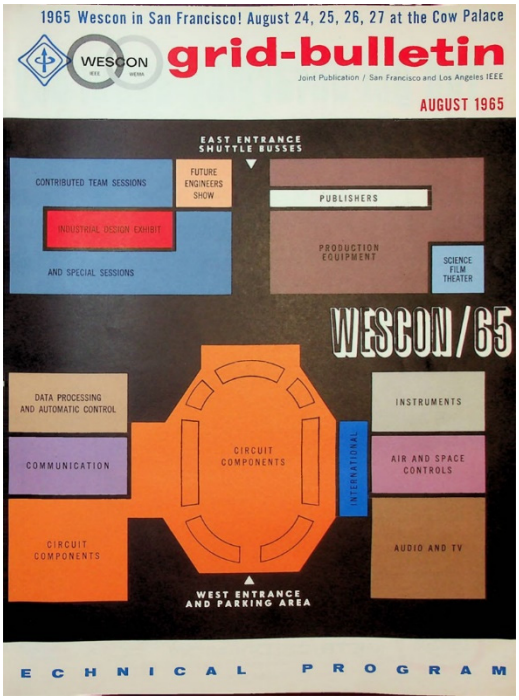
EDITOR'S PROFILE of this issue

from a historical perspective …

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

August, 1965:



Cover: The exhibits floor diagram for WESCON.

Page 10: Talk 1/1 features James Meindl, who becomes a Stanford professor, then the president of Georgia Tech. He was awarded the 2006 IEEE Medal of Honor "for pioneering contributions to microelectronics, including low power, biomedical, physical limits and on-chip interconnect networks..

Page 12: Paper 8/6 is by Paul Baird of H-P, a reliability expert. After moving to H-P in the Bay area, he was a key person who did the statistical analysis of Japanese quality vs American-supplied semiconductors and sparked a needed upgrade in USA quality. I worked with Paul in the local IEEE Reliability Society chapter for many years.

Page 24: Doug Engelbart, of Stanford Research Institute (SRI), gives a talk (B/3) on text manipulation. He becomes famous later in the decade for his "Mother of all Demos" at the IEEE Fall Joint Computer Conference in S.F. where he linked up remotely to SRI computers in Menlo Park to demonstrate the mouse, WYSIWYG text editing, networking and other leading-edge technologies. They were implemented in the Xerox-PARC Alto computer (I helped bring one "back to life" in 2018) and then Steve Jobs' vision for the Lisa and Macintosh.

Page 28: J C R (Joseph Carl Robnett) Licklider (paper D/1) was at IBM, but moved to BBN, a time-sharing company that built the first Arpanet nodes. He headed up ARPA's project that became the Arpanet, then the Internet, funding a project at Stanford, and worked with Robert Taylor at Xerox-PARC.

Archive of available SF Bay Area GRID Magazines is at this location:
https://ethw.org/IEEE_San_Francisco_Bay_Area_Council_History

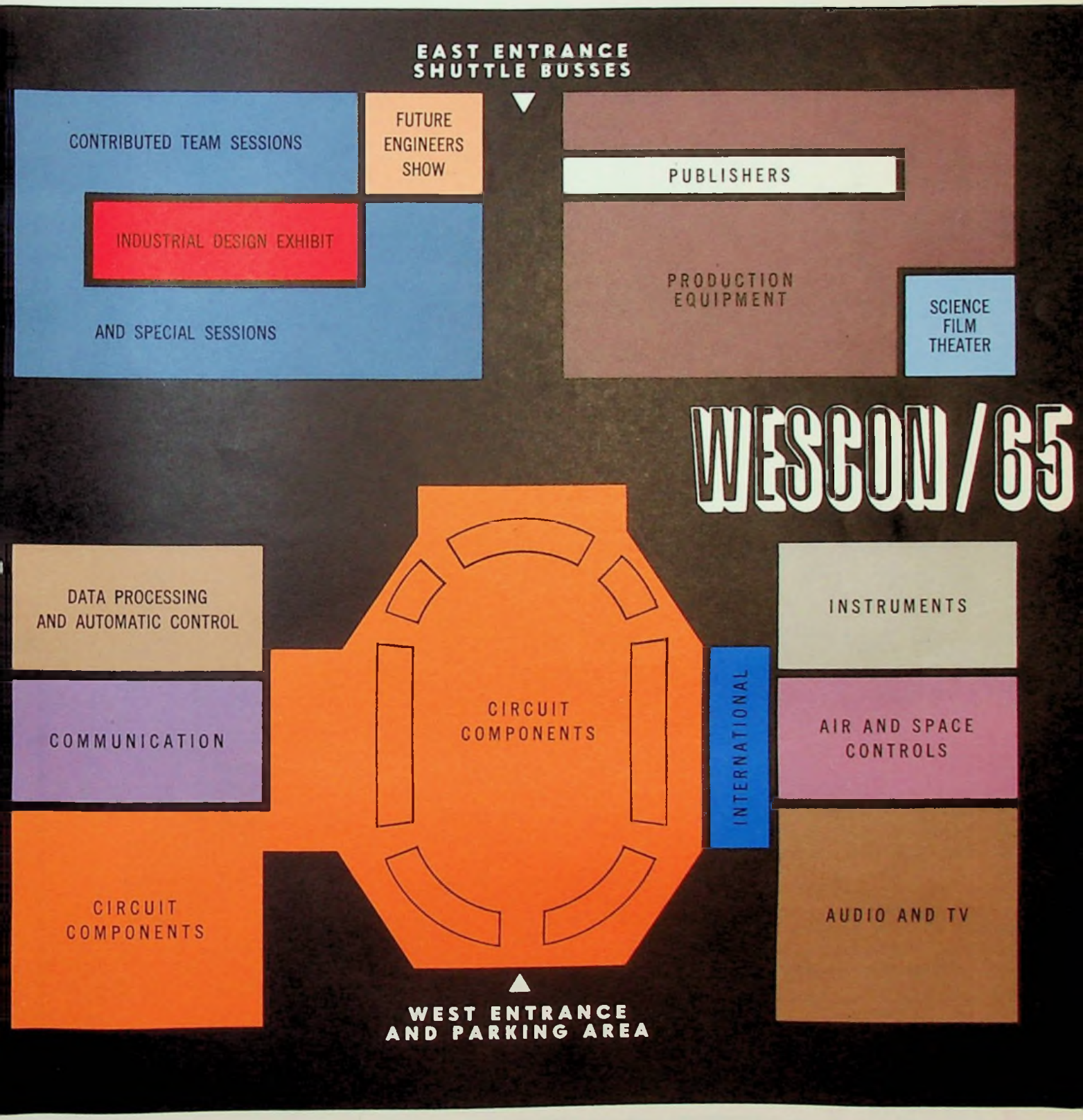
1965 Wescon in San Francisco! August 24, 25, 26, 27 at the Cow Palace

WESCON
IEEE WEMA

grid-bulletin

Joint Publication / San Francisco and Los Angeles IEEE

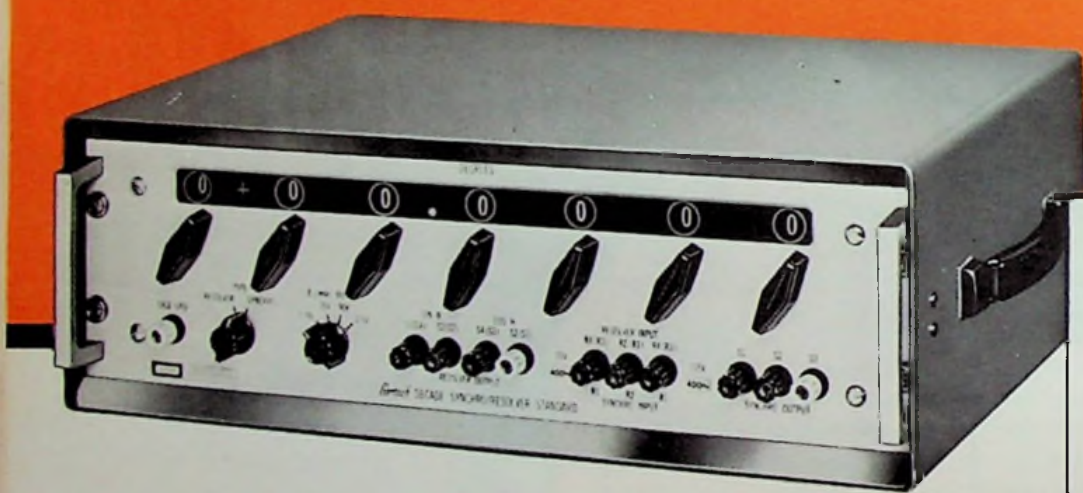
AUGUST 1965



TECHNICAL PROGRAM

You get unvarying accuracy with *Gertsch** synchro and resolver standards

—consistent 2 seconds-of-arc tolerance is unaffected by loading, external errors, or time



Decade Synchro / Resolver Standards Compact combination instrument tests both synchros and resolvers. 2 seconds-of-arc accuracy. Rapid quadrant switching. Available in .001° and .0001° resolution... 115, 90, 26, and 11.8 volts output... 115 or 26 volts excitation.

Synchro Standards or Resolver Standards. One-knob or two-knob models available as either synchro or resolver standard, in half rack or full-rack size. Continuous angular rotation from 355° to 0°, in 5° increments. 2 seconds-of-arc accuracy.

Coaxial Synchro Standards. Ideal where panel space is limited. Occupies only 2⅜" square panel area. Outer dial switches in 60° increments; inner dial in 5° increments. Zero to 360° range. 2 seconds-of-arc accuracy.

Due to exceptionally low output impedance, and low output impedance unbalance, *Gertsch* standards will operate continuously under load with no degradation of accuracy. This high degree of internal stability results from the time-proven design techniques originally developed for *Gertsch* RatioTran* precision voltage dividers. Effects of external errors, such as operator, hookup, readout, and associated equipment errors are also minimized.

You can rely on *Gertsch*-quality construction for unparalled precision, versatility, and ease of operation. Maintenance is practically eliminated since *Gertsch* standards are essentially ageless devices.

In addition to the standards listed, *Gertsch* also supplies rotary solenoid, and relay (programmable) models, dividing heads, phase angle voltmeters, null indicators, and a full line of synchro and resolver bridges.

For complete information, request Catalog 11—a valuable reference source for engineers.

Ask your Metrics Sales Representative about the new Singer Time Pay and Lease Programs—

Gertsch*

THE SINGER COMPANY
METRICS DIVISION

3211 S. LA CIENEGA BLVD., LOS ANGELES, CALIFORNIA
TELEPHONE (213) 870-2761 • TWX 910-340-6352

Design and production of PANORAMIC • SENSITIVE RESEARCH • EMPIRE • GERTSCH instruments for measurement

Circle Inquiry Card No. 1

Why do so many people read newspapers?

There are probably as many answers to that question as there are people. One thing is sure, however. One of the main reasons is news.

In the electronics industry, it is much the same story. Thousands of people read the industry's only newspaper because it is their only source for news. Why not find out how Electronic News does the job for you? Send the coupon today.

By the way, if you're at WESCON, why not drop by and pick up a copy of our latest edition. We'll be at booths 214-215 in the Cow Palace.

Electronic News
vital to profit and progress

ELECTRONIC NEWS • 7 East 12th St., New York, N.Y.10003

Enter my subscription for

1 YEAR (52 issues) **$3** ☐ Pan American $4; Foreign $5
2 YEARS (104 issues) **$5** ☐ Pan American $7; Foreign $9
3 YEARS (156 issues) **$6** ☐ Pan American $8; Foreign $10

Check or Money Order Enclosed ☐ Send Bill ☐

NAME_____

ADDRESS_____ ☐ BUSINESS? ☐ HOME?

CITY_____ STATE_____ ZIP CODE_____

COMPANY NAME_____

COMPANY PRODUCT OR SERVICE_____

PLEASE CHECK YOUR JOB FUNCTION

☐ General Management
☐ Engineering Management (R&D)
☐ Research, Design & Development
☐ Production, Operations or Maintenance
☐ Purchasing
☐ Sales or Marketing
☐ Other_____ (specify)

YOUR TITLE_____

G•B

Join the Jet Set to WESCON/65

A record number of jet flights on the world's most-traveled air route means Wescon in San Francisco is only an hour away from Los Angeles!

One-day commuting to Wescon from Southern California was never this easy before—'round-the-clock flights to San Francisco and Oakland and return make it easy and economical to spend a full day at Wescon and still have dinner at home with the family. All five airlines—United, PSA, Western, TWA, and Pacific—are cooperating with special check-in, baggage, and reservation services. Free shuttlebuses pick you up at San Francisco airport and take you to the Cow Palace—and back to the airport to catch your commuter flight home. Plan now to join the August 24-27 Wescon Jet Set on any of the fast flights listed below:

LOS ANGELES TO SAN FRANCISCO

7:00a	PSA	779	2:00	PAL	456	7:15	PSA	709
7:10	PSA	643	2:05	PSA	31B*	7:25	PSA	49B*
7:15	UAL	500	2:10	PSA	7B*	7:30	PAL	416
7:30	WAL	70	2:10	PSA	223*	7:35	UAL	115
7:30	PAL	406	2:20	PSA	229	7:50	PSA	45B*
7:35	PSA	1B	2:35	PSA	61B*	7:55	PSA	65B
8:00	PAL	422	2:45	PAL	756	8:00	PSA	839*
8:15	UAL	502	2:45	UAL	514	8:10	TWA	55
8:35	PSA	81B*	3:10	PSA	323*	8:15	UAL	528
8:35	TWA	105	3:15	TWA	157	8:15	PSA	859
8:45	PSA	819	3:15	PSA	329*	8:20	PSA	51B*
8:55	UAL	504	3:35	PSA	39B	8:20	PSA	823
8:55	PAL	732	3:40	PSA	359	8:40	PSA	869*
9:00	WAL	90	3:45	UAL	518	8:45	PAL	710
9:40	PSA	933	3:45	PSA	369*	8:55	TWA	407
9:40	PSA	909*	4:00	PAL	408	8:55	PSA	67B*
9:45	TWA	860	4:20	PSA	429*	9:00	PAL	758
9:50	PSA	3B	4:20	PSA	349*	9:15	PSA	953*
10:15	UAL	506	4:20	PSA	15B*	9:15	WAL	530*
10:30	WAL	100	4:30	WAL	160	9:20	PSA	899*
10:35	PSA	35B	4:30	PAL	754	9:30	PSA	939*
10:40	PSA	143*	4:35	PSA	409	10:10	PSA	69B*
11:15	UAL	508	4:35	PSA	469*	10:15	UAL	532*
11:35	TWA	95	4:50	PSA	41B	10:20	UAL	87
11:35	PSA	119	5:00	PSA	519*	10:30	WAL	220
11:40	UAL	51	5:10	PSA	523	10:35	PSA	929
11:55	PSA	5B*	5:15	UAL	522	10:55	PSA	855*
12:00	WAL	120	5:30	TWA	61	11:10	PSA	71B*
12:15p	TWA	59	5:30	WAL	170	11:15	PSA	199*
12:15	PAL	734	5:45	PSA	559*	11:20	TWA	87
12:15	UAL	510	5:50	PSA	553*	12:10a	UAL	318
12:25	PSA	153*	6:00	PSA	539*	12:15	PSA	299*
12:30	PSA	129*	6:00	PSA	43B	12:50	TWA	85
12:30	PSA	139*	6:15	UAL	524	3:10	TWA	15
12:30	WAL	122	6:15	TWA	69			
1:00	PSA	249*	6:15	PSA	619			
1:20	PSA	37B	6:20	PSA	53B*			
1:25	PSA	103*	6:25	PSA	629*			
1:30	PSA	239*	6:35	PSA	11B*			
1:35	PSA	339*	6:50	PSA	633			
1:45	UAL	512	6:50	PSA	653*			
1:45	PSA	123	7:00	WAL	190			
2:00	WAL	140	7:15	UAL	526			

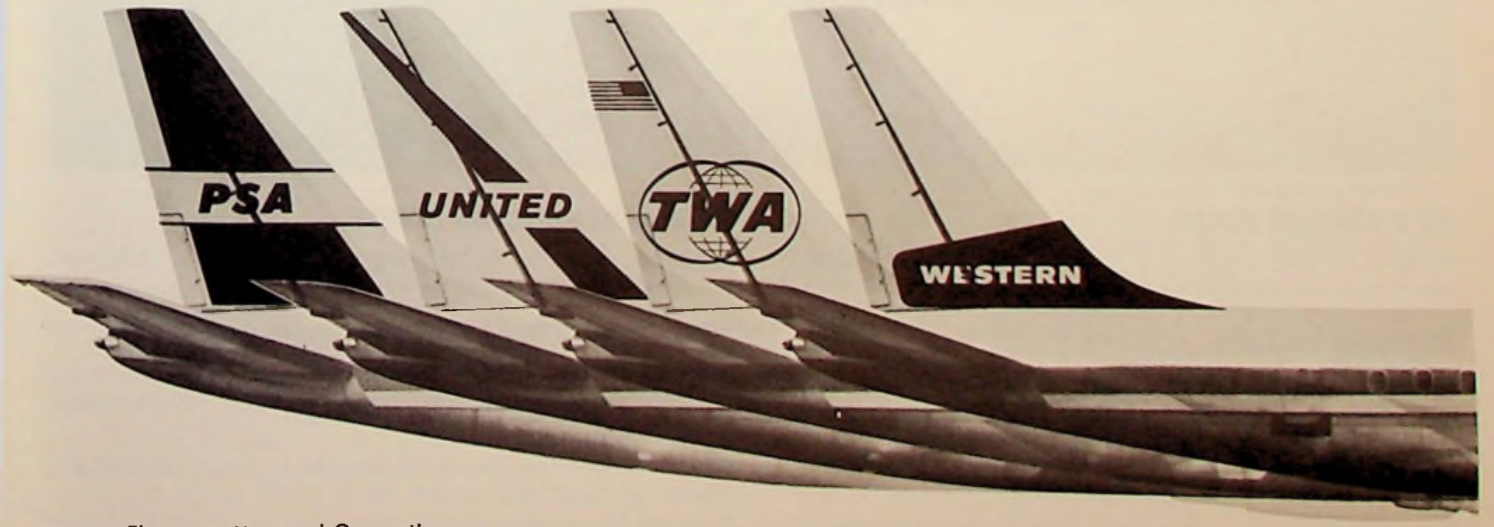
* Fri., Sat. or Sun. only.

San Diego to San Francisco is serviced by PSA, UAL, WAL, and PAL with 140 weekly flights including 20 nonstop.

