EDITOR'S PROFILE of this issue

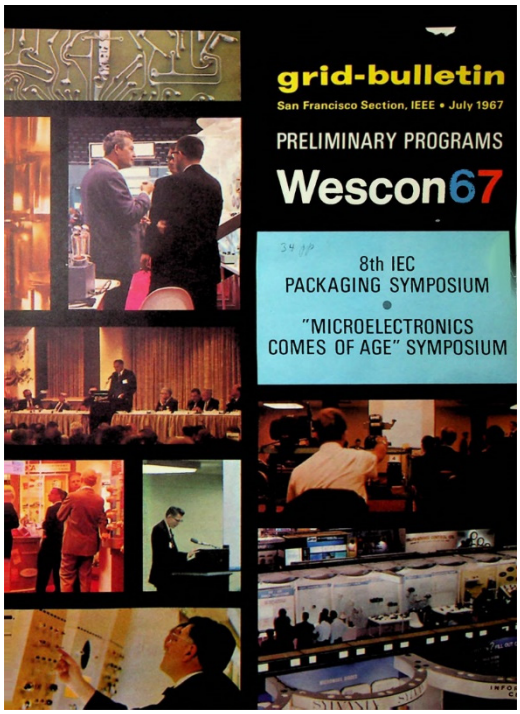
from a historical perspective …

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

July, 1967:

Cover: WESCON has a focus on microelectronics and also on electronics packaging, and is held in San Francisco's Cow Palace this year.

Page 9: Don Hoefler of Electronic News chairs a session on business management. Don goes on (in 1971) to coin the term "Silicon Valley", which has stuck to our area ever since. Bill Davidow, future venture capitalist, chairs session B on LSI, with Gordon Moore giving a talk on cost factors in LSI, which flows from his 1965 paper postulating the famous "Moore's Law" (page 10).



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San Francisco Section, IEEE • July 1967

PRELIMINARY PROGRAMS

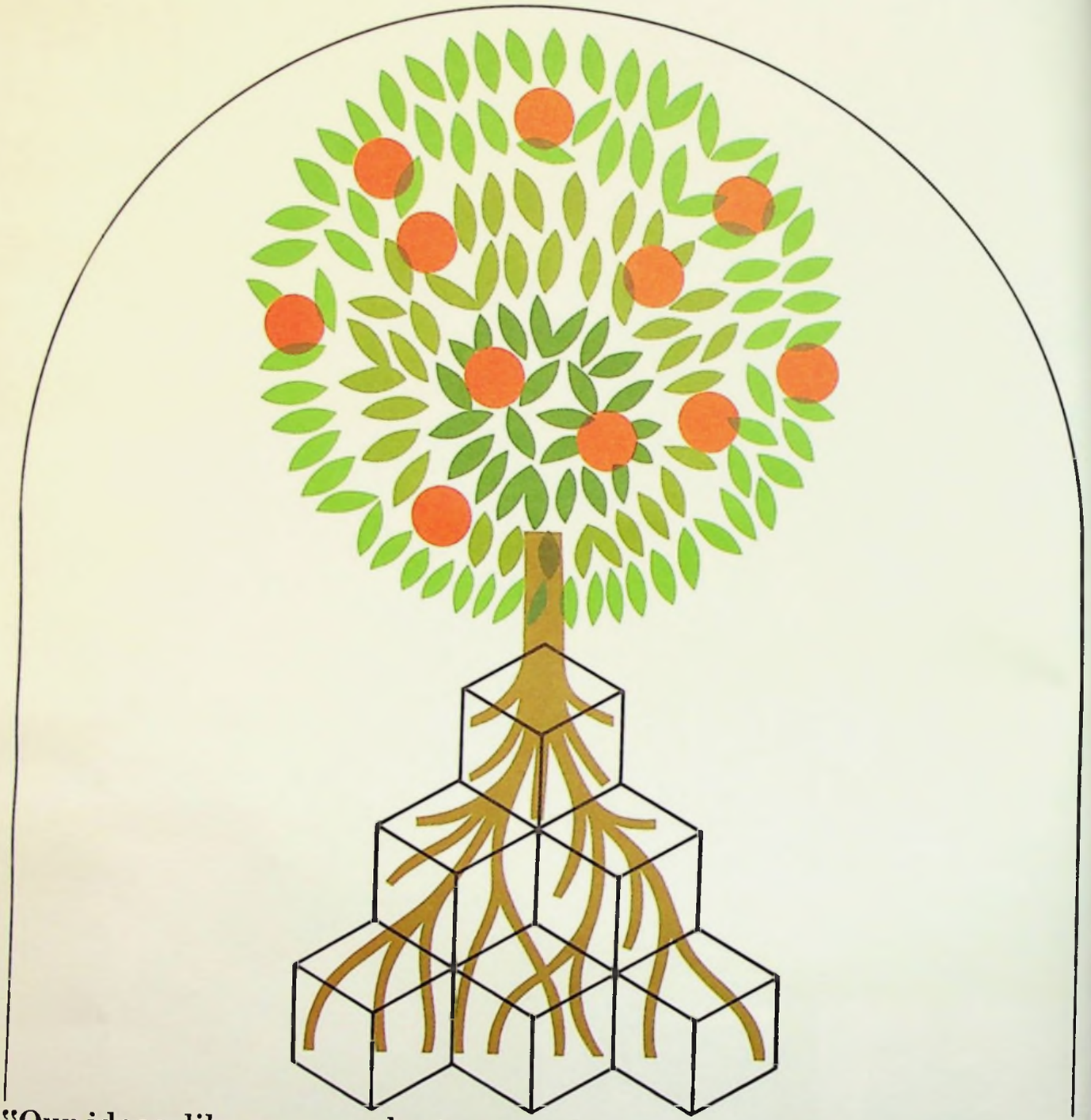
Wescon67

34 pp

8th IEC PACKAGING SYMPOSIUM

•

"MICROELECTRONICS COMES OF AGE" SYMPOSIUM



"Our ideas, like orange-plants, spread out in proportion to the size of the box which imprisons the roots." – Bulwer

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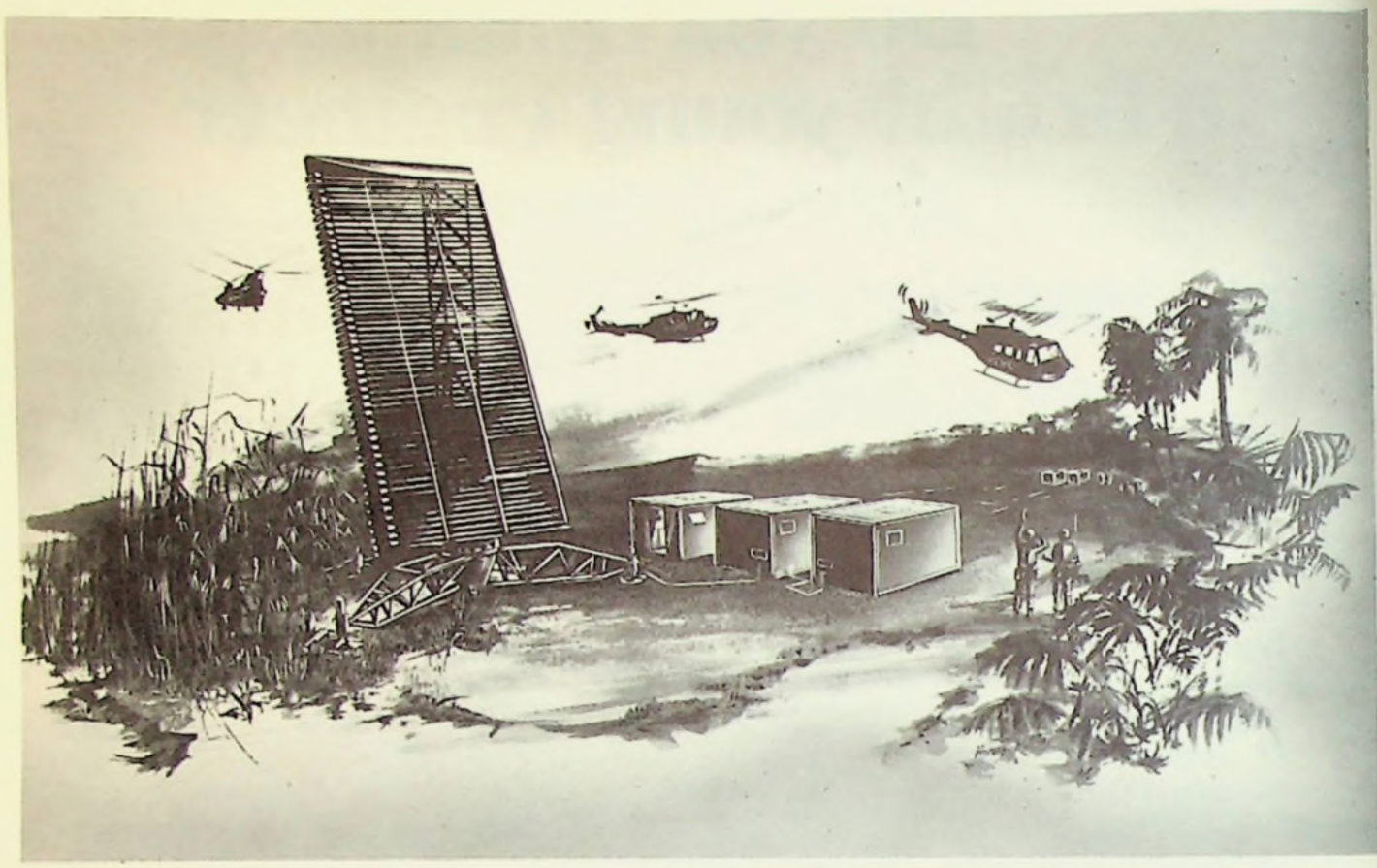

