

EDITOR'S PROFILE of this issue

from a historical perspective ...

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

May, 1967:

Cover: A quad helix antenna illustrates the coverage of the Beam Symposium and the National Telemetering Conference; in the upper-left is a SEM photo of red blood cells. See page 6.



Archive of available SF Bay Area GRID Magazines is at this location:

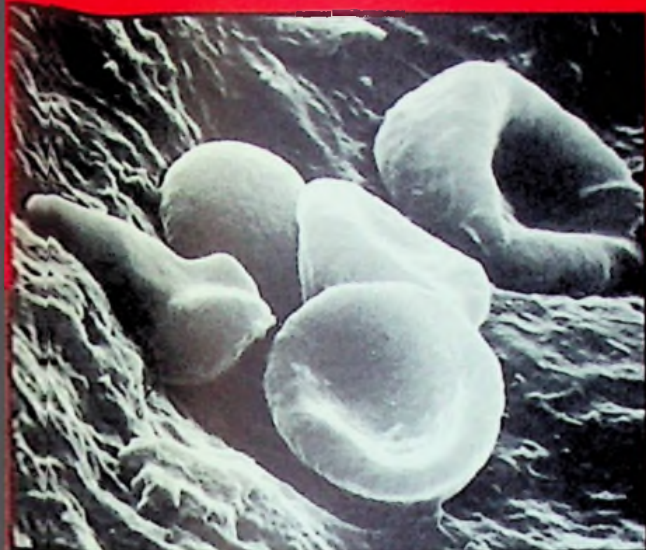
https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History

At time of scanning, the bound volumes are held by Paul Wesling. July, 2021 Contact p.wesling@ieee.org

IEEE *Grad*

MAY 1967

SPECIAL ISSUE



IEEE 9th Annual Symposium on Electron, Ion, and Laser Beam Technology, Hotel Claremont, Berkeley-Oakland, May 9-11

National Telemetry Conference

San Francisco Hilton
May 16-18

INDUSTRIAL

BIOMEDICAL

OCEANOGRAPHIC

AEROSPACE

meeting reminder

- Aerospace & Electronic Systems, Friday, May 12
- Friday, May 26
- Antennas & Propagation, Tuesday, May 16
- Automatic Control, Tuesday, May 16
- Circuit Theory, Wednesday, May 17
- Communication Technology, Monday, June 5
- Electromagnetic Compatibility, Wednesday, May 24
- Engineering in Medicine & Biology, Tuesday, May 16
- Industry & General Applications, Thursday, May 11
- Information Theory, Thursday, May 25
- Magnetics, Tuesday, May 16
- Nuclear Science, Monday, May 15
- Parts, Materials & Packaging, Tuesday, May 22
- Power, Tuesday, May 16
- San Francisco Section, Wednesday, June 7
- Vehicle Communications, Thursday, May 18

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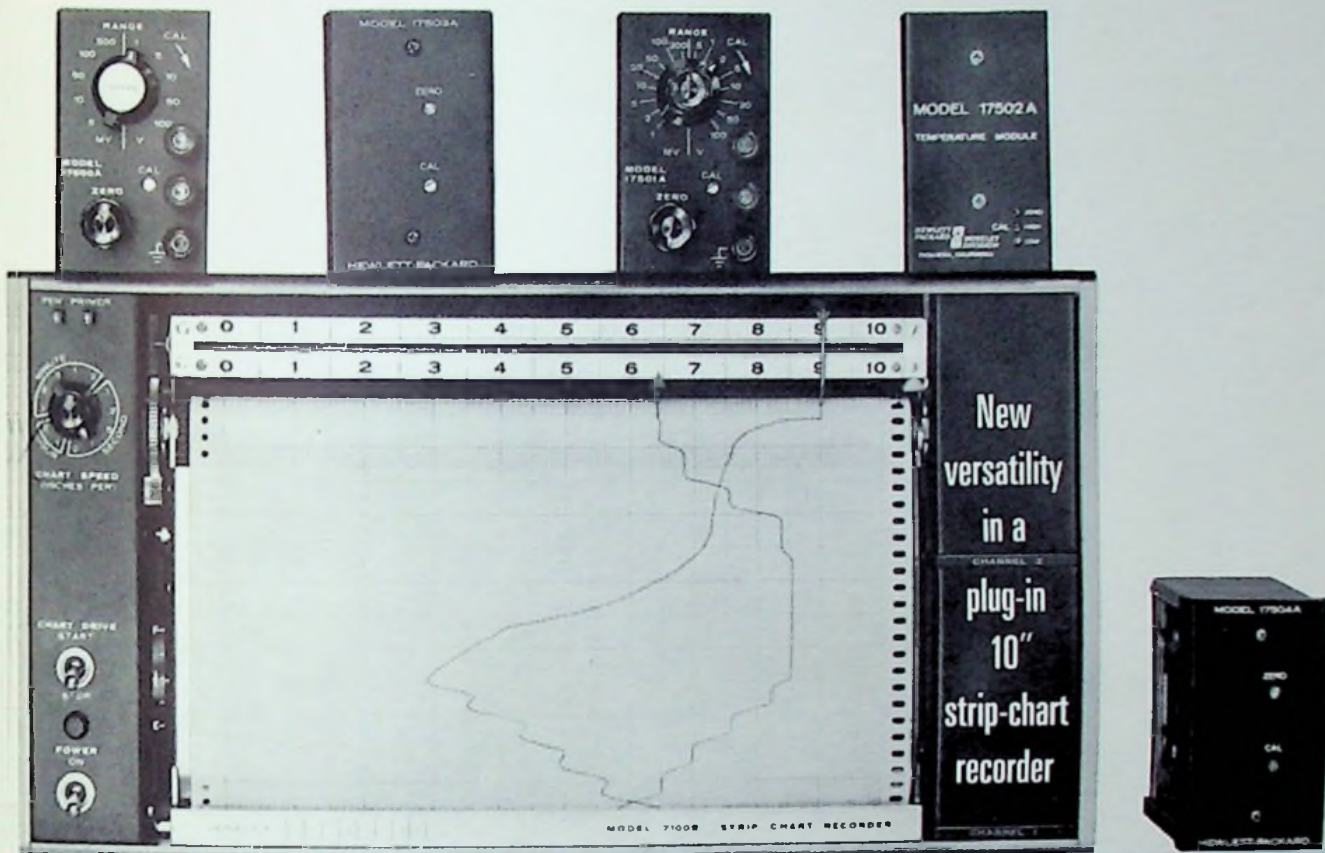
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- Model 7101B 1-pen Recorder, \$1000
- Model 17500A Input Module, \$250
- Model 17501A Input Module, \$350
- Model 17502A Input Module, \$250
- Model 17503A Input Module, \$250
- Model 17504A Input Module, \$200

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the section

MEMBERSHIP

Following are the names of individuals
who have been elected to current mem-
bership:

F. B. Badal	H. N. McKinney
J. Fajardo	L. Q. Pena
K. H. Kerwin II	L. M. Wyatt

events of interest

FIRST VEHICULAR COMMUNICATIONS

Sponsored by the LA Council chap-
ter of the VC Group, the First Sym-
posium on Vehicular Communications
Systems, devoted to improving systems
engineering in the field, will take the
form of a one-day technical conference
at the International Hotel (near airport)
on May 25. Fee of \$10 includes lunch-
con. General Chairman: John P.
Mumaw, Rm. 1600, City Hall, 200
N. Spring St., Los Angeles 90012.

