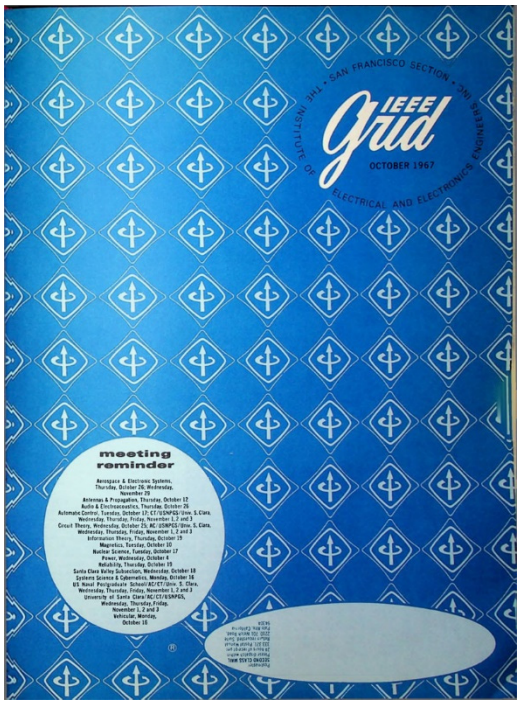
EDITOR'S PROFILE of this issue

from a historical perspective …

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

October, 1967:

Cover:



Page 8: Robert (Bob) Widlar (name misspelled in Calendar) discusses monolithic amplifiers. He is well-known for designing a series of opamps for Fairchild and National Semiconductor (the uA702 uA709, LM100, LM101 and a series of comparators and voltage regulators). He became known as the Valley's most celebrated dropout, once disappearing for 4 years.

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

IEEE Grid

OCTOBER 1967

meeting reminder

Aerospace & Electronic Systems, Thursday, October 26; Wednesday, November 29
Antennas & Propagation, Thursday, October 12
Audio & Electroacoustics, Thursday, October 26
Automatic Control, Tuesday, October 17; CT/USNPGS/Univ. S.Clara, Wednesday, Thursday, Friday, November 1, 2 and 3
Circuit Theory, Wednesday, October 25; AC/USNPGS/Univ. S. Clara, Wednesday, Thursday, Friday, November 1, 2 and 3
Information Theory, Thursday, October 19
Magnetics, Tuesday, October 10
Nuclear Science, Tuesday, October 17
Power, Wednesday, October 4
Reliability, Thursday, October 19
Santa Clara Valley Subsection, Wednesday, October 18
Systems Science & Cybernetics, Monday, October 16
US Naval Postgraduate School/AC/CT/Univ. S. Clara, Wednesday, Thursday, Friday, November 1, 2 and 3
University of Santa Clara/AC/CT/USNPGS, Wednesday, Thursday, Friday, November 1, 2 and 3
Vehicular, Monday, October 16

