

EDITOR'S PROFILE of this issue

from a historical perspective ...

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

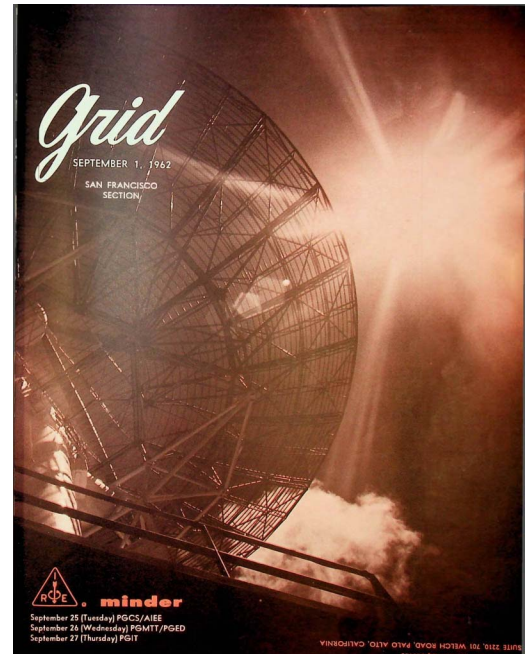
September, 1962:

Cover: A missile launches a satellite while a telemetry ground station antenna tracks it. The meeting of a joint AIEE/IRE chapter this month is a step on the way toward the merger between these two groups to form the IEEE. The meeting is profiled on page 8, with more telemetry information on page 9 (covering the Mariner R satellite, being launched to Venus after failures of the 1,100-pound Mariner's Centaur launch system).

Page 6: The merger is complete! Some 63% of IRE members voted (an amazing response!), and 87 percent were in favor of the merger. For the AIEE, 61.5% of the members voted, and it passed with 86.4% favorability.

Page 8: The Sixth National Product Engineering and Production Conference (which will be combined into the Electronic Components and Technology Conference, under the Electronics Packaging Society) is held in S.F. Bernie Oliver (who was a key to starting this IRE Group, at HP in Palo Alto) is the lunch speaker.

Page 14: Jim Gabbard is vice-chair of the Broadcasting chapter. I remember his experimental broadcasts of stereo FM, which we would listen to in our dorm at Stanford. The steam locomotive would approach from the left, getting louder, then cross in front of us and recede to the right. I had a "phase control" on the front panel of my Heathkit FM receiver that I'd adjust for maximum channel separation. Impressive!



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

Grid

SEPTEMBER 1, 1962

SAN FRANCISCO
SECTION



minder

September 25 (Tuesday) PGCS/AIEE
September 26 (Wednesday) PGMTT/PGED
September 27 (Thursday) PGIT

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Model 5211A has gate times of 0.1 and 1 second. Model 5211B has an additional gate time of 10 seconds. Otherwise, the instruments are identical. A storage feature, which can be disabled by a rear-panel switch, provides a continuous display, each reading held on the 4-digit neon columnar readout until the count itself changes. The counters provide a 1-2-2-4 BCD code output for systems use or recording devices. Manual gate allows the 5211 counters to be controlled by the front panel, or be operated remotely by contact closure or suitable pulses.

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Input sensitivity: 0.1 v rms sine wave

Temperature range: -20 to 50°C

Time base: 50 or 60 cps power line

Manual gate: Controlled by front panel function switch, by external contact closure, or by 3 volt peak positive pulses at least 10 μsec wide at half amplitude point.

Frequency measurement: 2 cps to 300 KC; accuracy ± 1 count, \pm time base accuracy

Ratio measurement: Reads: (f_1/f_2)

Range: f_1 : 2 cps to 300 KC (0.1 v rms)

f_2 : 100 cps to 300 KC (1 v rms into 1000 ohms)

Accuracy: ± 1 count of f_1 , \pm trigger error of f_2

Dimensions: 16 $\frac{3}{4}$ " wide x 3 $\frac{1}{2}$ " high x 11 $\frac{1}{2}$ " deep, 10 lbs.

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Passband—dc to 10 Mc at 3-db down.

Displays—single trace, dual trace, or algebraic addition.
6-cm linear scan.

Sensitivity—10 mv/cm to 10 v/cm in 10 calibrated steps, 1-2-5 sequence.
Variable sensitivity between steps.

No Signal delay.

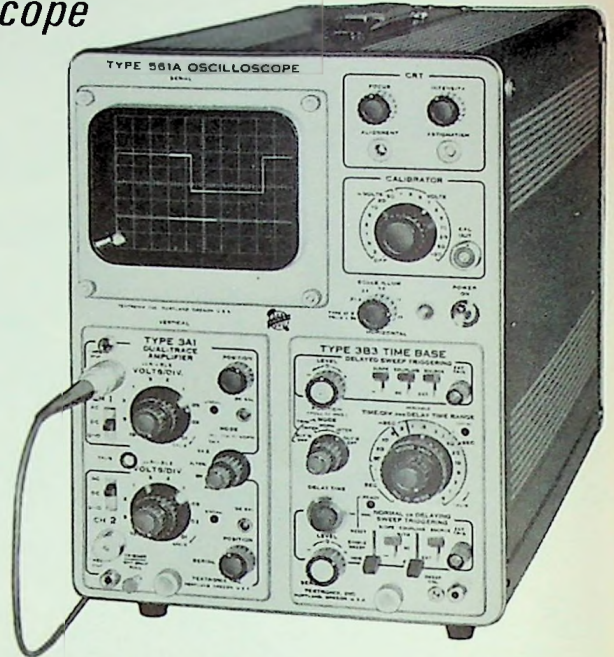
Type 3B3 Time-Base Unit

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TYPE 561A OSCILLOSCOPE (without plug-ins)	\$470
TYPE 3A1 DUAL-TRACE AMPLIFIER UNIT	\$410
TYPE 3B1 TIME-BASE UNIT	\$475
TYPE 3B3 TIME-BASE UNIT	\$525

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AMPLIFIER UNITS TYPE	PASSBAND (3-db down)	SENSITIVITY	PRICE	TIME-BASE UNITS TYPE	SWEEP FEATURES	TRIGGERING	PRICE
2A60	dc-1 Mc.	50 mv/cm-50 v/cm 4 decade steps with variable control.	\$105	2B67	1 μ sec/cm to 5 sec/cm, 1-2-5 sequence, variable between rates. 5X Magnifier. Single Sweep.	Internal, External, Line; Amplitude-Level Selection; AC or DC- Coupling; Automatic or Free-Run; \pm Slope.	\$175
2A63-Differential (50:1 rejection ratio)	dc-300 kc.	1 mv/cm-20 v/cm 1-2-5 sequence with variable control.	\$130				
3A72-Dual Trace (Identical Channels)	dc-650 kc. (each channel).	10 mv/cm-20 v/cm, 1-2-5 sequence, with variable control.	\$250	3T77 Sampling Sweep (for use with 3S76)	Equivalent to 0.2 nsec/cm to 10 μ sec/cm, 1-2-5 sequence, variable between rates. 10X Magnifier.	Internal or External, \pm Slope.	\$650
3A74-Four Trace (Identical Channels)	dc-2 Mc (each channel).	20 mv/cm-10 v/cm, 1-2-5 sequence, with variable control.	\$550				
3A75-Wide Band	dc-4 Mc.	50 mv/cm-20 v/cm, 1-2-5 sequence, with variable control.	\$175				
3S76-Dual Trace Sampling (for use with 3T77)	equivalent dc-to-875 Mc. (0.4-nsec risetime)	2 mv/cm-200 mv/cm, 1-2-5 sequence, with variable control.	\$1100				