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Be sure that you talk to us during the San Francisco WESCON meeting. Just drop us a line or call us collect here in Los Angeles or call Mr. Paul West in San Francisco during the show for an appointment there.

Contact: *Mr. Paul West, 1815 Venice Boulevard, Los Angeles, California 90006, Phone: (213) 386-3708*

San Francisco: *during the convention: Phone: (415) 392-4933*

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Circle Inquiry Card No. 11

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contents

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region six news

1968 PORTLAND CONFERENCE

The 1968 Region Six IEEE Conference will be held May 20-22 at the Sheraton Motor Inn, Portland, Ore., with the theme "Electronics Serving Mankind."

Session topics will include energy sources, biomedical engineering, education, simulation, transportation, computers, aerospace, communications, lasers and oceanography. Authors are invited to submit 500-word abstracts in any of these categories, by the closing date for abstracts of Jan. 5 and will be notified of acceptance by Feb. 1. March 11 will be the closing date for final manuscripts.

Authors of accepted papers will be expected to give a 20-minute oral presentation followed by a 10-minute discussion period. Authors are specifically requested not to read their papers; rather, they should provide additional current and/or philosophical details of their subject. Maximum interaction between the authors and the audience is the goal of this conference.

Each session will be keynoted by a leading scientist in the field. He will speak for approximately 50 minutes and lay the historical and philosophical background for the session. Contributed papers will supplement the keynoter's presentation by describing leading technical work in the field of discussion.

For further information write to: Program Chairman, IEEE Region 6 Conference, P.O. Box 831, Portland, Ore., 97207.

wema news

'67 WEMA DIRECTORY

Detailed and updated information on western electronic manufacturers—from AAI Pacific to Zenith Radio Research Corporation—is contained in the Western Electronic Manufacturers Association 1967 Directory.

The 96-page reference book lists 410 WEMA companies and research firms, whose operations account for more than 80 percent of electronic sales volume in the western states.

Company listings include principal management personnel, number of employees, headquarters and divisions information, date of establishment, form of ownership, methods of marketing and principal products.

Within the 282 product categories, ranging from particle accelerators to yokes, deflection, the list of manufacturers totals more than 3,200.

The directory may be obtained from WEMA, 2600 El Camino Real, Palo Alto; or 3600 Wilshire Blvd., Los Angeles. Sales price is $10.

Wescon67

27 LEADERS OF 400

A team of 27 Bay Area electronics industry volunteers heads up the committees planning the Western Electronic Show and Convention to be held in San Francisco in August.

WESCON, the largest single meeting of the year in the city, will attract a record crowd of about 40,000 engineers and other specialists to its four-day program at the Cow Palace, August 22-25. Nearly 700 companies will exhibit products in the show.

Fourteen committees totalling 400 members have helped plan and organize the big technical-industrial exposition. Serving as the heads of committees are:

Dr. Donald R. Scheuch, Stanford Research Institute, and Ernest W. Pappenfus, Granger Associates, technical program.

Emmett N. Brownell, Varian Associates, and Charles R. Gibbs, Fairchild Instrumentation, exhibits.

Jesse R. Lien, Sylvania Electric Products, and Prof. William R. Rambo, Stanford Electronics Laboratories, keynote luncheon.

William H. Heflin, Fisher Research Laboratory, and John A. Chartz, Dalmo Victor Co., attendance.

Thomas D. Sege, Eimac division, Varian, and John W. Ballard, Granger Associates, cocktail party.

David H. Ross, David H. Ross Co., and Elvin Feige, Elmar Electronics, Distributor-Manufacturer-Representative Conference.

Einar Ingebretson, Lockheed Missiles & Space, and Louis D. Stevens, IBM Advanced Systems Development, facilities.

Alan B. Simpkins, Delcon division, Hewlett-Packard, and Fred J. MacKenzie, Stanford Research Institute, Future Engineeers Show.

Robert M. Ward, Ultek, hospitality.

Mrs. Philip J. Rice and Mrs. Robert DeLiban, women's activities.

Carl J. Clement, Spectra-Physics, and Gene Tepper, Tepper/Steinhilber, industrial design.

David Kirby, Hewlett-Packard, and Jon W. Wilcox, Varian, public relations.

Larry E. Henninger, Aerotherm, and Austin F. Marx, Hewlett-Packard, registration.

Martin R. Wank, Ray-Tek, and F. W. Moulthrop, F. W. Moulthrop & Associates, visitor services.

The WESCON show will be open from 9:30 a.m. to 5:30 p.m. on three of its four days. On Wednesday, August 23, however, the Cow Palace exhibits will remain open until 9:30 p.m. This represents a change from the two previous years, when the show remained open two evenings.

Wescon67 COMMITTEES


Exhibits: Brownell and Gibbs

Hospitality: Ward


Technical program: Scheuch and Pappenfus

DMR Conference: Ross and Feige


Attendance: Heflin and Chartz


Women's activities Mrs. Rice and Mrs. DeLiban


Visitor services: Frank and Moulthrop

Keynote luncheon: Lien and Ram


Cocktail party: Sege and Ballard


Registration: Henninger and Marx

Industrial design: Clement and Tepper


Facilities: Ingebretson and Stevens


Public relations: Kirby and Wilcox

Future Engineers: Simpkins and MacKenzie

Wescon67

SPONSORS

Kaisel

Hulse

Woodman

McCullough

Sponsors' representatives are Dr. Stanley F. Kaisel, IEEE Region Six Director; E. H. Hulse, IEEE San Francisco Section Chairman for 1966-67; Gil Woodman, IEEE Los Angeles Council Chairman for 1966-67; and John S. McCullough, WEMA President.

DIRECTORS

Gundy

Leifer

Beckett

Cameron

When the doors open on WESCON in San Francisco August 22, an "instant city" of about 40,000 persons will have been created.

The "population" will find that provision has been made for a community of 40,000—information services, transportation, food and beverage service, electrical power, and a dozen other services. Visitors will find a well-organized product exposition and a carefully planned technical program. They will move through a registration procedure that has been timed out with a stopwatch, and they will find dozens of people—obviously volunteers—who have been thoroughly trained in what could be called "crowd management" services.

What's behind this major effort each summer? How does a very large conference and exposition get from the starting point—a large empty hall and a paper plan—into a bustling, efficient "instant city" serving 40,000 inhabitants?

In the case of the Western Electronic Show and Convention, the roots are in an unusual partnership between a professional society and a manufacturing association. WESCON is jointly sponsored by the San Francisco Section and Los Angeles Council of IEEE, representing Region 6, and the Western Electronic Manufacturers Association.