SAN FRANCISCO TO LOS ANGELES

6:45a	UAL	501	2:00	PSA	206	7:00	WAL	191
7:00	PAL	411	2:00	PSA	286*	7:00	PAL	777
7:00	PSA	706	2:00	PSA	214*	7:00	PSA	696*
7:15	UAL	240	2:00	WAL	141	7:05	PSA	716*
7:15	TWA	66	2:15	UAL	517	7:10	PSA	714*
7:30	PSA	726	2:25	PSA	226*	7:15	PSA	44B
7:30	WAL	71	3:00	TWA	78	7:15	PSA	52B*
7:40	TWA	56	3:00	PSA	306*	7:25	PSA	786*
7:45	UAL	503	3:00	PAL	453*	7:30	PSA	66B*
8:00	PSA	806*	3:00	PSA	316*	7:40	PSA	744
8:00	PAL	771	3:15	TWA	43*	7:45	UAL	529
8:20	PSA	814	3:15	UAL	519	7:50	PSA	72B*
8:20	PAL	701	3:15	PSA	14B*	8:00	PAL	433
8:20	TWA	24	3:30	PSA	366*	8:05	PSA	816*
8:45	PSA	2B	3:35	PAL	717	8:05	PSA	804*
8:45	UAL	505	3:40	PAL	419	8:15	TWA	106
9:00	WAL	91	3:45	PSA	38B	8:15	PSA	836
9:30	TWA	108*	4:00	TWA	88	8:35	PSA	54B*
9:30	TWA	860	4:00	WAL	161	8:45	UAL	531*
9:45	UAL	507	4:00	PSA	404	8:55	PSA	46B
9:45	PAL	411*	4:00	PSA	406	9:00	WAL	211
10:00	PSA	106	4:00	PSA	62B*	9:00	TWA	62
10:00	PSA	82B*	4:05	PAL	459	9:05	PSA	74B*
10:45	UAL	509	4:10	PSA	49B*	9:20	PSA	906*
10:55	PSA	4B*	4:30	PSA	436*	9:30	PSA	934*
11:00	PSA	114	4:40	PSA	434*	9:30	UAL	58
11:00	PSA	34B	4:45	UAL	523	9:35	UAL	78
11:00	WAL	111	4:50	PSA	450	9:40	PSA	916*
11:15	PSA	126*	5:00	PSA	40B	9:45	TWA	871*
11:45	UAL	511	5:00	PSA	506*	9:45	UAL	533*
11:45	PSA	30B*	5:10	PSA	576*	10:00	WAL	221*
12:00	PSA	116	5:15	PSA	64B*	10:00	PSA	166
12:00	PSA	216*	5:30	TWA	132	10:00	TWA	74
12:00	WAL	121	5:30	PSA	68B*	10:05	PSA	76B*
12:15p	PSA	276*	5:30	PSA	50B*	10:50	PSA	976
12:15	PAL	703	5:30	PAL	709	10:50	PSA	134*
12:40	PSA	145	5:40	UAL	521	11:05	PSA	176*
1:00	PAL	403	5:40	PSA	544*	11:15	TWA	72
1:00	PSA	36B	5:45	PSA	546*	12:20a	PSA	80B*
1:00	PSA	124*	5:45	UAL	525	3:40	UAL	291
1:05	PSA	32B*	5:55	PSA	42B			
1:05	PSA	6B*	6:00	PSA	606			
1:15	PSA	566*	6:10	WAL	181			
1:15	PSA	144*	6:25	PSA	626			
1:15	UAL	515	6:30	PSA	634			
1:30	PSA	154	6:45	UAL	527			

Schedules subject to change; please check with the airline or your travel agent.



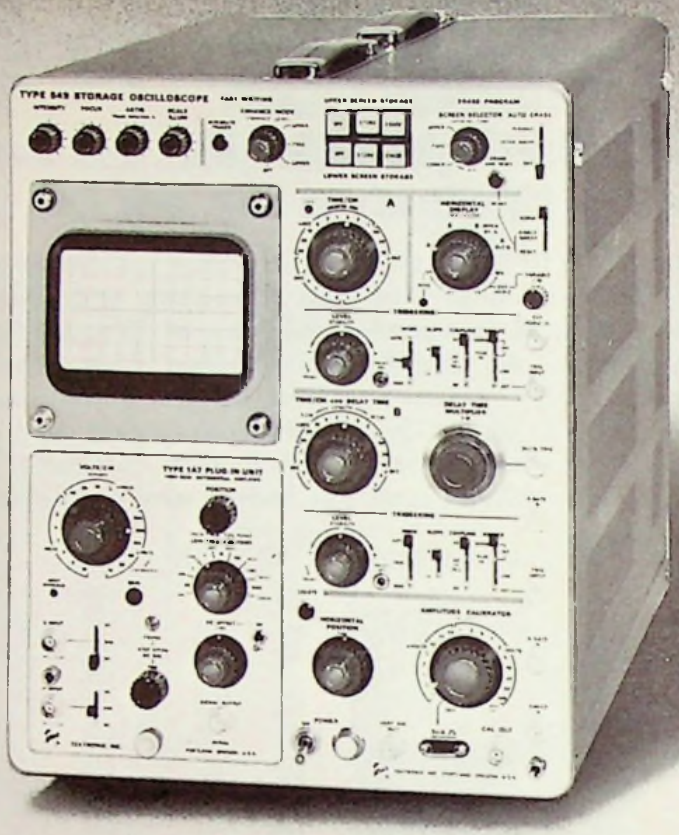
Western Electronic Show and Convention
3600 Wilshire Boulevard
Los Angeles, California 90005

Circle Inquiry Card No. 13

TEKTRONIX

type 549

STORAGE OSCILLOSCOPE



see at WESCON

New Scope of Versatility

accepts more than 20 plug-in units for DC-to-30 Mc operation, or for storage applications

adapts easily to:

- low-level, differential-input applications
- wide-band applications
- sampling applications
- multi-trace applications
- spectrum-analyzer applications
- strain-gage applications

as a storage scope

Enables holding single-shot events, and low duty cycle waveforms, for detailed analysis.

features include:

unparalleled writing speed—up to 5 cm/μsec, with enhancement, *split-screen storage*—storage on either upper or lower half of crt (with other half for conventional displays, if desired), *automatic erase feature*—with selectable viewing times from 0.5 seconds to 5 seconds.

Storage feature adds a new dimension to *sampling applications* and *spectrum analysis*—permitting displays not possible with any other oscilloscope.

as a conventional scope

Accepts more than 20 plug-ins—either the Tektronix letter-series units or the newer 1-series units.

features include:

calibrated sweep delay from 1 microsecond to 10 seconds, single sweep, 5X sweep magnifier, and full-passband triggering facilities.

Adaptable and reliable, the Type 549 can handle almost any laboratory application in the DC to 30 Mc range.

Type 549 Oscilloscope (without plug-ins) $2375

U. S. Sales Price f.o.b. Beaverton, Oregon

Tektronix, Inc.

SEE THE LATEST TEKTRONIX INSTRUMENTS AT WESCON BOOTH 3818-3822.

grid-bulletin

Joint Publication/San Francisco and Los Angeles IEEE

volume 10 *august, 1965* *number 2*

1965 Executive Editor: James D. Warnock, San Francisco Section
IEEE, Suite 2210, 701 Welch Road, Palo Alto, Calif.

grid-bulletin staff

For San Francisco:

publications advisor:
HOWARD ZEIDLER
Stanford Research Institute

advertising director:
ERNESTO A. MONTANO

editorial & advertising assistant:
MRS. JEAN HELMKE

For Los Angeles:

editor:
HAROLD C. HOOD
Harold C. Hood & Associates

district publicity chairman:
GERALD M. GOLDENSTERN
Business Development Associates

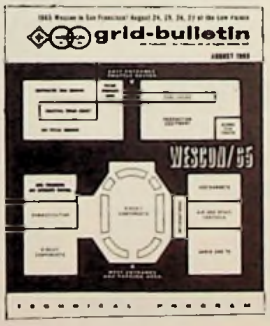
executive editor:
RAY BANKS

managing editor:
JEANNE L. MOHIT

associate editor:
RONALD TANSKY

contents

Wescon Quick-Check List 7
Welcome to Wescon 8
Technical Program 10-28
Wescon Background, WEMA Luncheon 10
Regional Report 11
Concurrent Symposia 12
Future Engineers Show, Eta Kappa Nu Luncheon 27
Plans for the Ladies 29
Directory of Exhibitors 30-33
Classified Advertising 34-35
Industrial Design Awards 36-38



cover

Wescon's unique departmentalization of exhibits for the convenience of its 35,000 expected visitors, a first in industrial shows, was unveiled at last year's event and will be seen at the Cow Palace for the first time this year.

san francisco section officers 1965-66

Chairman: Jack L. Melchor
Vice Chairman: E. H. Hulse
Secretary: Fred J. MacKenzie
Treasurer: J. E. Barkle

los angeles district officers 1965-66

Chairman: Edward C. Bertolet
Vice Chairman: G. R. Woodman
Secretary: Charles M. Edwards
Treasurer: Everett C. Ross

Second class postage paid at San Francisco, Calif.
Returns, address changes: IEEE, 701 Welch Rd., Palo Alto, Calif. 94304
Subscription: $4.00 (members); $6.00 (others); overseas, $7.00 per annum

advertising

Bay Area & National: E. A. Montano, IEEE, Suite 2210, 701 Welch Rd., Palo Alto, Calif.,
East Coast: Cal Hart, Martin & Hart, 25 W. 43rd St., New York, N.Y., 212 LW 4-1290
Southern California: Ray Banks, IEEE, 3600 Wilshire Blvd., Los Angeles 5, Calif., 213 387-1203

When this headline was current news . . .
digital recording tapes
had a packing rate of 200 bpi.

Today, 800 bpi is standard;
improvement in tape and base is the reason.

In analyzing the sensational development of EDP over the past decade, most of us naturally talk in terms of improvement of hardware. But when you stop to examine them, the contributions made by tape manufacturers have been quite remarkable.

The tape of today *looks* like the tape of 1954 . . . but think of the differences: improved oxide coatings to increase total capacity, reduce fluctuations in performance; much stronger binders to reduce dropouts and flaking, lengthen tape life; smoother surfaces to give longer, error-free wear; thinner coatings and better production controls to guarantee reel-to-reel uniformity.

Working hand in hand with the tape manufacturers during this time has been Du Pont. Improvements in the uniformity, stability and overall reliability of the base of MYLAR* have played a vital role in making possible the sophisticated tape in use today. Continuing cooperation of research and development facilities assures continuing improvements in the future. Your guarantee of the most advanced tape is the manufacturer's brand and a base of MYLAR polyester film.

*Du Pont's registered trademark for its polyester film

DU PONT REG. U.S. PAT. OFF.

only DU PONT makes MYLAR® POLYESTER FILM

Better Things for Better Living . . . through Chemistry

At the base of all tape improvements: Mylar®

WESCON QUICK-CHECK LIST

EVENTS — TIME — PLACES

ADDITIONAL INFORMATION: Wescon Information Centers at the airport, Cow Palace and in the major hotels should be checked for last minute information on events. The centers may be reached by calling the Fairmont (DO 2-8800), the Hilton (YU 6-1080, YU 6-0991), or the Cow Palace (JU 4-2480).

Monday, August 23

8:00 AM to 5:30 PM	**Distributor-Manufacturer-Representative Conference,** Jack Tar Hotel
12:00 Noon to 5:00 PM	**WEMA Board of Directors Meeting,** Walnut Suite, Hilton Hotel
9:00 AM to 5:00 PM	**IEEE Sections Committee Meeting,** Diablo Suite, Hilton Hotel
9:00 AM to 5:00 PM	**EDN Packaging Symposium,** Continental Ballroom 6, Hilton Hotel
9:00 AM to 5:00 PM	**JEDEC J-T 13.2 Sub-Committee on Klystrons,** State Room, Fairmont Hotel
9:30 AM to 5:30 PM	**IEEE TAB OPCOM,** Lassen Suite, Hilton Hotel
9:30 AM to 5:00 PM	**JEDEC Semiconductor Device Council,** Frontier Room, Fairmont Hotel
12:00 Noon to 2:00 PM	**EDN Luncheon,** Continental Ballroom 4 & 5, Hilton Hotel
2:00 PM to 5:00 PM	**Electron Devices Symposium,** Terrace Room, Fairmont Hotel
5:00 PM	**IEEE Group on Component Parts & Materials Meeting,** Diablo Suite, Hilton Hotel
5:00 PM to 7:00 PM	**EDN Symposium Discussion,** Teakwood Suite, Hilton Hotel
6:00 PM to 9:00 PM	**IEEE Intersociety Relations Committee Meeting,** Lassen Suite, Hilton Hotel
7:00 PM to 10:30 PM	**IEEE TAB Forum,** South Continental Parlors 1, 2, & 3, Hilton Hotel

Tuesday, August 24

9:00 AM to 5:00 PM	**Women's Hospitality Room,** Rosewood Suite, Hilton Hotel
9:00 AM to 5:00 PM	**IEEE Intersociety Relations,** Lassen Suite, Hilton Hotel
9:00 AM to 5:00 PM	**EDN Symposium,** Ballrooms 1, 2, 3, 4, & 5, Hilton Hotel
9:00 AM to 5:00 PM	**Electron Devices Symposium,** Terrace Room, Fairmont Hotel
9:00 AM to 11:00 PM	**IEEE Executive Committee Task Force on Districts Meeting,** Diablo Suite, Hilton Hotel
9:00 AM to 5:00 PM	**JEDEC J-T 13.2 Sub-Committee on Klystrons,** State Room, Fairmont Hotel
9:30 AM to 5:30 PM	**IEEE TAB,** Toyon Suite, Hilton Hotel
9:30 AM to 6:30 PM	**WESCON Exhibits,** Cow Palace
9:30 AM to 6:30 PM	**Future Engineers Show,** Cow Palace
9:30 AM to 6:30 PM	**Industrial Design Exhibit,** Cow Palace
9:30 AM to 5:00 PM	**JEDEC JS-10 Committee on Mechanical Standardization,** International Room, Fairmont Hotel
10:00 AM to 12:30 PM	**Technical Session No. 1,** Room A, Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 2,** Room B, Cow Palace
10:00 AM to 1:30 PM	**Technical Session No. 3,** Room D, Cow Palace
10:00 AM to 1:00 PM	**Technical Session No. 4,** Room C, Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 5,** Room E, Cow Palace
10:00 AM to 11:22 AM	**Film Session No. 1,** Science Film Theater, Cow Palace
11:25 AM to 12:52 PM	**Film Session No. 2,** Science Film Theater, Cow Palace
12:00 Noon	**EDN Luncheon,** Continental Ballrooms 4 & 5, Hilton Hotel
12:00 Noon to 2:30 PM	**Eta Kappa Nu Luncheon,** Continental Ballrooms 7, 8, & 9, Hilton Hotel
1:55 PM to 3:15 PM	**Film Session No. 3,** Science Film Theater, Cow Palace
2:00 PM to 4:30 PM	**Technical Session A,** Room C, Cow Palace
3:20 PM to 5:15 PM	**Film Session No. 4,** Science Film Theater, Cow Palace
6:30 PM to 8:30 PM	**Cocktail Party,** Continental Ballroom, Hilton Hotel

Wednesday, August 25

8:30 AM to 6:00 PM	**IEEE Board of Directors Meeting,** Walnut Room, Hilton Hotel
9:00 AM to 5:00 PM	**Women's Hospitality Room,** Rosewood Suite, Hilton Hotel
9:00 AM to 4:00 PM	**IEEE Region 6 Committee Meeting,** Shasta Suite, Hilton Hotel
9:30 AM to 1:30 PM	**SLAC Technical Tour;** buses depart from east entrance of Cow Palace
9:00 AM to 12:00 Noon	**IEEE New Technical Activities Advisory Committee Meeting,** Tamalpais Room, Cow Palace
9:30 AM to 9:30 PM	**WESCON Exhibits,** Cow Palace
9:30 AM to 9:30 PM	**Industrial Design Exhibit,** Cow Palace
10:00 AM to 1:30 PM	**Technical Session No. 6,** Room A, Cow Palace
10:00 AM to 1:30 PM	**Technical Session No. 7,** Room B, Cow Palace
10:00 AM to 1:30 PM	**Technical Session No. 8,** Room E, Cow Palace
10:00 AM to 11:30 AM	**Technical Session No. 9,** Room C, Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 10,** Room D, Cow Palace
10:00 AM to 11:22 AM	**Film Session No. 1,** Science Film Theater, Cow Palace
11:25 AM to 12:52 PM	**Film Session No. 2,** Science Film Theater, Cow Palace
12:00 Noon	**WEMA Annual Meeting and Luncheon,** Ballrooms 4 & 5, Hilton Hotel
12:00 Noon to 2:00 PM	**IEEE Board of Directors Luncheon,** Toyon Suite, Hilton Hotel
12:00 Noon to 9:30 PM	**Future Engineers Show,** Cow Palace
1:00 PM to 3:00 PM	**FES Symposium,** Room D, Cow Palace
1:55 PM to 3:15 PM	**Film Session No. 3,** Science Film Theater, Cow Palace
2:00 PM to 4:00 PM	**Women's Activities Flower Arranging Demonstration,** Continental Ballroom 6, Hilton Hotel
2:00 PM to 5:00 PM	**IEEE New TAB Advisory Committee Meeting,** Tamalpais Suite, Hilton Hotel
2:00 PM to 4:30 PM	**Technical Session B,** Room C, Cow Palace
3:20 PM to 5:15 PM	**Film Session No. 4,** Science Film Theater, Cow Palace
3:00 PM	**Exhibitor's Meeting,** Room E, Cow Palace
6:00 PM to 10:00 PM	**IEEE Board of Directors Dinner Meeting,** Toyon Suite, Hilton Hotel
7:00 PM	**FES Evening Tour,** Hyatt Music Theater

Thursday, August 26

9:00 AM to 5:00 PM	**Women's Hospitality Room,** Rosewood Suite, Hilton Hotel
9:00 AM to 6:00 PM	**IEEE Board of Directors Meeting,** Walnut Suite, Hilton Hotel
9:00 AM to 12:00 Noon	**IEEE PMP Sub-Committee on Electronic Power Transformer Standard,** Diablo Suite, Hilton Hotel
9:30 AM to 9:30 PM	**WESCON Exhibits,** Cow Palace
9:30 AM to 9:30 PM	**Future Engineers Show,** Cow Palace
9:30 AM to 9:30 PM	**Industrial Design Exhibit,** Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 11,** Room C, Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 12,** Room A, Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 13,** Room B, Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 14,** Room E, Cow Palace
10:00 AM to 12:30 PM	**Technical Session No. 15,** Room D, Cow Palace
10:00 AM to 11:22 AM	**Film Session No. 1,** Science Film Theater, Cow Palace
11:25 AM to 12:52 PM	**Film Session No. 2,** Science Film Theater, Cow Palace
11:30 AM to 2:00 PM	**Women's Fashion Show and Luncheon,** Peacock Room, Mark Hopkins Hotel
12:00 Noon to 2:00 PM	**IEEE Board of Directors Luncheon,** Teakwood Suite, Hilton Hotel
12:00 Noon to 5:00 PM	**IEEE Engineering Management ADCOM Meeting,** Shasta Suite, Hilton Hotel
12:15 PM to 2:15 PM	**FES Awards Luncheon,** NCO Club, Presidio

(Continued on page 8)

welcome to WESCON/65

Suddenly it's August, and Wescon explodes on the scene with its excitement and provocative personality. Never willing to trod the old path, this fabulous child of WEMA and the IEEE can be counted upon constantly to experiment and innovate in its quest to improve continually its past successes in the tradition of the dynamic profession and industry which are its heritage in the West.