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Grid

September 1, 1962

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EXECUTIVE EDITOR:
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cover

At the dramatic moment of blast-off, beautifully caught here by a Lockheed Missiles and Space Company photographer, telemetry takes over to accomplish the basic tracking station functions of vehicle tracking, vehicle and experimental data reception and recording, and satellite command and control. For the Air Force satellite program, utilizing the Lockheed Agena, stations are located at Vandenberg AFB; Kaena Point,

Hawaii; Kodiak, Alaska; and New Boston, N.H.

Telemetry and data sampling are the subjects of the first IRE/AIEE jointly sponsored meeting, first of many in the program year, being encouraged by section officers of both groups to effect the coming merger on the section level. For more details see the Calendar of Events and the story on page 8

section officers

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Vice Chairman—Charles Süsskind
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MEETING CALENDAR

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Grid reporters

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BROADCASTING: BEN WOLFE, KPIX-TV

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COMMUNICATIONS SYSTEMS: MAURICE H. KEBBY, LENKURT ELECTRIC COMPANY

CIRCUIT THEORY: R. E. KIESSLING, IIT LABORATORIES

ELECTRON DEVICES: MAHLON FISCHER, SYLVANIA, MICROWAVE DEVICE DIVISION

ELECTRONIC COMPUTERS: WILLIAM DAVIDOW, GENERAL ELECTRIC COMPUTER LABORATORY

ENGINEERING MANAGEMENT: LEONARD M. JEFFERS, SYLVANIA E. D. L.

ENGINEERING WRITING AND SPEECH: DOUGLAS WM. DUPEN, ASSOCIATED TECHDATA INC.

INFORMATION THEORY: CHARLES H. DAWSON, PHILCO W. D. L.

INSTRUMENTATION: JAMES HUSSEY, GENERAL RADIO COMPANY

MICROWAVE THEORY AND TECHNIQUES: ROBERT J. PRICKETT, HEWLETT-PACKARD CO.

MILITARY ELECTRONICS: J. WEITSTEIN, LOCKHEED

PRODUCT ENGINEERING AND PRODUCTION: W. DALE FULLER, LOCKHEED

RADIO FREQUENCY INTERFERENCE: JOHN W. WATTENBARGER, SIERRA ELECTRONICS CORPORATION

RELIABILITY AND QUALITY CONTROL: W. WAHRHAFTIG, PHILCO CORPORATION

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Communication Systems

7:30 P.M. • Tuesday, September 25

(Joint meeting with Communications Division, SFS AIEE)

"Sampled Data Telemetry for Satellite Applications"

Speaker: Cecil M. Kortman, Group Leader, Telecommunications Dept., Lockheed Missiles and Space Co., Palo Alto

Place: Engineer's Club, 16th Floor, 206 Sansome Street, San Francisco

Reservations: None required

Electron Devices

8:00 P.M. • Wednesday, September 26

(Joint meeting with PGMTT, see below)

Information Theory

8:00 P.M. • Thursday, September 27

"Data Communication Through Binary Superposition Channels"

Speaker: William H. Kautz, Senior Research Engineer, Stanford Research Institute

Place: Philco Auditorium, Building 56, Fabian Way, Palo Alto

Dinner: 6:00 P.M., Sakura Gardens, 2226 N. El Camino Real, Mountain View

Reservations: Mrs. Saltzman, DA 6-4350, Ext. 4101

Microwave Theory & Techniques

8:00 P.M. • Wednesday, September 26

(Joint Meeting with PGED)

"Microwave Modulation and Demodulation of Light"

Speaker: Prof. A. E. Siegman, Stanford University

Place: Physics Lecture Hall, Stanford

Dinner: 6:00 P.M., the Red Shack Hofbrau, 4085 El Camino Way, Palo Alto

Reservations: DA 4-0631

how goes the merger?

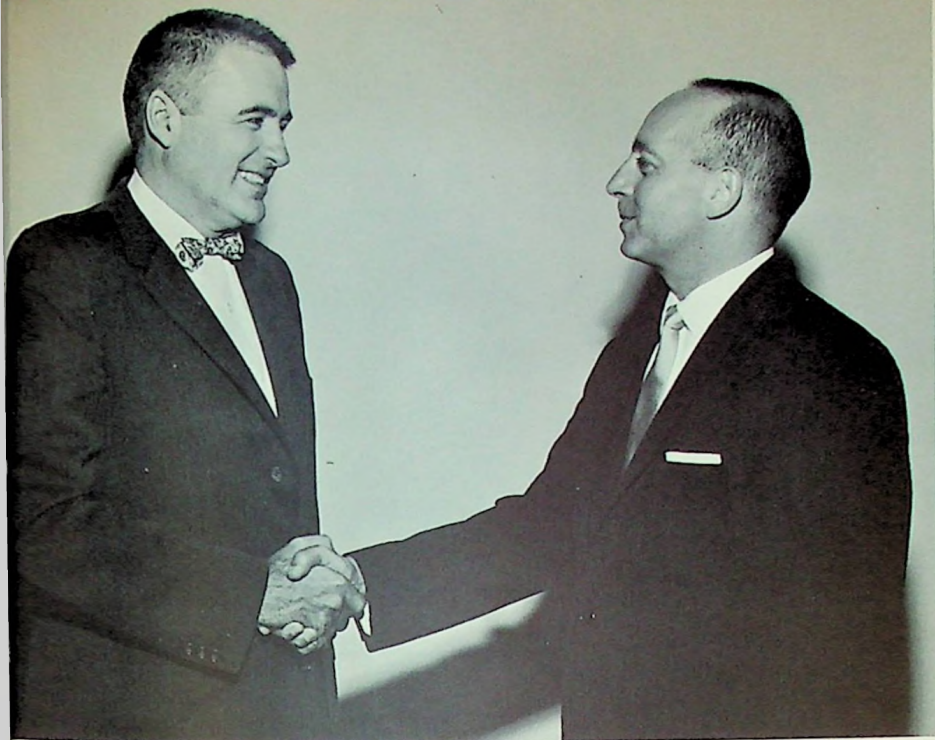
REPORT FROM NATIONAL PRESIDENT

On July 10 at IRE Headquarters in a special historic meeting, IRE members, present in person and by proxy, voted overwhelmingly in favor of the proposed consolidation of IRE and AIEE. Approximately 63 percent of all eligible voting members actually voted, either in person or by proxy. This is by far the greatest percentage of our eligible members ever to take part in an election, and it is both gratifying and evidence of the strong interest of our members in this important matter. Of all those voting, 87 percent voted affirmatively with respect to the merger with the AIEE.