WESCON's directors—eight of them in all—represent the two sponsors equally. In a similar way, the directorate also represents WESCON's two host cities, Los Angeles and San Francisco, equally.

The eight directors, each serving a four-year volunteer term, direct the planning for each year's show and convention.

In 1967, for example, the four Bay Area directors (two representing WEMA and two representing IEEE) serve as the WESCON executive committee. A fifth member is Don Larson, general manager of the small WESCON business staff. Starting last November, this committee has been directly responsible for the event that will take place in San Francisco August 22-25.

Members of the executive committee, are Phillip Gundy, Computer Equipment Corp., chairman of the board; Meyer Leifer, Melabs, chairman of the executive committee; John C. Beckett, Hewlett-Packard, convention director; and Emmet G. Cameron, Varian Associates, show director.

In 1967, southern California board members serve as the long-range planning committee. They are William J. Moreland, Conrac Corp.; John J. Guarrera, Guide Industries Inc.; Floyd L. Goss, Los Angeles Department of Water and Power; and Donald C. Duncan, Duncan Electronics Inc. In 1968, with WESCON scheduled for Los Angeles, this group will make up the executive committee for the year.

With direction from the board and the executive committee, 14 working committees are formed each year to carry the major load of WESCON planning. The parallelism in the table of organization is again repeated—half of the committees are "show" committees, reporting to the show director, and half are "convention" committees, reporting to the convention director.

These committees, which will include about 400 members by show time, provide the content of technical programs, special and social events, the student program, and a dozen or more special services.

At WESCON itself, they will serve as information sources, registration supervisors, technical session monitors, hosts at social events, overseers of WESCON's elaborate bus system.

All of these committeemen, representing both the electronics industry and the engineering profession, provide their time and talent without tangible recompense. Some committees—the Technical Program Committee is a good example—will have been at work for more than one year by this August.

This WESCON "symmetrical plan"—balancing representation from IEEE and WEMA, from San Francisco and Los Angeles, and providing equal emphasis on the show and convention sides of the event—has been greatly instrumental in the growth of WESCON week to an annual event of international importance.

Wescon67 TECHNICAL PROGRAM

TUESDAY, AUGUST 22

Wescon67

20-SESSION PROGRAM

The technical program committee for the 1967 Western Electronic Show and Convention has given the go-ahead to 20 session organizers for the final program of the big August convention.

Dr. Donald R. Scheuch, Stanford Research Institute, who is chairman of the program, said his eight-man committee chose 16 session plans out of a record 73 that were submitted for consideration. Four more "special" sessions, organized at the committee's request, will bring the session total to 20. All will be presented in a convention hall at San Francisco's Cow Palace, also the site of the 1100-booth WESCON product exposition.

The technical program will run August 22-25 (Tuesday through Friday). Four concurrent sessions will be presented each morning except Tuesday (three in morning, one in afternoon), and one of the special sessions each afternoon, Dr. Scheuch said.

Concurrent with this schedule, and designed to complement the program, two special-interest symposia will be staged in the San Francisco Hilton Hotel. They are the 8th International Electronic Circuit Packaging Symposium, to be presented on August 21 and 22, and a "Microelectronics Comes of Age" symposium slated for August 23 and 24. The latter program, organized by the IEEE/PMP group, takes the form of a highly concentrated short course on microelectronics.

WESCON's 20-session program will be made up of about 85 papers, Dr. Scheuch said. He noted, that under WESCON's session unit format, each session has been made up of papers that cover different phases within a single subject area, and that each paper has a planned relationship to the others in its session.

The IECP Symposium has scheduled 26 papers in its two-day program, and three manufacturing-process workshops, to be held concurrently on the afternoon of August 22. The workshops are being prepared under auspices of the California Circuits Association.

A fourth technical program attraction will be a Science Film Theater to be presented daily during WESCON at the Cow Palace. About 20 engineering and scientific films are included in the schedule, which is repeated each day.

1

Linear Integrated Circuits

Tuesday, August 22, 10 a.m.-12:30 p.m.
(DuBridge Hall, Cow Palace)

The "chicken or egg" dichotomy is similar to the constraints which accompany *Linear Integrated Circuits.* Monolithic linear *IC's* have potential low fabrication cost. However, the low cost must be accompanied by high use which is stimulated by low cost.

To interrupt this round robin, this session describes not only the design considerations, but also the economic and marketing effects.

Session Organizer and Chairman: Jerry Eimbinder, EEE Magazine, New York.

1/1 APPLICATIONS FOR RF/I-F INTEGRATED-CIRCUIT AMPLIFIERS. Ralph Seymour, Signetics Corp., Sunnyvale, Calif.

1/2 DUAL INTEGRATED-CIRCUIT OPERATIONAL AMPLIFIERS. Leo L. Wisseman and Bill Ehrsam, Motorola Semiconductor Products, Phoenix, Ariz.

1/3 THE TRADE-OFF BETWEEN COST AND PERFORMANCE IN OPERATIONAL-AMPLIFIER INTEGRATED CIRCUITS.

PART 1 — DESIGNING FOR INDUSTRIAL / CONSUMER APPLICATIONS. Jerry W. Gibbs, Amelco Semiconductor, Mountain View, Calif.

PART 2 — THE PERFORMANCE/ECONOMICS/MARKETPLACE INTER-RELATIONSHIPS. Jack Gifford, Fairchild Semiconductor, Mountain View, Calif.

2

Business Management: The Engineer Becomes Manager

Tuesday, August 22, 10 a.m.-12:30 p.m.
(Terman Hall, Cow Palace)

"Congratulations, you've just been promoted to a managerial position." How will you handle it? *Business Management: The Engineer Becomes a Manager* provides directly applicable management information to the man whose education is science and technology, but whose career emphasis has shifted—or may likely shift—to management.

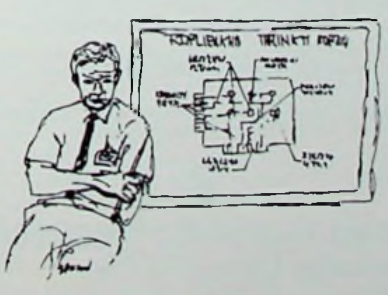
Session Organizer and Chairman: Don C. Hoefler, Electronic News, San Francisco, Calif.

2/1 MANAGEMENT IS THE DIRECTION OF PEOPLE. James F. Riley, Signetics Corp., Sunnyvale, Calif.

2/2 PITFALLS IN MONEY MANAGEMENT. Daniel G. White, Commonwealth National Bank of San Francisco.

2/3 A MODEL FOR MANAGEMENT ACTION. Charles H. Keller, Illumination Industries, Sunnyvale, Calif.

2/4 MANAGING A MAJOR TURNAROUND. Martin H. Dubilier, Friden Inc., San Leandro, Calif.



3

Radar Performance On Hypersonic Re-entry

Tuesday, August 22, 10 a.m.-12:30 p.m.
(DeForest Hall, Cow Palace)

"In the next few minutes we will lose contact with the vehicle during its re-entry." The crucial moments at re-entry are masked by an envelope of plasma. These effects have been known for years, but the implications are just now being fully understood. Recent studies of these phenomena are emphasized in this session.

The contribution of ablative gases to the complex dielectric properties of vehicle flow fields, simulation of re-entry using an arc-jet generator, and the effects of roll position on radar altimeters are discussed.

Session Organizer: James A Cooper, Sandia Corp., Albuquerque, N.M.

Session Chairman: Lloyd M. Melick, Sandia Corp., Albuquerque, N. M.

3/1 HIGH PRESSURE PLASMA SHEATH ANALYSIS. Charles D. Joerger, McDonnell Aircraft Corp., St. Louis, Mo.

3/2 EFFECT OF RE-ENTRY VEHICLE ENVIRONMENT ON ELECTROMAGNETIC TRANSMISSION. J. B. Chown, SRI, Menlo Park, Calif.

3/3 AN EXPERIMENTAL EVALUATION TECHNIQUE FOR RE-ENTRY VEHICLE ANTENNA WINDOWS. Lt. Bruce J. Benedict, Kirtland AFB, Albuquerque, N. M.