This year is no exception to the pattern, as even a brief glance at the program will disclose. An "all-new" technical format with its five special invited sessions and its twenty "team" project engineering sessions promises an unusual and technically profitable opportunity to the IEEE member.

Add to this the latest in engineering and scientific motion pictures, a visit to the Stanford 2-mile Linear Accelerator, a product exhibit par excellence, Future Engineers Show, Industrial Design Awards Exhibit, women's program, banquet, and cocktail party, and the result is a professional and industrial extravaganza which Region Six is proud to co-sponsor and indebted to its San Francisco Section for their involvement as this year's representatives.

B. S. Angwin
Region 6 Director

Angwin

Bertolet

Wescon has traditionally been known as a forward-looking convention for the exchange of ideas in both our industry and profession. This year's program is carrying on in that same tradition, as exemplified by an all-new technical program consisting of five special invited sessions covering a wide interest range, and 20 contributed sessions organized by specialists in their respective fields.

The past few years have seen many changes take place in our fast-moving industry, and it is a challenge to each and every one of us to look ahead to tomorrow by studying well the information we have available to us today. Wescon can be an important link in this endeavor, but it is up to each of us as professionals to determine the extent of our participation.

There are many activities at Wescon, and the Los Angeles District of the IEEE is proud and pleased to join with the San Francisco Section, with the Sixth Region, and with WEMA, in cordially inviting each and every one of you to visit and participate in Wescon 1965 at San Francisco.

Edward C. Bertolet
Los Angeles District Chairman
1965-66

A most cordial welcome to Wescon/65!

WEMA shares with the IEEE, our partner in Wescon, the hope that you will find this year's show and convention the most enlightening and entertaining ever.

We are proud of this, one of the world's major technical meetings, for it is an outgrowth of a small trade exposition launched by WEMA 21 years ago. Through our representatives on the Wescon board of directors and committees, we have helped shape the course of this great event.

Wescon has earned its high stature over the years by consistently offering new and better ways for technical companies to improve their own effectiveness. Many seeds have been planted at Wescon, later to bloom into the technical initiative that is the mark of the industry's leaders.

The electronics industry of the West is pleased that you are here. We urge you to take full advantage of all that will be offered this week.

William H. Heflin
President,
Western Electronic Manufacturers Association

Heflin

Melchor

Welcome to Wescon and to San Francisco in the Year of the Snake.

Wescon's new task force technical format and concerted efforts by Wescon management to attract parallel national technical group meetings are indicative of strong emphasis on technical communications. Similarly, the excellent show that you'll see exemplifies the fruits of technical efforts throughout our profession.

We sincerely hope that Wescon, co-sponsored by Region 6, IEEE and WEMA, gives you new perspective and appreciation for our industry's ability to translate yesterday's ideas into today's products for benefit of mankind.

The San Francisco Section of IEEE is proud of its members' contributions to this annual event.

Jack L. Melchor
San Francisco Section Chairman
1965-66

wescon roster

WHERE THEY'RE STAYING

A running roster of Wescon registrants and where they are staying will be maintained in the Information Center at the West entrance of the Cow Palace. The booth may be reached by calling the Cow Palace, JU 4-2480.

social note

WESCON DINNER DANCE

The annual Wescon dinner-dance will be held in the grand ballroom of the San Francisco Hilton, beginning at 8 p.m. on Thursday, August 26, with dinner and dancing to the orchestra of Walt Tolleson for $7.50 per person.

MORE WESCON QUICK-CHECK LIST

1:55 PM to 3:15 PM	Film Session No. 3, Science Film Theater, Cow Palace
2:00 PM to 4:30 PM	Technical Session C, Room C, Cow Palace
3:20 PM to 5:15 PM	Film Session No. 4, Science Film Theater, Cow Palace
8:00 PM	WESCON Dinner-Dance, Continental Ballroom, Hilton Hotel

Friday, August 27

9:00 AM to 5:00 PM	Women's Hospitality Room, Rosewood Suite, Hilton Hotel
9:30 AM to 6:30 PM	WESCON Exhibits, Cow Palace
9:30 AM to 6:30 PM	Future Engineers Show, Cow Palace
9:30 AM to 6:30 PM	Industrial Design Exhibit, Cow Palace
10:00 AM to 10:45 AM	Women's Continental Breakfast (Remarks by Dr. John V. N. Granger), Rosewood Suite, Hilton Hotel
10:00 AM to 12:00 Noon	Technical Session No. 16A, Room A, Cow Palace
10:00 AM to 12:30 PM	Technical Session No. 17, Room B, Cow Palace
10:00 AM to 1:30 PM	Technical Session No. 18, Room D, Cow Palace
10:00 AM to 12:30 PM	Technical Session No. 19, Room C, Cow Palace
10:00 AM to 12:30 PM	Technical Session No. 20, Room E, Cow Palace
10:00 AM to 11:22 AM	Film Session No. 1, Science Film Theater, Cow Palace
10:45 AM	Women's Tour of WESCON, Cow Palace
11:25 AM to 12:52 PM	Film Session No. 2, Science Film Theater, Cow Palace
12:00 Noon to 2:00 PM	Technical Session No. 16B, Room A, Cow Palace
1:55 PM to 3:15 PM	Film Session No. 3, Science Film Theater, Cow Palace
2:00 PM to 4:30 PM	Technical Session D, Room C, Cow Palace
3:20 PM to 5:15 PM	Film Session No. 4, Science Film Theater, Cow Palace

YOUNGSTERS: Main exhibit areas—No one under 10 admitted. Youngsters 10-18 admitted during entire show if accompanied by registered adult and for $1 fee.

Future Engineers Show—No age restriction if youngster accompanied by registered adult.

LADIES: $1 registration fee at Cow Palace.

VARIAN ASSOCIATES

The growth of world-wide demand for Varian products in commercial, military, and industrial markets is providing new career opportunities for engineers. The following positions are among those now available:

LINAC ENGINEERS

Experienced in design of high-power pulse modulators, power distribution systems, or solid-state circuits. Background in high-power microwave system design in the megawatt range helpful.

APPLICATION ENGINEERS

Interesting positions in providing support to marketing functions in the chemical, electronic, and vacuum fields. Duties will include new equipment evaluation, analysis of customer requirements and samples, and direct support of field sales activities.

DESIGN ENGINEERS

B.S. and M.S. levels in circuits and systems. Transistors, servo, RF, or microwave experience desired. Background or interest in physics or chemistry helpful.

TUBE ENGINEERS

Experience in design, development, or manufacture of klystrons BWO or TWT's. Should be familiar with microwave techniques and vacuum tube engineering. Experience in systems and evaluation helpful.

MANUFACTURING ENGINEERS

To handle transfer of products from development into manufacturing. Prefer strong background in the electronics or instrumentation field. Experience in production processes and methods necessary.

SERVICE ENGINEERS

Must have strong electronics background in solving service problems on complex electronics equipment, including amplifiers and information and secondary function circuits. To assist in preparing service and maintenance sections of instruction manuals.

Many other technical and professional openings also exist and all inquiries will be welcomed. Successful candidates for these positions will work with technical staff members noted in the industry. Varian is one of the leading employers in Northern California, noted for its unique living, cultural, and educational environment.

For consideration of your qualifications, submit a resumé in confidence to:

Technical Employment Manager

VARIAN associates

611 Hansen Way • Palo Alto, California • 326-4000

an equal opportunity employer

Circle Inquiry Card No. 70

Last-minute walk-through of Cow Palace facilities is undertaken by Wescon executives Meyer Leifer (left) and John A. Chartz. Show and convention will use main arena plus four exhibit halls. All technical and film sessions will be held in West exhibit hall. Leifer, Wescon board chairman, is vice president of Energy Systems Inc. Chartz, chairman of the Wescon executive committee, is executive vice president of Dalmo Victor Co.

wescon background

400 ON COMMITTEES

Nearly 400 volunteer committee members, primarily members of the San Francisco Section of IEEE and the San Francisco Council of WEMA, provide the vital manpower for Wescon/65.

More than 120 committeemen and women have worked on the event since January. The committees will be supplemented by about 275 more volunteers for the event.

wema luncheon

LOCKHEED'S HAUGHTON ON DIVERSIFICATION

Daniel J. Haughton, president of Lockheed Aircraft Corp., will be the guest speaker at the annual luncheon meeting of the Western Electronic Manufacturers Association.

Date of the luncheon is August 25. The annual event is scheduled for the Continental ballroom of the San Francisco Hilton. More than 400 people, including presidents and top executives of the electronics industry, are expected to attend the meeting.

Haughton will explore the new areas of opportunity for the electronics and aerospace industry, drawing on Lockheed's diversification studies.

David Ross, left, and V. N. Zachariah discuss plans for the Distributor-Manufacturer-Representative Conference. More than 500 participants are expected to take part in all-day marketing confab.

Contributed sessions

SESSION 1

LOW-POWER INTEGRATED CIRCUITS

Tuesday, August 24
10 A.M.-12:30 P.M.
Room A, Convention Hall, Cow Palace

Organized by Westinghouse Electric Corp.

Session Director: A. Burzio, University of Santa Clara

Session Chairman: H. C. Lin, Westinghouse Electric Corp., Baltimore

1/1 STATIC AND DYNAMIC PERFORMANCE OF MICROPOWER TRANSISTOR LOGIC CIRCUITS
Lawrence F. Wagner and James D. Meindl, U. S. Army Electronics Command, Fort Monmouth, New Jersey

1/2 INTEGRATED HIGH-SPEED, LOW-POWER COMPLEMENTARY BIPOLAR TRANSISTOR NAND GATE
R. Y. Hung and H. C. Lin, Westinghouse Electric Corp., Elkridge, Maryland

1/3 MOS COMPLEMENTARY TRANSISTOR LOGIC
M. M. Mitchell and R. W. Ahrons, Radio Corporation of America, Somerville, New Jersey

1/4 A SILICON MONOLITHIC MICROPOWER COMPLEMENTARY FLIP-FLOP
G. Y. Chang, Westinghouse Electric Corp., Elkridge, Maryland

1/5 A MONOLITHIC SILICON CLASS B HEARING AID AMPLIFIER
M. J. Hellstrom and J. J. Hsieh, Westinghouse Electric Corp., Elkridge, Maryland

SESSION 2

AN ADVANCE IN THE DEVELOPMENT OF AIRBORNE DIGITAL COMPUTERS

Tuesday, August 24, 10 A.M.-12:30 P.M.
Room B, Convention Hall, Cow Palace

Organized by Honeywell, Inc.

Session Director: John Newman, University of Santa Clara

Session Chairman: C. E. Collum, Honeywell Inc., St. Petersburg, Florida

2/1 CONSIDERATIONS IN THE DESIGN OF AIRBORNE DIGITAL COMPUTERS
C. E. Collum, Honeywell, Inc.

2/2 FUNCTIONAL DESIGN OF A HIGH-SPEED AIRBORNE PROCESSOR
R. N. Carpenter, Honeywell, Inc.

2/3 A FAMILY OF HLTTL CIRCUITS FOR USE IN HIGH-SPEED MILITARIZED COMPUTERS
J. W. Martin, Texas Instruments Inc., Dallas, Texas

2/4 THE MICROBIAX MEMORY ELEMENT
R. W. Beveridge, Raytheon Computer, Santa Ana, California

2/5 AN NDRO AIRBORNE MEMORY SYSTEM UTILIZING THE MICROBIAX ELEMENT
M. G. Petersen, Honeywell Inc.

2/6 PHYSICAL DESIGN OF AN INTEGRATED-CIRCUIT AIRBORNE DIGITAL COMPUTER
W. O. Martin and E. Steltzer, Honeywell Inc.

2/7 THERMAL CONSIDERATIONS FOR AN ADVANCED AIRBORNE DIGITAL COMPUTER
A. D. Kraus and R. K. Smith, Honeywell Inc.

2/8 SOFTWARE DEVELOPMENTS FOR AIRBORNE COMPUTER APPLICATIONS
T. R. Jefferies and C. T. Brown, Honeywell Inc.

SESSION 3

PORTABLE AND STORAGE OSCILLOSCOPES

Tuesday, August 24, 10 A.M.-1:30 P.M.
Room D, Convention Hall, Cow Palace

Organized by Tektronix, Inc., Beaverton, Oregon

Session Director: Michael O'Flynn, San Jose State College

Session Chairman: Orvin Olson, Tektronix, Inc.

3/1 PORTABLE OSCILLOSCOPE DESIGN
Oliver Dalton, Tektronix, Inc.

3/2 VERTICAL AMPLIFIER SYSTEMS OF TYPE 422 AND 453 PORTABLE OSCILLOSCOPES
R. Eugene Andrews, Tektronix, Inc.

3/3 PRINCIPLES OF SIMPLIFIED DIRECT-VIEWING STORAGE TUBES
Orvin Olson, Tektronix, Inc.

3/4 SIMPLIFIED STORAGE TUBE OPERATING MODES AND DESIGN CONSIDERATIONS
Pierre Morinaud, Tektronix, Inc.

3/5 DESIGN CONSIDERATIONS OF THE TYPE 549 STORAGE OSCILLOSCOPE
Russell V. Fillinger, Tektronix, Inc.

3/6 APPLICATIONS
Geoffrey A. Gass, Tektronix, Inc.

SESSION 4

MARINER/MARS SCIENCE SUBSYSTEM

Tuesday, August 24, 10 A.M.-1 P.M.
Room C, Convention Hall, Cow Palace
Organized by Jet Propulsion Laboratory
Pasadena, California
Session Director: R. B. Yarbrough
University of Santa Clara
Session Chairman: Frank L. Schutz
Jet Propulsion Laboratory

4/1 INTRODUCTION: THE MISSION; THE SPACECRAFT
Frank L. Schutz
Jet Propulsion Laboratory

4/2 SCIENCE SUBSYSTEM
W. G. Fawcett
Jet Propulsion Laboratory

4/3 COSMIC RAY TELESCOPE
J. A. Simpson and
J. J. O'Gallagher
University of Chicago

4/4 COSMIC DUST DETECTORS
D. K. Schofield
Jet Propulsion Laboratory

4/5 TRAPPED RADIATION DETECTORS
D. K. Schofield
Jet Propulsion Laboratory
D. Chinburg
State University of Iowa
D. Enemark
State University of Iowa

4/6 IONIZATION CHAMBER
L. G. Despain and
H. A. Andersen
Jet Propulsion Laboratory

4/7 PLASMA PROBE
R. A. Graham
Jet Propulsion Laboratory

4/8 MAGNETOMETER
Donald D. Norris,
James S. Bunn
Jet Propulsion Laboratory
James L. Lawrence
Analog Technology Corp.

4/9 TELEVISION SYSTEM
J. Denton Allen and
L. Malling
Jet Propulsion Laboratory

4/10 DATA AUTOMATION SYSTEM
W. J. Schneider and
D. L. Nay
Jet Propulsion Laboratory

4/11 PLANETARY SCAN SYSTEM
R. Y. Wong
Jet Propulsion Laboratory

4/12 SCIENCE DATA PROCESSING
Stephen Z. Gunter and
M. J. Sander
Jet Propulsion Laboratory

SESSION 5

BRUSHLESS DC MOTORS

Tuesday, August 24, 10 A.M.-12:30 P.M.
Room E, Convention Hall, Cow Palace
Organized by Sperry Farragut Co., Bristol, Tenn.
Session Director: Lincoln D. Jones
San Jose State College
Session Chairman: R. D. Kincer
Sperry Farragut

5/1 PRINCIPLES OF BRUSHLESS DC MOTOR OPERATION
R. D. Kincer and
R. G. Rakes
Sperry Farragut

5/2 MODIFICATIONS OF BASIC DRIVE MOTORS IN APPLICATIONS
R. D. Kincer and
B. F. DeWitt
Sperry Farragut

5/3 CONTROL OF BRUSHLESS DC TORQUER-REACTION WHEEL
Philip A. Studer (Part A)
NASA Goddard Space Flight Center
Greenbelt, Maryland

5/4
W. M. Casaday (Part B)
Sperry Farragut

SESSION 6

FIELD EFFECT TRANSISTORS

Wednesday, August 25, 10 A.M.-1:30 P.M.
Room A, West Hall, Cow Palace
Authors from two engineering teams will discuss FET characteristics, design of FET circuits and patterns of performance, and recent developments in complex metal-oxide-silicon FET and their application to electronic systems.
Session Chairman:
R. L. Pritchard
Stanford University

6/1 FIELD EFFECT TRANSISTOR APPLICATIONS
Dean C. Bailey
Union Carbide Electronics
Mountain View, California

6/2 FIELD EFFECT DEVICE RELIABILITY
Richard C. McCoy
Quality Assurance Manager
Union Carbide Electronics
Mountain View, California

6/3 USE OF MOS TECHNOLOGY IN THE MANUFACTURE OF MOS CIRCUIT FUNCTIONS
D. E. Farina
General Micro-Electronics Inc.
Santa Clara, California

6/4 USE OF MOS COMPLEX CIRCUIT FUNCTIONS IN ELECTRONIC EQUIPMENT
L. E. Banghart
General Micro-Electronics Inc.
Santa Clara, California

SESSION 7

SIGNIFICANT ELECTRONIC APPLICATIONS AND EXPERIMENTAL RESULTS FROM PROJECT ECHO

Wednesday, August 25, 10 A.M.-1:30 P.M.
Room B, West Hall, Cow Palace
Session organized by NASA Goddard Space Flight Center
Session Director: Glenn H. Keitel
San Jose State College
Session Chairman: H. L. Eaker
NASA/Goddard

7/1 PROJECT OBJECTIVES AND EXPERIMENT PLANS
H. L. Eaker
Goddard Space Flight Center
Greenbelt, Maryland

7/2 FULL SCALE GROUND TESTS OF ECHO II PROTOTYPE SPHERES
James P. Talentino
Goddard Space Flight Center

7/3 INSTRUMENTATION OF ECHO II THROUGH TV TECHNIQUES
John Yagelowich
Goddard Space Flight Center

(more)

regional report

DIRECTOR ANGWIN REVIEWS IEEE YEAR

The past year has been one of great action and adjustment within the IEEE. Membership in all grades except student has shown an increase. The headquarters functions have been totally consolidated in the United Engineering Center, and the new computer has been installed and partially programmed to process the tremendous volume of data necessary to accommodate the business functions of the world's largest technical society.

The editorial programs of the institute are now pretty well merged and stabilized with some major additions, removals, and consolidations of individual publications. Each publication is now growing in quality and effectiveness as the polishing process proceeds.