At their regular Annual Meeting in Denver on June 18, 61.5 percent of the AIEE members eligible to vote did so and 86.4 percent of them voted in favor of the merger. These almost identical results within the two societies certainly confirm a mutual

feeling of agreement on the desirability of consolidation.

While the percentage of total members voting in person or by proxy was very large, there were actually only 29 members present at the special meeting in person. Among those present were Senior Members Joseph Baer and Kerim Onder, who represented the minority negative opinion with respect to the merger. Their statements were thoughtful and well expressed and bore particularly on their feelings that the total time allotted for discussion by the membership was inadequate. Feeling as I have that consolidation of IRE and AIEE is in the best interests of the profession, I am, of course, gratified at the overwhelmingly affirmative vote of our membership. At the same time, I am especially grateful to all IRE members, including those who



Peter Lacy, 1962-63 Chairman

Stanley F. Kaisel, 1961-62 Chairman

remarks from the chair

This will be a year with major changes in our national and local organization. The national merger of the AIEE and IRE will become effective in January, while the local section organizations will be allowed some additional time. Our semimonthly **Grid** publication schedule will be put to good use in keeping the section membership informed.

Merger activities will certainly not diminish our other activities. A new plan for general section meetings is being tried. Six technical meetings will be arranged, each by a different Professional Group Chapter. This should provide

a strong general-interest program series with outstanding speakers on topics of wide interest. You will get more on this later from Charles Süsskind, Vice-Chairman and Program Committee Chairman.

Continued strong activity by committees — membership, historical, awards, education and student relations (college), and secondary education (high school)—will be seen during the coming year.

Section and **Grid** activities are now combined in a single location and this will provide an efficient central clearing house for all section matters.

Returning to the AIEE/IRE

merger activities, Stan Kaisel will head our consolidation efforts. I have met with Vic Kaste, AIEE Section Chairman, and we are proceeding on certain combined efforts prior to section consolidation. The first such effort will be a single education and student relations committee to deal with the college chapters. Most of these chapters in the section area are joint AIEE/IRE in form now, so we will be consolidating this activity at the section committee level.

Joint technical and general meetings will be planned with the AIEE when possible this coming year. The two program committees will maintain close contact during the year to carry out this plan. A combined annual meeting is contemplated for June, 1963, whether or not complete section consolidation has been accomplished by that time.

The enlargement of the scopes and circulations of the **Grid** and **Grid-Bulletin** to include AIEE membership is now being discussed. This would add new incentive and support to our vigorous publications, as well as increasing the flow of information among all Bay Area and Seventh Region members of IRE and AIEE, future partners in IEEE.

Peter Lacy, Chairman,
San Francisco Section

viewed the merger negatively, who took the time and effort to express their opinions on the question of consolidation and to make suggestions on how either IRE or the consolidated society could be more effective. Even though Messrs. Baer and Onder undoubtedly felt they would find themselves in a small minority, they had sufficient interest in IRE and dedication to their profession to attend the special meeting and express forcefully their views and those of others who voted negatively. We especially appreciated their being present.

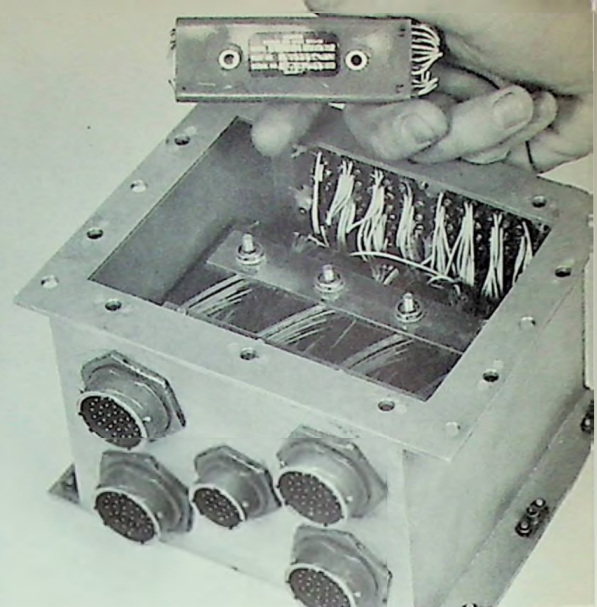
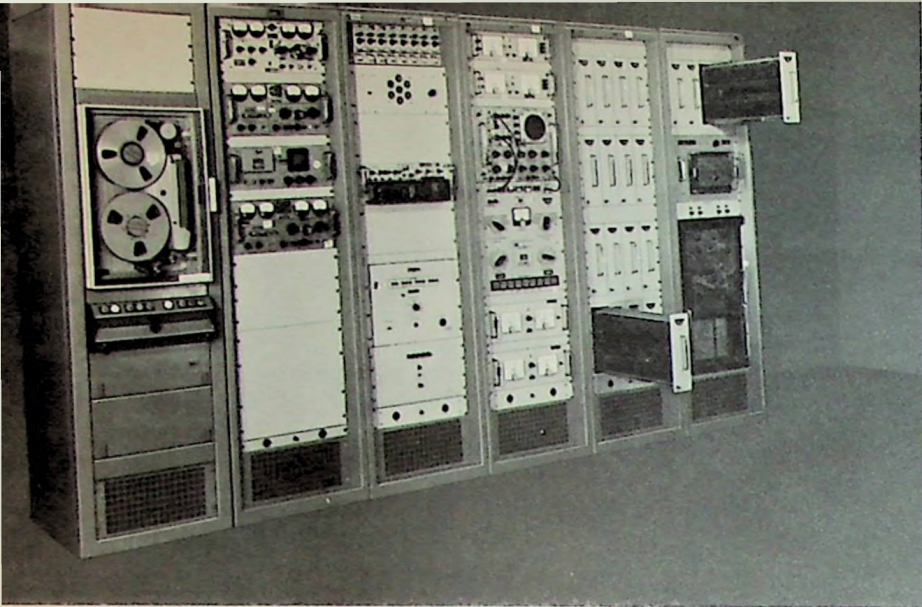
The 14-man Joint Committee has been appointed, including, of course, the original eight-man Joint Committee.

Important initial duties of this committee include the recommendation of a general manager and a slate of officers and directors of the IEEE to the two Boards of Directors for subsequent presentation to the two memberships. Excellent progress is being made, and we hope to submit the slate of officers and directors to our memberships for vote in early September.

I know that all of you are anxious for guidance in the matter of meeting with your AIEE counterparts to discuss the best way to effect consolidation. You will receive recommendations within the next few months.

I want to thank all Section officers for their cooperation in arranging to have the question of consolidation discussed within the Section. I know we can count on a smooth and speedy transition to a new and even better IEEE.