student branch news

HEALD OFFICERS

Current officers at the Associate Stu-
dent Branch at Heald College are E.J.
Aston, chairman; M. Ostrovsky, vice-
chairman; M. Wong, treasurer; G.
Gardner, secretary; and P. Jereb, mem-
bership chairman.

publication notes

ELECTRIC CAR PROCEEDINGS

Proceedings (208 pp.) of the Febru-
ary 24-25 National Electric Auto Sym-
posium held at San Jose State College
are now ready and may be obtained by
sending a check or purchase order for
\$10 to Hugh C. Ross, 11915 Shady-
brook Court, Saratoga, Calif. 95070.

events of interest

ASCE CONFERENCE

Conference on Civil Engineering in
the Ocean, San Francisco Hilton, Sep-
tember 6-8. Thomas C. Kavanagh, 200
Park Ave., New York 10017, is chair-
man of ASCE's newly-formed Techni-
cal Council on Ocean Engineering.

cover

A scanning electron microscope (up-
per left) shows an excellent picture of
red blood cells in the aorta, magnified
5,250 times. This display is typical of
what can be achieved with the new
techniques to be described at the Beam
Symposium in Berkeley on May 9-11.
The Philco-Ford WDL modified quad
helix antenna (lower right) carries the
four theme words of the National Tele-
metering Conference, San Francisco
Hilton, May 16-18. Details on both
international conferences follow in *The
Grid*.



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SYMPOSIUM AT A GLANCE
IEEE 9th Annual Symposium on Electron, Ion, and Laser Beam Technology

TUESDAY, MAY 9th.	Keynote Address (Hillier) I. Physics of Beams (1)	II-A. Physics of Beams (2) II-B. Nonthermal Interactions (1)
WEDNESDAY MAY 10th.	III-A. Nonthermal Interactions (2) III-B. Thermal Interactions	Open House at U.C. IV. History Lecture (Marton)
THURSDAY MAY 11th.	V-A. Interference Effects, Measurements V-B. Biomedical Applications (1)	VI-A. Information Recording VI-B. Biomedical Applications (2)

beam symposium

9TH ANNUAL MEET MAY 9-11

James Hillier, vice president of RCA Laboratories in Princeton, N.J., will be keynote speaker of the IEEE 9th Annual Symposium on Electron, Ion, and Laser Beam Technology to be held at the Claremont Hotel on May 9-11. He will speak on "Beam Technology and the Electronics Industry."

The meeting will feature sessions on the physics of beams, their thermal and nonthermal applications (including information recording), interference effects, measurements, and biomedical applications.

Professors Charles Susskind and R. F. W. Pease of the University of California in Berkeley are respectively symposium chairman and program chairman. Members of the program committee, most of whom will also serve as session moderators, include R. Bakish (Bakish Materials Corp.), T. E. Everhart (University of California), L. Marton (National Bureau of Standards), D. E. Rounds (Pasadena Foundation for Medical Research), C. F. Spitzer (Ampex Corp.) and R. G. Wilson (Hughes Research Laboratories).

The annual symposium, which is attended by delegates from all over the world, is the outgrowth of meetings originally organized by Alloyd Corp. and concerned with the generation and control of radiant energy for the purpose of modifying the shape or nature of materials, including processes such as melting, refining, welding, machining, and evaporating.

In subsequent years, nonthermal interactions with materials have also been included, notably such topics as scanning electron microscopy, electron-probe microanalysis, and high-precision measurements, as well as medical and biological effects of laser beams, novel instrumentation, and the applicable physics. Other examples of topics to be covered include microelectronic fabrication and examination and information storage (e.g., thermoplastic recording).

A special feature will be a public lecture, to be given in the afternoon of

(Continued on page 14)

beam symposium

PRELIMINARY PROGRAM

(Note: Some of the titles have been abbreviated to conserve space.)

Tuesday, May 9

Morning

Keynote Address: "Beam technology and the electronics industry" (J. Hillier, RCA)

I. Physics of Beams (1)

"LaB₆ cathode" (A.N. Broers, IBM)

"12 j in 3 ns with 600-keV electrons" (J. L. Brewster, J. P. Barbour, F. M. Charbonnier, F. J. Grundhauser, Field Emission Corp.)

"Point-cathode electron sources" (T. E. Everhart, UC)

"Ion sources" (R.G. Wilson, Hughes)

Afternoon

II-A. Physics of Beams (2)

"Energy and current measurement of an accelerator electron beam" (J.W. Motz, J.H. Sparrow, NBS)

"Magnetic current control for hollow cathodes" (C.M. Banas, C.O. Brown, United Aircraft)

"Handling high-energy high-power electron beams" (S. Penner, NBS)

"Gun for electron-beam evaporator" (H. Kimura and H. Tamura, Hitachi)

"Pulsed electron-beam calorimetry" (R.A. Graham, R.E. Hutchison, W.B. Benedick, Sandia)

10¹²-W electron beam (D.H. Sloan, Physics International)

II-B. Nonthermal Interactions (1)

"Electron-optical fabrication of solid-state devices" (R.F.M. Thornley, M. Hatzakis, IBM)

"Circuit deposition by energy beam irradiation" (M. F. Levy and T. F. Saunders, IBM)

"Ion implantation in semiconductors" (J.F. Gibbons, Stanford)

"Ultra high-vacuum surface electron microscopy" (D. E. Miller, R. F. W. Pease, UC)

Evening

Cocktail party and banquet

Wednesday, May 10

Morning

III-A. Nonthermal Interactions (2)

"Low-energy electron-beam interactions with surfaces" (E. D. Wolf, Hughes)

"Oil-free scanning electron microscopy" (P.R. Thornton, Univ. College, North Wales)

"Scanning electron microscopy of imperfections in silicon integrated circuits" (C. J. Varker, E. M. Juleff, Westinghouse)

"Low-voltage scanning electron microscopy" (R.F.W. Pease, UC)

"Semiconductor secondary-electron detector" (A.J. Gonzales, UC)

"New detection method of secondary electrons on scanning electron microscope" (H. Kimura and H. Tamura, Hitachi)

III-B. Thermal Interactions

"Electron-beam welding in space" (R. Schollhammer, H. Standards)

"In-orbit welding experiment" (H. Lienau, NASA; J.F. Lowry, C. B. Hassan, Westinghouse)

"Electron-beam micro-zone processing of thin layers" (N. M. Davis, USNOL)

"High-purity shape casting with an electron-beam furnace" (R. E. McDonald, C. W. Dean, C. F. Leiten, Jr., Oak Ridge)

"Metalworking lasers" (J.F. Smith, A. Thompson, IBM)

"Control for electron-beam deflection in welding and cutting" (A. Emery, HI-G)

Afternoon

Open house, laser and electron-microscope laboratories, UC

IV. Special Public Lecture: "The invention of the electron microscope" (L. Marton, NBS)

Thursday, May 11

Morning

V-A Interference Effects, Measurements

"Interference effects in electron microscopy" (G.W. Stroke, U. Michigan)

"Fraunhofer holograms for particle sizing" (B.J. Thompson, Technical Operations Research)

"Laser alignment for Stanford 3-km accelerator" (W.B. Hermannsfeldt, M. J. Lee, J. J. Spranza, SLAC; K.R. Trigger, Applied Theory Inc.)