3/4 A TECHNIQUE FOR ANALYZING ANTENNA PATTERN AND RADAR RETURN EFFECTS ON SPINNING VEHICLES. James A. Cooper and C. D. Ouverson, Sandia Corp.

4

Varactor Tuning Of Receivers

Tuesday, August 22, 2:30-5:00 p.m.
(DuBridge Hall, Cow Palace)

When you think about it, receiver tuning elements haven't changed much in over 50 years. They didn't need to; they were efficient, reliable and inexpensive—albeit bulky. Within the next few years, this will change. *Varactor Tuning of Receivers* will be widespread, which is in line with the trend to integrated circuits.

Varactor tuning offers instantaneous search and remote tuning capability with improved reliability and small size. These factors as well as many recent applications will be discussed.

Session Organizer: Gerald Schaffner, Motorola Semiconductor, Phoenix.

Session Chairman: Johnnie Cochran, Motorola Semiconductor, Phoenix.

4/1 DESIGNING AROUND THE TUNING DIODE INDUCTANCE. G. Schaffner, Motorola Semiconductor, Phoenix.

4/2 APPLICATION OF ELECTRONIC TUNING TO TACTICAL COMMUNICATIONS EQUIPMENTS. Dean Strief, Avco Electronics, Cincinnati, Ohio.

4/3 VOLTAGE VARIABLE CAPACITOR TUNING OF RADIO FREQUENCY AMPLIFIERS. Jorge E. Roza, General Dynamics Electronics Div., Rochester, N.Y.

4/4 VARACTOR TUNING APPLIED TO RADIO RECEIVERS. Rinaldo DeCola, Warwick Electronics, Niles, Illinois.

4/5 HYPERABRUPT TUNING DIODE THEORY AND APPLICATION TO AM RADIO. Peter M. Norris, Motorola Semiconductors, Phoenix.

SPECIAL SESSION A

Electronics and Meteorology

Tuesday, August 22, 2:30-5:00 p.m.
(Edison Hall, Cow Palace)

In the last few years electronics has contributed significantly to transforming meteorology from an art to a science. Sophisticated sensing elements, combined with high speed data systems, have produced a wealth of climatological knowledge. Several in-progress projects will be reviewed and a look at future electronic requirements will be included.

Session Co-Chairman: Bruce B. Lusignan, Stanford University.

Session Co-Chairman: Allen M. Peterson, Stanford Research Institute.

Session Organizer: M. G. H. Ligda, Stanford Research Institute.

A/1 FEASIBILITY AND UTILITY OF SATELLITE LIDAR. William E. Evans, Stanford Research Institute.

A/2 OBSERVATIONS OF EARTH'S CLOUD COVER FROM SYNCHRONOUS SATELLITE. Verne Suomi, University of Wisconsin.

A/3 WEATHER EXPERIMENTS FOR APOLLO APPLICATIONS. Dallas Evans, NASA, Houston.

A/4 METEOROLOGICAL SATELLITE ELECTRONICS REQUIREMENTS OF THE FUTURE. Speaker to be announced.

WEDNESDAY, AUGUST 23

5

Gas Laser Stabilization

Wednesday, August 23, 10 a.m.-12:30 p.m.
(Edison Hall, Cow Palace)

Even an ideal laser has random fluctuations in amplitude and frequency. To remove these fluctuations, caused by external perturbations or inherent noise, *Gas Laser Stabilization* techniques are required.

In this session, four acknowledged authorities present specific results for two types of stabilization schemes.

Session Organizer and Chairman: D. E. Caddes, Sylvania Electronic Systems, Mountain View, Calif.

5/1 THE SPECTRUM OF A LASER OSCILLATOR. A. E. Siegman, Stanford University, Stanford, Calif.

5/2 PRESSURE SHIFTS AND RELATED EFFECTS IN THE HE-NE LASER. Arnold L. Bloom, Spectra-Physics, Inc., Mountain View, Calif.

5/3 FREQUENCY STABILIZATION OF GASEOUS ZEEMAN LASERS. W. Culshaw, J. Kannelaud, and D. G. Peterson, Lockheed Missiles and Space Co., Sunnyvale, Calif.

5/4 A FREQUENCY STABILIZED FM LASER. Russell Targ and L. M. Osterink, Sylvania Electronic Systems, Mountain View, Calif.

6

Data Compression

Wednesday, August 23, 10 a.m.-12:30 p.m.
(DuBridge Hall, Cow Palace)

The information explosion has far reaching effects on the data links used

to transmit the information. The straightforward approach is to increase communications link capacity. However, costs are often prohibitive.

A more economical approach is the use of *Data Compression*. With this technique, computers detect and reject redundant data prior to transmission and reconstruct the compressed data at the receiving terminal.

Session Organizer and Chairman: C. M. Kortman, Lockheed Missiles & Space Co., Sunnyvale, Calif.

6/1 MECHANIZATION OF A DIGITAL COMPRESSOR FOR BIOMEDICAL DATA. G. M. Loh, Lockheed Missiles & Space, Sunnyvale.

6/2 THE EFFECT OF CHANNEL ERRORS ON DATA COMPRESSION. L. D. Davisson, Princeton University, New Jersey.

6/3 ADAPTIVE BUFFER DESIGN FOR DATA COMPRESSION SYSTEMS. G. R. Schwarz, IBM, Federal Systems Div., Gaithersberg, Md.

6/4 GENERAL PURPOSE VS. SPECIAL PURPOSE COMPUTERS FOR DATA COMPRESSION. D. Hochman, Adcom, Inc., Palo Alto, Calif.

6/5 GENERAL PURPOSE TELEMETRY DATA COMPRESSION. J. J. Downing, W. E. Smith, and J. E. Stubbles, LM&SC, Sunnyvale, Calif.

7

Patient Monitoring Systems: Progress, Problems and Prospects

Wednesday, August 23, 10 a.m.-12:30 p.m.
(Terman Hall, Cow Palace)

Patience is a virtue, especially when trying to determine the "right" approach to patient monitoring. Many potential users do not really know what they want—either the measurements they need, or the manner in which they want to make them.

This session will give a critical review of present and future instrument needs. New and improved measurements, ways of obtaining them, and a proposed standard for patient-intensive care systems will be outlined.

Session Organizer and Chairman: Curtis E. Miller, M.D., Beckman Instruments, Fullerton, Calif.

7/1 Eliot Corday, M.D., Cedars-Sinai Hospital, Los Angeles, Calif.

7/2 C. William Hall, M.D., Baylor University, College of Medicine.

7/3 Donald C. Harrison, M.D., Stanford University School of Medicine.

7/4 John Mannes, Methodist Hospital, Houston. (PAPER TITLES TO BE ANNOUNCED.)

8

Designing Radio Frequency Circuits Using FETS

Wednesday, August 23, 10 a.m.-12:30 p.m.
(DeForest Hall, Cow Palace)

Circuit innovations using *FET's* are occurring every day. Now it appears *FET's* will find their area of greatest usefulness at radio frequency, for here they have some unique characteristics.

The session will be a balance between theory and practice. Certain device characteristics, circuit configuration, and design principles will be discussed. Equally important will be the emphasis on techniques to "get things done."

Session Organizer: Roy Hejhall, Motorola Semiconductor, Phoenix.

Session Chairman: Robert Dale, Motorola Semiconductor, Phoenix.

8/1 FIELD EFFECT TRANSISTOR RF MIXER DESIGN TECHNIQUES. Siang Ping Kwok, Motorola Semiconductor, Phoenix.

8/2 FIELD EFFECT TRANSISTOR RF POWER DESIGN TECHNIQUES. J. B. Compton, Siliconix, Sunnyvale, Calif.

8/3 FIELD EFFECT TRANSISTOR RF AMPLIFIER DESIGN TECHNIQUES. Roy Hejhall, Motorola Semiconductor, Phoenix.

8/4 FIELD EFFECT TRANSISTOR DESIGN TECHNIQUES AT BROADCAST FREQUENCIES. Donald L. Wollesen, Philco Microelectronics Division, Santa Clara, Calif.

8/5 USING INSULATED-GATE FIELD-EFFECT TRANSISTORS AS VERSATILE OSCILLATOR ELEMENTS. George D. Hanchett, RCA, Somerville, N. J.