P. E. HAGGERTY
PRESIDENT



meeting ahead

SAMPLING DATA FROM SPACE

Leading off a program year which, if IRE and AIEE section officers have their way, will see many jointly sponsored IRE/AIEE meetings both to make effective the coming merger on a section level and reduce the total number of meeting demands made on the two memberships, will be a September 25 meeting at the Engineer's Club, 16th Floor, 206 Sansome Street, San Francisco.

Under joint sponsorship of the Professional Group on Communication Systems and the Communications Division of AIEE, the speaker will be Cecil M. Kortman, a senior member of IRE and group leader of the telecommunications department of Lockheed Missiles and Space Company at its Palo Alto facilities.

"Sampled Data Telemetry for Satellite Applications" will be his subject, the meeting lasting from 7:30 to 9:00 p.m.

As acting leader of the subcarrier development group, Mr. Kortman is responsible for the design and development of telemetering subcarrier oscillators utilized in data sampling in such ground-station equipment as that seen above, a highly refined weld-stick version of the space hardware he works with, highly compact compared to its forbears, being seen in close-up at right.

A 1950 graduate of George Washington University in electrical engi-

neering, the speaker is a veteran of U.S. Army Air Corps and Signal Corps communications, where he worked on IFF, both ground and airborne. With the National Bureau of Standards, 1947-51, he did research and development on improved primary standards of frequency and time in the high frequency standards section.

With Chance Vought Aircraft Co., 1951-52, he engaged in system study and design of missile guidance components as a member of the electronic design group. With Bendix Aviation Corp., 1952-56, he worked on telemetering systems and components, ground-station subcarrier discriminators, and applications of transistors to telemetering components. He has been with Lockheed since 1956.

A variety of sampled data telemetry systems have been developed and successfully flown since 1957, according to Mr. Kortman. They have ranged from a low-power, narrow-bandwidth system operating at one sample per second to several high-capacity systems operating at sampling rates as high as 40,000 samples per second.

Important features of the systems are: maximum data-handling capability in minimum bandwidth; accuracy consistent with the instrumentation requirement; flexibility and versatility; and reliability.

meeting ahead

PEP

Details on the topics to be covered during the four sessions at the Sixth National Conference on Product Engineering and Production to be held in San Francisco on November 1 and 2 have been released by George Reyling, program chairman.

One of the speakers for the session on "Processes and Equipment for the Special Problems of Small Lot Production" will be L. B. Stearns, president of Chemical and Aerospace Products, Inc., of Gardena, California. Mr. Stearns will discuss chemical milling for making lightweight, difficult-to-machine parts, chemical blanking for the production of close tolerance detail parts from thin or exotic metals, and chemical etching of preformed circuitry. Other subjects to be covered during this opening session of the Conference will be vacuum deposition techniques, miniature mechanical counter-parts to microelectronic circuitry and particle identification, and techniques for control of clean areas.

The second session will consist of a "Survey of Interconnection Techniques." Dr. L. Pessel, with RCA's Central Engineering, Defense Electronics Products, in Camden, New Jersey, will talk on the reliability of soldered connections from the viewpoint of the important parameter of solderability of the surfaces to be joined. An entirely new test will be described which is rapid, simple, and

significantly correlated with connection quality. Samuel A. Francis, vice-president of The Sippican Corp. of Marion, Massachusetts, will make another of the presentations for this session on welding techniques including laser, electron beams, controlled resistance, ultrasonic, and cold pressure. A talk on microwrapped connections will complete the session.

The third session will be on "Man-Hardware Relationships." The important subject of protective packaging and handling of high reliability parts for the space age will be covered by Bronson B. Baker, manager, Packaging, Handling Engineering and Conservation of Lockheed Missiles and Space Company in Sunnyvale, California. Other subjects include human engineering problems in assembly and application of micro-miniature packages, incoming test of miniature components, and automated instructions for product reproducibility.

The final session of the Conference will be on "Circuit Packaging." Elephantine electronics (very high-power, high-voltage equipment) will be discussed by R. L. Blessing, senior project engineer, and A. M. Poiré, production project engineer, both of Radiation at Stanford in Palo Alto, California. Special problems are presented when transformers the size of a week-end cabin and capacitors as large as a railroad car must be packaged into an assembly. W. Dale Fuller, senior member of Lockheed's Research for System Microminiaturization in Palo Alto, California, will talk on integrated electronics and the production picture for the ultimate in miniaturized circuitry. Other subjects included will be application of dot components to a miniaturized circuit and circuit packaging with modern conventional components.

Luncheons will be held each of the two days of the Conference with the one on November 2 featuring an interesting and thought-provoking talk on "Communication With Other Intelligent Species" by Bernard M. Oliver, vice-president for Research and Development of the Hewlett-Packard Company in Palo Alto, California. The luncheons and all activities of the Conference will be held at the Jack Tar Hotel in San Francisco.

Mr. Reyling is manager of Engi-

neering Services for Varian Associates in Palo Alto, California. Other members of the committee for the Sixth National Conference, which is sponsored by the San Francisco Chapter of the IRE Professional Group on Product Engineering and Production, include General Chairman Arthur P. Kromer, also of Varian Associates; Exhibits, W. Dale Fuller of Lockheed Missiles and Space Company; Publicity, Olof Landeck of Electro Engineering Works; Finance, Hugh D. Kennedy of Granger Associates; and Arrangements, Vic B. Buell of Hewlett-Packard.

For additional information, contact Harmon R. Traver, Hewlett-Packard Company, 1501 Page Mill Road, Palo Alto, California.

meeting review

MARINER REPORT

Charles C. Kirsten, engineering group supervisor of Telecommunications Ground Systems, California Institute of Technology Jet Propulsion Laboratory, Pasadena, detailed the Mariner R telemetering system before a joint June meeting of the San Francisco chapters of PGSET and PGMIL at the Lockheed auditorium in Palo Alto.

Mariner R is a 350-lb. version of the original 1100-lb. spacecraft, Mariner. The reduction in payload was required because of the recent failures in the Centaur launch vehicle, he said, and the system is now at the Cape for checkout. Launch will be accomplished with an Atlas-Agena combination, the system employing the first generation of a new telemetry system.

Goal of the system is scientific measurement in the vicinity of Venus and in interplanetary space between earth and Venus. An important additional objective, however, is to obtain developmental experience which will increase the likelihood of success of future missions, especially on the flyby trip to Mars.

To those who would like to delve further into the various facets of the Mariner communication system design, Mr. Kirsten offered JPL Technical Report No. 32-85 from JPL, Pasadena.