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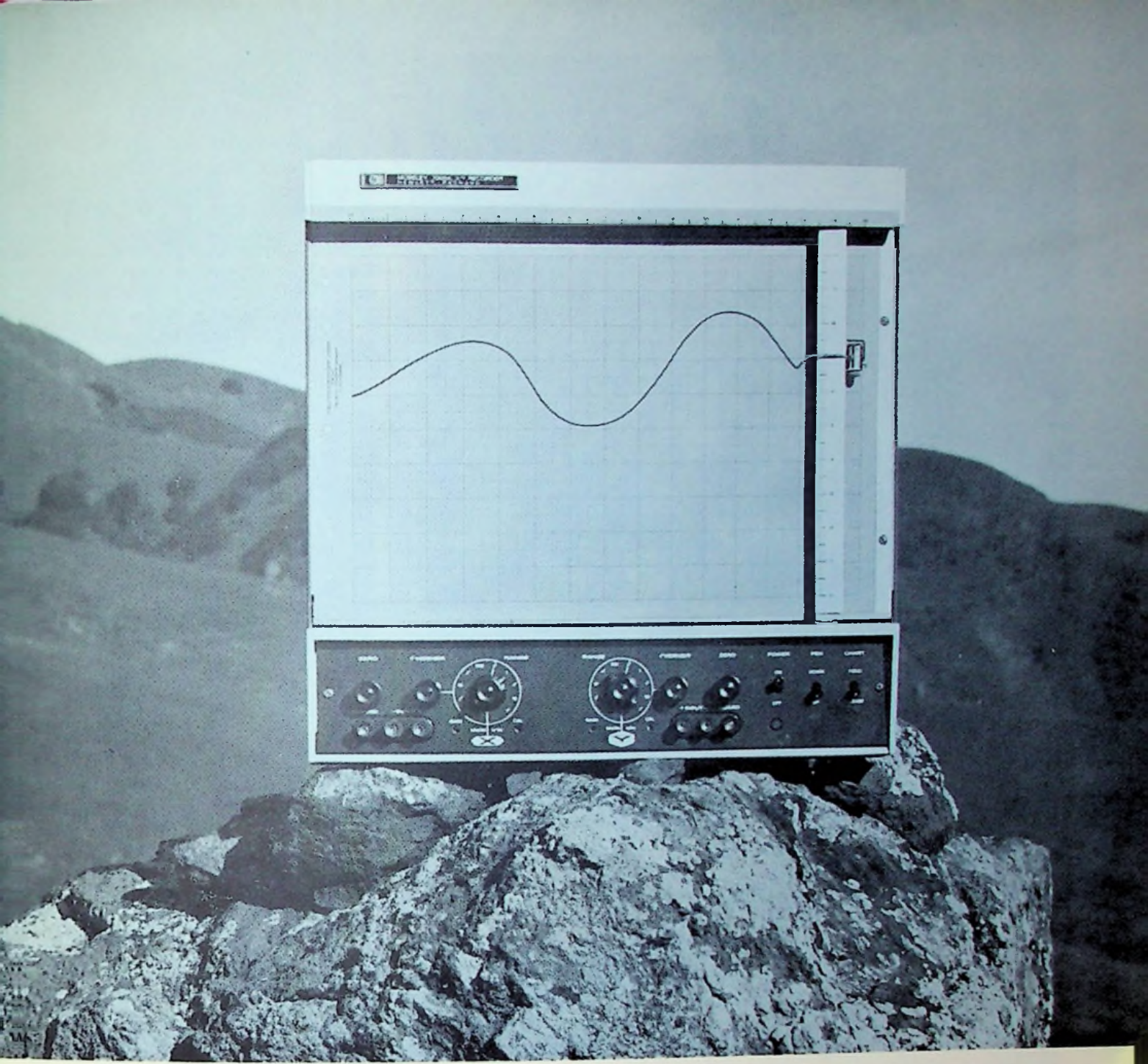

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Several thousand prospective members of IEEE were contacted through the membership counter near the west entrance of WESCON and the membership table near the east entrance. Taking part in the four-day project were 18 members of the section membership committee, two IEEE HQ staff members and three section staff members. Here Miss Anne Biskup, Cow Palace employee, and Ernesto Montano, Grid advertising director, look over the August issue of Grid-Bulletin, 10,000 copies of which were distributed as a service to visiting engineers.

TWO POWER COURSES

The professional education committee of the Power chapter, under the direction of W. J. Slimak, is sponsoring two lecture series this fall. "Grounding Principles and Practices," as first offered last spring, is being continued. Demand has been so great that this course is already oversubscribed and no openings exist.

"Protective Relaying" will be the subject of the second series and will be offered on Tuesday evenings, starting October 10, 1967. Eight lectures are planned, covering basic principles and practical methods of system and equipment protection. The topics to be covered include basic equipment, mathematical calculation methods, and protection of generators, motors, transformers, buses, distribution and transmission lines.

The lectures will be conducted on a level to provide useful and practical information to experienced engineers in the power and industrial field. Each session will be presented by an engineer who is well qualified in the field being discussed.

The course will be held at PG& E's San Francisco division office at 245 Mission Street on Tuesday evenings from 6:00 to 8:00 p.m. starting on October 10, and continuing through December 5, with the exception of November 14, when the regular monthly Power chapter meeting is scheduled. Lecture subjects and speakers:

October 10, Introduction to Relaying, H. W. Lydick, Westinghouse Electric. October 17, Technical Tools, (Lecturer to be announced). October 24, Instrument Transformers (Lecturer to be announced). October 31, Generator and Motor Protection, J. B. MacLean, Bechtel Corporation. November 7, Transformer and Bus Protection, (Lecturer to be announced). November 14, Power Chapter Meeting, no lecture scheduled. November 21, Line Protection I, D. E. Rodgers, PG & E. November 28, Line Protection II, D. H. Colwell, PG& E. December 5, System Stability, (Lecturer to be announced).