SPECIAL SESSION B

Large-Scale Integration of Computer System Design

Wednesday, August 23, 2:00-4:30 p.m.
(Edison Hall, Cow Palace)

Where does large scale integration stand today? *Large Scale Integration of Computer System Design* attempts to answer this question by reporting on the state-of-the-technology. The factors that influence the cost of *LSI*, how *LSI* will be used in large and small systems, effects on design, and predictions for the future will be examined.

Session Chairman: W. H. Davidow, Hewlett-Packard, Palo Alto, California.

Session Coordinator: Kenneth T. Larkin, Lockheed Missiles & Space Co., Sunnyvale, California.

B/1 THE STATE OF LSI TECHNOLOGY. Richard Petritz, Texas Instruments.

B/2 PRESENT AND FUTURE COST FACTORS IN LSI. Gordon Moore, Fairchild, Palo Alto.

B/3 USE OF LSI IN FUTURE LARGE COMPUTER SYSTEMS. Gene M. Amdahl, IBM Corp., San Jose.

B/4 LSI IN SMALL SYSTEMS: PRACTICALITY AND ECONOMIC CONSIDERATIONS. L. C. Hobbs, Hobbs Associates, Corona del Mar, Calif.

THURSDAY, AUGUST 24

9

Recent Developments in Communications Systems

Thursday, August 24, 10 a.m.-12:30 p.m.
(Edison Hall, Cow Palace)

Where *do* we stand with regard to electronic communications? A large number of communications systems are being proposed or developed using new techniques. It's time to review *Recent Developments in Communications Systems*, the new techniques, the problems associated with their application, as well as the economic and social aspects.

Session Organizers: Timothy Healy, University of Santa Clara, and W. R. Vincent, Stanford Research Institute.

Session Chairman: John V. N. Granger, Granger Associates, Palo Alto.

9/1 TRENDS IN COMMUNICATIONS SYSTEMS DEVELOPMENT. W. R. Vincent, SRI, Menlo Park, Calif.

9/2 PROGRESS IN MODULATION AND DEMODULATION TECHNIQUES. W. L. Hatton, Defense Telecommunications Establishment, Ottawa, Canada.

9/3 LIMITATIONS OF RADIO PROPAGATION MEDIA. Thomas Kailath and Paul Shaft, SRI, Menlo Park, California.

9/4 TRANSPORTATION OR COMMUNICATIONS—SOME BROAD CONSIDERATIONS. Timothy Healy, University of Santa Clara, Santa Clara, California.

10

Digital Approach to Analog Functions

Thursday, August 24, 10 a.m.-12:30 p.m.
(DuBridge Hall, Cow Palace)

"Alternative" is a familiar word to engineers. One alternative to the use of linear integrated circuits (Session 1) is the *Digital Approach To Analog Functions*.

Digital *IC's* are relatively inexpensive, reliable and easy to use, though there is difficulty adapting digital design philosophies. This session presents some of the design requirements techniques, and applications.

Session Organizer: Maria Dekany, Electronic Design Magazine, N. Y.

Session Chairman: James F. Kaiser, Bell Telephone Labs, Murray Hill, N. J.

10/1 WHY USE DIGITAL ICs FOR ANALOG FUNCTIONS. Donald Breslow, Itek Corporation, Lexington, Mass.

10/2 FOUR DIGITAL ARRAYS DO ALL ALGORITHMS. George T. Sendzuk, General Electric Company, Binghamton, New York.

10/3 A COMPARISON OF ANALOG AND DIGITAL INTEGRATED CIRCUIT TECHNIQUES FOR SINE AND COSINE GENERATION. James R. Garvey, RCA Aerospace Systems Division, Burlington, Mass.

10/4 STAGGERED PHASE CARRIER CANCELLATION EXTENDS POWER-FREQUENCY COMPROMISE OF POWER DEVICES. Richard J. Ravas and Paul F. Pittman, Westinghouse Research Labs, Pittsburgh, Pa.

Special symposia on electronic packaging and on microelectronics are to be presented in the San Francisco Hilton Hotel. Each is a two-day program, designed to complement the regular program.

11

Progress in Fluidics Applications

Thursday, August 24, 10 a.m.-12:30 p.m.
(Terman Hall, Cow Palace)

Anyone who says Fluidics will replace Electronics is all wet! During the past six years, the potential of Fluidics has been recognized, but so have the limitations.

Progress in Fluidics Applications is oriented to allow the electronic engineer to assess the effect of Fluidics on the electronic field. It is apparent that the field is large for both disciplines and that Fluidics and Electronics can complement each other.

Session Organizer and Chairman: D. F. Folland, Sperry Utah Co., Salt Lake City, Utah.

11/1 SECONDARY INJECTION THRUST VECTOR CONTROL USING FLUIDIC VORTEX VALVES. Jerome G. Rivard, Bendix Research Labs, Southfield, Mich.

11/2 FLUIDIC TIME OPTIMAL ADAPTIVE CONTROL SYSTEM. Robert F. Turek, Bowles Engineering Corp., Silver Spring, Md.

11/3 FLUIDIC DEVICE TESTING. Harold L. Fox, Fluidonics Research Labs, Div. Imperial Eastman Corp., Salt Lake City, Utah.

11/4 PROPORTIONAL CONTROL SYSTEMS IN INDUSTRY. Robert L. Blosser, Sperry Utah Co., Div. of Sperry Rand Corp., Salt Lake City.

11/5 A PNEUMATICALLY CONTROLLED DOCUMENT HANDLING SYSTEM. R. R. Coleman, Jr. and Richard S. Gluskin, Univac, Div. of Sperry Rand Corp., Blue Bell, Pa.

12

High Density Recording Techniques

Thursday, August 24, 10 a.m.-12:30 p.m.
(DeForest Hall, Cow Palace)

Billion-bit storage requirements now threaten to inundate us with warehouses. Vast amounts of information collected by government and industry must ultimately be stored.

High Density Recording Techniques can increase the tape storage of the computer by a factor of 20 or more. This session will encompass advanced developments—including electron and laser beam recording—as well as current technology.

Session Organizer and Chairman: Roy D. Sturkie, Leach Corp.—Controls Div., Azusa, Calif.

12/1 HIGH DENSITY ELECTRON AND LIGHTBEAM RECORDING. Charles F. Spitzer, Ampex Corp., Redwood City, Calif.

12/2 MAGNETIC HEADS FOR HIGH DENSITY DIGITAL RECORDING. Donald T. Best, Ferroxcube Corp., Saugerties, N. Y.

12/3 A TECHNIQUE FOR HIGH DENSITY DIGITAL RECORDING. Kermit Norris, Leach Corp.—Controls Div., Azusa, Calif.

12/4 ULTRA-HIGH DATA PACKING DENSITY RECORDING RELATED TO MANNED SPACECRAFT. Donald Ray Smith, NASA, Houston, Texas.

SPECIAL SESSION C

The Frequency Spectrum—A National and International Resource

Thursday, August 24, 2:00-4:30 p.m.
(Edison Hall, Cow Palace)

What can be expected as the use of the electromagnetic spectrum expands? What are the economical, political and sociological effects of frequency allocation? Will international agreements be made in time to advance development of communications satellites?

These are some of the aspects of spectrum management, to be discussed by a panel of expert spokesmen, led by James D. O'Connell, Director, Telecommunications Management, Office of the President.

Session Chairman: James D. O'Connell, Executive Office of the President, Washington, D.C.

Session Organizer: Edward E. Nolan, Farinon Electric, San Carlos, Calif.

FRIDAY, AUG 25

13

Solid State Imaging, an Evolving Technology

Friday, August 25, 10 a.m.-12:30 p.m.
(Edison Hall, Cow Palace)

Imagine an Image without high voltage, magnetic fields, vacuum envelopes or filament power. *Solid-state Imaging; An Evolving Technology* gives this promise as early research begins to bear fruit. The session provides an understanding of the basic concepts involved, as well as the performance of present and advanced hardware.

Session Organizer: W. F. List, Westinghouse Electric, Baltimore, Md.

Session Chairman: Carl Huggins, Marshall Space Flight Center, Huntsville, Ala.