—J. WETTSTEIN
REPORTER
SF PGMIL CHAPTER



Charles L. Seeger

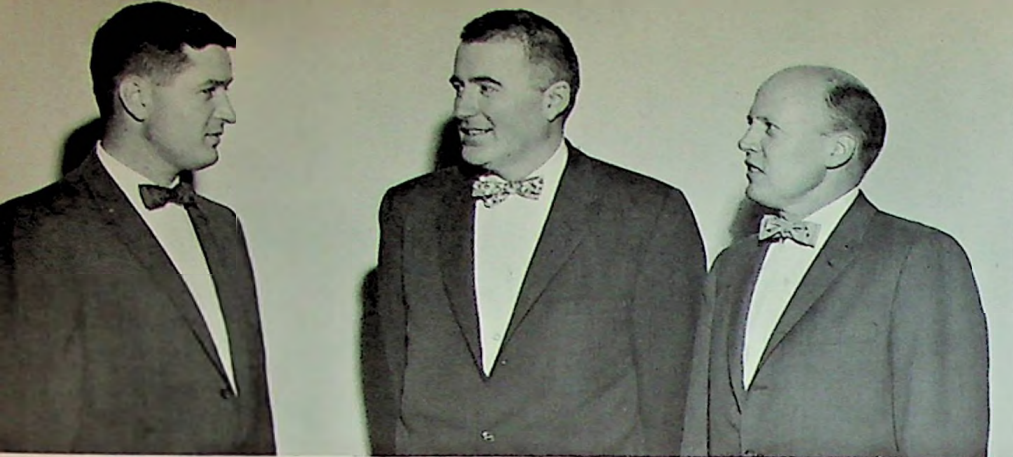
meeting review

ANNUAL MEETING

"Listening in on the Universe" was the compelling subject of a talk given by Charles L. Seeger, radio astronomer, Stanford University, before the annual dinner meeting of the San Francisco Section June 12 at the Fremont Hills Country Club, Los Altos Hills.

Our universe may soon be completely charted through radio astronomy, he said, i.e., all known radio signal emissions will have been documented through rapid progress in the field completed within the past few years. Seeger, a member of IRE and nine professional groups, has been closely identified with many of the major projects achieving this progress, including the Heliopolis Observatory, the Leiden Observatory, and the giant Benelux cross-antenna, for which he led the design group in 1960 and 1961.

At Stanford Radio Astronomy Institute, Radioscience Laboratory, Stanford University, since 1961, he has been engaged in the development of precision equipment for absolute flux and position measurements, parametric amplifiers, and automated receivers for extensive studies of the polarization of the Galactic background radiation. He is also industrial consultant on problems related to large antennas, low-noise receivers, and high stability equipment designs.



Jack L. Melchor, Treasurer; Peter Lacy, Chairman; and Alan T. Waterman, Jr., Secretary



Carter

Süsskind

election notes

BIG YEAR AHEAD

Following the biggest vote return in the history of the Section, new officers were installed June 12 at the annual meeting at the Fremont Hills Country Club before one of the largest groups ever to gather for that event.

Peter Lacy, 1962-63 chairman, is vice president and director of engineering, Wiltron Co., Palo Alto, and a senior member of IRE. A graduate of the University of Florida in 1942

with the B.S.E.E. degree, he received the M.S. from Stanford in 1947 and the Ph.D. from that same institution in 1952. He has been the Sperry Gyroscope Fellow and a research assistant at Stanford Microwave Laboratory, a consultant with Varian Associates, and a member of the advanced development staff of Hewlett-Packard Co.

Charles Süsskind, vice chairman and program committee chairman, is an associate professor in the electrical engineering department at the University of California. A senior

member of IRE, he received the B.S.E.E. from Cal Tech in 1948, the M.Eng. from Yale in 1949, and the Ph.D. in 1951. A former research associate at Stanford, he was also a lecturer in the microwave laboratory and assistant to the director. At the University of California since 1955 he was also a USAF radar specialist and is a member of Sigma Xi and Tau Beta Pi.

Alan T. Waterman, Jr., secretary of the Section, is associate professor of electrical engineering at Stanford and associate director of the systems-technique laboratory there. A senior member of IRE, he attended Princeton University, receiving an A.B. in physics. He also holds a B.S. in meteorology from Cal Tech and an A.M.

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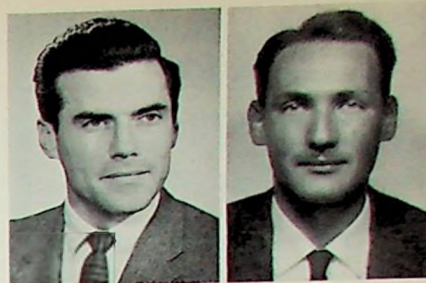
Granger

Leifer



MacKenzie

Rubenson



Sherrill

Lavrischeff

and Ph.D. in engineering sciences and applied physics from Harvard University. He is a member of AMS, AAAS, Sigma Xi, and APS.

Jack L. Melchor, Section treasurer, is president of H-P Associates, Palo Alto, and a senior member of IRE. He attended the University of North Carolina, receiving the B.S. and M.S. in physics, and received the Ph.D. at Notre Dame University in 1953. A former U.S. Navy mine countermeasures physicist, he was also with U.S. Rubber Co., and a fellow in high-polymer physics at Notre Dame. Formerly with the missile division of Bendix Aviation Corp., he has also had experience at Sylvania EDL and Melabs, where he was cofounder and president.

These Section officers, together with the junior past chairman, two Section-WESCON directors, and an IRE director-at-large, constitute the operating committee of the Section which holds monthly meetings to guide operations. General policy matters are formulated by the executive committee of the Section, consisting of the officers and the chairman of the East Bay Subsection, the chairmen of eight standing committees, and the chairmen of the 19 active professional groups.

Junior past chairman is Stanley F. Kaisel, who also has been appointed Section representative on a joint merger committee recently activated by SF IRE and AIEE to work out con-

solidation details in the year ahead.

Section-WESCON directors are John V. N. Granger, Granger Associates, and Meyer Leifer, Ampex Instrumentation Products Co.

Director-at-large is E. Finley Carter, Stanford Research Institute.

Joseph G. Rubenson, Watkins-Johnson Co., is chairman of the committee for secondary education. Fred J. MacKenzie, Stanford Research Institute, is chairman of the membership committee.

Publications advisor, who works closely with the operating committee on Grid policy matters, is Peter N. Sherrill, West Associates. Chairman of the East Bay Subsection is John T.

(Continued on page 12)

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Jr. Past Chairman: Stanley F. Kaisel, Microwave Electronics Corp., 4061 Transport St., Palo Alto, DA 1-1770.

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Director-at-Large: E. Finley Carter, Stanford Research Institute, Menlo Park, DA 6-6200.

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EDUCATION AND STUDENT RELATIONS:

Contact Section Office for information.

Student Branches

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San Francisco State College, 1600 Holloway Ave., San Francisco, JU 4-2300.

Advisor: Rene B. Marxheimer; Student Chairman: Frank Thirion.

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(Continued on page 14)

MORE ELECTIONS

Lavrischeff, Lawrence Radiation Laboratory of Berkeley.

Brief additional data is found on all Section officers, standing com-

mittee chairmen, and Professional Group chairmen in the roster which follows. More details on all of them will be carried in subsequent issues of the Grid.

EAST VS. WEST DIAGRAMS VS. EQUATIONS

THE COMPUTER'S ANSWER TO A LONG-STANDING COMPUTER ISSUE.