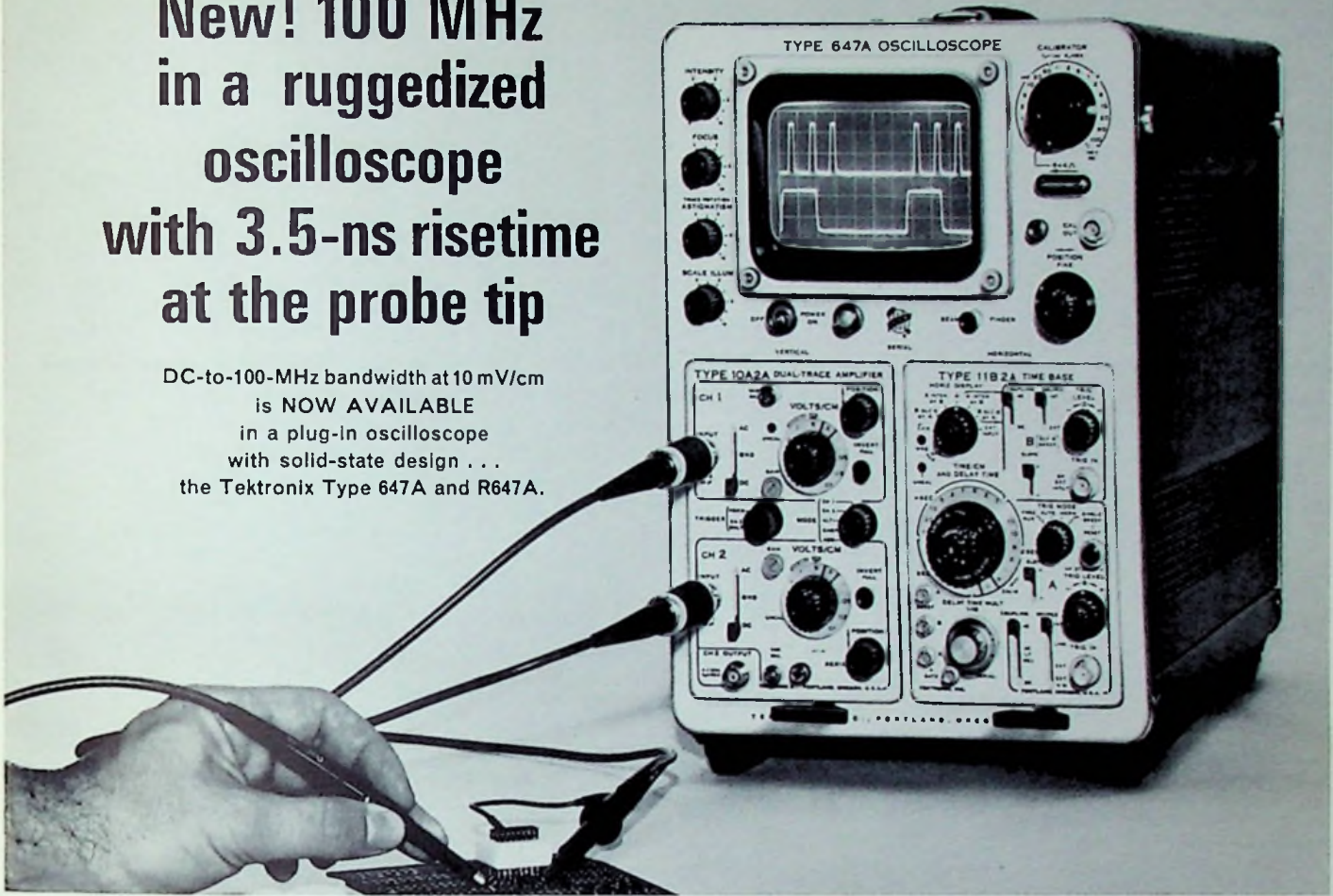
"Preliminary measurements with a laser geodimeter" (H.S. Boyne, NBS)

"Raman spectroscopy of natural products" (J.R. Scherer, USDA Western Regional Lab.)

(Continued on page 16)

New! 100 MHz in a ruggedized oscilloscope with 3.5-ns risetime at the probe tip

DC-to-100-MHz bandwidth at 10 mV/cm
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New Type 10A2A Dual Trace Amplifier. The risetime and bandwidth are specified where you use it — at the probe tip. The vertical system performance with or without the new miniature P6047 10X Attenuator Probe is DC-to-100 MHz bandwidth with 3.5-ns risetime at ambient temperatures of 0° C to +40° C (+32° F to +104° F). Bandwidth is DC-to-90 MHz with 4.1-ns risetime over its entire operating range, —30° C to +65° C. The calibrated vertical deflection range (without probe) is from 10 mV/cm to 20 V/cm.

Bright Displays. The Tektronix CRT provides bright displays with its advanced design and 14-kV accelerating potential. It has a 6-by-10 cm viewing area and a no-parallax, illuminated, internal graticule.

New Type 11B2A Delayed Sweep Time Base. The Type 11B2A triggers to above 100 MHz internally and provides a calibrated delayed sweep. Calibrated sweep range is from 100 ns/cm to 5 s/cm, extending to 10 ns/cm on both normal and delayed sweeps with X10 magnification. Calibrated sweep delay is from 1 μs to 50 s and the plug-in also provides single sweep operation.

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New Type R647A Rack Mount. The same DC-to-100 MHz performance also is available in a 7-inch-high rack mount oscilloscope, the Type R647A. Additional plug-ins include the Type 10A1 Differential Amplifier and the Type 11B1 Time Base.

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Type R647A Oscilloscope (Includes 2-P6047 Probes)	\$1625
Type 11B2A Time Base	\$ 850
Type 10A2A Dual Trace Amplifier	\$ 775

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telemetry conference
1967 EVENT IN SAN FRANCISCO

More than 80 papers will be presented in 24 sessions by 110 authors from the U.S. and abroad at the 1967 National Telemetry Conference at the San Francisco Hilton, May 16-18.

Included in the format will be an educational seminar of 3 days and 6 sessions, with a special publication being distributed at all lectures. Other highlights will be survey panels, invited sessions on state-of-the-art, management, and systems, and a \$2 million exhibit.

NTC 67—the 17th annual National Telemetry Conference—will offer many program innovations, reflecting the striking technological progress that has been achieved in telemetry.

All Major Telemetry areas—acrosspace, industrial, oceanography and biomedical.

The Aerospace telemetry timetable includes papers on state-of-the-art, data recording, adaptive techniques, systems, RF techniques and applications. Additionally, a critical survey of management problems will be presented in four papers focused on personnel, R and D, bids, subcontracts, and nursing of new technologies in large hardware systems.

During the state-of-the-art sessions, seven topical areas will be surveyed: tape recording; transmission techniques; data encoding; treatment of dynamic information; antennas; reception and decoding; and information of retrieval and presentation.

A Timely Seminar on education will also be featured at NTC 67. Subject areas to be covered include: a survey of telemetry; transducers and signal conditioning; time multiplexing; encoding techniques; modulation and detection theory and application; data management; and system techniques, stressing applications. Typical problems will be posed and analyzed during workshop periods.

In view of the tutorial format of the education sessions, but a limited number—75—can be seated. Accordingly, attendance will be limited to the first 75 reservations received.

Industrial Telemetry will be represented by symposia on data and control interface, high-speed transit operation control, oil pipeline supervisory systems, computers and telemetry networks.

Biomedical and Oceanography telemetry advancements will be discussed in four sessions.