13/1 100 x 128 ELEMENT SOLID STATE IMAGING SYSTEM. D. E. Callahan, R. A. Anders, W. F. List, M. E. Wing, and D. H. McCann, Westinghouse Electric Corp., Baltimore, Md.

13/2 A REPORT ON THE DEVELOPMENT AT FAIRCHILD SEMICONDUCTOR OF INTEGRATED ARRAYS OF SILICON PHOTODETECTORS FOR IMAGE SENSING. G. P. Weckler and R. H. Dyck, Fairchild Semiconductor Research and Development Laboratory, Palo Alto, Calif.

13/3 A SELF-SCANNED SOLID STATE IMAGE SENSOR. P. K. Weimer, G. Sadasiv, J. E. Meyer, L. Meray-Horvath and W. S. Pike, RCA Labs, Princeton, New Jersey.

13/4 SOLID STATE IMAGE INTENSIFIER. R. D. Stewart, General Electric, Syracuse, N. Y.

14

The Future of Solid State Phased Arrays

Friday, August 25, 10 a.m.-12:30 p.m.
(DuBridge Hall, Cow Palace)

The Future of Solid-state Phased Arrays is bright indeed. In this session, capabilities and limitations of solid-state phased arrays will be explored by examining present and projected advances in solid-state microwave art.

Wescon67 TECHNICAL PROGRAM

Session Organizer and Chairman: Arthur S. Robinson, RCA Missile & Surface Radar Div., Moorestown, N. J.

PANELISTS:
R. D. Alberts, Air Force Avionics Lab, Wright-Patterson AFB, Ohio
Carl Blake, Lincoln Laboratories, Lexington, Mass.
Douglas Mather, Rome Air Development Center, Griffiss AFB, New York.
Thomas Hyltin, Texas Instruments, Dallas, Texas.
Frank A. Brand, Electronic Components Laboratory, Ft. Monmouth, N. J.
Thomas Madigan, Bell Telephone Labs, Whippany, New Jersey
Malcolm Vosburg, Institute of Defense Analysis, Arlington, Va.
Arthur S. Robinson, RCA, Missile & Surface Radar Div., Moorestown, N. J.

15

Static Power Systems: Controls, Inverters, Rectifiers, Power Systems

Friday, August 25, 10 a.m.-12:30 p.m.
(Terman Hall, Cow Palace)

On land, under the sea, and in the air, *Static Power Systems* are being used. While most power is generated and trasmitted as a-c, it has been estimated that 40% of the power is rectified at the load. Moreover, almost all power is subject to some control. Then, there is sudden absence of power—hence the need for standby systems. These aspects are discussed in this session.

Session Organizer: Stuart P. Jackson, Solidstate Controls, Inc., Worthington, Ohio.

Session Chairman: David W. Borst, International Rectifier Co., El Segundo, Calif.

15/1 PROBLEMS IN DESIGNING A D. C. POWER TRANSMISSION SYSTEM. Stuart P. Jackson, Solid state Controls, Inc., Worthington, Ohio.

15/2 CURRENT REGULATORS FOR ELECTROCHEMICAL RECTIFIER SYSTEMS. R. P. DePuy and J. W. Luoma, General Electric Co., Philadelphia.

15/3 APPLICATION & DESIGN ASPECTS OF A 2.5 KVA SOLID STATE FREQUENCY CONVERTER FOR AN AIRBORNE INSTALLATION. S. G. Campbell and T. H. Ussher, The de Havilland Aircraft of Canada Ltd., Malton, Ontario, Canada.

15/4 STATIC STANDBY POWER SYSTEMS. Chris F. Seyer, Fansteel Metallurgical Corporation, North Chicago, Illinois.

15/5 REDUNDANCY AND SWITCHING IN STANDBY SYSTEMS. Stuart P. Jackson and Dennis M. Swing, Solidstate Controls, Inc., Worthington, Ohio.

16

The Computer as a System Component

Friday, August 25, 10 a.m.-12:30 p.m.
(De Forest Hall, Cow Palace)

New system approaches, streamlined design procedures or greater system capability, can be obtained by using the *Computer as a System Component*.

This session views the computer as an element within a problem-oriented system, rather than considering computer technological advances alone. By clarifying the new tools and techniques, the growing need for systems that are natural and easy to use is emphasized.

Session Organizer: R. A. Burks, Scientific Data Systems, Santa Monica, Calif.

Session Chairman: Pete England, Scientific Data Systems, Santa Monica, Calif.

16/1 THE IMPACT OF THIRD-GENERATION COMPUTERS ON SYSTEM DESIGN. David L. Stein and Joe Glasier, Scientific Data Systems, Santa Monica, Calif.

16/2 A THIRD GENERATION COMPUTER IN A NUCLEAR PHYSICS LABORATORY. Richard F. Au, John V. Kane, and William E. Merritt, Michigan State University, East Lansing, Mich.

16/3 SOFTWARE AS A COMPONENT IN COMPUTERIZED SYSTEMS. Bob L. Ryle, Planning Research Corp., Los Angeles, Calif.

16/4 ON-LINE COMPUTERS AND PATIENT CARE. Shannon Brunjes and Robert F. Maronde, USC, Los Angeles, Stanley Seibert, Los Angeles County Hospital, Los Angeles, and John C. Soutter, IBM, Los Angeles, Calif.

SPECIAL SESSION D

Systems Approach to Natural Resources Control

Friday, August 25, 2:00-4:30 p.m.
(Edison Hall, Cow Palace)

This session will give an overview to the problems associated with hydroelectric power generation. The balance between hydro and thermal power requirements, control of water storage levels and flow, and navigation requirements will be examined. Future system applications will be noted.

Session Chairman: R. J. Pafford, Jr., Bureau of Reclamation, Sacramento, California.

Session Coordinator: Ernest W. Pappenfus, Granger Associates, Palo Alto, California.

D/1 INTEGRATING HYDRO AND THERMAL GENERATION. E. F. Kaprielian, Pacific Gas and Electric Co., San Francisco.

D/2 SYSTEMS ANALYSIS APPLICATIONS FOR THE FUTURE. John Eichelman, Stanford Research Institute, Menlo Park.

D/3 MISSOURI BASIN FLOOD CONTROL AND WATER CONSERVATION. Tim Waara, Missouri River Div., U. S. Corps of Engineers, Omaha.

D/4 BONNEVILLE POWER ADMINISTRATION SYSTEM CONTROL. Marvin Harris, Bonneville Power Administration, Portland, Oregon.

Wescon67

DMR CONFERENCE

The biggest Distributor-Manufacturer-Representative Conference in the history of the event is planned for Monday, August 21 at the Jack Tar Hotel, San Francisco, and will consist of 20 20-minute sessions by appointment with distributors, tables provided to distributors at no charge. The registration fee of $6.50 covers a continental breakfast, coffee breaks and luncheon.

Electronic parts distributors, representatives who sell to electronic parts distributors, and all WESCON exhibiting manufacturers are eligible and cordially invited to participate. The conference, held the day before WESCON begins, provides a full day to meet and talk with distributors, uninterrupted by show activities.

Wescon67

UNIQUE GUEST REGISTRATION

WESCON's "pink card" plan for guest and employee registration is again being offered to corporations and organizations, it was noted this month by William Heflin, attendance committee chairman.

Under the plan, an organization can order an unlimited number of the pink registration cards, to be made available to "friends of the company" or employees. Each order is assigned a keypunch account number, and the organization is billed after the show for registration cards actually used at the rate of 50 cents each. This compares with "over-the-counter" registration cost at the Cow Palace of $2 per person.

Heflin pointed out the plan makes it practical for companies to encourage employees to visit WESCON either during the day or in the August 23 evening hours (the show will remain open until 9:30 p.m.).

"Many production and test people and members of the office staff never really see the product go to market," Heflin commented. "There are some real benefits to giving employees a chance to see this side of the company picture."

Universities, research labs and similar organizations are also eligible to participate in the guest registration plan, he said. Inquiries or orders of guest registration cards (in lots of 100) should be addressed to WESCON, 3600 Wilshire Boulevard, Los Angeles 90005. Since each order will be assigned an account number for post-WESCON billing (based on cards actually used at the show), no payment should be included with the order.