The Internal Revenue Service, some time ago, expressed certain disturbing opinions regarding the taxable position of IEEE's activities. These have been carefully studied, and appropriate and vigorous action has been and will be taken.

Most of these developments have been covered in considerable detail in the June issue of the Spectrum. *I urge every member to carefully read that issue. in particular.*

The most complex, and therefore last, merger problem to be resolved by the IEEE has been the blending of the technical activities of the AIEE and IRE. This has finally been accomplished with the formation of TAB, the Technical Activities Board. At last, these activities are truly consolidated and centralized, based upon the groups, with accommodation for necessary general committees, including the Committee on IEEE Standards. We are now seeing a healthful and logical consolidation of several groups with overlapping interests. When completed, the IEEE member should have an even greater opportunity to participate in and benefit from a more highly concentrated choice of activities in his fields of specialized interest with far less dispersion of these activities through a multiplicity of concurrent and competing meetings.

The IEEE is truly an organization of which its members can be proud. Its value to the individual is now proportional to the extent of his participation. How about you?

B. S. ANGWIN
REGION 6 DIRECTOR

Wescon visitors should visit the Future Engineers Show to encourage these bright, promising young engineers.

Two-mile-long Stanford Linear Accelerator will be scene of a Wescon technical tour on August 25. SLAC team will provide full briefing on the accelerator, conduct tour of completed portions.

concurrent symposium

ELECTRON DEVICES

The IEEE Group on Electron Devices will hold a two-day, three-session symposium August 23 and 24 at the Fairmont Hotel.

GED responded to an invitation to IEEE Groups by Wescon's directors to present a program concurrent with Wescon week in San Francisco. The result is a schedule of 13 papers, organized into an electron devices symposium. GED sponsors anticipate a registration of 500 for the event.

concurrent symposium

ELECTRONIC CIRCUIT PACKAGING

The Sixth International Electronic Circuit Packaging Symposium, being presented at the San Francisco Hilton concurrent with Wescon, has its own special format, its own point-of-view, and its own long record of high-quality programming.

The symposium will mount five technical sessions in two days, made up of 21 technical presentations. All are scheduled for the ballrooms of the Hilton on Monday and Tuesday, August 23 and 24.

Wescon executive committee, left to right: John S. McCullough, Philip Gundy, John Chartz, Don Larson, Mike Leifer.

7/4 APPLICATION OF A BEACON TELEMETRY SYSTEM FOR MEASURING ORBITAL PERFORMANCE OF THE ECHO II SATELLITE
N. Martin and
Harold Moriuchi
Goddard Space Flight Center

7/5 RESULTS OF THE COMMUNICATION EXPERIMENTS CONDUCTED WITH THE ECHO II SATELLITE
W. C. Nyberg
Goddard Space Flight Center

7/6 THE NEED FOR A CALIBRATION SATELLITE
H. L. Eaker
Goddard Space Flight Center
Greenbelt, Maryland

7/7 SUMMARY OF THE OVERALL RESULTS OF THE ECHO PROJECT
H. L. Eaker
Goddard Space Flight Center
Greenbelt, Maryland

SESSION 8

TIME DOMAIN REFLECTOMETRY AND VOLTAGE MEASUREMENTS —DC TO MICROWAVE

Wednesday, August 25, 10-A.M.-1:30 P.M.
Room E, West Hall, Cow Palace
Organized by Hewlett-Packard Co.
Session Director: J. D. Bruce
University of Santa Clara
Session Chairmen: Darwin Howard
Hewlett-Parkard
Colorado Springs, Colorado
Marco R. Negrete
Hewlett-Packard
Loveland, Colorado

8/1 TRANSMISSION LINE PULSE REFLECTOMETRY
Lawrence S. Kreyer
Edgerton, Germeshausen & Grier
Las Vegas, Nevada

8/2 TIME DOMAIN REFLECTOMETRY AS A DESIGN TOOL
Carl Sontheimer
Anzac Electronics
Norwalk, Connecticut

8/3 MECHANICAL SCALING ENHANCES TIME DOMAIN REFLECTOMETRY USE
Howard Poulter
Hewlett-Packard Co.
Palo Alto, California

8/4 COAXIAL LINE STANDARDS FOR MEASUREMENT OF REFLECTIONS WITH A TIME DOMAIN REFLECTOMETER SYSTEM
J. E. Cruz and
R. L. Brooke
National Bureau of Standards
Boulder, Colorado

8/5 DC VOLTMETERS — SPECIFICATION, TRACEABILITY, VERIFICATION
Donald F. Schultz
Hewlett-Packard Co.
Loveland, Colorado

8/6 EXTRANEOUS NOISE AND DC VOLTAGE MEASUREMENTS
Paul G. Baird
Hewlett-Packard Co.
Loveland, Colorado

8/7 THE EFFECTS OF DISTORTION ON AC VOLTMETERS
Marco R. Negrete
Hewlett-Packard Co.
Loveland, Colorado

8/8 VOLTMETER CALIBRATION TO 1 GHz
M. C. Selby, W. J. Blank, and R. P. Chariton
National Bureau of Standards
Boulder, Colorado

SESSION 9

THE NORAD STORY —THE AEROSPACE DEFENSE OF THE NORTH AMERICAN CONTINENT

Tuesday, August 24, 10-11:30 A.M.
Room B, Convention Hall, Cow Palace
Session Director: R. E. Humphrey,
University of California
Berkeley, Calif.
Session Chairman: Major A. H. Davis, Jr. USAF

PART I: THE MISSION OF NORAD
Flight Lieutenant L. G. Jenks
Royal Canadian Air Force

PART II: CURRENT AEROSPACE DEFENSE OPERATIONS
Major H. A. Davis, Jr.
United States Air Force

PART III: THE FUTURE OF AEROSPACE DEFENSE
Lt. Commander
N. H. Scawthorn, U. S. Navy

SESSION 10

ELECTRONIC PACKAGING IN THE PERSHING WEAPON SYSTEM

Wednesday, August 25, 10 A.M.-12:30 P.M.
Room D, Convention Hall, Cow Palace
Organized by The Martin Co., Orlando, Fla.
Session Director: Rajinder P. Loomba
San Jose State College
Session Chairman: J. W. Chasteen
Martin Company
Orlando, Fla.

10/1 THE PERSHING WEAPON SYSTEM
J. W. Chasteen
Martin/Orlando

10/2 PACKAGING TRADEOFFS FOR PERSHING GROUND SUPPORT EQUIPMENT
William J. Kahn
Martin/Orlando

10/3 PERSHING GSE PACKAGING
R. H. Carlson
Martin/Orlando

10/4 RELIABILITY EVALUATION OF MULTILAYER PRINTED WIRING SYSTEMS
W. S. Rigling
Martin/Orlando

10/5 TRANSFER MOLDING
Hugo L. Uglione, Jr. and
Allen R. Bell, Jr.
Martin/Orlando

10/6 PRODUCIBILITY — THE KEY TO LOW COST ELECTRONIC SYSTEMS
L. M. Schneider
Martin/Orlando

10/7 DOES MINIATURIZATION REALLY HELP RELIABILITY?
W. P. Wood
Martin/Orlando

(more)

SESSION 11

INTEGRATED CIRCUITS

Thursday, August 26, 10 A.M.-12:30 P.M.
Room C, Convention Hall, Cow Palace

Session Director: R. M. White, University of California, Berkeley, Calif.

Session Chairman: C. H. Phipps, Texas Instruments, Inc., Dallas, Texas

11/1 THE EVOLUTION OF SATURATED DIGITAL DESIGN
J. W. Martin, Texas Instruments

11/2 DESIGN CONSIDERATIONS FOR HIGH SPEED UNSATURATED LOGIC
Hector Cardenas, Texas Instruments

11/3 STATE-OF-THE-ART OF LINEAR INTEGRATED CIRCUITS
W. L. Fowler, Texas Instruments

11/4 AN INTEGRATED SENSE AMPLIFIER
James R. Talley, Texas Instruments

11/5 TRENDS IN INTEGRATED CIRCUIT PACKAGING
C. H. Phipps, Texas Instruments

SESSION 12

A NEW GENERATION OF DATA PROCESSING SYSTEMS

Thursday, August 26, 10 A.M.-12:30 P.M.
Room A, Convention Hall, Cow Palace

Organized by Radio Corporation of America, Princeton, New Jersey

12/1 SPECTRA-70, BASIC DESIGN AND PHILOSOPHY OF OPERATION
A. D. Beard, RCA Electronic Data Processing, Camden, New Jersey

12/2 INTEGRATED CIRCUITS DESIGN FOR THE SPECTRA-70
R. D. Lohman, RCA Electronic Components and Devices, Somerville, New Jersey

12/3 EMULATION ON RCA SPECTRA-70
W. R. Lonergan, RCA Electronic Data Processing, Cherry Hill, New Jersey

12/4 MEMORIES IN PRESENT AND FUTURE GENERATIONS OF COMPUTERS
Jan A. Rajchman, RCA Laboratories, Princeton, New Jersey

12/5 HIGH SPEED OPTICAL CHARACTER READERS
J. A. Torre, RCA Electronic Data Processing, Camden, New Jersey

SESSION 13

LASER APPLICATIONS

Thursday, August 26, 10 A.M.-12:30 P.M.
Room B, Convention Hall, Cow Palace

Organized by Stanford Electronics Laboratories, Stanford, Calif.

Session Chairman: W. H. Huntley, Jr., Stanford Electronics Laboratories

13/1 THE ROLE OF COHERENT OPTICS IN ELECTRICAL ENGINEERING
J. W. Goodman, Stanford Electronics Laboratories

13/2 OPTICAL DEVICES AND TECHNIQUES
D. W. Jackson, Stanford Electronics Laboratories

13/3 PHOTOGRAPHY FOR OPTICAL MEASUREMENTS
Matt Lehmann, Stanford Electronics Laboratories

13/4 SURVEY OF U.S. LASER APPLICATIONS PROGRAMS
W. H. Huntley, Jr., Stanford Electronics Laboratories

13/5 OPTICAL SIGNAL PROCESSING AND APPLICATIONS TO PATTERN RECOGNITION
Charles Weaver, Stanford Electronics Laboratories

13/6 OPTICAL RADAR TECHNIQUES
J. W. Goodman, Stanford Electronics Laboratories

SESSION 14

TRENDS IN AEROSPACE COMMUNICATIONS AND TELEMETRY

Thursday, August 26, 10 A.M.-12:30 P.M.
Room E, Convention Hall, Cow Palace

Session organized by Lockheed Missiles & Space Co., Sunnyvale, California

Session Director: D. J. Angelakos, University of California, Berkeley, California

Session Chairman: D. Hochman, Lockheed Missiles & Space Co., Sunnyvale, California

14/1 ADVANCED ANTENNAS FOR SPACE APPLICATION
A. M. Berkman and W. M. Young, Lockheed Missiles & Space Co.

14/2 WIDE BANDWIDTH TRANSMITTERS AND RF-TO-RF REPEATERS FOR SPACE APPLICATIONS
R. T. Murphy, Lockheed Missiles & Space Co.

14/3 PROGRAMMABLE TELEMETRY FOR AEROSPACE MISSIONS
N. N. Berger and R. W. Ulrickson, Lockheed Missiles & Space Co.

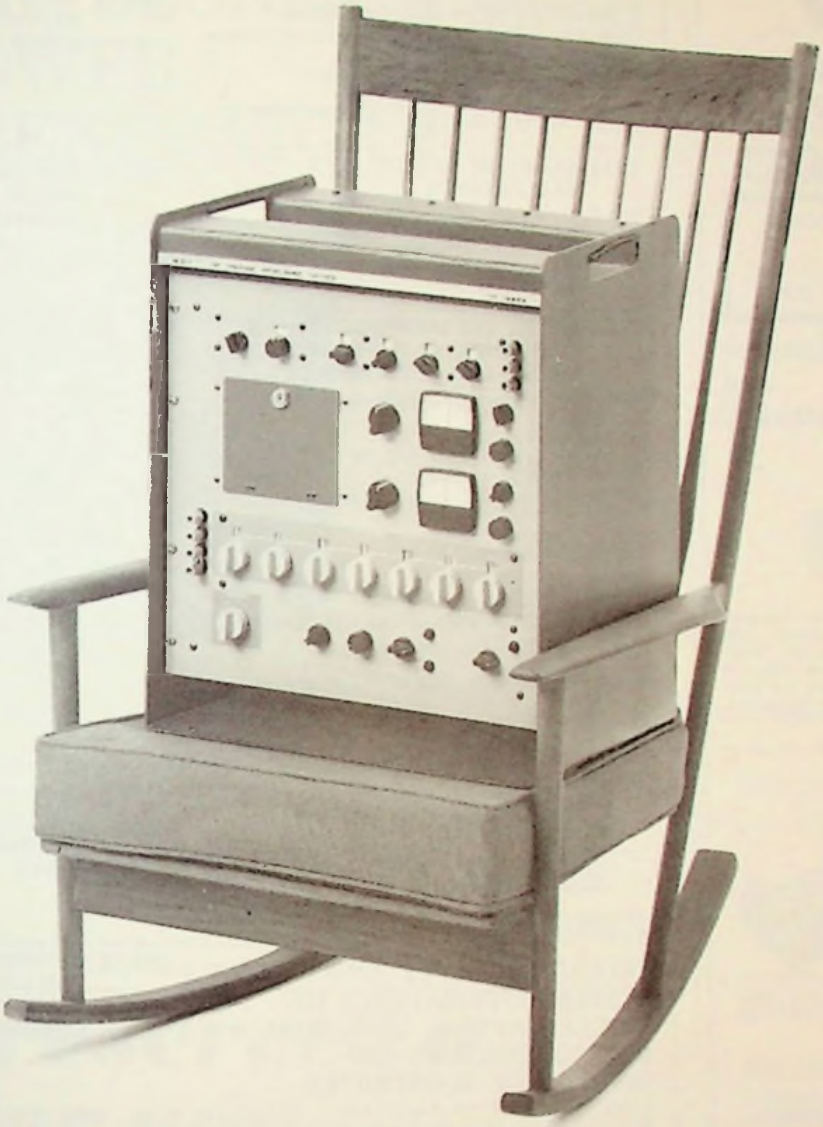
14/4 DATA COMPRESSION AND ADAPTIVE TELEMETRY
C. M. Kortman, Lockheed Missiles & Space Co.

14/5 MASS MEMORIES
Mark M. Siera, Lockheed Missiles & Space Co.

SESSION 15

MANUFACTURING AND MARKETING OF MEDICAL ELECTRONIC DEVICES

(more)



Voltmother

This self-calibrating system can tend your entire brood of dc voltage sources and measuring devices—with 5 ppm accuracy.

Our new 1045A DC Voltage Measuring System is designed to serve as your final authority on voltages ranging from above 1100 volts down to less than a volt. This range used to require two or more separate instruments.

The system's accuracy—5 ppm with 7 place resolution—is the best you can get. For all this range and accuracy, you don't have to be a fuss-budget with the 1045A. Even a fledgling technician can fly with six-place accuracy.

No external calibration is required to verify the system's accuracy. It functions as a voltage comparator, comparing voltages to saturated reference standard cells. As an added safeguard, the voltage of the standard cells is continuously monitored during the measurement.

Think of the many voltage devices used in your plant or lab that you rely on for consistently accurate readings: decade power supplies, potentiometric and digital voltmeters, X-Y Recorders, pH meters, thermocouples, electrometers, reference voltage power supplies...

If the behavior of any of these instruments is open to question, consider how they might respond to the discipline of a good Voltmother. ESI, 13900 NW Science Park Drive, Portland, Oregon (97229).

The ESI 1045A Voltage Measuring System combines a direct-reading potentiometer, direct-reading standard cell comparator, and guarded voltbox. Price: $4,200

	1000V	100V	10V	1V	0.1V
Limit of Error at Specified Voltages (in ppm)	11.7	4.1	3.6	4.6	21
Probable Error* (in ppm)	2.6	0.9	0.8	1.0	4.7

*At least one-half of all measurements will be more accurate than the probable error.

INSTRUMENTS ROOM #D-16; COMPONENTS—BOOTH 2909

Electro Scientific Industries esi.

Circle Inquiry Card No. 85

Thursday, August 26, 10 A.M.-12:30 P.M.
Room D, Convention Hall, Cow Palace

Organized by Palo Alto Medical Research Foundation, Palo Alto, California

Session Organizer and Chairman: Noel P. Thompson, M.D., M.S.E.E., Palo Alto Medical Research Foundation

15/1 CLINICAL MEDICAL ELECTRONICS

Noel P. Thompson, M.D.
Palo Alto Medical Research Foundation, Palo Alto Medical Clinic, and Physiology and Electrical Engineering Depts. Stanford University

15/2 PANEL ON MANUFACTURING, LICENSING, AND PATENTING OF MEDICAL ELECTRONIC DEVICES

Elliott Farnsworth, Corbin-Farnsworth, Inc. Palo Alto

Richard Holmes
Counsel for Smith Kline & French, Inc. Philadelphia

Lawrence Rivken, M.D., Mt. Zion Hospital San Francisco

Noel P. Thompson, M.D.
Stanford University

15/3 PANEL ON MEDICAL ELECTRONIC MARKETING

Richard Bischoff, Will Ross, Inc. San Jose

Sergius Bryner, M.D., Palo Alto Medical Clinic Palo Alto

Frank C. Culver, Hewlett-Packard Co. Palo Alto

Austin Reblin, Neely Sales Div., Hewlett-Packard Co. San Carlos

Martin Shiner, Electronics for Medicine White Plains, New York

SESSION 16A

LATEST CONCEPTS AND SYSTEM APPLICATIONS OF SINGLE CRYSTAL THIN FILM SEMICONDUCTORS ON INSULATING SUBSTRATES

Friday, August 27, 10 A.M.-Noon
Room A, Convention Hall, Cow Palace

Session Organizer and Chairman: Dr. Arnold Miller, Physical Research Dept. Autonetics, a Division of North American Aviation, Inc. Anaheim, California

16A/1 THIN FILM EPITAXIAL SINGLE CRYSTAL SEMICONDUCTORS ON INSULATING SUBSTRATES: BACKGROUND, CONCEPTS, APPLICATIONS

Arnold Miller
Autonetics
Anahelm, California

16A/2 SINGLE CRYSTAL SILICON ON SAPPHIRE; A NEW DIMENSION IN MICROELECTRONICS FLEXIBILITY

D. H. Forbes and H. M. Manasevit
Autonetics
Anaheim, California

16A/3 SILICON ON SAPPHIRE DEVICE AND INTEGRATED CIRCUIT PROCESSING TECHNOLOGY

P. J. Hagon
Autonetics
Anaheim, California

16A/4 SILICON/SAPPHIRE INTEGRATED MICROCIRCUIT AND MICROPOWER CONCEPTS

R. W. Downing
Autonetics
Anaheim, California

16A/5 THIN FILM SILICON-ON-SAPPHIRE DIODE MATRIX FIXED MEMORY

T. J. La Chapelle and F. L. Morritz
Autonetics
Anaheim, California

16A/6 CIRCUIT APPLICATIONS OF DIODE MATRICES FOR COMPUTER FIXED MEMORIES

R. H. Drew
Autonetics
Anaheim, California

16A/7 TRANSIENT RADIATION EFFECTS ON FIELD EFFECT TRANSISTORS

A. F. Krueger and E. E. Griffin, Jr.
Autonetics
Anaheim, California

SESSION 16B

A FAILURE MECHANISM OF GOLD-ALUMINUM INTEGRATED CIRCUIT BONDS

Friday, August 27, 12-2 P.M.
Room A, Convention Hall, Cow Palace

Session Organizer and Chairman: D. G. Cummings, Autonetics, a Division of North American Aviation, Inc. Anaheim, California

16B/1 IDENTIFICATION OF THE THERMAL COMPRESSION BOND FAILURES

D. G. Cummings
Autonetics
Anaheim, California

16B/2 CHARACTERIZATION OF FAILURE MODES IN GOLD-ALUMINUM THERMO-COMPRESSION BONDS

L. E. Colteryahn and D. D. Shaffer
Autonetics
Anaheim, California

16B/3 FAILURE MECHANISMS AND KINETICS OF INTERMETALLIC FORMATION

J. L. Kersey and L. E. Colteryahn
Autonetics
Anaheim, California

16B/4 TIME-TEMPERATURE EFFECTS ON GOLD-ALUMINUM THERMOCOMPRESSION BONDS

J. R. Howell and J. W. Kanz
Autonetics
Anaheim, California

16B/5 THERMAL COMPRESSION BOND MATRIX STUDY

D. G. Cummings
Autonetics
Anaheim, California

SESSION 17

COMPUTER-CONTROLLED INDUSTRIAL SYSTEMS

Friday, August 27, 10 A.M.-12:30 P.M.
Room B, Convention Hall, Cow Palace

Organized jointly by University of Santa Clara Santa Clara, California Electronic Associates Inc. Palo Alto, California

Session Chairman: Dr. Richard C. Dorf, University of Santa Clara

(more)

SEE THE VELONEX HIGH POWER PULSE GENERATOR

OPERATING AT WESCON BOOTH 3919

CONDENSED SPECS:

20 KW PEAK

2000 VOLTS
10 AMPS
.05 μSEC RISE TIME
.1 TO 200 μSEC WIDTH
3 CPS TO 100 KC PRF
COMPLETE FLEXIBILITY

MODEL 350 HIGH POWER PULSE GENERATOR

As easy to operate as an ordinary low-power lab pulse generator. Output current, voltage and impedance modifiable by plug-ins.
Price $3990.00

Representation Open in Southern California . . .

a division of Pulse Engineering, Inc.