The biomedical topics include telemetry of the newborn, miniature endoradiosondes, facilities for the blind, and tracking of fresh-water fish.

Speakers in the oceanography ses-



Lowy



Long



Towle

telemetry conference

**REGISTRATION,
EXHIBITS, FEES**

Conference Registration Hours:

Mon. May 15... 12:00 Noon-6:00 P.M.
 Tues. May 16... 8:00 A.M.-4:00 P.M.
 Wed. May 17... 8:00 A.M.-4:00 P.M.
 Thurs. May 18... 8:00 A.M.-1:00 P.M.

Exhibit Hours:

Tues. May 16... 12:00 Noon-7:00 P.M.
 Wed. May 17... 10:00 A.M.-6:00 P.M.
 Thurs. May 18... 10:00 A.M.-1:00 P.M.

Conference Fees:

Society Members \$15.00
 (AIAA-ISA-IEEE)
 Nonmembers \$20.00
 Students \$ 3.00
 Award Luncheon—May 17 \$ 5.00
 Additional copies of
 PROCEEDINGS \$10.00

Educational Seminar Fees*:

Society Members \$50.00
 Nonmembers \$75.00
 (*Attendance will be limited to 75 as
 registrations are received.)

All remittances should be made out to the order of NTC 67 and mailed to the registration chairman:

Louis Gado
 80 El Camino Real
 Mountain View, Calif. 94040

In the interest of time, preregistration is urged. Complete registration packets—including the PROCEEDINGS—will be ready for immediate pickup.

telemetry conference

1968 EVENT IN HOUSTON

The 1968 National Telemetry Conference will be held April 9-11 at the Shamrock Hilton Hotel in Houston under the sponsorship of IEEE, with AIAA, ISA and others invited to contribute to the technical program. General chairman will be F. Vinton Long, Texas Eastern Transmission Co., Shreveport, La.

sions will cover underwater acoustics, surface-to-air propagation with dipoles, and telemetry skiff.

telemetry conference

NTC/67 COMMITTEES

General chairman of the conference committee is Richard W. Towle, consultant, Los Altos Hills.

Program chairman is Max Lowy, General Electric, Philadelphia; treasurer, S. Diaz, Quantic Industries, San Carlos; and registration chairman, Louis Gado, Mountain View.

Members of the program committee are Arthur Westneat, Raytheon, Portsmouth, R. I.; Walter Frost, Marshall Space Flight Center, Huntsville; Kenneth Hall, TRW Systems, San Bernardino; Milton Berkowitz, General Electric, Philadelphia; and F. Vinton Long, Texas Eastern Transmission Co., Shreveport.

Lewis Winner, consultant, New York City, is manager of exhibits and public relations.

telemetry conference

GENERAL CHAIRMAN TOWLE

Richard W. Towle is a Senior Member of IEEE, having joined in 1948. He was program chairman for NTC '65 in Houston, and this year is pulling the show together as general chairman. He has an extensive background in telemetry and instrumentation, working through Bendix, Lockheed, Philco and most recently as engineering manager and technical director at the Advanced Technology Division of American Standard in Mountain View. He is now on his own with a small development shop.

A volunteered comment regarding active participation in professional societies shows that Mr. Towle believes that it is a responsibility of the true professional to his peers, and a tremendous opportunity to learn and grow. Young fellows take note!

telemetry conference

AWARD LUNCHEON

The Annual Luncheon will be highlighted by the traditional NTC Telemetry Man-of-the-Year award for outstanding achievements in the art.

SESSION CHAIRMEN

Session 1A: Educational Seminar/1, K. Hall, TRW Systems, San Bernardino
 Session I: State-of-the-Art/1, M. Berkowitz, General Electric Co., Phila.
 Session II: Data Recording, W. Selsted, Hewlett-Packard Co.

Session IIA: Educational Seminar/2, K. Hall, TRW Systems, San Bernardino.
 Session III: Adaptive Techniques, W. Frost, Marshall Space Flight Center, Huntsville.

Session IV: Industrial Telemetry/1, High-Speed Ground Transportation, P. J. Larsen, Office of Under Secretary of Commerce, Washington, D.C.

Session V: Industrial Telemetry/2-Panel Report, High-Speed Ground Transportation, P.J. Larsen, Office of Under Secretary of Commerce, Washington, D.C.

Session III A: Educational Seminar/3, K. Hall, TRW Systems, San Bernardino.

Session VI: Systems/1, J. Crow, Sonex, Inc., Philadelphia.

Session VII: Industrial Telemetry/3, W. J. Kantenberger, The Kantenberger Co., Dallas.

Session VIII: Telemetry Techniques, M. Lowy, General Electric Co., Phila.

Session IV A: Educational Seminar/4, K. Hall, TRW Systems, San Bernardino.

Session IX: State-of-the-Art/2, M. Berkowitz, General Electric Co., Phila.

Session X: Industrial Telemetry/4, Data Interface Standardization, J. L. Wheeler, Xerox Corp., Rochester.

Session XI: RF Techniques, N. Friedman, Rand Corp., Santa Monica.

Session V A: Educational Seminar/5, K. Hall, TRW Systems, San Bernardino.

Session XII: Biomedical Telemetry, G. B. Devey, National Science Foundation, Washington, D.C.

Session XIII: Oceanography/1, A. Westneat, Raytheon Co., Portsmouth, R.I.

Session VI A: Educational Seminar/6, K. Hall, TRW Systems, San Bernardino.

Session XIV: Systems/2, J. Keys, Lockheed Missiles & Space Co., Sunnyvale.

Session XV: Oceanography/2, R. Hill, University of Rhode Island, Kingston, R.I.

Session XVI: Management, V. Anderson, Vidar Corp., Mountain View.

For advance programs, including papers, authors, and preregistration forms, call the section office, 327-6622.

SAN FRANCISCO HILTON HOTEL

	Timetable	East Lounge Ballroom Floor	Exhibit Hall	Rosewood Rooms A-B	Ballroom A	Ballroom B	Ballroom C	Ballroom D
MONDAY, MAY 15	12:00 Noon-6:00 P.M.	Registration						
	8:00 A.M.-4:00 P.M.	Registration						
TUESDAY, MAY 16	8:00 A.M.-12:00 Noon			SES. I A Educational Seminar/1				
	9:00 A.M.-12:00 Noon				SES. I State-of-the Art/1	SES. II Data Recording		
	12:00 Noon-7:00 P.M.		NTC Exhibition					
	2:00 P.M.-4:00 P.M.			SES. II A Educational Seminar/2				
	2:00 P.M.-5:00 P.M.				SES. III Adaptive Techniques	SES. IV Industrial Telemetry/1		
	8:00 P.M.					SES. V Industrial Telemetry/2 (Panel Discussion)		
	8:00 A.M.-4:00 P.M.	Registration						
WEDNESDAY, MAY 17	8:00 A.M.-12:00 Noon			SES. III A Educational Seminar/3				
	9:00 A.M.-12:00 Noon				SES. VI Systems/1	SES. VII Industrial Telemetry/3	SES. VIII Telemetry Techniques	
	10:00 A.M.-6:00 P.M.		NTC Exhibition					
	12:15 P.M.-1:45 P.M.							Awards Luncheon
	2:00 P.M.-4:00 P.M.				SES. IV A Educational Seminar/4			
	2:00 P.M.-5:00 P.M.					SES. IX State-of-the Art/2	SES. X Industrial Telemetry/4 (Data Interface)	SES. XI RF Techniques
THURSDAY, MAY 18	8:00 A.M.-1:00 P.M.	Registration						
	8:00 A.M.-12:00 Noon			SES. VA Educational Seminar/5				
	9:00 A.M.-12:00 Noon				SES. XII Biomedical Telemetry	SES. XIII Oceanography/1		
	10:00 A.M.-1:00 P.M.		NTC Exhibition					
	1:00 P.M.-3:00 P.M.				SES. VIA Educational Seminar/6			
2:00 P.M.-5:00 P.M.					SES. XIV Systems/2	SES. XV Oceanography/2	SES. XVI Management	

NTC/67 SPONSORS

Sponsors are the American Institute of Aeronautics and Astronautics (Host Society), Instrument Society of America, and Institute of Electrical and Electronics Engineers.