Wescon67

FREE BUS SERVICE

Free shuttlebus service linking San Francisco International Airport, downtown hotels, and the Peninsula with the Cow Palace will operate during all WESCON show hours.

In anticipation of a record attendance, the service for this August has been increased over previous years, with a more frequent airport service and addition of the route to the Peninsula. The Peninsula shuttlebus will pick up and discharge passengers at Rickey's Hyatt House, Palo Alto.

Bus service will operate during all WESCON show hours—all day on August 22, 24, and 25, and until 9:30 p.m. on Wednesday, August 23, when WESCON remains open in the evening.

In the city, the bus routes will include service to the Del Webb Townhouse, Jack Tar, Palace, Hilton, and Fairmont Hotels.

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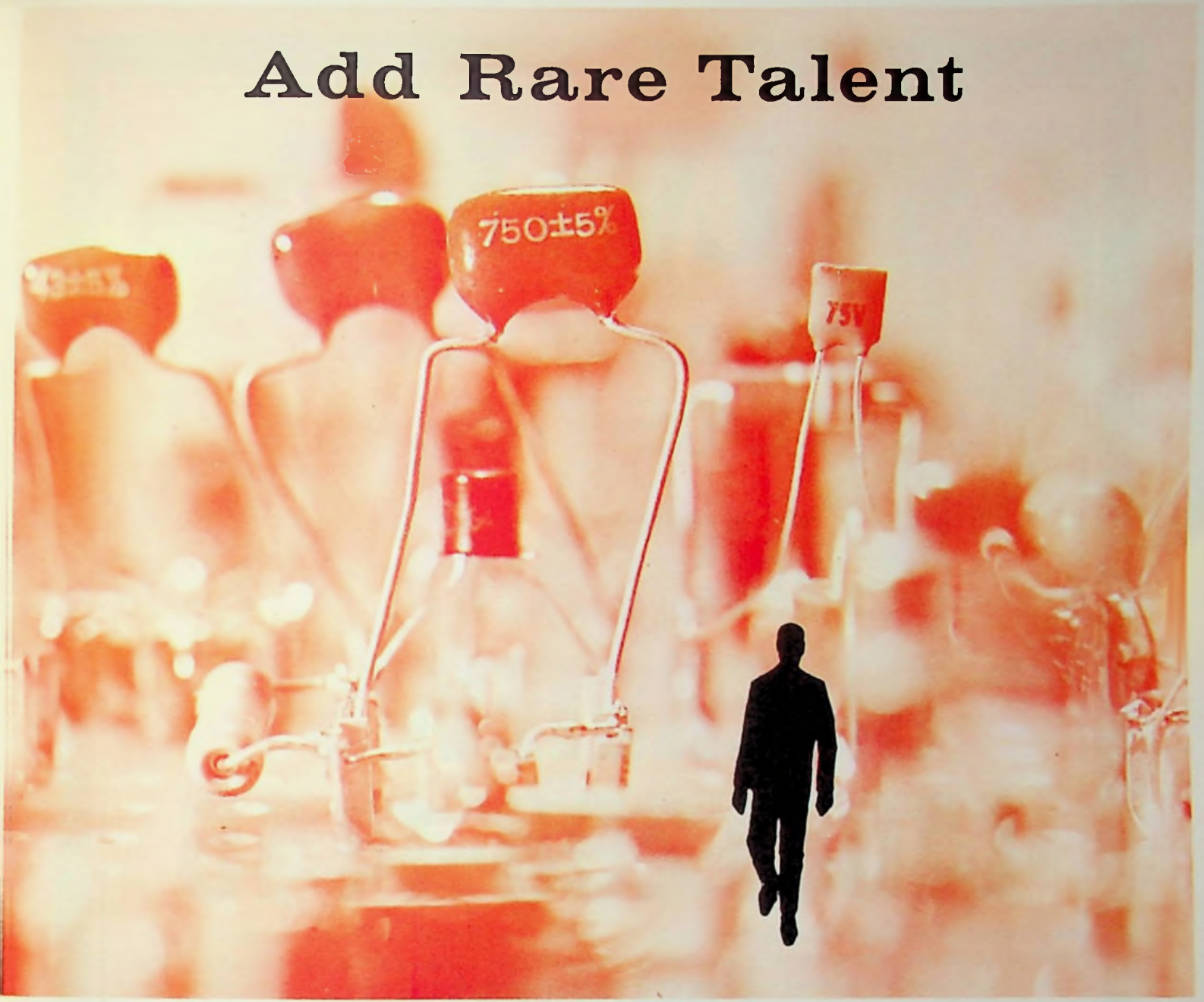

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KEYNOTE LUNCHEON

Dr. Eugene G. Fubini, former Assistant Secretary of Defense (DDRE) and now a vice president and group executive of IBM Corp., will deliver WESCON's keynote address on August 22, it was announced this month by John C. Beckett, convention director.

The keynote luncheon, a second year event, will be held in Convention Hall at the Cow Palace, Beckett said. An audience of about 600 will hear Dr. Fubini address the subject, "Requirements Vs. Reality."

In his IBM assignment, Dr. Fubini directs activities of several divisions, including research and engineering, production systems, and advanced systems development. Last year's keynote speaker was Dr. Glenn T. Seaborg, chairman of the U.S. Atomic Energy Commission.

The luncheon is open to all WESCON attendees. Tickets are priced at $6 per person, and full table reservations will be available.

The roster of special events at WESCON includes a keynote luncheon (at the Cow Palace on Tuesday, August 22); the all-industry cocktail party (at the Fairmont Hotel Tuesday evening); WEMA's annual corporate luncheon (Fairmont Hotel on Wednesday); the Future Engineers awards luncheon (Hilton Inn, Thursday); and Eta Kappa Nu awards luncheon (Thursday, Fairmont).

Women-at-WESCON will find two highlights on the ladies program, billed as "A Happening in San Francisco." On Tuesday morning, they'll attend a continental breakfast served in the famed Top of the Mark (with a 360-degree view of San Francisco Bay and the city). On Thursday, they'll follow a luncheon at Fisherman's Wharf with a tour of six famous San Francisco homes in the exclusive Pacific Heights district.

WESCON information centers will be expanded in several ways for 1967. A "courtesy telephone system" will be installed in a number of Cow Palace locations. The courtesy phones will all be direct lines to WESCON information centers, so that visitors can get fast answers to their questions. Plans also call for a visual information aid to be located at both the east and west Cow Palace entrances.

Both the east and west Cow Palace information centers will be equipped with high speed copying equipment, provided as a service by Xerox Corp. The two 2400 copiers will be made available to all WESCON attendees for copying data sheets, business cards, or other printed materials.

This August, WESCON will present about 1100 exhibit booths, showcasing the product achievements of 600 companies.

E. J. Lorenz, IBM, chairman of the Packaging Symposium Committee. J. R. Goodykoontz, TRW Systems, co-moderator of "Some Aspects of Thermal Design." H. J. Scagnelli, Bell Labs, co-moderator of "Advances in Packaging Techniques." T. A. Telfer, GE, co-moderator with Scagnelli.

circuit packaging

EIGHTH IECPS SCHEDULED AUG. 21-23, SF HILTON

The diverse disciplines of electronic circuit packaging will be further highlighted during WESCON. The Eighth International Electronic Circuit Packaging Symposium (IECPS), San Francisco Hilton, Aug. 21-22, has added concurrent workshop sessions to broaden its scope.

26 technical papers will be given in six consecutive sessions during the two-day symposium, emphasizing current technology as well as the most recent advances in the state-of-the-art. Three concurrent workshop sessions will be held during the second day, August 22, 1967. While the six regular sessions will provide vanguard of packaging technology, the workshop sessions will be a forum to disseminate practicable information. The complementary nature of the sessions will form a closely knit program.

The workshop sessions, prepared under the auspices of the California Circuits Association, will deal with specific engineering and production problems. Each workshop session will feature a panel of five authorities in the field under discussion. The panelists will spend a few minutes to discuss the scope of the session and then open the meeting to interchange concepts between the attendees and between attendees and panel. Attendees are encouraged to present specific problems and/or unique solutions of problems to the audience.