560 Robert Avenue, Santa Clara, California. Area Code (408) 244-7370;

velonex

Circle Inquiry Card No. 79

we've reserved a copy for you...

TECHNIPOWER'S 1965 REFERENCE CATALOG

containing over 4,000 power supply modules including the new Laboratory Modules Series with twice the output ratings of comparable units.

This informative manual also includes AC-DC Modules, DC-AC Inverters and DC-DC Converters. From a single supplier you have a choice of power sources to meet any military and commercial application.

See us at WESCON Booths 4425-4525

TECHNIPOWER

A **BENRUS** SUBSIDIARY

18 MARSHALL STREET, SOUTH NORWALK, CONNECTICUT

Circle Inquiry Card No. 80

Electronically speaking consider our values...

- **ULTRA LOW NOISE FACTOR** (quiet rooms)
- **PRECISION POTS** (good plumbing)
- **WIDE DYNAMIC RANGE** (big rooms)
- **MICRO INDUCTOR** (short desk clerk)
- **CONTINUOUSLY VARIABLE ATTENUATORS** (attentive waiters)
- **SPECIAL COMMUNICATION TECHNIQUES** (telephones in every room)

and in any language...

SERVICE!

HYATT HOUSE HOTELS

LOS ANGELES INT'L. AIRPORT • CITY OF COMMERCE (L. A., Calif.) • SAN FRANCISCO INT'L. AIRPORT RICKEYS (Palo Alto, Calif.) • SAN JOSE AIRPORT (Calif.) SALINAS (Calif.) • LINCOLNWOOD (Chicago, Illinois) ■ SEATTLE-TACOMA INT'L. AIRPORT (Washington) ■

Circle Inquiry Card No. 81

17/1 INTRODUCTION TO COMPUTER CONTROL SYSTEMS

Richard C. Dorf
University of Santa Clara

17/2 THE ANALYSIS AND MODEL OF A SPECIFIC PROCESS — A DISTILLATION COLUMN

Irwin R. Etter
Electronic Associates, Inc.
Palo Alto, California

17/3 THE APPLICATION AND DESIGN OF AN ELECTRONIC ANALOG COMPUTER CONTROL SYSTEM FOR THE DISTILLATION COLUMN

Robert E. Finnigan
Electronic Associates, Inc.
Palo Alto, California

17/4 THE APPLICATION AND DESIGN OF A DIGITAL COMPUTER CONTROL SYSTEM FOR THE DISTILLATION COLUMN

Richard C. Dorf
University of Santa Clara

17/5 THE APPLICATION AND DESIGN OF AN ELECTRONIC HYBRID COMPUTER CONTROL SYSTEM FOR THE DISTILLATION COLUMN

Irwin R. Etter
Electronic Associates, Inc.

17/6 COMPARISON OF POSSIBLE COMPUTER CONTROL SYSTEMS AND REQUIRMENTS FOR THE FUTURE

A panel discussion.

SESSION 18

ADVANCED TECHNIQUES IN MEMORY DESIGN

Friday, August 27, 10 A.M.-1:30 P.M.
Room D, Convention Hall, Cow Palace

Organized by Ampex Corporation

Session Director: C. A. Desoer
University of California
Berkeley, California

Session Organizer: Lane Wolman
Ampex Computer
Products Division
Culver City, California

18/1 AIRBORNE DIGITAL TAPE TRANSPORT USING A BALANCED TAPE DRIVE

P. D. Georgantas
Ampex Computer
Products Division
Culver City, California

18/2 RUGGED BUFFER-TAPE DATA STORAGE SYSTEM FOR RECORDING DATA ON COMPUTER COMPATIBLE TAPE

D. Cervin
Ampex Computer
Products Division
Culver City, California

18/3 TECHNICAL ADVANCEMENTS IN ROTARY HEAD INSTRUMENTATION RECORDER SYSTEMS

John Lake
Ampex Corporation
Redwood City, California

18/4 A MAGNETIC TAPE CAPSTAN SERVO SYSTEM

Robert W. Allington
Ampex Corporation
Redwood City, California

18/5 FILM SCANNING AND RECORDING BY ELECTRON BEAMS

Charles F. Spitzer
Ampex Corporation
Redwood City, California

18/6 SIGNAL-TO-NOISE RATIO OF ELECTRON BEAM RECORDERS

Bob V. Markevitch
Ampex Corporation
Redwood City, California

18/7 THE ROLE OF THE VIDEOFILE FILING SYSTEM IN THE NASA/APOLLO RELIABILITY PROGRAM

Charles A. Steinberg
Ampex Corporation
Redwood City, California

SESSION 19

SYNCHRONOUS SATELLITE TECHNOLOGY

Friday, August 27, 10 A.M.-12:30 P.M.
Room C, Convention Hall, Cow Palace

Organized by Hughes Aircraft Co., El Segundo, California

Session Director: Harry M. Engwicht
San Francisco State College

Session Chairman: F. P. Adler
Hughes Aircraft Co.

19/1 SYNCHRONOUS SATELLITES

F. P. Adler
Hughes Aircraft Co.

19/2 ORBIT AND ATTITUDE CONTROL

Donald D. Williams
Hughes Aircraft Co.

19/3 THE EARLY BIRD PROGRAM

Albert T. Owens
Hughes Aircraft Co.

19/4 ADVANCED SYNCHRONOUS SYSTEMS

W. F. Bakemeyer
Hughes Aircraft Co.

SESSION 20

TRENDS IN POWER SUPPLY DESIGN

Friday, August 27, 10 A.M.-12:30 P.M.
Room E, Convention Hall, Cow Palace

Organized by Engineered Magnetics Division
Gulton Industries, Hawthorne, California

Session Director: Byron Thinger
San Francisco State College

Session Chairman: Donald L. McDermott
Engineered Magnetics

20/1 POWER CONDITIONING SYSTEM DESIGN

J. W. Bates
Gulton Industries, Inc.

20/2 SOLAR-ARRAY, BATTERY POWER SYSTEMS

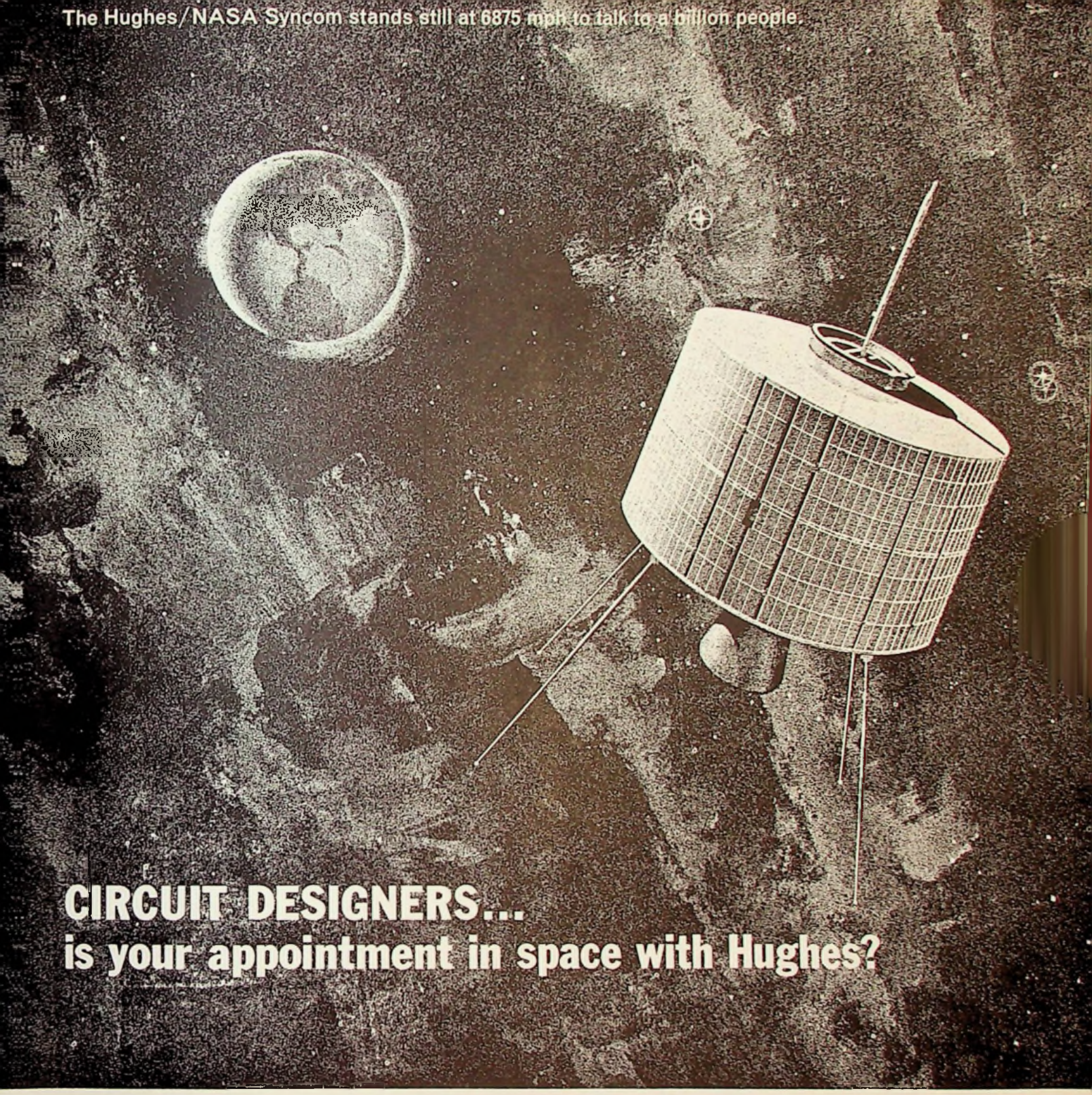
B. Gladstone
Gulton Industries, Inc.

20/3 MINIATURIZED POWER CONVERSION TECHNIQUES

Don E. Wuerflein
Gulton Industries, Inc.

20/4 TRENDS IN RELIABILITY OF SPACE POWER CONDITIONING EQUIPMENT

James E. Comer
Gulton Industries, Inc.



CIRCUIT DESIGNERS...
is your appointment in space with Hughes?

Today, Hughes is one of the nation's most active aerospace/electronics firms: Projects include: F-111B PHOENIX Guided Missile System, TOW Anti-Tank Missile, SURVEYOR Lunar Spacecraft, SYNCOM, POLARIS, VATE, Hard Point Defense and others.

This vigor will assist the qualified engineers and scientists towards more and better opportunities for both professional and personal growth.

Many immediate openings exist. The engineers selected for these positions will be assigned to the following design tasks: the development of high power airborne radar transmitters, the design of which involves use of the most advanced components; the design of low noise radar receivers using parametric amplifiers; solid state masers and other advanced microwave components; radar data processing circuit design, including range and speed trackers, crystal filter circuitry and a variety of display circuits; high efficiency power supplies for airborne and space electronic systems; telemetering and command circuits for space vehicles, timing, control and display circuits for the Hughes COLIDAR (Coherent Light Detection and Ranging).

If you are interested and believe that you can contribute, make your appointment today.

For immediate consideration, please airmail your resume to:

Mr. Robert A. Martin
Head of Employment
Hughes Aerospace Divisions
11940 W. Jefferson Blvd.
Culver City 60 California

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY
AEROSPACE DIVISIONS
An equal opportunity employer.
U. S. CITIZENSHIP REQUIRED

A Giant Step Forward in Integrated Circuits...

MOGISTERS™

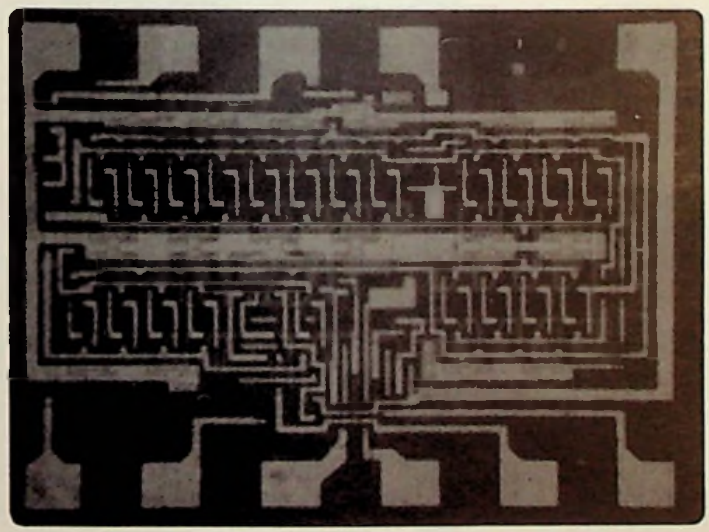
(The New Generation of MOS Monolithic Shift Registers)

MOGISTERS ARE:

GENERAL INSTRUMENT'S NEW MOS MONOLITHIC 21-BIT SHIFT REGISTERS

With GI's new MOGISTERS, pronounced "mo′-jisters," the much discussed advantages of MOS (metal-oxide-silicon) circuitry are now a practical, commercially available reality.

This availability represents a significant milestone in MOS technology, not only because of the unique design possibilities offered by MOS units in general, but also because of the **unconditionally assured voltage stability** of these GI devices in particular.



MEM-501 — New General Instrument MOGISTER, 21-bit MOS shift register, magnified 70 diameters; operating from DC to 500kc. This is the first of a complete line General Instrument will announce shortly. Also available, MEM-521 operating from DC to 1 mc.

COST SAVINGS

If you're concerned with lower costs (and who isn't), you'll find MOGISTERS can help you trim equipment costs three ways:

- Lower cost per bit . . . substantially less than individual double-diffused JK flip-flops or single shift registers.
- Fewer packages required . . . MOGISTERS are available in register lengths up to 21 bits (16-4-1), all in a single TO-5 or flat pack.
- Fewer interconnections within your system . . . only one hook-up, instead of 21.

VERSATILITY

Each MOGISTER provides three separate and distinct multi-bit shift registers on one monolithic chip. These may be used as parallel registers, each with its own push-pull output stage; or as 21 bits serially, by simply connecting the output of each register to the input of the next.

In addition, you may directly buffer into double-diffused integrated circuits merely by grounding the $-V_O$ pin and applying +3V or +5V to the ground terminal.

SUPERIOR PERFORMANCE

In terms of in-system performance, MOGISTERS offer a line-up of advantages that just won't quit. Here are a few of the more significant ones:

- capable of operation down to DC
- high fan-out capability; 25 or more
- high noise immunity; 3 volts or more
- large voltage swings; 10 volts or more

MOGISTERS are available <u>now</u> from your authorized General Instrument Distributor.

Call or write today for full data and specifications.

GENERAL INSTRUMENT CORPORATION
SEMICONDUCTOR PRODUCTS GROUP
600 West John Street, Hicksville, New York

Circle Inquiry Card No. 92

Special sessions

SPECIAL SESSION A

NEW POWER SOURCES

Tuesday, August 24, 2-4:30 P.M.
Room C, Convention Hall, Cow Palace

SESSION ORGANIZER: DOUGLAS V. KELLY, PACIFIC GAS & ELECTRIC, SAN FRANCISCO

SESSION CHAIRMAN: A. W. TRIVELPIECE, UNIVERSITY OF CALIFORNIA, BERKELEY

Three distinguished authors discuss research and development work in new sources of power.

A/1 NEW USES OF FISSION ENERGY

HANS MARK
UNIVERSITY OF CALIFORNIA
BERKELEY

Several new applications of fission and fusion energy, based on nuclear explosions, have been discussed in recent years. This paper covers some of these applications, including earth-moving, mining, sea-water conversion, scientific programs (precision measurement of neutron cross-sections and the study of seismic waves produced by nuclear explosions, and others), and describes several other possible experiments, including space programs.

A/2 MHD POWER GENERATION

DR. ARTHUR KANTROWITZ
AVCO-EVERETT RESEARCH LABORATORY
EVERETT, MASSACHUSETTS

Discussion will include a general review of the current status of MHD power-generation programs and some of the prospects for this power source in the future.