THERMAL REACTORS

Harry Ongman, sales manager, advanced product operations, General Electric Co., Sunnyvale, will discuss thermal and fast reactors for atomic power plants at the May 9 meeting of the Power chapter.

The talk will describe the present trends in commercial nuclear power generation which are oriented toward the use of light water systems. These trends indicate a rate of availability of the by-product plutonium which may be determining the selection and timing of the introduction of advanced reactor systems. The introduction of fast reactors fueled with plutonium in an existing economy of water system holds promise for major savings to the nuclear power business, as it can reduce the fuel cost of the existing water systems, and the high performance fast reactors will produce electric power at lower costs than the current systems.

A graduate of the University of Illinois in chemical engineering (BS and MS), Mr. Ongman has been with the nuclear energy division of General Electric since 1957, following experience with Combustion Engineering, Inc., New York and Chattanooga and UI's engineering experiment station. He is presently working on the marketing of fast neutron spectrum reactor development programs.

meeting ahead

BART ELECTRIFICATION

Deane Aboudara, electronic and equipment design engineer, BART, will discuss BART progress in electrification and automation at the May 11 meeting of the Industry & General Applications chapter.

He will give an up-to-date presentation, with slides, of the many aspects of BART's ultra modern electrification system which represents approximately 10% of BART's total cost. These will include testing on automatic train control and fare collection, propulsion aspects and power supply problems.

Born in Los Angeles, Mr. Aboudara graduated from Santa Cruz High School and from California State Polytechnic College. He joined BART in 1964, following a career which included design work with FMC Corporation and transportation railroad and automatic material handling responsibilities with General Electric Co.

Mr. Aboudara has been a member of IEEE since 1953, is a member of many civic organizations and is a professional engineer in California, Oregon and Virginia.

MAY 9, TUESDAY, 7:30 PM — Power Thermal and Fast reactors for atomic power plants

Harry Ongman, sales manager, advanced products operations, General Electric Co.
Place: Engineers' Club of San Francisco, Hong Kong Bank Bldg., Pine & Sansome Sts.

Cocktails: 5:30 PM

Dinner: 6:30 PM

Reservations: Engineers' Club - 421-3184 by noon 5/9

MAY 11, THURSDAY, 7:30 PM — Industry & General Applications Progress report on BART re: electrification-automation, etc.

D. N. Aboudara, BART

Place: PG&E Service Center, 4801 Oakport, Oakland

No dinner

Reservations: Ruth McManus, 434-2211 ext. 239 by noon, 5/11

MAY 12, FRIDAY, 6:00 PM — Aerospace & Electronic Systems Annual steak bar-b-que and meeting for members

Tour of Paul Masson Winery, Saratoga

Dinner: 6:30 PM - Paul Masson Winery: limited capacity: members & wives only

No phone reservations: Mail checks for \$4.75 per person to J. Shrock, 430

Queens Court, Campbell, Calif. 95008 by 5/5

MAY 15, MONDAY, 8:30 PM — Nuclear Science Aerojet high temperature plasma research

John L. Hilton, Aerojet-General Corp.

Place: Villa San Ramon Restaurant, San Ramon

Dinner: 7:30 PM

Reservations: Arlene Lenzi, 837-5311, ext. 700 by 5/11

MAY 16, TUESDAY, 8:00 PM — Antennas & Propagation Tutorial lecture series on tropospheric propagation

Lecture No. 4 (final): Tropospheric earth-space effects

G. H. Keitel, chairman, EE Department, San Jose State College

Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto

Dinner: 6:00 PM, Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto

Reservations: W. K. Chang, 591-1414, ext. 223 by 5/15

MAY 16, TUESDAY, 8:00 PM — Automatic Control Traffic control systems

Merle Mason, manager, systems programming group, IBM

Place: City of San Jose traffic engineering computation center, 441 Park Ave., San Jose

Dinner: 6:30 PM, Hotel St. Claire: buffet bar, San Carlos St. (between 1st & Market, San Jose)

Reservations: none required

MAY 16, TUESDAY, 8:00 PM — Engineering in Medicine & Biology General business meeting and ELECTION OF OFFICERS: No program

Place: Room M112, Stanford Medical School

No dinner

MAY 16, TUESDAY, 8:00 PM — Magnetics Signal processing in time-varying media

Dr. B. A. Auld, Hansen Laboratories, Stanford University

Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto

No dinner

MAY 17, WEDNESDAY, 8:00 PM — Circuit Theory Design consideration for integrated complementary pair MOS switching circuits

Jerry D. Hutcheson, senior member, technical staff, Signetics Corp.

Place: University of Santa Clara engineering center, Room 551

Dinner: 6:30 PM - Lucca's, Santa Clara (across from the university)

Reservations: Mary Lou Schaffer, 739-7700 by noon 5/17

Meeting Calendar

MAY 18, THURSDAY, 7:30 PM - Vehicular Communications High isolation slot type antennas for fixed transmitters and receivers at close frequency spacings

Sidney Pickles, president, Nevada Antenna Co., Colusa, Calif.

Place: College of San Mateo, student council room, 2nd floor, student activities bldg.

Dinner: 6:30 PM - college cafeteria CSM: \$1.00 - \$1.50

Reservations: none required

MAY 23, TUESDAY, 8:00 PM - Parts, Materials & Packaging Development and applications of vacuum electronic components

Tour of laboratory facilities will follow

William W. Hicks, applications engineer, ITT Jennings, San Jose

Place: ITT Jennings, 970 McLaughlin Ave., San Jose. (Bayshore to Storey Rd., west on Storey Road to McLaughlin)

No dinner

MAY 24, WEDNESDAY, 8:00 PM - Electromagnetic Compatibility Automatic time domain transient detection and analysis

Stanley R. Schaub, consulting engineer

Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto

Dinner: 6:00 PM - Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto

Reservations: E. R. Isacson, 867-3912 by 5/22

MAY 25, THURSDAY, 8:30 PM - Information Theory The Stanford robot and other intelligent creatures

R. E. Kling, research engineer, Stanford Research Institute

N. J. Nilsson, head, artificial intelligence group, SRI

Place: SRI, 333 Ravenswood Ave., Bldg. 1, Conf. Room B

Dinner: 6:30 PM, L'Omelette, 4170 El Camino Real, Palo Alto

Reservations: Mrs. Deane Saltzman, 326-4350, ext. 4101 by May 24

MAY 26, FRIDAY, 8:00 PM - Aerospace & Electronic Systems Engineering at the crossroads

W. Prise, project leader, operations development, LMSC, Sunnyvale

ALSO ELECTION OF OFFICERS

Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto

No dinner

JUNE 5, MONDAY, 7:30 PM - Communication Technology An experimental 224 MB/S PCM System