A registration fee of ten dollars will be charged to defray the costs of publications and papers which will be distributed during the course, and to cover other expenses. The course is open to the public. However, enrollment will be limited to convenient class size for maximum effectiveness.

If interested in enrolling, please call the course coordinator, Jack B. MacLean (433-4567, Ext. 3761).

If you plan to change your address, notify headquarters and the section office at least three weeks in advance.

IEEE Grid

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contents

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the section

MEMBERSHIP

The following members have recently been transferred to the grade of Senior Member:

R. C. Dorf P. E. T. Jensen

Following are the names of individuals who have been elected to current membership:

N. E. Cellers R. L. Pratt
E. R. Fuller C. F. Schulenberg
E. E. Ivanoff L. A. Sibley
Y. Koyasako D. D. Siljak
K. Y. Wong

HELP THE SECTION GROW
BRING IN A NEW MEMBER.

grid errata

SEPTEMBER MEMBERSHIP ITEM

Only Messrs. Sharp and Rausch, whose pictures appeared on page 3 of the September issue, were transferred to senior membership. Messrs. Andreae through Wolin were newly elected to membership, the paragraph which indicated their status having been inadvertently omitted.

grid errata

DIRECTORY INFORMATION

J. E. Barkle is chairman of the section's professional education committee. The correct mailing address of Einar Ingebretsen, membership chairman of the section, is Dept. 91-32, Bldg. 531, LMSC, Sunnyvale, 94088. The correct telephone number of Allen Hastings, secretary-treasurer of the A & ES chapter, is 742-9387. The correct extension of C. W. Dick, chairman of the Power chapter, is 3817. The correct telephone of Philip Smaller, treasurer, Magnetics chapter, is 248-3344, ext. 525.

Chapter officers and others are urged to double check address and telephone data in the future before sending them to the section office.

meeting ahead

ARRAY DESIGN

Ernest T. Harper, development engineer at Sylvania Electronic Systems, Mountain View, will discuss a unique design for a high gain, end-fire slot array at the October 12 meeting of the Antennas & Propagation chapter.

Pencil beam radiation patterns are normally associated with broadside arrays or continuous sources which radiate a main beam in a direction normal to the plane of the antenna. This paper describes an end-fire traveling wave type of antenna which exhibits moderate to very high gains accompanied by very low sidelobes, thus making it a useful antenna design for flush-mounted applications. The antenna can be built in sections the lengths of which depend on the period of the modulation. The appropriate number of sections can be chosen depending upon the gain required. The antenna consists of a quasi-continuous array of transverse slots in the broad wall of a dielectric-loaded rectangular waveguide. Waveguide width

(Continued on page 8)

Harper

Douce

meeting ahead

STEPPING MOTORS

Dr. John Douce, visiting professor, University of Santa Clara, will discuss the control of stepping motors at the October 17 meeting of the Automatic Control chapter.

Prof. Douce will present a technique for controlling the torque developed by synchronous and stepping motors, with particular applications where high performance regarding torque output or maximum running speed is desired. The method eliminates the possibility of pole slipping or loss of synchronization under all loading conditions.

Examples of systems constructed include a 1/4 H.P. synchronous motor in speed and position control loop and stepping motor systems operating at speeds of 30,000 R.P.M.

Dr. Douce is a visiting N.S.F. Fellow at the University of Santa Clara, from the University of Warwick, England. His interests include the analysis of non-linear control systems and the use of pseudo-random sequences for system identification. He has both a Ph.D. and a D. Sc.