A/3 HIGHLIGHTS OF RECENT DEVELOPMENTS IN THE FIELD OF CONTROLLED FUSION

A. S. BISHOP
PLASMA PHYSICS LABORATORY
PRINCETON UNIVERSITY

Building on previously presented surveys of the U.S. fusion program, this paper reviews the various approaches being pursued under Project Sherwood, with particular emphasis on the most recent developments. Specifically, it treats the various classes of instability, together with the energy sources available to drive them, and the means by which these instabilities can hopefully be prevented.

SPECIAL SESSION B

COMPUTER-AIDED ENGINEERING DESIGN

Wednesday, August 25, 2-4:30 P.M.
Room C, Convention Hall, Cow Palace

SESSION ORGANIZER AND CHAIRMAN: J. F. GIBBONS
ELECTRICAL ENGINEERING DEPT.
STANFORD UNIVERSITY
STANFORD, CALIFORNIA

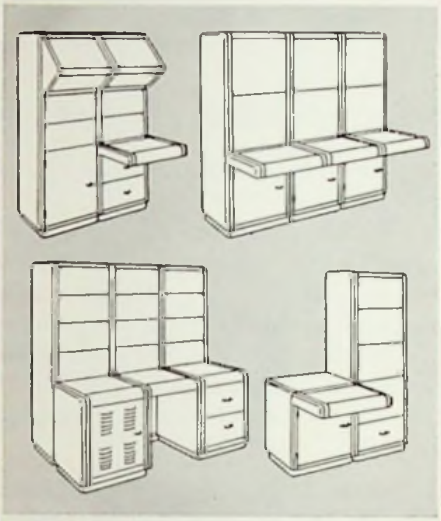
B/1 COMPUTER-AIDED DRAFTING TECHNIQUES

J. T. GILMORE
ADAMS ASSOCIATES
BEDFORD, MASSACHUSETTS

This paper will give a historical review of computer-aided drafting techniques leading to present research problems and existing facilities for computer-aided drafting.

(more)

BUILD



...CUSTOM ELECTRONIC ENCLOSURES FROM STANDARD LOW COST PARTS

With Stantron's modular approach, build-up your own custom electronic enclosure package from standard low-cost component parts in Stantron's new 70-page catalog. Starting with the basic frame module, available in ball corner or new "square corner" models, you create the over-all design from a wide variety of doors, slides, panels and all other necessary components.

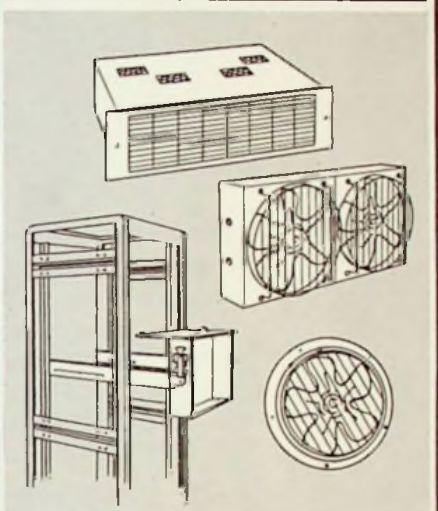
Easy to wire and install, Stantron enclosures feature 4-sided corner posts with weight/load capacities to 3,035 lbs. . . . heavy-duty panel mounting angles with tapped mounting holes that adapt for direct mounting of accessories . . . and handsome styling.

For custom enclosures without custom fabrication costs, write to Stantron. Our new catalog will be sent to you.

STANTRON MODULAR ELECTRONIC HOUSING SYSTEM

DIVISION OF WYCO METAL PRODUCTS
6914 BECK AVE., NORTH HOLLYWOOD, CALIF.

BUILD



...ENCLOSURES WITH FANS, BLOWERS, SLIDES AVAILABLE AT ONE SOURCE

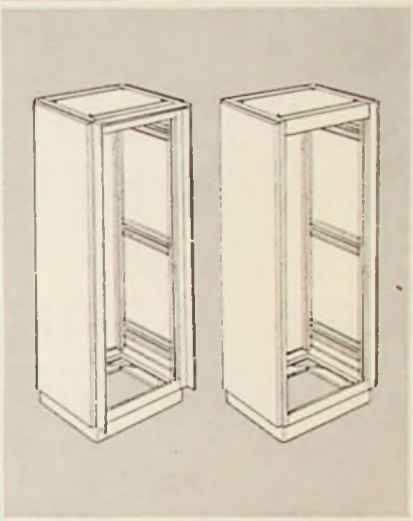
No worry about making the pieces fit with Stantron's modular electronic housing systems. And, save money and time with everything supplied by Stantron including many models of high-performance centrifugal blowers and propeller type exhaust and intake fans, and new types of solid bearing slides.

From frames, doors and sides, to chassis/equipment slides, panels, drawers, pontoon bases, fans, blowers, even touch-up paints . . . select only what you need to build custom enclosure packages from standard low-cost parts. Many Stantron accessories are distinctively designed, and all are built for rugged, long-life use. Write today for full details.

STANTRON MODULAR ELECTRONIC HOUSING SYSTEM

DIVISION OF WYCO METAL PRODUCTS
6914 BECK AVE., NORTH HOLLYWOOD, CALIF.

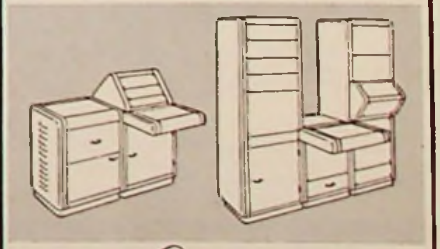
BUILD



...ENCLOSURES WITH STANTRON'S NEW SQUARE CORNER FRAMES

Stantron now provides "square corner" design frames with optional shadow box fronts for its modular electronic housing systems. These rugged, versatile basic and wedge-shaped frames, available in 19" and 24" widths, and 18⅝", 22⅛", 25⅝" and 30⅞" deep, are used with "square corner" work/writing desk frames and side panels. All other standard Stantron accessories may be used with the new type frame design.

Users can develop square cornered or ball cornered custom packages from low-cost component parts. Write for information on the new "square corner" design and Stantron's modular enclosure concept.



STANTRON MODULAR ELECTRONIC HOUSING SYSTEM

DIVISION OF WYCO METAL PRODUCTS
6914 BECK AVE., NORTH HOLLYWOOD, CALIF.

Circle Inquiry Card No. 84

B/2 COMPUTER-AIDED DESIGN

PROF. S. COONS
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DR. L. ROBERTS
LINCOLN LABORATORIES
MR. T. JOHNSON
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

This paper will describe research work being carried on at MIT and Lincoln Laboratories in which on-line computation techniques using CRT display are used to facilitate engineering design. Stress analysis, linkage motion, and graphic design examples will be described.

B/3 TEXT MANIPULATION AND DESIGN PLANNING

DR. D. N. ENGELBART
STANFORD RESEARCH INSTITUTE
MENLO PARK, CALIFORNIA

The computer-augmented engineer, besides being helped with computation and graphic design, will be much better able to organize, study, retrieve and modify records containing specifications, constraints, possibilities, plans, etc. pertaining to his work. This will improve his capability for working effectively with complex interrelationships in the cut-and-try evolution of an engineering solution. It will also significantly aid effective group cooperation within a design team.

B/4 SOME VISUAL ILLUSTRATIONS OF ENGINEERING PROBLEMS SOLVED WITH ON-LINE COMPUTATION TECHNIQUES

PROF. GLENN CULLER
UNIVERSITY OF CALIFORNIA AT SANTA BARBARA
PROF. BURTON FRIED
UNIVERSITY OF CALIFORNIA AT LOS ANGELES

This paper will describe the use of on-line computation techniques to give visual demonstrations of conformal mapping problems, complex integration and other mathematical tools of importance in engineering problems.

SPECIAL SESSION

C

LASERS: THE STATE-OF-THE ART

Thursday, August 26, 2-4:30 P.M.
Room C, Convention Hall, Cow Palace

SESSION ORGANIZER: BURTON J. McMURTRY
SYLVANIA ELECTRONIC SYSTEMS
MOUNTAIN VIEW, CALIFORNIA

SESSION CHAIRMAN: JOHN R. WHINNERY
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

C/1 GAS LASERS

C. K. N. PATEL
BELL TELEPHONE LABORATORIES
MURRAY HILL, NEW JERSEY

The present state-of-the-art of gas lasers is reviewed with emphasis on new techniques for obtaining selective excitation of the desired energy levels. Performance and capabilities of high power gas lasers are also discussed.

C/2 LIQUID LASERS

A. LEMPICKI
GENERAL TELEPHONE & ELECTRONICS LABS.
BAYSIDE, L.I., NEW YORK

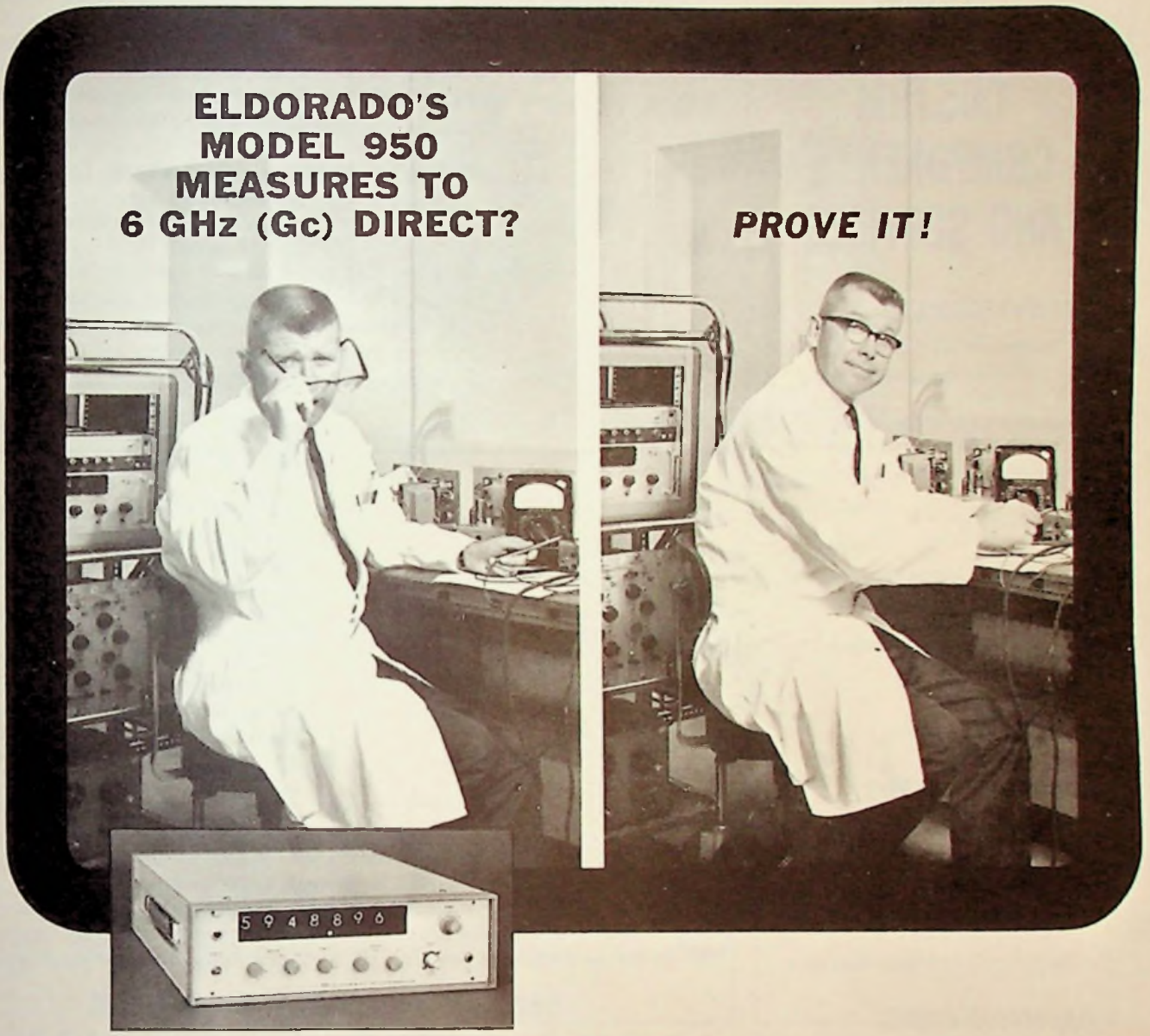
The usual requirements for production of stimulated emission such as intense, narrow band luminescence, adequate pump absorption bands and lifetimes compatible with flash sources are rather rarely met in liquid media. A review of various suggested schemes and materials indicates that rare earth chelates are best suited for the purpose and have led to the only existing liquid laser. The characteristics, limitations, and future prospects of chelate lasers will be discussed.

(more)

Leadership in Digital Measurement

ELDORADO'S MODEL 950 MEASURES TO 6 GHz (Gc) DIRECT?

PROVE IT!



Are you skeptical too? If so, it's not surprising, for you then fit the profile of Model 950 purchasers who were nonbelievers. The Model 950 really does make direct frequency measurements from 10 Hz to 6 GHz. Zero beating, calculating and hunting harmonics, reinterpreting the readout... all are now passé. And using the Model 950 is a one-control operation: automatic trigger level combined with a parity check feature leaves only a three-position range switch to set. Parity check gives you an added bonus too—total elimination of operator error.

As if that weren't enough, the Model 950 now has a preset reset feature that allows you to preset the five most significant digits to reset at any desired frequency. So what? Preset reset gives you direct readout of frequencies from 6 GHz to 26.6 GHz with Eldorado's series of frequency extenders (which, by the way, require no tuning or adjustments). This feature also permits direct readout of the received frequency when monitoring a receiver's local oscillator.

Input sensitivity of the instrument is 50 mv rms into 50 ohms (—13 dbm, 0.05 mw). Measurements are accurate to within ±1 count ± oscillator stability, and readings are visually presented on a 7-digit readout while printout signals for all digits and decimal point are simultaneously available in a binary coded decimal format.

Other Eldorado GHz Direct Frequency Counters. **Model 951:** 10 Hz to 6 GHz with 9-digit readout, automatic trigger level, preset reset and selectable resolution. **Model 945:** 10 Hz to 4 GHz with 7-digit readout. **Model 946:** 10 Hz to 4 GHz with 9-digit readout and selectable resolution. **Model 920:** 10 Hz to 2.5 GHz with 7-digit readout; fully automatic operation; IF offset compensation; remote programing; and RFI per MIL-I-26600, Class III.

A Challenge. Don't take our word for it that Eldorado's GHz Direct Frequency Counters perform as described. Make us prove it! For complete specifications and a demonstration, contact your nearest Eldorado representative, or contact:

ELDORADO ELECTRONICS
601 Chalomar Road · Concord, California
Telephone (415) 686-4200

Senior Design Engineers: *Are you interested in advancing the state-of-the-art in digital instrumentation? If so, we need you in our Research and Development group. Call or write David C. Condon, Chief Engineer.*

For the latest advancements in frequency/time interval counters and radar/laser ranging equipment, see us at **WESCON, Booth 4106-4107.**

Circle Inquiry Card No. 77

C/3 SEMICONDUCTOR LASERS

MARSHALL I. NATHAN
INTERNATIONAL BUSINESS MACHINES CORP.
THOMAS J. WATSON RESEARCH CENTER
YORKTOWN HEIGHTS, NEW YORK

A brief description of the principles of operation will be given, followed by a discussion of pumping methods — their advantages and limitations. Performance characteristics of junction lasers, particularly Gallium Arsenide, will be discussed.

C/4 OPTICALLY PUMPED SOLID-STATE LASERS

J. E. GEUSIC
BELL TELEPHONE LABORATORIES
MURRAY HILL, NEW JERSEY

Recent developments in the area of optically pumped solid-state lasers will be discussed. In particular, the characteristics of Nd:YAG (Neodymium doped Yttrium Aluminum Garnet) laser will be reviewed. In addition, the possible applications of solid-state lasers such as Nd:YAG will be considered.

(more)

social note

COCKTAIL PARTY

The Wescon All-Industry Cocktail Party will be held in the Continental Room of the San Francisco Hilton on Tuesday, August 24, from 6:30 to 8:30 p.m. The price is $6 per person.

There will be one technical tour (or field trip) during Wescon. It will take visitors to the Stanford Linear Accelerator Center near the Stanford campus in Palo Alto. The accelerator is now about 65 percent completed. It is about two miles long, and will ultimately have a 15-billion-volt electron beam. It is being built at a cost of $114 million under AEC funding.

future engineers show

BIGGEST STUDENT SHOW TO DATE

The largest Future Engineers Show in the history of Wescon, with 35 student exhibitors announced at press time as participating from throughout Region 6, will take place in the special exhibit area near the east entrance of the Cow Palace.

Transportation and living expenses for the students, selected by their local section, and for their advisors, are provided jointly by the sections and Wescon.

The best exhibit will win the Lee De Forest Award, which provides a $1000 scholarship.

Five of the students exhibiting in the Future Engineers Show will participate in a symposium in Room D of the Cow Palace on Wednesday, August 25, from 1 to 3 p.m.

Stephen Freiberger, St. Elizabeth's High School, Oakland, will present a paper on his project "A Digital Computer"; Richard Holsclaw, Catalina High School, Tucson, "Hexapawn Machine Related Game Learning"; Leslie Poppe, Pocatello High School, "Bio-electrical Fields in Plants"; Albert Smith, Grossmont High School, San Diego, "Photoelectric Photometry of the Eclipsing Binary BV 267 Auriga"; and Reinhold Ziegler, Sacramento, "Investigation into the Application of Thermomagnetic and Galvanomagnetic Effects."

The winning presentation will be accorded the Frederick Emmons Terman Award, which carries a $300 scholarship, with $200 going to the runner-up.

eta kappa nu luncheon

OUTSTANDING U.S. EE STUDENT

Eta Kappa Nu, national electrical engineering honor society dedicated to the advancement of education in the field and improved recognition of the profession, will honor the outstanding electrical engineering student in the United States at a luncheon on the first day of Wescon, August 24.

He is Carl A. Cooper, who received his Bachelor of Science degree in electrical engineering from the University of Southern California in June, having served as president of the student branch of IEEE, vice president of Tau Beta Pi, and corresponding secretary of the Upsilon chapter of Eta Kappa Nu.

The program to select the outstanding electrical engineering student in the United States has been developed during the past four years.

SESSION D

COMPUTER-CONTROLLED SYSTEMS

Friday, August 27, 2 P.M.-4:30 P.M.