J. M. Sipress, Bell Telephone Labs, Holmdel, New Jersey

Place: Pacific Telephone auditorium, 140 New Montgomery (between 2nd & 3rd Sts. San Francisco)

No host cocktails 5:30

Dinner: 6:00 PM, Iron Horse, 19 Maiden Lane, San Francisco: choice of entrees: chicken bonne femme \$4.35 or beef stroganoff \$4.50 (plus tip)

Reservations: Robert Howland, (408) 291-4039; George Griffith (415) 591-8461, ext. 525, or Ed Combs, 397-1471 by noon 6/5

JUNE 7, WEDNESDAY, 8:00 PM - San Francisco Section/All Subsections and Chapters, ladies night

Lasers in medicine

FH. Christian Zweng, M. D., research associate, Palo Alto Medical Research Foundation; staff member Palo Alto Clinic; assistant clinical professor, Stanford University Medical Center

Place: The Bold Knight, 769 No. Mathilda Ave., Sunnyvale (2 blocks west of Bayshore)

Social hour: 6:00 PM (refreshments 65¢)

Dinner: 7:00 PM - roast sirloin of beef, \$4.50 incl. tax & tip

Reservations: Mrs. Jean Helmke, Section Office, 327-6622 by June 5

Tables of six or more may be reserved for Subsections, Chapters, Committees and Companies

meeting ahead

PLASMA RESEARCH

John L. Hilton, a principal physicist at the San Ramon research operation of the Aerojet-General Corp. (formerly the research division of Aerojet-General Nucleonics) will discuss that organization's high temperature plasma research at the May 15 meeting of the Nuclear Science chapter.

Mr. Hilton will describe the work being done on the adiabatic mirror-cusp machine. This experiment, which is in the final stages of construction, has as its goal the achievement of a stable high temperature plasma. The long-term objective is the utilization of thermonuclear power for propulsion and power producing systems in space. Mr. Hilton will discuss the design and engineering of the 200 ma ion source, the 600 kv neutral injection system, and the cryogenic magnetic bottle.

The talk will be followed by a tour of the nearby Aerojet Research Laboratories.

The speaker is head of the injection group of the high temperature plasma program. As such he has responsibility for ion source development and the 600 kv injection accelerator. He has been with Aerojet for 10 years.



Hilton

Mason

meeting ahead

1800 TRAFFIC CONTROL

Merle Mason, advisory programmer in IBM's industry development group, will discuss the 1800 traffic control system at the May 16 meeting of the Automatic Control chapter.

The discussion will be directed at the surveillance, decision, execution, verification, and evaluation aspects of a traffic system controlled by a digital computer. It will also include a description of the physical layout of the San Jose system and an on-line demonstration on the streets of San Jose.

Mr. Mason joined IBM in 1957 as a methods programmer after spending two years with the Atomic Energy Commission as a scientific programmer. In 1960 he joined the 1710 systems programming group and became manager of this group in 1962. In 1964 he began working with the IBM-San Jose traffic study team and this past summer he installed the 1800 traffic system in Wichita Falls, Texas.

remarks from the chairs
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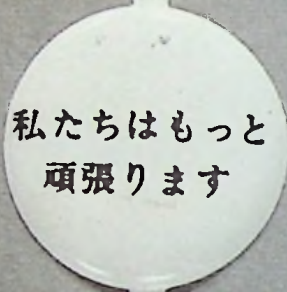
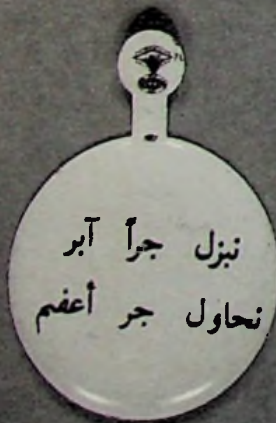
Although the San Francisco Section is the largest section of IEEE, the Los Angeles Council, made up of twelve small sections, is the largest entity of IEEE. Members will recall the 1966 membership campaign conducted throughout IEEE, the results of which, recently received, show that the San Francisco Section had the largest numerical net gain of membership within the institute—532—while the LA Council gained only 248. Through the good work of the 117-man Membership Committee, the subsections, the chapters and the members at large, Number 2 obviously tried harder!

We hope you'll keep up the good work during 1967. Newly-designed application forms just received should make it easier for you to sign up IEEE members and Group members and encourage present members to upgrade their membership. These last two areas—more Group memberships and upgrading present memberships—are particularly important for the institute, the section and the individual member, for here lie the greatest stability of membership and the most benefits of membership.

For our part, we will continue to investigate every area of increased service to the membership through encouraging the formation of new chapters in your fields and assisting their operation in every way we can.

JOHN B. DAMONTE, *Chairman*
 Membership Committee

E. H. HULSE, *Chairman*
 San Francisco Section



Auld



Hutcheson

meeting ahead

SIGNAL PROCESSING

Dr. B. A. Auld, W. W. Hansen Laboratories of Physics, Stanford, will discuss signal processing in time-varying media at the May 16 meeting of the Magnetics chapter.

During the past decade, time-varying media have been intensively exploited in the development of low noise parametric amplifiers. More recently, various methods have been proposed for using such media to transform and process signals, and have been demonstrated experimentally. Some of these methods involve Bragg scattering of light from acoustic waves in liquids and solids. Modulation, frequency translation and switching can be achieved by using this mechanism. In this talk, methods will be described for realizing these, and other, signal processing functions in time-varying magnetic media. General principles of signal transformation in time-varying media will be outlined, and will be outlined by some recently reported experiments of frequency translation, signal gating and pulse chirping.

meeting ahead

TROPOSPHERIC EFFECTS

Dr. G. H. Keitel, chairman of the department of electrical engineering, San Jose State College, will discuss the effects of the troposphere on propagation between earth and space terminals at the May 16 meeting of the Antennas and Propagation chapter.

This lecture, the fourth and final lecture in the tutorial series on tropospheric propagation, will cover refraction in the troposphere, angular tracking errors, range errors, range rate errors, Doppler errors, attenuation, and scintillations. These effects will be related to the geometry of the earth-space path and the characteristics of the troposphere. Methods of reducing the errors in observational data will also be discussed.

Dr. Keitel joined the faculty of San Jose State in 1962 and during the 1963-4 academic year was on leave to serve as liaison scientist for electronics with the London branch office of the U.S. Office of Naval Research.

... courtesy of Avis

MOS SWITCHING CIRCUITS

Jerry D. Hutcheson, senior member of the technical staff of Signetics Corp., Sunnyvale, will discuss design considerations for integrated complementary pair MOS switching circuits at the May 17 meeting of the Circuit Theory chapter.

Integrated complementary pair MOS switching circuits make use of both n-channel and p-channel MOS field-effect transistors that are not only fabricated upon the same substrate, but by the same process. This process will favor one type of transistor at some places and at other places will favor the opposite one. The net result is an integrated complementary pair with mismatched components. This mis-matching introduces undesirable operating characteristics because ideal complementary pair circuits require matched components. The salient switching characteristics degrade rapidly as mismatching increases, the turn-on characteristics of the pair are determined by one transistor but the turn-off characteristics are determined by its complement transistor. However, it is usually possible to obtain reasonably matched operating conditions with these mismatched complementary components if cognizance is taken of both the operating conditions as well as the fabrication design conditions. These overall design requirements, when taken together, establish the design and performance criteria of integrated complementary pair MOS switching circuits.