Meeting Calendar

OCTOBER 4, WEDNESDAY, 7:30 PM — Power
Speaker and topic to be announced
Place: Engineers' Club of San Francisco, 160 Sansome St.
Cocktails: 5:30 PM
Dinner: 6:30 PM
Reservations: Engineers' Club, GA 1-3184 by Oct. 3

OCTOBER 10, TUESDAY, 8:00 PM — Magnetics
The story of ferrite development
Jan Smit, University of Southern Calif., Los Angeles
Place: Ampex auditorium, Redwood City (401 Broadway)
No dinner

OCTOBER 12, THURSDAY, 8:00 PM — Antennas & Propagation
Unique design for a high-gain, end-fire slot array
Ernest T. Harper, engineer at Sylvania Electronic Systems, Mtn. View
Place: PH 104, Stanford University
Dinner: 6:30 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
Reservations: Wilbert Chang, 591-1414 ext. 456 by Oct. 11

OCTOBER 16, MONDAY, 8:00 PM — Systems Science & Cybernetics
The Stanford artificial intelligence project
Prof. John McCarthy, Stanford University
Place: Stanford Research Institute, Bldg. 1, Conf. Rm. B, 333 Ravenswood Ave., Menlo Park
Dinner: 6:30 PM, Red Cottage, 1706 El Camino, Menlo Park
Reservations: Margie Hensley, 324-4701 by Thursday, Oct. 12

OCTOBER 16, MONDAY, 8:00 PM — Vehicular
Exploring the time and frequency domain
Stan V. Foss, Tektronix, Inc., Palo Alto
Place: Dinah's Shack, 4269 El Camino, Palo Alto
Cocktails: 6:00 PM
Dinner: 6:45 PM
Reservations: Mrs. Nathan, 349-3111 ext. 220 by noon Oct. 13

OCTOBER 17, TUESDAY, 8:00 PM — Automatic Control
Control of stepping motors
Dr. John Douce, visiting professor, University of Santa Clara, on leave from University of Warwick, England
Place: Univ. of Santa Clara, Engineering Center, Room 551
Dinner: 6:30 PM, Lucca Restaurant, Santa Clara (across from the Univ.)
No reservations required.

OCTOBER 17, TUESDAY, 8:00 PM — Nuclear Science
Tour of General Electric Vallecitos Test Reactor
Robert Butler, GE Vallecitos Atomic Laboratory
Place: Vallecitos Road, Bldg. 102, Sunol
Cocktails: 6:15, Hap's, 122 Neal St., Pleasanton
Dinner: 6:45 PM, Hap's, $4
Reservations: Dale Swadley, 837-5311, ext. 301 by Oct. 13

OCTOBER 18, WEDNESDAY, 7:30 PM — Santa Clara Valley Subsection
Tour of Santa Clara County Communications Center; limited to 45 persons
Place: 2700 Carol Drive, San Jose
No dinner
Reservations for tour: Miss Chris Mazzeo, 291-4014 by Oct. 16

OCTOBER 19, THURSDAY, 8:00 PM — Reliability
Computerized circuit analysis, its role in system reliability
Arthur Schmid, Planning Research Corp., Palo Alto
Place: PH 104, Stanford University
Dinner: 6:30 PM, Stanford View Restaurant, 1921 El Camino, Palo Alto, $3
Reservations: Robert Welch or Adeline Fako, 966-3342 by Oct. 17

Sign up for Power Protective Relaying Course 8 evening lectures starting October 10 at PG&E SF Division Office Fee $10. Call Jack MacLean for info (433-4567 ext.3761)

OCTOBER 19, THURSDAY, 8:30 PM — Information Theory
A general result on the detection of random signals in white gaussian noise
Thomas Kailath, associate professor, Stanford University
Place: Stanford Research Institute, Bldg. 1, Conference Room B, 333 Ravenswood Ave., Menlo Park
Dinner: 6:15 PM, L'Auberge, 2826 El Camino Real, Redwood City
Reservations: Mrs. Rachel Bingham, 321-3300, ext. 453 by Oct. 18

OCTOBER 25, WEDNESDAY, 8:00 PM — Circuit Theory
Progress in monolithic operational amplifiers
Robert J. Wiblar, director of science, National Semiconductor Corp., Santa Clara
Place: Stanford Univ., McCullough Bldg., Room 134
Dinner: 6:00 PM, Red Cottage, El Camino, Atherton
No reservations required.