For a decade East Coast and West Coast computer designers have been using different methods of representing computer logic—the Easterners with diagrams, the Westerners with equations.

$$\begin{aligned}
 \text{LBSMI} &= (\text{LXA1})(\text{LXA2}^*)(\text{LFCA}^*) \\
 &+ (\text{LXA1}^*)(\text{LXA2})(\text{LFCA}^*) \\
 &+ (\text{LXA1}^*)(\text{LXA2}^*)(\text{LFCA}) \\
 &+ (\text{LXA1})(\text{LXA2})(\text{LFCA}) \\
 \text{LFCAJ} &= (\text{LXA1})(\text{LXA2}) \\
 \text{LFCAK} &= (\text{LXA1}^*)(\text{LXA2}^*)
 \end{aligned}$$

In the example illustrated here, the diagram and the equation tell us exactly the same thing. Either represents a serial full adder where the sequence of pulses at the output, LBSM, will represent a serial binary number that is the sum of two serial binary input numbers occurring at LXA1 and LXA2. (The asterisks indicate binary complements; for example, whenever LXA1 is energized LXA1^{*} is not, and vice versa. LFCA is a carry flip-flop.)

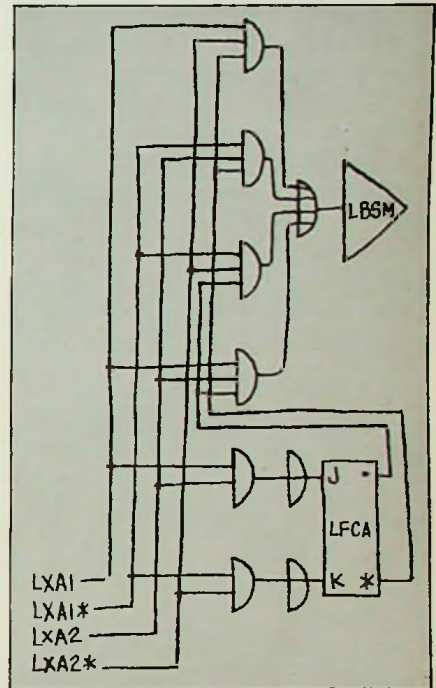
There are persuasive arguments on both sides. Eastern proponents of diagrams point out that the logical interconnections can be seen at a glance and followed through any number of stages by eye. The logical structure of an entire system can be understood from a diagram more directly and intuitively, they maintain, than from a set of equations.

The Western argument for equations goes like this. It's not true that diagrams communicate better to the viewer's intuition, except at first exposure. The human mind is highly adaptive. After working analytically with the equations for a while, the mind begins to operate intuitively in that symbology. Then the intrinsic superiority of equations over diagrams begins to make itself evident. One advantage, say the Westerners, is that equations can represent the same information more compactly and efficiently, as our illustration shows. Another is that equations lend themselves better to computer manipulation of logical design information.

As evidence of the latter advantage Westerners point to a recent achievement of some Litton Systems people: a completely mechanized procedure for translating logical designs into wiring lists, including operational simulation of the design to verify its accuracy. A procedure enormously facilitated by the computerizability of logical equations. It's easy to picture the benefits in cost, delivery schedules, reliability, price. Using only a partial development of this method Litton Systems recently brought a major computer system from concept to operation in less than a year.

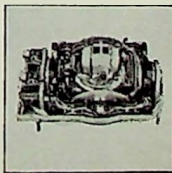
Now under consideration at Litton: a machine that will accept as inputs a supply of standard computer components and a set of coded specifications defining the logical functions desired, and will crank out completely fabricated systems.

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imagination-stretching atmosphere generated by Litton management's appreciation of the rewards of creative controversy. And we have a few excellent opportunities for computer design people. Ask for Harry Laur at Litton Systems, Inc., Data Systems Division, 6700 Eton Ave., Canoga Park, California.

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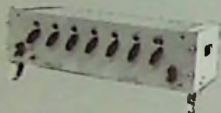


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WEMA announces the second in a series of seminars devoted to management problems of electronic companies, scheduled September 20-22 at Timberline Lodge, Mount Hood, Oregon. **William B. Webber**, vice president of Tektronix, Inc., is seminar chairman. Speakers are **Dwayne Orton**, editor of THINK; **Paul S. Ford**, director of taxes, Boeing Company; **Walter J. Mead**, economics department, UC, Santa Barbara; and **Alex Bavelas**, department of psychology and graduate school of business, Stanford. Reservations may be made through **Al Beeson**, WEMA management development director, DA 4-4497.

Vactite, Inc., manufacturer of ultra-high vacuum systems and fittings, plans to move from San Carlos to larger quarters in Palo Alto, **David J. Goerz, Jr.**, president, reports.

AMPEX Corporation has begun construction of a 150,000-sq.-ft. building in Redwood City to house corporate headquarters and research



Sporck



Raupach



Kallstrom



Webster

and engineering activities, scheduled for completion in 1963.

Fairchild Semiconductor has named **Charles E. Sporck** to the new position of operations manager with direct responsibility for the transistor plant, instrumentation division and material sections in Mountain View, the diode plant in San Rafael, and the new transistor manufacturing facility in South Portland, Maine.

Sylvania Electric Products Inc. has named **Paul R. Raupach** manager of project coordination and planning at the Santa Cruz systems manufacturing facility.

Quantic Industries, Pelmec division, has named **Donald W. Kallstrom** qual-

ity control manager, replacing **John Mulhearn**, who assumes the new position of assistant director of manufacturing.

University of California Extension plans an intensive five-day program on the technology of welding and joining, October 15-19, intended for design engineers, fabrication supervisors, and quality-control and reliability engineers.

Robert H. Webster has been named quality assurance manager for **Precision Instrument Company**, San Carlos, after two years in the same field with **Philco**, Palo Alto.

Jay Stone & Associates, Los Altos, has been appointed sales represent-

MICROWAVE ENGINEERS

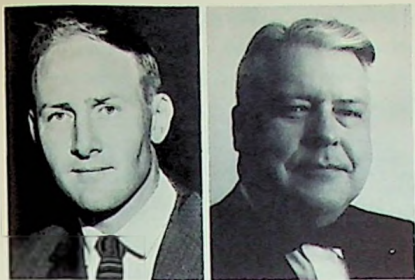
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Robert F. Schulz has been appointed manager of manufacturing for Applied Technology, Inc., according to William E. Ayer, president.

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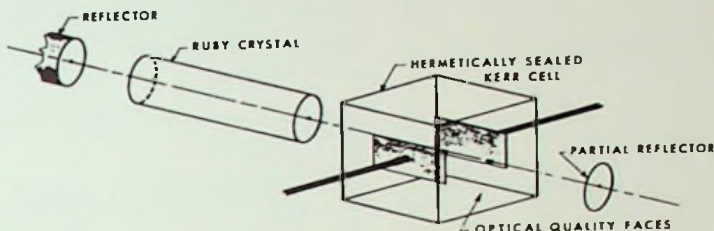
The new model will operate both as a conventional flux measuring and plotting instrument and as an expanded scale, suppressed zero meter for observing small changes, or increments, in flux density. By means of a controlled feedback system, it is capable of magnifying a small change by a factor of 100 or more for detail study. This permits a 1% change to be expanded to FULL SCALE, resulting in good readability to 1/1000, resolution to 1/10,000.