Room C, Convention Hall, Cow Palace

SESSION CHAIRMAN: W. K. LINVILL
INSTITUTE IN ENGINEERING-ECONOMIC SYSTEMS
STANFORD UNIVERSITY

SESSION ORGANIZER: R. D. SMALLWOOD
STANFORD UNIVERSITY

D/1 SOME PROBLEMS IN INFORMATION RETRIEVAL SYSTEM DESIGN

J. C. R. LICKLIDER
IBM RESEARCH CENTER
YORKTOWN HEIGHTS, NEW YORK

D/2 COMPUTER-BASED INSTRUCTION IN THE ELEMENTARY SCHOOLS

PATRICK C. SUPPES
INSTITUTE FOR MATHEMATICAL STUDIES
IN THE SOCIAL SCIENCES
STANFORD UNIVERSITY

D/3 TIME-SHARED COMPUTERS FOR COMMUNICATION AND CONTROL IN THE HOSPITAL ENVIRONMENT

JOHN H. HUGHES
BOLT BERANEK AND NEWMAN INC.
CAMBRIDGE, MASSACHUSETTS

D/4 PROCESS CONTROL COMPUTER SYSTEMS — PRESENT STATUS AND FUTURE POTENTIAL

R. W. FERGUSON
MANAGER, ENGINEERING DEPARTMENT
COMPUTER SYSTEMS DIVISION
WESTINGHOUSE ELECTRIC CORPORATION

Wescon women's committee planners made early trip this month to Saks Fifth Avenue to finalize plans for major fashion luncheon at the Mark Hopkins during Wescon. Model Miss Avril of Saks poses in a sheath evening dress for Mrs. E. E. Van Bronkhorst and Mrs. Stanley Kaisel, vice chairman and chairman of the women's program.

special events

PLANS FOR THE LADIES

The ladies who visit Wescon in August will find what most people want when they come to the city by the bay—plenty of time to take in the San Francisco scene.

Women will have their own Wescon headquarters, a special hospitality center to meet friends over continental breakfast, plan excursions, and learn "where to" and "how to get there." The graceful Rosewood Room of the San Francisco Hilton will be available every day—Tuesday through Friday.

DIRECTORY OF EXHIBITORS

look for these interesting exhibits among the many appearing at wescon

American Electronic Laboratories, Inc.

P.O. Box 552, Lansdale, Pa.

Booth 1715

Products displayed: Antennas, solid state devices, microwave components.

Circle Inquiry Card No. 38

Burgess Battery Company

Division of Servel, Inc., Freeport, Ill.

Booth 2526

Products displayed: Complete line of dry batteries, mercury activators, alkaline batteries, sealed rechargeable nickel cadmium batteries, water activated batteries, plus a complete line of magnetic recording tape.

BURGESS BATTERY COMPANY
DIVISION OF SERVEL, INC.

Circle Inquiry Card No. 41

Conductron Corp.

343 S. Main St., Ann Arbor, Mich.

Booths 2203-2204

Products displayed: Optical computers, conductroMOUNTS, magnetic particle clutches, miniature wide band amplifiers, airborne and space magnetic modulators, pneumatic gyros, antenna multicouplers, level sensors, optical pick-offs, radar absorbing material, holograms.

Conductron Corporation

Circle Inquiry Card No. 44

Cornell Dubilier Electronics

Division of Federal Pacific Electric Co.
50 Paris St., Newark, N.J.

Booth 2527

Products displayed: Capacitors, RFI filters, wave filters, delay lines, relays, vibrators and power supplies.

Circle Inquiry Card No. 39

Eldorado Electronics

601 Chalomar Road, Concord, Calif.
686-4200

Booths 4106-4107

Products displayed: Model 950 6Gc Direct frequency counter (7-decade); Model 951 6Gc direct frequency counter (9-decade); Model 920 2.5Gc direct frequency counter (I.F. offset compensation); Model 682 X-band frequency extender; Model 793 1-nanosecond time interval counter; Model 610 1-nanosecond digital delay generator; Model 5210 radar/laser range unit.

ELDORADO ELECTRONICS

Circle Inquiry Card No. 42

Gould-National Batteries, Inc.

Alkaline Battery Division, E. 1509 1st National Bank Bldg., St. Paul, Minn.

Booths 1512-1513

Products displayed: Nickel-cadmium and silver-zinc cells and batteries.

GOULD ALKALINE

Circle Inquiry Card No. 45

Hewlett-Packard

Palo Alto, Calif.
326-7000

3700 Aisle

Products displayed: Electronic instruments from Hewlett-Packard, Boonton, Dymec, Harrison, Sanborn.

HEWLETT hp PACKARD

Circle Inquiry Card No. 40

Huggins Laboratories, Inc.

999 E. Arques Ave., Sunnyvale; 736-9330

Booths 4203-4204

Products displayed: TWT amplifiers, nanosecond pulse generators, transient detectors, infrared radiometers, TWT's, and ferrite devices.

HUGGINS LABORATORIES, INC.

Circle Inquiry Card No. 43

Hurletron, Inc. Hurletron Control Prod. Div.

750 W. Rivera Road, Whittier, Calif.
698-9824

Booths 2406-2407

Products displayed: Electronic and electro-mechanical control devices; time function devices —fixed or adjustable; sensors & detectors—voltage, current, frequency phase, temperature and speed; fixed or adjustable; military standard balanced armature relays—dry circuit to 25 amperes; micro-miniature power relays; stepping relays, programed rolling contacts; sub-systems, "total energy control."

Circle Inquiry Card No. 46

Melabs

3300 Hillview Ave., Palo Alto, Calif.
326-9500

Booth 1813

Products displayed: Tunnel-diode amplifiers, broadband diode switch, ferrite circulators and isolators, telemetry down-converter, mixers, filters, integrated microwave circuits.

Melabs

Circle Inquiry Card No. 59

OPTIMATION PRESENTS — BOOTH 4514

NEW 3φ POWER SOURCE — 150VA — MODEL AC153

- .01% REGULATION, LINE OR LOAD
- .1% DISTORTION
- SOLID STATE RELIABILITY
- FREQUENCY FIXED OR VARIABLE TO 100KC

NEW AC CALIBRATION SOURCE — MODEL AC105A

- .005% AMPLITUDE INSTABILITY
- .05% DISTORTION
- RATIO-XFMR TO DIAL-IN VOLTS or AMPS
- FREQUENCY RANGE 10 to 100,000 CPS

NEW AMPLIFIERS 15 & 50VA — PA15 & PA50

- .05% DISTORTION
- FREQUENCY RANGE DC to 100,000 CPS
- ZERO OUTPUT IMPEDANCE
- .01% GAIN INSTABILITY

OPTIMATION, INC. Phone 877-0221
7243 Atoll Ave. North Hollywood

Circle Inquiry Card No. 62

Packard Bell

1920 So. Figueroa St., Los Angeles, Calif.
748-6103

Booths 3816-3817

Products displayed: Television cameras, video monitors, RF modulators, switchers, and other closed-circuit system components.

Packard Bell | PB

Circle Inquiry Card No. 65

Phaostron Instrument and Electronic Company

151 Pasadena Ave., South Pasadena, Calif.
255-1471

Booths 3810-3811

Products displayed: See Phaostron's new taut band mechanism. New design prevents damage to ligaments. Demonstration shows why Phaostron D'Arsonval Meters exceed MIL-M-10304C specs. Phaostron "the name to measure by." Representatives in all principal cities.

phaostron

Circle Inquiry Card No. 60

Philbrick Researches, Inc.

Allied Drive at Route 128, Dedham, Mass.

Booth 1914

Products displayed: Electronic analog computing components; operational amplifiers, including differential, chopper stabilized, low-cost, wideband, low-noise, high input impedance, field effect, low power drain, and ultra-compact types; regulated power supplies, and regulators; the new prize-winning Q3 modular packaging system; multipliers, dividers, squarers, rooters, logarithmic devices; amplifier manifolds for educators and experimenters; universal operational modules; publications on applications of the analog art.

Circle Inquiry Card No. 63

Quan-Tech Laboratories, Inc.

43 So. Jefferson Road, Whippany, N.J.

Booth 3903

Products displayed: Transistor, diode, and resistor noise analyzers; low and medium frequency wave and spectrum analyzers; DC, AC, and instrumentation amplifiers.

Quan-Tech LABORATORIES

Circle Inquiry Card No. 66

Texas Instruments Incorporated

P.O. Box 5012, Dallas 22, Texas

Booths 3101-3103

Products displayed: 3 new families of digital integrated circuits for industrial applications and an optoelectric pulse amplifier; gallium arsenide transistor; gallium arsenide voractor diode; temperature compensated diode; 500 MC N-channel field effect transistor; light sensor arrays; high voltage silicon power transistor; wideband linear amplifier germanium transistor.

TEXAS INSTRUMENTS
INCORPORATED
SEMICONDUCTOR-COMPONENTS DIVISION

Circle Inquiry Card No. 61

Varo, Inc.

2201 Walnut, Garland Texas;
Santa Barbara, Calif.; Chicago, Ill.

Booths 1213-1214

Products displayed: Static power conversion equipment; fractional HP motors; precision optics; integrated bridge rectifiers; high voltage and fast recovery time rectifiers; thin film microcircuit modules (TF circuits).

Circle Inquiry Card No. 64

Vidar Corp.

77 Ortega, Mountain View, Calif.
961-1000

Booths 4418-4419

Products displayed: Vidar 5001 data logging system; Vidar 5202 data logging system; Vidar FM VCOs and discriminators.

VIDAR

Circle Inquiry Card No. 67

The Electronic Representatives Association and the Electronic Sales Managers Association (ESMA) have joined forces in planning a one-day marketing workshop to be held Wednesday (August 25) at the St. Francis Hotel.

Scientific Apparatus Manufacturers Association (SAMA) will hold a three-hour workshop Monday, August 23, at the Sheraton-Palace Hotel. The session, titled "New Ideas in Problem Analysis and Decision Making," is the seventh annual SAMA presentation to be made immediately preceding Wescon's formal program.

Dage Television Division Dage-Bell Corp.
4555 Sheridan Ave., Michigan City, Ind.
874-3251

Booth 3920

Products displayed: Television systems for industrial, military, educational, broadcast applications; television cameras with capabilities access of 1,000 horizontal lines of resolution; helical scan video tape recorders.

Circle Inquiry Card No. 47

Engelhard Industries, Inc.
113 Astor St., Newark, N.J.

Booths 244-245

Products displayed: Fused quartz and silica, sized titanium, precious metal plating solutions, platinum clad tungsten wire, aluminum powders and pastes, electrical contacts, platinum metals.

Circle Inquiry Card No. 48

Hull Corp.
Hatboro, Pa.

Booth 511

Products displayed: Model #359-E encapsulating machine; Model #5 AR vacuum potter.

Circle Inquiry Card No. 49

Landis & Gyr, Inc.
455 W. 45th St., New York, N.Y. 10036

Booth 1906

Products displayed: Electromagnetic impulse meters; predetermining counters; monodecade counters, monodecade counters with electric readout; add/subtract counters; printing counters models for serial and parallel entry with or without time and date register); pulse generators; summation metering equipment.

Circle Inquiry Card No. 50

Littelfuse, Inc.
800 EE. Northwest Highway, Des Plaines, Ill.

Booth 1402

Products displayed: Microfuse and picofuses; high reliability microfuses and picofuses; zero defect defects; complete line standard circuit protective devices.

Circle Inquiry Card No. 51

Mechanical Wire Products, Inc.
129 Dermody St., Cranford, N.J.

Booth 710

Products displayed: RFI/EMI shielding products including air filters, see-thru panels, toggle switch shields, tapes, testing, consulting and specified production run tests.

Circle Inquiry Card No. 52

Insaco Incorporated
P.O. Box 422, Quakertown, Pa.

Booth 314

Products displayed: Sapphire, ceramics, fused quartz precision ground; sapphire windows, and substrates.

Circle Inquiry Card No. 53

National Beryllia Corp.
First & Haskell Avenues, Haskell, N.J.

Booth 141

Products displayed: Beryllium oxide, alumina oxide, electronic components, ceramic-to-metal seals, beryllium oxide, loaded epoxies.

Circle Inquiry Card No. 54

Radio Frequency Laboratories, Inc.
Powerville Road, Boonton, N.J.

Booths 4501-4502

Products displayed: RFL Model 100 AC calibration system; magnetic measurement and charging systems; electronic proportional controls and electric thermometers.

Circle Inquiry Card No. 55

Siemens America Incorporated
350 Fifth Ave., New York, N.Y.

Booths 3324-3325

Products displayed: Level tracer, level meter, level oscillator, sweep frequency meas. set, cable fault locator, group delay meas. set.

Circle Inquiry Card No. 56

Spectrol Electronics Corp.
1704 So. Del Mar Ave., San Gabriel, Calif.
288-6666

Booths 2409-2410

Products displayed: Precision and trimming potentiometers, both wirewound and non-wirewound; turns-counting dials and miniature rotary indexing switches.

Circle Inquiry Card No. 57

Speer Electronics
800 Theresia St., St. Marys, Pa.

Booth 1020

Products displayed: JXP precision metal film resistors, carbon composition resistors, inductors.

Circle Inquiry Card No. 58

Classified Advertising

Positions Available

PROFESSIONAL Opportunities

Major Division of nationally prominent company offers these exceptional growth opportunities in Advanced Research and Development in the fields of Electronics and Medical Electronics.

- **RESEARCH SCIENTIST**

Requires a graduate engineer with a background and training in electronics and physics at the Ph.D. level as well as evidence of professional accomplishment in product conception. Will conduct and/or direct Scientists and Engineers in advanced idea product planning involving a high degree of creativity and inventiveness.

- **MANAGER OF MEDICAL ELECTRONICS**

Graduate engineer with broad knowledge of the medical electronics market. Will be responsible for the development and design of new product lines. Requires a minimum of 10 years experience in seeking out, defining, solving customer needs and problems.

These positions represent a unique opportunity for professional recognition and career acceleration.

PLEASE SUBMIT RESUME
AND SALARY REQUIREMENTS
TO
BOX A
IEEE GRID-BULLETIN
3600 WILSHIRE BLVD.
LOS ANGELES, CALIF. 90005

An Equal Opportunity Employer
(Male or Female)

Circle Inquiry Card No. 21

Electronic Engineer

Leading manufacturer of quality scientific instruments has one opening, which offers:

- job stability in NON-GOVERNMENT work
- challenging, interesting problems
- opportunity to exercise initiative and judgment
- creative atmosphere in small group of select scientists and engineers
- opportunity for advancement
- profit-sharing, stock-purchase and medical-insurance plans

Salary open for BSEE or MSEE with at least 2 years' experience; TOP references; professional pride and enjoyment in developing useful finished products; and thorough familiarity with both theory and application of network synthesis, transistor circuit design, etc. Instrument experience preferred. Present projects involve ultra-high-impedance circuits.
Submit resumé.

Cary INSTRUMENTS
APPLIED PHYSICS CORPORATION
2724 South Peck Road
Monrovia, California 91016

Circle Inquiry Card No. 22

TWO OPENINGS

MICROWAVE ENGINEERS with experience in VARACTORS, PIN and STEP-RECOVERY DIODES.

1. Microwave Application Engineer
   Senior Engineer to participate in the design and development of high-frequency components, harmonic generators, parametric amplifiers, etc.
2. Semiconductor Development Engineer
   Processing development, material preparation & manufacturing of high-frequency diodes.

Located in the beach area of So. Calif. Send resumes to:

SEMICONDUCTOR DEVICES, INC.
875 West 15th St.
Newport Beach, Calif.
All inquiries will be held in strict confidence.

Circle Inquiry Card No. 23

ELECTRONICS
SALES ENGINEER

PRODUCTS: Power supplies and battery chargers.
EDUCATION: Electrical degree or equivalent technical ability.
EXPERIENCE: Electrical design, testing or selling.
QUALIFICATION: A knack for selling.
TERRITORY: Southern California.

Call Mrs. Haines, 750-1151

Christie Electric Corp.
67th & Crenshaw, Los Angeles, Calif. 90043
An Equal Opportunity Employer

Circle Inquiry Card No. 24

ELECTRICAL ENGINEER NEEDED

to do electro-mechanical design and supervise production for small East Bay medical electronics firm. Experience in solid-state circuitry necessary. B.S. plus 3 years experience minimum. Salary open.

Send resume to

Box B, IEEE/Grid-Bulletin
Suite 2210, 701 Welch Road
Palo Alto, California

Circle Inquiry Card No. 25

Services

PROFESSIONAL RESUMÉ $5

Writing, IBM Typing, and Offset Printing

Los Angeles MA 8-6378 • W.L.A. 474-0618
No. Hollywood PO 1-3429 • Covina 966-4344
Inglewood 677-1900 • Long Beach 423-6474
Anaheim 635-1940 • Santa Ana 541-6031
Wilshire DU 3-1695 • Hollywood 463-6127
Pasadena 795-1178 • Downey 869-8744
San Diego 284-2747 • Phoenix, Ariz. 254-3462
San Francisco 474-4646 • Oakland 451-4418
San Jose CY 5-2295 • Sacramento 455-2188

PROFESSIONAL RESUMÉ SERVICE
The very best in professional resumes

Circle Inquiry Card No. 26

Consultants

RRT
PROFESSIONAL SERVICES
System—Parts Reliability • Quality Assurance • Engineering Management Systems • Operation Analysis
Reliability Research and Technology, Inc.
Subsidiary of Planning Research Corp.
ALHAMBRA: 1 West Hellman Ave. (213) 283-3781
SAN DIEGO: 4202 Genessee Ave. (714) 278-4311

Circle Inquiry Card No. 27

PHILIP S. WESSELS
Consulting Electronics Engineer
Systems • Solid State • Feedback • Statistical Design •
425 Charmingdale Road
Diamond Bar, California 91766
(714) 595-3015
Registered EE

Circle Inquiry Card No. 28

Instrumentation Consultant
BIOMEDICAL
Louis G. Fields & Associates
Industrial • Scientific • Photographic
Creative New Product Development
11662 Sunset Blvd., Los Angeles, Cal. 90049
(213) BR 2-0942 • GR 2-0388

Circle Inquiry Card No. 29

NOW: RESUMÉS BY MAIL!
Unique "By Mail" resumé service for Engineers and Scientists by California's experienced technical resumé consultant. For complete information write:
PROFILE RESUME SERVICE INC.
378 Cambridge - Palo Alto, Calif. 94306
(Member IEEE) 321-6180

Circle Inquiry Card No. 30

Products

CUSTOM SHORT-RUN
PRECISION MOTORS
for—photo-instruments
geophysical instruments
laboratory instruments
HANSON RESEARCH CORP.
6170 SEPULVEDA VAN NUYS, CALIF.
782-7915

Circle Inquiry Card No. 31

SERVO AMPLIFIERS
FOR
AC and DC MOTORS
WESTAMP, INC.
11529 PICO BLVD. W.L.A.

Circle Inquiry Card No. 32

Products

For Rent

PREPRINTS

Preprints of 18 of 20 Wescon contributed sessions will be available during the conference. Because of the "team" nature of the presentations, papers will be bound by sessions, and will be priced at $2 per session. There will be no preprints of papers included in five special sessions.

industrial design awards

17 PRODUCTS SELECTED FROM 152

Seventeen new product designs will make up the 1965 Wescon Industrial Design Awards exhibit, it was announced by Edward W. Vopat of Varian Associates, committee chairman.

Five judges selected the 17 products for the show from entries totaling 152, Vopat said. Entries in the program had submitted photographs, specifications, and descriptions of products for the judging.