OCTOBER 26, THURSDAY, 7:30 PM (briefing) — Aerospace & Electronic Systems
Tour of United Airlines Maintenance Base
Engineering and overhaul of jet airliners for minimum turn-around time
Place: San Francisco Airport, San Bruno
Dinner: 6:15 PM, United Airlines Maintenance Base, $2
Reservations: Al Hastings, 742-9387 or 742-1660 by Oct. 19

OCTOBER 26, THURSDAY, 9:30 PM sharp — Audio & Electroacoustics
New developments in motion picture sound and optical systems
Wives and guests welcome
Place: Cinema 150, 2600 El Camino, Santa Clara
Dinner: 7:30 PM, The Berry Farm, 2825 El Camino, Santa Clara; Selections from menu: $3 to $6
Reservations: Miss Jones, 328-2961

NOVEMBER 1, 2 & 3, WEDNESDAY, THURSDAY & FRIDAY — Automatic Control / Circuit Theory / USNPGS / Santa Clara Univ.
Asilomar Conference on Circuits and Systems; registration $15
Place: Asilomar Hotel and Conference Grounds, Pacific Grove, Calif.
Information: Dr. Dorf, 246-3200 ext. 226 or Prof. Parker, (408) 646-2232

NOVEMBER 29, WEDNESDAY, 8:00 PM — Aerospace & Electronic Systems
Engineering and scientific manpower: the problem of mass lay-offs
Dr. Rajinder A. Loomba, San Jose State College
Place: Lockheed Auditorium, 3251 Hanover St., Palo Alto
No dinner

meeting ahead

COUNTY COMMUNICATIONS CENTER FIELD TRIP

The Santa Clara Valley Subsection will participate in a tour of the Santa Clara Communications Center, limited to 45 persons, on October 18. The center is located at 2700 Carol Drive (off of Condas Garden). Call Miss Chris Mazzeo, 291-4014, for early reservations.

The Santa Clara County Communications Department was established by the Board of Supervisors in January 1948, and was charged with the responsibility of providing communications service to all tax supported public safety agencies within the county who desired to avail themselves of such service.

The basic responsibilities of the department are to provide a radio communications service to the various governmental public safety agencies in the county; provide an emergency telephone answering and dispatching service for the public safety agencies; act as the county fire control center; provide a central intelligence and information center and to provide coordination between agencies. In addition, the department is responsible for all telephone service used by the various county departments, as well as the installation, maintenance, and repair of all electronic equipment.

meeting ahead

FERRITE DEVELOPMENT

Dr. Jan Smit, professor of physics, University of Southern California, will relate the story of ferrite development at the October 10 meeting of the Magnetics chapter.

A description of the times, circumstances and personalities involved in the development of the first ferrite materials in occupied Holland will be presented. The evolution of these materials for their present varied magnetic characteristics will be described.

Jan Smit is a world-known expert in magnetic materials, particularly ferrites. With an associate, H. Wijn at the Phillips Company in Eindhoven, Dr. Smit wrote *Ferrites* which was the first book in the then new field and remains unsurpassed. Dr. Smit was educated through the Ph. D at Delft and now serves on the faculty of physics at the University of Southern California. He also is a consultant to Ampex Corporation.

meeting ahead

ARTIFICIAL INTELLIGENCE

Professor John McCarthy of Stanford University will address the first meeting of the newly-formed Systems Science and Cybernetics chapter on October 16. He will present an overview of some of the many interesting activities of the Stanford artificial intelligence project.

The goal of research in artificial intelligence is the design of computer programs that can perform tasks which, if done by people, would be said to require intelligence. To play games such as checkers or chess requires the ability to set goals and to solve problems. To discover and prove mathematical theorems requires the ability to form hypotheses and to recognize analogies.

The Stanford project is actively pursuing research in programming computers to perform such tasks. Activities include developing programs to play checkers and chess, to generate mechanical drawings, to act as an assistant to an organic chemist, to perform the algebraic computations of particle physics, to recognize people from photographs, and to recognize and manipulate simple real-world objects.

Professor McCarthy is well known for his work in computer programming languages, the theory of computation, and artificial intelligence. He graduated from the California Institute of Technology in 1948 and received a Ph. D.

(Continued on page 8)

Schmid

Kailath

meeting ahead

COMPUTERIZED CIRCUIT ANALYSIS

Arthur Schmid, Planning Research Corporation, Palo Alto, will address the Reliability chapter on October 19, with a timely talk on computerized circuit analysis, its role in system reliability.