This presentation centers around these design and performance criteria, how they are established, and what their significance is to both the circuit designer as well as the process engineer.

BIOMEDICAL GROUP

The Engineering in Medicine & Biology chapter will hold a business meeting at 8 p.m. on May 16 in Rm. M112 of the Stanford Medical School.

The program will consist of a general membership discussion of chapter business and an election of new officers. In addition officers would like to hear from members of the audience as to their particular bioengineering activities.

AEROSPACE BARBECUE

The Aerospace & Electronic Systems chapter will have its annual steak barbecue and meeting, limited to members of the Group, at the Paul Masson Winery in Saratoga on May 12. Checks for \$4.75 per person should be mailed to J. Shrock, 430 Queens Court, Campbell, 95008 by May 5.

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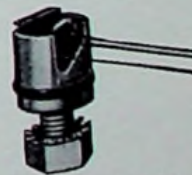


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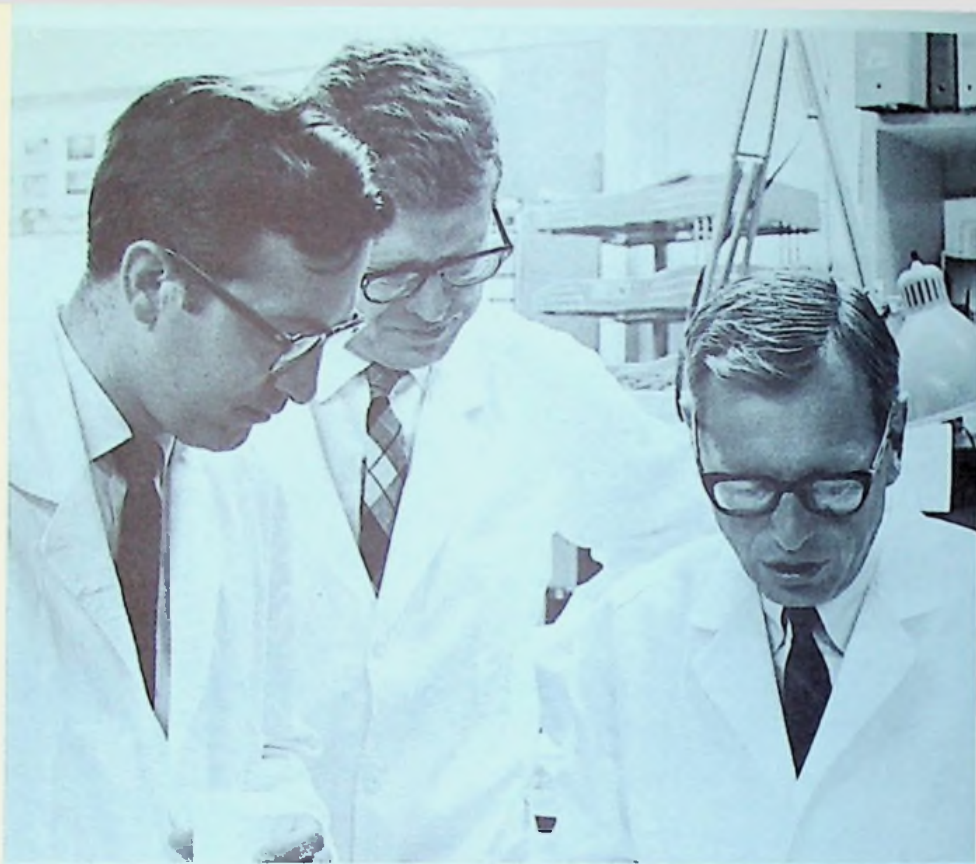
SECTION ANNUAL MEETING

Dr. H. Christian Zweng, Palo Alto ophthalmologist who made the first West Coast clinical application of the laser in repairing a detached retina by photocoagulation, will be the principal speaker at the annual meeting of the San Francisco Section on Wednesday, June 7 at the Bold Knight, Sunnyvale.

Dr. Zweng, who has performed the unique operation as many times as any doctor in the world, will discuss lasers in medicine. A research associate of the Palo Alto Medical Research Foundation, staff member of the Palo Alto Clinic, and assistant clinical professor at the Stanford University School of Medicine, he is engaged in two major medical laser research projects in cooperation with the Stanford Research Institute. The first resulted from a National Institutes of Health grant to Stanford University School of Medicine in the amount of \$246,000 for experiments being carried out by SRI in laser equipment to study the effects of various lasers on eye tissues in order to develop clinical instrumentation. The second is a \$140,000 Air Force sponsored program contracted to SRI for studying thresholds of eye damage in order to set safety standards for field use of lasers. Both projects are being carried out jointly by Dr. Zweng and Dr. Richard C. Honey, manager, electromagnetic techniques laboratory, SRI. Other medical participants are Dr. Milton Flocks, Dr. Robert Peabody, and Dr. Robert C. Rosan.

Since the enunciation of the laser principle in 1958, and the demonstration of its feasibility in 1960, physicians have been speculating on the use of this unique light source in the care of patients. Since photocoagulation of ocular tissues had been made a clinical reality in the 1950's, using an incoherent white light source, it was natural that laser light would be first applied to eye problems.

The use of the laser to seal off retinal holes and tears, to prevent retinal detachment, is well established. The usefulness of laser light to treat certain changes seen in the retina in diabetes is under intensive investigation and gives considerable promise. The treatment with laser light of a number of eye diseases, all of which give a collection of tissue fluid (edema) in the center of the macula, thereby endangering reading vision, is also receiving intensive investigation and shows the greatest promise of any means of treatment in these difficult and threatening problems. The treatment of ocular tumors with laser light is also being investigated; heretofore the lasers used



Dr. Arthur Vassiliadis, senior research engineer, electromagnetic techniques laboratory, SRI, and Dr. Richard C. Honey, laboratory manager, confer with Dr. Zweng. Other laboratory personnel on the projects are Norman Peppers, Zev Pressman, and Miss Ann Hammond

in the ocular field have not had sufficient power to modify such tumors.

The use of laser energy for the treatment of certain skin problems, such as removal of tattoos has been shown to be feasible. The use of laser energy in the treatment of general malignancies is currently under intensive investigation, especially at the National Cancer Hospital in Bethesda, Maryland. One entire operating room has been modified to receive fairly high-powered ruby lasers to treat visceral cancers.

The use of laser light in all medical therapeutics is in a highly investigative and fluid phase. It would be surprising if this unique form of light did not offer some unique advantages.

Professor John R. Whinnery, winner of the Education Medal, will be honored at the event.

The annual meeting will also honor newly-elected officers of the section, subsections and chapters, as well as the 1967 Fellows of the section, who will be presented their diplomas. Special seating will be arranged for past chairmen of the section and incoming chairmen of subsections and chapters.

Tables of six or more may be reserved for subsections, chapters, committees or companies. Reservations at \$4.50, should be made by calling Mrs. Helmke in the section office not later than June 5.

meeting ahead

STANFORD ROBOT

R. E. Kling and N. J. Nilsson of Stanford Research Institute will speak at the May 25 meeting of the Information Theory chapter.

The artificial intelligence group at SRI is developing a mobile robot to perform simple tasks in real environment. To function properly it must integrate its perceptual and (pattern recognition) cognizance (model building and problem solving) abilities with its motor functions. Such a synthesis has never been realized before and is a crucial step in the development of mechanical creatures which will perform independent tasks.