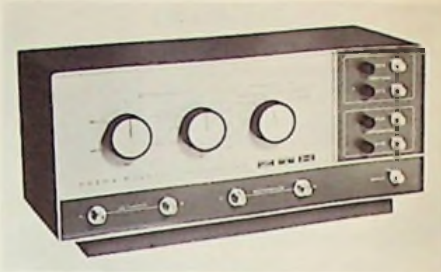
Just before Wescon in August, the judges will reassemble, this time with the actual product "hardware" on hand, for judging of final awards of excellence in product design.

The jury of five was headed by Frank T. Walsh, Ampex Corp. director of corporate industrial design, and included John Duddy, Lockheed Missiles and Space Co. (a human factors specialist); Jack Crist, head of industrial design at San Jose State College; Cornelius Sampson, head of the San Francisco design firm of Cornelius Sampson and Associates; and John Crane, of Saffier, Lerner, and Schindler, also of San Francisco.

Criteria for judging included the following statement: The criteria shall include such joint parameters affecting design excellence as visual clarity of function, manufacture, and material via creative product design engineering; possible improvement in lowered manufacturing cost; and such design areas as maintainability and human factors, which improve the competitive marketing position of the product.

Selected entries, their companies, designer, and product engineer are:

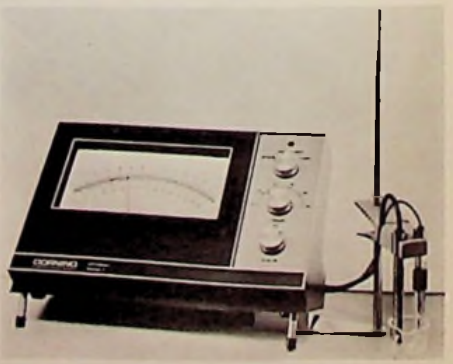
Po_2 electrode catheter, Beckman Instruments/Spinco Div., Palo Alto; Jerome Mahoney; Henry Faigh, Douglas Hillier, Jerome Mahoney.



Transolver, Adams-Russell Co., Waltham, Mass.; Gregory Fossella Associates.

Socket for integrated circuit, Barnes Development Co., Lansdowne, Pa.; James W. Barnes; Kenneth E. Blachard.

Digital model 205, Beckman Instruments/Helipot Div., Fullerton; David J. Malk and Hugh O. Brown.



PH meter, Corning Glass Works, New York City; design department.

(Continued on page 38)

In stock in San Francisco

Carpenter electronic, magnetic and glass sealing alloys

Chances are you'll find the alloy you need, in the form you want, in stock right now in our San Francisco warehouse. Look over the list . . . if what you want isn't there, just ask us about it. We're here to serve you, and service means off-the-shelf delivery whenever possible.

These alloys are in stock now:

Glass Sealing "52"	Vacumet Nicoseal	HyMu "80"
a 51% nickel-iron alloy developed for glass-to-metal seals with the special soft glasses and certain ceramics. Glass Sealing "52" is available in 8" wide strip in several closely controlled thicknesses.	a vacuum induction melted nickel-cobalt-iron alloy for glass-to-metal seals with hard glasses such as 7052 manufactured to ASTM Specification F15-61T. Vacumet Nicoseal is completely vacuum melted from virgin material to assure highest quality. Nicoseal is available either as strip in a variety of widths and controlled thicknesses, or as machining bar stock.	a nickel-molybdenum-iron alloy which offers very high initial permeability and maximum permeability at low magnetizing forces with minimum hysteresis loss for transformer cores, tape wound toroids, stamped laminations and shields. HyMu "80" is available from stock in the three most commonly used strip thicknesses—.020", .025" & .031".

Don't see what you need?

Ask for a copy of our comprehensive catalog of Carpenter Alloys for Electronic, Magnetic and Electrical Applications. It contains complete technical data, including magnetic and electrical properties, physical constants, information on working the materials, and applications for over 40 special Carpenter alloys

for the electronic industry. For your copy, just call or write The Carpenter Steel Service-Center nearest you. • 1530 Industrial Way, Belmont, California. Telephone 415-593-8461 • 4423 East District Blvd., Los Angeles, California. Telephone 213-587-9131.

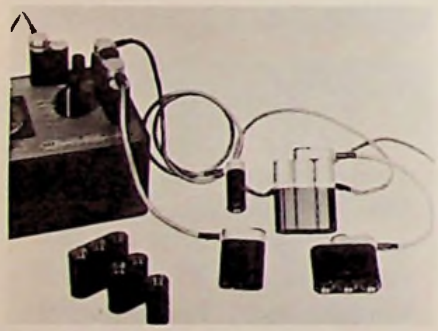
Carpenter steel
IN A WORD, CONFIDENCE

ELECTRONIC, MAGNETIC AND ELECTRICAL ALLOYS • STAINLESS STEELS • HIGH TEMPERATURE ALLOYS • TOOL AND DIE STEELS • SPECIAL-PURPOSE STEELS • TUBING AND PIPE • FINE WIRE SPECIALTIES

Circle Inquiry Card No. 15

Front access "card cage," Dymec division of Hewlett-Packard Co., Palo Alto; Gerry Priestley; Bob Pierce, Arlan Saunders, Ted Pollard.

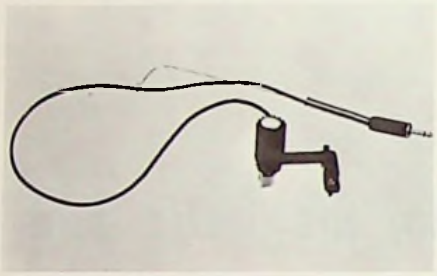
Dymo M-10 tapewriter, Dymo Industries, Emeryville; James Lee; Armand Massen and Georg Bremer.



Shielded cable and connector system, Electro Scientific Industries, Portland, Ore.; Perry H. Rosen, Rosen/Sirois Industrial Design; Harold Lawson.

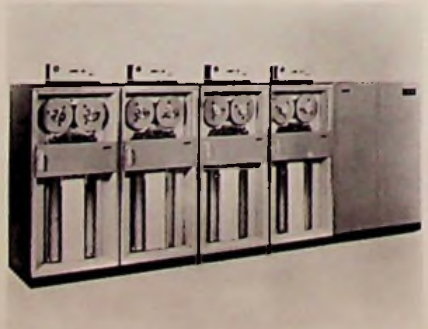
Integrating digital meter (and family), Fairchild Instrumentation, Palo Alto; Gruye/Brandt and Associates.

Electronic computyper, Friden, Inc., San Leandro; E. Stoltz, E. Salter; A. van den Berg and W. Ates.



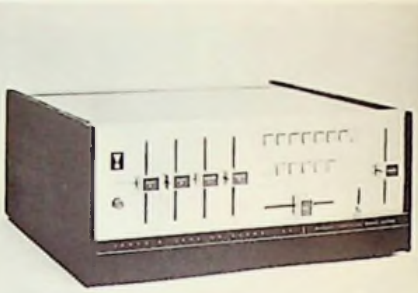
Character printer, Hewlett-Packard, Moseley Division, Pasadena; Richard Kemplin; Thomas Minor.

"KB" switch/display system, Honeywell, Micro Switch Div., Freeport, Illinois; William H. Harkins, John F. Graham; Jack A. Cox, Walter R. Ditsworth.

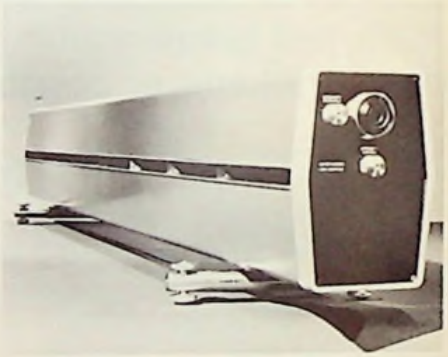


IBM 2400-series magnetic tape units, International Business Machines, Systems Development Div., Poughkeepsie, New York; R. V. Jones.

JBL 80-watt stereo energizer, James B. Lansing Sound, Los Angeles; Arnold Wolf, Arnold Wolf Associates, Berkeley; Lamont J. Seitz.



JBL graphic controller, James B. Lansing Sound, Los Angeles; Arnold Wolf, Arnold Wolf Associates, Berkeley; Lamont J. Seitz.



Helium-neon high-power laser, Spectra-Physics, Mountain View; Carl J. Clement; Robert C. Rempel, David L. Wright, John C. Everitt, Dennie L. Leimer, Carl J. Clement, and James C. Sprout.

Automatic scribing machine, Tempress Research Co., Sunnyvale; Leonhard Albrecht Associates, San Francisco; Frank L. Christensen.

Introducing Item 11 in the Fluke '65 Pacesetter Line

New solid state voltage calibrator accurate to 0.003% with variable current limiting and overvoltage trip for absolute protection of all the equipment in your set-up. Line and load regulation, 0.0005% of setting. Panel meter monitors either output voltage or current. Easy to read seven digit dial-up. Weighs 40 lbs. Only 7 inches high. Price, $2,490. It's a bargain!

More Model 332A Features and Specifications—Seven inline decade switches provide one-tenth part per million resolution on each voltage range. DC common mode error is less than 2 nanovolts per volt of common mode voltage (174 db CMR). Range is 0 to 1,111.1110 volts in steps as small as 1 microvolt. Output current is 0 to 50 milliamperes at any output voltage. Overcurrent protection automatically limits output current at any preset level between 1 ma and 60 ma. Overvoltage protection automatically disables output voltage if level exceeds setting of front panel control. The continuously variable overvoltage trip can be set to operate at any point from 10% to 110% of each range. Stability is ±0.0015% per week or ±0.0025% per six months. Temperature coefficient is 0.0002% of setting per °C from +20 to +40 °C. Ripple and noise are less than 20 μv rms on the 10 v range and less than 40 μv rms on the 1,000 v range.

FLUKE

FLUKE • Box 7428 • Seattle, Washington • Phone: (206) PR 6-1171 • TWX: (910) 449-2850

Model 332A Voltage Calibrator

INSTRUMENT SPECIALISTS, INC.

See it at WESCON, Booth #'s 4420, 4421, and 4422.

1121 S. CENTRAL AVE., GLENDALE 4, CALIFORNIA
PHONE: (213) 245-0111
1090 W. EVELYN AVE., SUNNYVALE, CALIFORNIA
PHONE: (408) 245-3321

Circle Inquiry Card No. 10

Call your Neely Field Engineer. He offers you the most complete line of quality instrumentation available. Furthermore, you can put his talents as an instrumentation engineer to work for you. Try him.

HEWLETT PACKARD hp NEELY SALES DIVISION

North Hollywood, (213) 877-1282; **Palo Alto,** (415) 327-6500; **Sacramento,** (916) 482-1463; **San Diego,** (714) 223-8103; **Scottsdale,** (602) 945-7601; **Tucson,** (602) 623-2564; **Albuquerque,** (505) 255-5586; **Las Cruces,** (505) 526-2486; **Seattle,** (206) 454-3971; **Denver,** (303) 771-3455; **Salt Lake City,** (801) 486-8166.

Our Latest Products
See them at WESCON

New Pulse Generator produces accurately controlled pulses . . . 2.5 c/s to 1.2 Mc/s range . . . durations from 100 ns to 1 s . . . less than 5 ns rise and fall times . . . both positive and negative pulses adjustable up to 60 mA (60 V across 1 kΩ) . . . simultaneous complimentary pulses available for digital applications. . . . Type 1398-A, $535.

New Pulse Amplifier . . . High output in small package; up to 1.2 A, peak to peak, positive or negative (60 V into 50 Ω), direct-coupled . . . linear amplification for complex pulses . . . adjustable rise and fall times over a 0.1- to 100-microsecond range . . . Type 1397-A, $495.

Modular Pulse Generator . . . Five different modules available for maximum flexibility: 2.5-c to 1.2-Mc PRF Unit, 100-ns to 1-s Pulse/Delay Unit, Pulse Shaper, Power Amplifier provides 20 V into 50 Ohms, and a 16-bit Word Generator . . . Type 1395-A, Prices start at $650.

New Variac® Automatic Voltage Regulators . . . All solid-state regulators in both military and industrial versions . . . power capacities from 2 to 20 kVA . . . no distortion added . . . high accuracy, will correct to 0.25% of output voltage . . . high response speed, 40 V/s . . . no power-factor restrictions . . . tolerates transient overloads up to 10 times rated load . . . Prices start at $495.

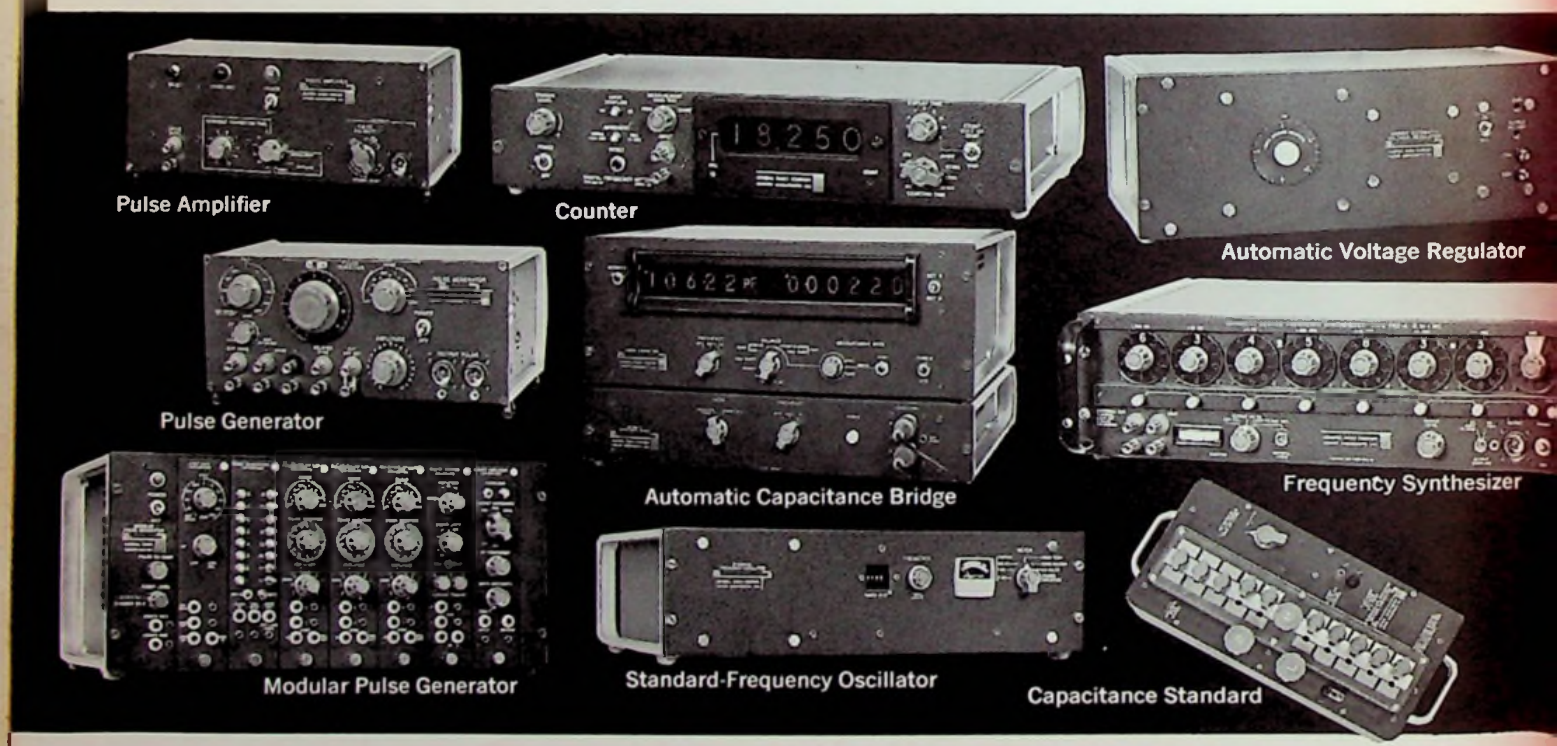
Counters . . . 0 to 10 Mc/s, 0 to 100 Mc/s, and 0 to 500 Mc/s with sensitivities of better than 100 mV, peak to peak (better than 10 mV from 100 kc/s to 500 Mc/s) . . . input controls give choice of sensitivity, dc or ac coupling, and trigger level . . . models also available with data output . . . price of basic 1153-A 10-Mc Counter is $1,495.

Decade Frequency Synthesizers . . . 100-kc, 1-Mc, and 12-Mc models . . . frequency increments as small as 0.01 c/s and 0.1 c/s . . . models with calibrated continuous tuning and sweep capability . . . programmable models . . . prices start at $3,200.

New Polystyrene Decade Capacitance Standard . . . 0 to 100 μF in steps of 10 μF . . . accuracy, ±0.25% . . . switching resistance is kept low through the use of tapered plug connectors . . . Type 1425-A, $1,400.

Automatic Capacitance Bridge . . . selects range, makes balance, displays measured value in ½ second . . . 0.01 pF to 100 μF direct reading range . . . accuracy ±0.1% of reading . . . in-line readout also locates decimal point and presents correct units of measurement . . . BCD output for data handling systems . . . Type 1680-A, $4,850.

Frequency and Time Instrumentation . . . Type 1115-B, $2,050, a 5-Mc crystal oscillator with a short-term stability of better than 1×10^{-11} measured over a one-second averaging time . . . and the Type 1123-A, $2,950, a companion all solid-state digital clock for time comparisons to a resolution of better than 20 nsec . . . both instruments equipped with internal emergency battery supplies.



Booths 3801-3804
August 24-27
San Francisco Cow Palace

Also on Display at WESCON . . .

- A Megohm Bridge with a 1-kilohm to 1000-teraohm (10^{15} ohms) range.
- A Sound-Level Meter that meets all A.S.A. specifications and fits in the palm of your hand.
- A general-purpose, 2-c to 2-Mc Oscillator with low distortion and high output.
- Coaxial Connectors, components, and instruments for use at frequencies to 9 Gc/s.

IN CANADA: Toronto 247-2171, Montreal (Mt. Royal) 737-3673
IN EUROPE: Zurich, Switzerland — London, England

50 YEARS

GENERAL RADIO COMPANY
WEST CONCORD, MASSACHUSETTS

BOSTON (W. Concord) 646-0550 | NEW YORK, N. Y., 964-2722 (Ridgefield, N. J.) 943-3140 | CHICAGO (Oak Park) 848-9400 | PHILADELPHIA (Ft. Washington) 646-8030 | WASHINGTON, D.C. (Rockville, Md.) 946-1600 | SYRACUSE 454-9323 | DALLAS FL 7-4031 | SAN FRANCISCO (Los Altos) 948-8233 | LOS ANGELES 469-6201 | ORLANDO, FLA. 425 4671 | CLEVELAND 886-0150

Circle Inquiry Card No. 12