Current computer systems and associated software programs permit a very thorough analysis of circuit characteristics to an extent not possible previously, particularly where repeated or complex calculations must be performed, such as for non-linear circuits and for stability analysis.

Mr. Schmid will discuss the advantage which analysis by computer methods offers the designer or the design analyst, where such computerized methods are useful (in contrast with cases where manual methods are more feasible), the steps which must be performed in using a computer program, the different types of programs available, and some of the difficulties which may exist in the applications of computers to the analysis. He will point out the relationship of this computer-aided approach to the evaluation of the reliability of the disign. He will be joined by Kenneth King, manager of the analysis function at PRC.

meeting ahead

GAUSSIAN NOISE SIGNALS

Thomas Kailath, associate professor, Stanford University, will report on a general result on the detection of random signals in white gaussian noise at the October 19 meeting of the Information Theory chapter.

Prof. Kailath was born in Poona, India, and obtained his bachelor's degree in Telecommunications Engineering at the University of Poona in June, 1956, and his S. M. and Sc. D. degrees at the Massachusetts Institute of Technology in June, 1959, and June, 1961.

He worked at the Jet Propulsion Laboratories, Pasadena, California until January 1963, and since then has been an associate professor of electrical engineering at Stanford University. His research interests are in communication through time-variant channels, continuous-time detection problems, feedback communication systems and the modeling of stochastic dynamical systems.

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meeting ahead

TIME & FREQUENCY

Stan V. Foss, field service engineer, Tektronix, Inc., Palo Alto, will discuss exploring the time and frequency domain at the October 16 meeting of the Vehicular chapter.

Mr. Foss will describe the use of cathode ray oscilloscopes for investigating time and frequency variables and phenomena. Use of the spectrum analyzer in identifying unknown sources of electromagnetic radiation will be emphasized.

MORE ARRAY DESIGN

and slot width are periodically modulated with axial distance along the antenna. The resulting aperture excitation exhibits periodic modulation in amplitude but a constant phase velocity. An X-band experimental model of the antenna 50 wavelengths long is described which exhibits a directivity which is 6 db greater than that of an antenna satisfying the conventional Hansen-Woodyard condition.

MORE ARTIFICIAL INTELLIGENCE

in mathematics at Princeton University in 1951. He has taught at Princeton, Dartmouth, and MIT, and is currently a professor of computer science and head of the artificial intelligence project at Stanford.

Robert J. Widlar

meeting ahead

MONOLITHIC AMPLIFIERS

Robert J. Widlar, director of science, National Semiconductor Corp., Santa Clara, will describe progress in monolithic operational amplifiers at the October 25 meeting of the Circuit Theory chapter.

The performance expected of a universal operational amplifier will be outlined, and a number of problems encountered in realizing this in an integrated circuit will be discussed. A recent monolithic operational amplifier design will be described which makes extensive use of new integrated components from the standard six-mask process. Finally, comments will be made on future trends in monolithic operational amplifiers.

Former head of the development of linear integrated circuits at Fairchild Semiconductor, Mr. Widlar joined National Semiconductor in 1966. From 1961 to 1963 he worked on the control system design for the orbiting solar observatory with Ball Bros. Research, Boulder, Colo. He holds the EE degree from the University of Colorado.

meeting ahead

JET ENGINEERING

The Aerospace & Electronics Systems chapter will sponsor a tour of the United Airlines Maintenance Base, San Bruno, on October 26, emphasis being on engineering and overhaul of jet airliners for minimum turn-around time.

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PRODUCTS

meeting ahead

SOUND AND OPTICAL SYSTEMS

Mr. and Mrs. Richard Burton will be featured at the October 26 meeting of the Audio and Electroacoustics chapter. Their subject will be "The Taming of the Shrew," or "New Developments in Motion Picture Sound and Optical Systems."

Following a complimentary screening of this opus for IEEE members and guests and their ladies at Cinema 150, Santa Clara, there will follow a description of the new Dimension 150 Process and a series of short, interesting test and demonstration films.