Mr. Kling received a BS from Columbia in electrical engineering and an MS from Stanford and is currently completing doctoral work at Stanford. He has worked on microwave systems, concept formation and is currently studying means for artificial systems to reason by analogy.

Dr. Nilsson received his MS in electrical engineering from Stanford in 1956 and his Ph.D. in 1958, also in electrical engineering. After a tour of duty in the Air Force at Rome Air Development Center, he joined Stanford Research Institute where he is now head of the artificial intelligence group.

COMTECH SPEAKER FROM BELL

Dr. J. M. Sipress, Bell Telephone Laboratories, Holmdel, New Jersey, will describe an experimental 224/MB/S PCM system at the June 5 meeting of the Communication Technology chapter.

An experimental 224/MB/S digital transmission system has been developed for digitized speech, television and data. This system includes:

- Terminals to pulse code modulate television and frequency multiplexed mastergroups of voice channels;
- A time division multiplex to combine lower speed pulse streams into a 224 MB/S stream; and
- A transmission line using regenerative repeaters to operate over coaxial cable.

The fundamentals of digital transmission will first be reviewed. Then, the experimental system will be discussed with emphasis on the basic design considerations. Finally, possibilities for incorporating a high-speed digital system into the Bell system plant will be considered.

Jack M. Sipress, supervisor of the PCM transmission studies group at Bell Laboratories, received the BEE, MEE and DEE degrees from the Polytechnic Institute of Brooklyn in 1956, 1957 and 1961, respectively.

ANTENNAS FOR VC

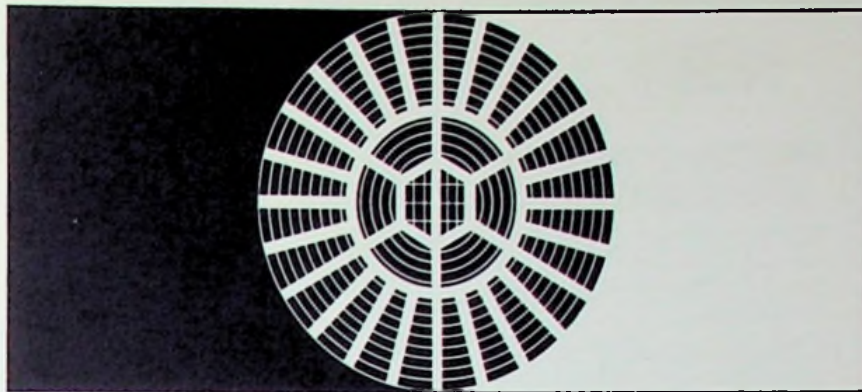
Sidney Pickles, president, Nevada Antenna Co., Colusa, will discuss high isolation slot-type antennas for fixed transmitters and receivers at close frequency spacings at the May 18 meeting of the Vehicular Communications chapter.

In 1931, Sidney Pickles was graduated from Stanford University with a B.S. in physics followed by the degree of electrical engineer in 1933.

He spent fifteen years in IT&T system associates such as Mackay Radio and the Federal Telephone and Radio Laboratories. The primary activity in these years was in the field of radio aids to air navigation. During this period about thirty patents were issued in his name, the azimuth portion of TACAN being among them.

In 1955 he decided to found his own company, the Nevada Antenna Co. This activity was moved from Nevada to Colusa, California. It is located on the edge of the Colusa County airport to facilitate continued development in the radio aids field, with particular emphasis on TACAN.

Other activities have had to do with forward scattering arrays, and a ruggedized and inductively heated antenna.



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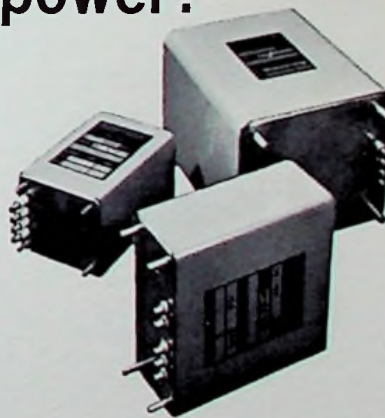


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meeting ahead

TRANSIENT INTERFERENCE

At the May 24 meeting of the Electromagnetic Compatibility chapter Stanley R. Schaub, a consulting engineer in the field of automatic test equipment and high speed data processing, will discuss and demonstrate equipment recently developed for automatic time domain detection and analysis of transient interference in complex electronic systems.

Three standard methods are currently in use for detecting transient phenomena: oscilloscopes, high speed tape recorders, and NFI meters. Unfortunately these methods have not proven satisfactory for long duration system compatibility tests.

Mr. Schaub and his associates have developed an instrumentation system capable of detecting high speed transients at many test points, automatically analyzing them, storing the data on a single channel of a slow moving magnetic tape, and displaying the information in a simple readout form immediately after the test. The data include transient time of occurrence, polarity, amplitude, width maximum rate of rise, and energy. Transients can be detected with rise times as short as 100 nsec.

Mr. Schaub's prime interests lie in solving the unique problems associated with EMC/EMI testing. Prior to his current endeavors he was a staff engineer on Project Surveyor at Hughes Aircraft Co. Prior to this he was associated with TRW on a variety of space projects. He has been intimately involved with system compatibility testing for a number of years.

MORE BEAM SYMPOSIUM

the second day on the Berkeley campus, by Dr. L. Marton of the National Bureau of Standards in Washington. He will speak on "The Invention of the Electron Microscope" at 3 p.m.

Registration materials and other meeting information may be obtained by writing to Prof. Charles Susskind, Electrical Engineering, University of California, Berkeley, CA 94720. Advanced registration will open at 5 p.m., Monday, May 8, at the Claremont. The \$30 registration fee includes admission, a hardbound record of the symposium, 1 ticket for the banquet, coffee breaks, and a book of abstracts.

meeting ahead

EE AT THE CROSSROADS

A talk by Walter J. Prise—"Engineering at the Crossroads"—and election of officers will be features of the May 24 meeting of the Aerospace & Electronic Systems chapter.

Mr. Prise, project leader, operations development, Lockheed Missiles & Space Co., Sunnyvale, has engaged in highly diversified areas of engineering in his 25 years in the field, including design and construction of submarine tenders for the U.S. Navy, power plants in this country and abroad, and steel mills in India. He has also participated in the development of radar and other electronic equipment and was associated with electrical and electronic design of Polaris and Poseidon missiles and special programs in development of micro-electronic devices and advanced circuit packaging methods. He has presented and published more than 60 technical papers.

Formerly associated with Kaiser Engineers, Moore Dry Dock Co., Raytheon, Consolidated Copper and Steel and other firms, he is a past chairman of the San Francisco chapter of the IEEE Professional Group on Military Electronics (now merged into AES).

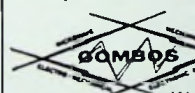
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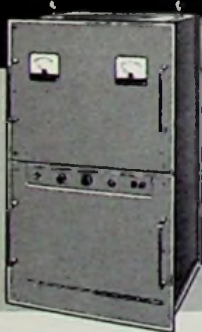
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"Anthropods as experimental media for laser investigations" (R.W. Kobylnyk, W.H.A. Wilde, U. of Guelph)

"Ruby laser micro-irradiation of single tissue culture cells" (R. Storb, U. Washington; R.L. Amy, R.K. Wertz, M. Bessis, Hopital de Bicetre, Paris)

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