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events of interest

IRE MEETINGS SUMMARY

Sept. 3-7—National Adv. Technology-Management Conference. Opera House, World's Fair Grounds, Seattle, Wash. Exhibits: Hugh Fairclough, 1624 22nd Ave., East, Seattle 2. Program: Georges Brigham, 805 Logan Bldg., Seattle 1. Proceedings: \$8. National Adv. Tech. Mgt. Conf., 512 First Ave., North, Seattle 9.

Sept. 3-7—International Symposium on Information Theory. Free Univ. of Brussels, Brussels, Bel. Program: F. L. Stumpers, Philips Research Labs., Eindhoven, Netherlands. IRE TRANSACTIONS on Information Theory.

Sept. 13-14—National Symposium on Engineering Writing and Speech. Mayflower Hotel, Washington, D.C. Program: John E. Durkovic, ARINC, 1700 K St., N.W. Wash., D.C.

Sept. 19-20—11th Annual Industrial Electronics Symposium. Hotel Sheraton, Chicago, Ill. Program: J. A. Granath, Armour Res. Found., 10 W. 35 St., Chicago 16, Ill. IRE TRANS-

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Sept. 5-8—16th National Conference for Computing Machinery and First International Data Processing Exhibit. Statler-Hilton Hotel, Los Angeles. For information contact B. F. Handy, Jr., Litton Systems, 5500 Canoga Ave., Woodland Hills, Calif.

Sept. 11-15—Instrument-Automation Conference and Exhibit. Sports Arena, Los Angeles, Calif. For information, contact John E. Witherspoon, 7107 Penfield Ave., Canoga Park, Calif.

Sept. 13-14—Tenth Annual Engineering Management Conference. Roosevelt Hotel, New Orleans. For information write J. S. Cave, American Tel & Tel Co., 195 Broadway, New York 7, N.Y.

Sept. 20-21—Industrial Electronics Symposium, Bradford Hotel, Boston, Mass. For information, contact W. M. Trenholme, Instrument Dept., General Electric Co., 40 Federal St., West Lynn, Mass.

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Includes product design review, test specifications, to mil. specs. Degree and experience in design, test or evaluation of miniature electro-mechanical assemblies required.

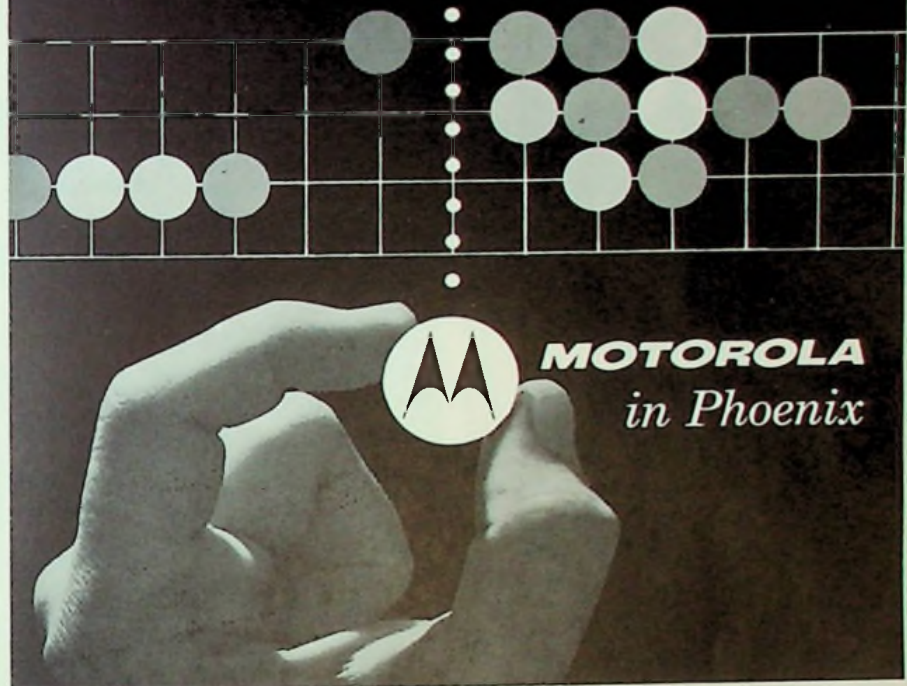
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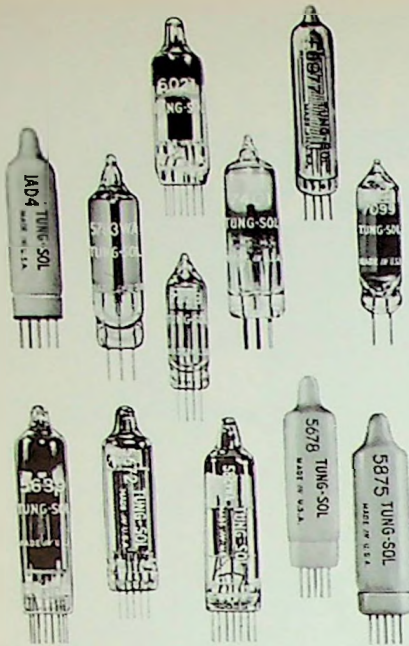
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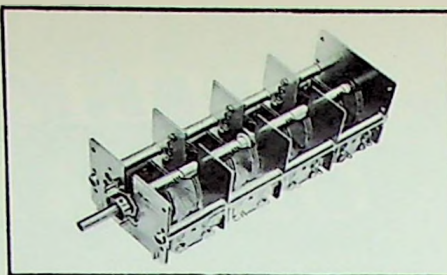
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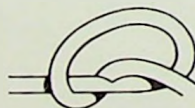
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PAPERS CALLS

Sept. 30: 100-word abstract for the Fourth Joint Automatic Control Conference to be held at the University of Minnesota in Minneapolis on June 19-21, 1963. Manuscripts by Nov. 15, 1962. Program Chairman: Prof. Otis L. Updike, Dept. of Chemical Engineering, University of Virginia, Charlottesville, Va.

Oct. 19: 1963 IRE International Convention, Waldorf-Astoria Hotel and the New York Coliseum, New

York, N.Y. 1. 100-word abstract; 2. 500-word summary. Address to: Dr. Donald B. Sinclair, Chairman, 1962 Technical Program Committee, The Institute of Radio Engineers, Inc., 1 East 79 Street, New York 21, N.Y.

Oct. 1: 3rd International Symp. on Quantum Electronics, UNESCO Bldg., Paris, France. Madame Cauchy, Secrétaire Seme Congress d'Electronique Quantique, 7 rue de Madrid, Paris Seme, France.



