates are awarded upon completion of the workshop.
- 1.2 CEU's are also awarded.

### COURSE CONTENT

This is a workshop in which you learn by doing. With the instructor's help, you will be assessing, revising, and editing your own writing during the two days.

YOU WILL LEARN TO:

- Analyze your audience and choose the writing style most appropriate for that audience.
- Tailor communications for specific purposes, signifying exactly the message you intend.
- Organize your writing, making complex ideas simple to follow.
- Reduce sharply the wordage in your writing without sacrificing effect, logic, or power.
- Write the four different kinds of paragraphs which emphasize all the important ideas you want the reader to get.
- Strengthen your material by writing clear, clean sentences.
- Work with the instructor to develop a smoother, more natural writing style, getting rid of writing practices which dilute emphasis.
- Become your own editor, emphasizing what is significant and analyzing for effect while retaining logic, integrity, and strength.

### ABOUT THE INSTRUCTOR

Dean Berry, the principal of Dean Berry Associates, Inc., has been teaching communication skills to engineers for a quarter of a century.

He knows the writing skills which engineers need to learn. He knows how to teach these skills.

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