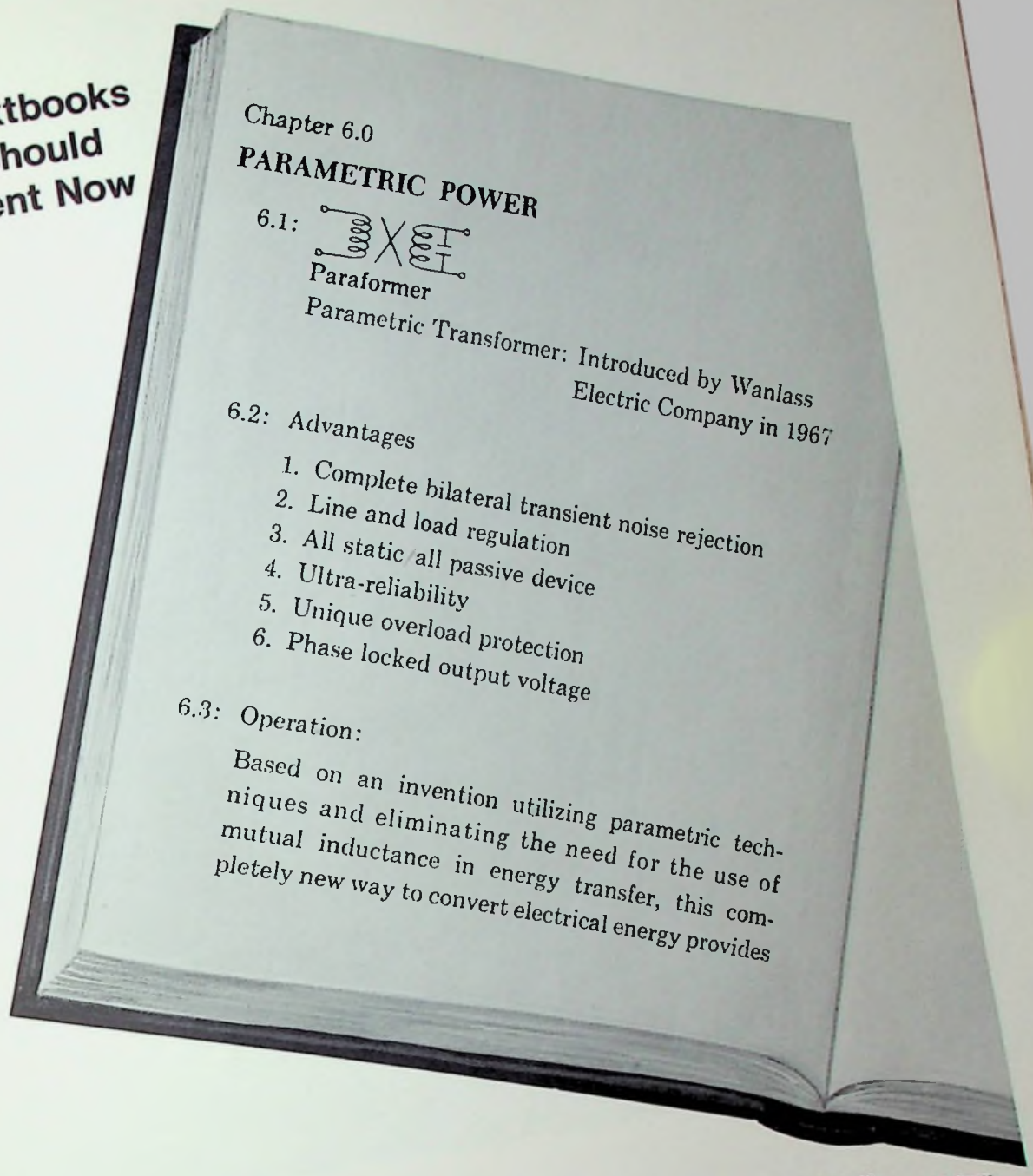
meeting ahead

VALLECITOS REACTOR

The Nuclear Science chapter's first meeting this fall will consist of a tour and discussion of the General Electric Vallecitos Test Reactor. This reactor has been in operation since 1958 and is used primarily in material testing and isotope production. Recent improvements in instrumentation have reduced the unscheduled down time to one-fourth that of last year.

Cocktails and dinner are planned prior to the October 17 meeting for those interested in a social gathering.