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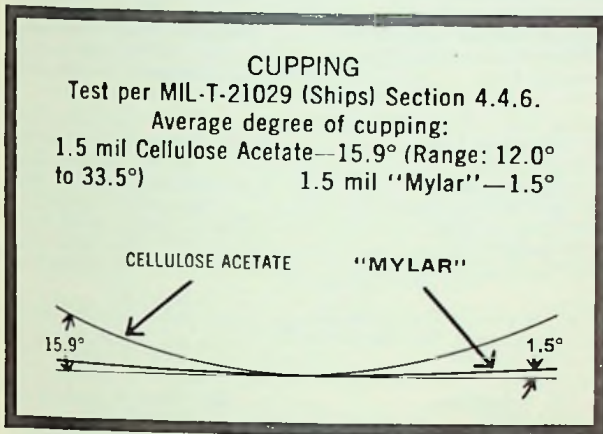
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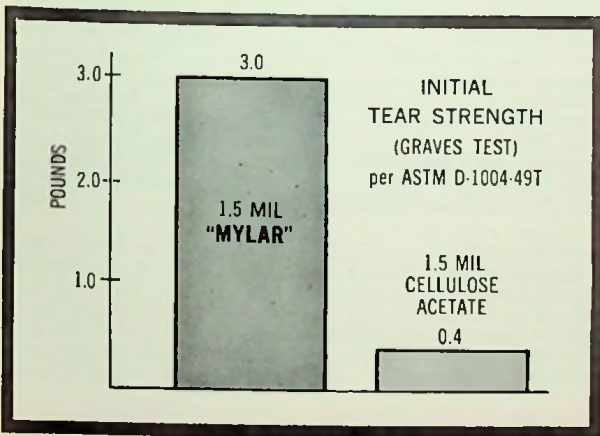
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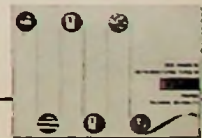
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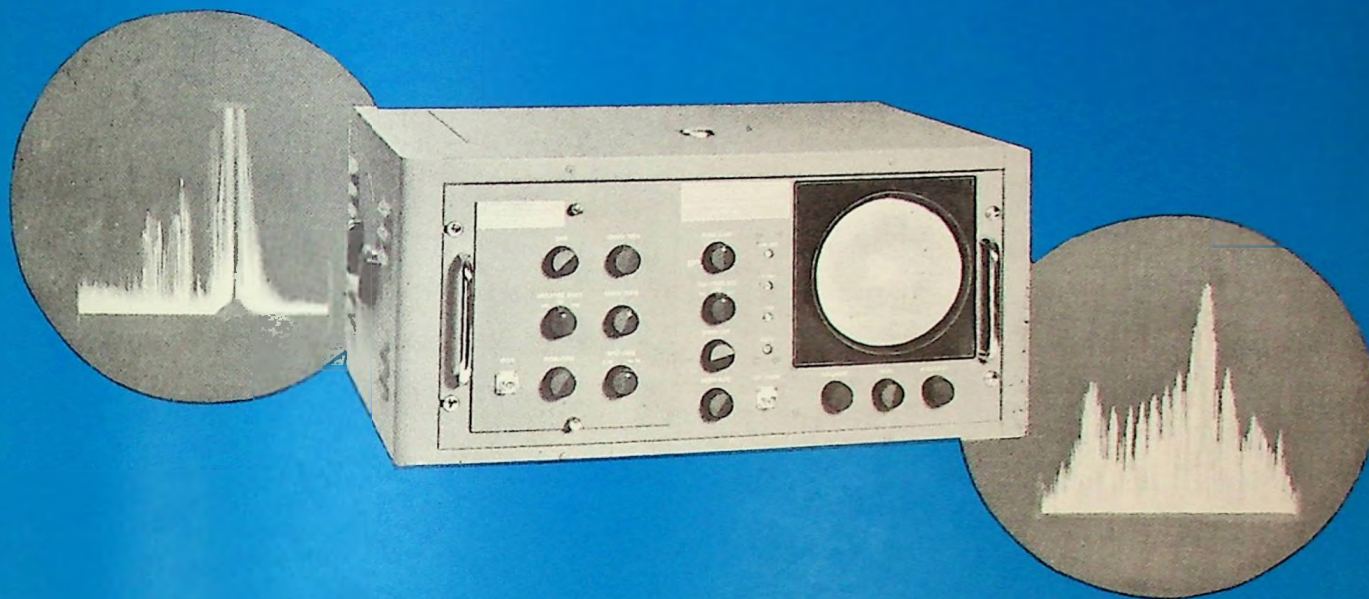
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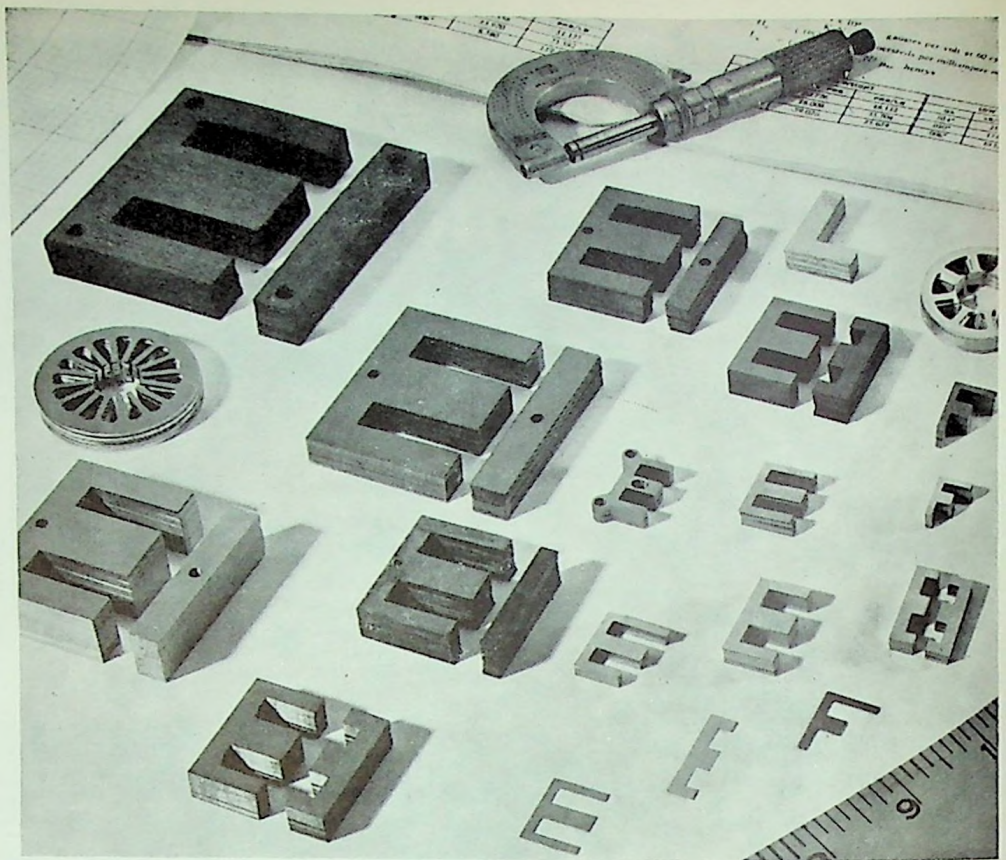
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