It Will Be In The Textbooks Next Year But It Should Be In Your Equipment Now



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Output Capacity	500 VA	500 VA	0–15 Amp.
Line Regulation (±10%)	±.25%	±.25%	±1 mv
Load Regulation (0–FL)	±1.5%	±2.% (typical)	±1 mv
Ripple	---	---	1 mv (RMS)
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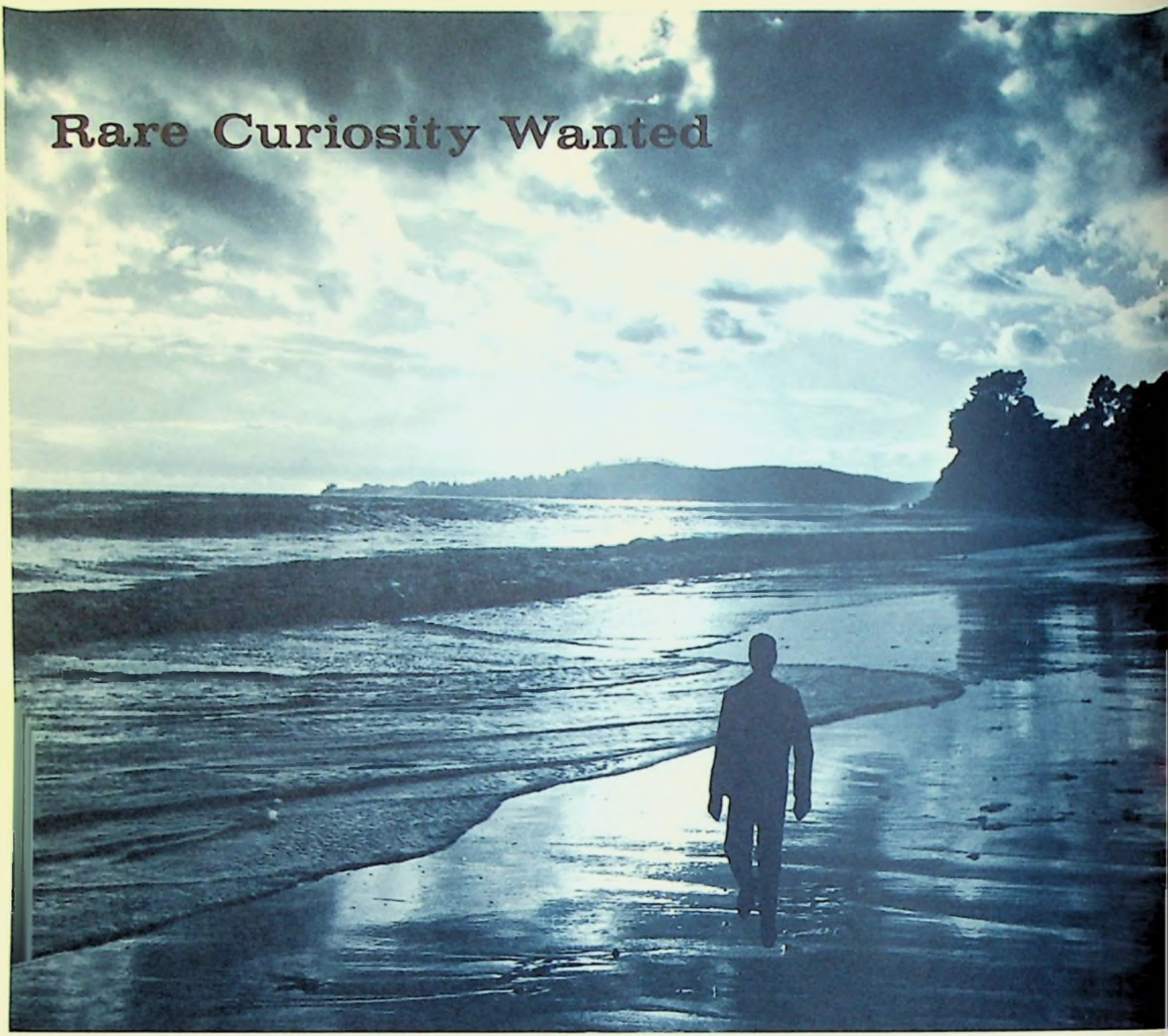

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