One session, entitled "The Communication Gap Between Multilayer Circuit Users and Fabricators," will deal with the many facets of this field. Anticipated areas of discussion include preparation of artwork, tolerance requirements, material selection, documentation, testing and trouble shooting.

During the session entitled, "From Printed Circuits to Thick Film Capability," the changes in organization and facilities that are necessary to include thick film manufacturing will be examined. Particular areas of interest are engineering involvement, the equipment needed, technical skills involved, and specific plant requirements.

In "Computer Design and Layout of Printed Circuits" the problems of this fast-paced technology will be discussed. Emphasis will be placed on current industry use of computer design and on the human aspects—program preparation, program knowledge, evaluation of computer time and preparing people to use this design tool.

The symposium is the confluence of attendees and participants who are recognized in the field of electronic packaging. The format of the regular sessions, as well as the workshop sessions, is designed to facilitate the exchange of information. All attendees receive ad-

L. S. Shuey, Sprague, co-moderator of "Meeting the Challenge in Electronic Packaging." E. C. Neidel, Sandia, co-moderator of "Considerations for Joining Techniques." W. J. Prise, LMSC, moderator of "Linking the Electronics." G. E. Gless, University of Colorado, co-moderator of "Linking the Electronics."

8TH INTERNATIONAL ELECTRONIC CIRCUIT PACKAGING SYMPOSIUM AUGUST 21-22 SAN FRANCISCO HILTON

The 8th International Electronic Circuit Packaging Symposium, concurrent with WESCON, includes six technical sessions during the two days, all at the San Francisco Hilton. Advance registration can be made by filling out the order form.

1
Considerations for Joining Techniques

Monday, August 21, 9:00-11:45 a.m.

Moderators: D. A. Beck, Bendix Research Labs, Southfield, Mich. E. C. Neidel, Sandia Corp., Albuquerque, New Mexico.

1/1 INFLUENCE OF SURFACE STRUCTURE ON THE QUALITY OF GOLD ELECTRODEPOSITS. J. B. P. Williamson and Morton Antler, Burndy Corp., Norwalk, Connecticut.

1/2 ULTRASONIC SOLDERING AND BONDING TECHNIQUES. Paul J. Bud, Electrovert, Inc., Mount Vernon, New York.

1/3 NONDESTRUCTIVE IN-PROCESS WELD EVALUATION. Forest C. Deal, Martin Marietta Corp., Orlando, Florida.

1/4 ELECTROMECHANICAL DESIGN OF A MATCHED IMPEDANCE CONNECTOR. H. H. Blonder and R. T. Evans, IBM, Poughkeepsie, N. Y.

1/5 SYSTEM PACKAGING AT THE CHIP LEVEL. W. L. Doelp, Jr., Philco-Ford Corporation, Blue Bell, Pennsylvania.

2
Advances in Packaging Techniques

Monday, August 21, 1:15-3:15 p.m.

Moderators: H. J. Scagnelli, Bell Telephone Labs, Whippany, N. J.
T. A. Telfer, General Electric Co., Utica, N. Y.

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vanced copies of the papers presented so that the speakers need only discuss the highlights of the paper. The digest form of the technical papers allows sufficient time for discussion between the speakers and attendees.

The registration fee of $30 includes all sessions of the symposium, lunch August 21st, a copy of the symposium proceedings and full registration for the WESCON program. For registration or information, contact WESCON Coordinator, 3600 Wilshire Blvd., Los Angeles, Calif.

MORE ELECTRONIC CIRCUIT PACKAGING PROGRAM

2/1 A PRELIMINARY INVESTIGATION OF PLASTIC ENCAPSULATED TRANSISTORS. Edward B. Hakim and R. Canepa, U. S. Army Electronics Command, Fort Monmouth, New Jersey.

2/2 DEVELOPMENT OF THIN FILM CIRCUITS WITH THICK FILM CONDUCTOR NETWORKS AND CROSSOVERS. Halle Abrams, Western Electric, Allentown, Pennsylvania.

2/3 THICK FILM TECHNIQUES AND DESIGN CRITERIA FOR SPACE VEHICLE APPLICATION. A. Ottaviano and J. Thomas, General Electric, Philadelphia, Pennsylvania.

2/4 THE APPLICATION OF THICK FILM TECHNOLOGY IN MULTILAYERED CIRCUITRY. W. O. Giesfeldt, Centralab, Milwaukee, Wisc.

3

Linking The Electronics

Monday, August 21, 3:30-5:00 p.m.

Moderators: W. J. Prise, Lockheed Missiles & Space Company, Sunnyvale, Calif. G. E. Gless, University of Colorado, Boulder, Colo.

3/1 FABRICATING RELIABLE MULTILAYER BOARDS. D. H. Rossi, Conductron-Missouri, Saint Charles, Missouri.

3/2 A FLAT PACK MODULE INTRACONNECTED BY MOLDED PRINTED CIRCUITS. L. Eugene Hayden and Cornelius D. Flynn, Westinghouse Electric Corporation, Baltimore, Maryland.

3/3 EQUIPMENT DESIGN FOR INTEGRATED CIRCUIT PACKAGING. J. P. Focarile and C. D. Irish, Bell Telephone Labs, Holmdel, N. J.

3/4 FLEXIBLE CIRCUIT CONNECTIONS. F. R. Sullivan, Lockheed Missiles & Space Company, Sunnyvale, California.

4

The Computer and Electronic Packaging

Tuesday, August 22, 8:30-10:30 a.m.

Moderators: E. J. Lorenz, IBM Corp., Poughkeepsie, New York. T. G. Boe, EDN Magazine, Englewood, Colo.

4/1 PACKAGING ASPECTS OF COMPUTER DESIGNED MULTILAYER INTERCONNECTION PRINTED WIRING. Gerald L. Ginsberg, Philco-Ford, Willow Grove,

4/2 LARGE SCALE INTEGRATION — COMPUTER AIDS AND SYSTEMS ASPECTS. Thomas F. Prosser, Philco-Ford Corp., Microelectronics Division, Santa Clara, California.

4/3 COMPUTER AUTOMATED DESIGN AND THERMAL ANALYSIS OF PRINTED CIRCUITS. B. Hyman and M. J. Merges, Bell Telephone Labs, Holmdel, New Jersey.

4/4 PACKAGING FLAT PACK INTEGRATED CIRCUITS FOR EARTH SATELLITES. Robert C. Moore, The Johns Hopkins University, Silver Spring, Md.

5/4 TEMPERATURE PREDICTIONS WITHIN AN ELECTRONICS SECTION OF AN EXTERNALLY MOUNTED AIRCRAFT MISSILE DURING MACH 4.0 CARRY FLIGHT. S. A. Casazza, Raytheon Company, Bedford, Mass.

5/5 SIMPLIFIED TRANSMITTER COOLING SYSTEM. L. R. Paradis, Raytheon Company, Bedford, Massachusetts.

5

Some Aspects of Thermal Design

Tuesday, August 22, 10:45-11:45 a.m.

Moderators: R. C. Mayne, Jet Propulsion Laboratory, Pasadena, Calif. J. R. Goodykoontz, TRW Systems, Redondo Beach, Calif.

5/1 THERMAL DESIGN CONSIDERATION OF A VERY HIGH SPEED COMPUTER. Kenji Taniguchi and Yuichiro Oya, Central Research Laboratory, Tokyo, Japan.

5/2 THERMAL DESIGN FOR IBM SYSTEM/360 MODEL 91. V. W. Antonetti, R. C. Chu and J. H. Seely, IBM Systems Development Division, Poughkeepsie, New York.

Session 5, Continued, 1:15-2:45 p.m.

5/3 THERMAL PROBLEMS ENCOUNTERED IN THE DESIGN OF THE ELECTRONICS PACKAGES OF THE LMS BAND STEERABLE ANTENNA AND THE APOLLO HIGH GAIN ANTENNA. Allen L. Schmidt, Dalmo Victor, Belmont, California.

6

Meeting the Challenge in Electronic Packaging

Tuesday, August 22, 3:00-5:00 p.m.

Moderators: J. C. Rubin, Eastman Kodak, Co., Rochester, N. Y. L. S. Shuey, Sprague Electric Co., Los Angeles, Calif.

6/1 PACKAGING DESIGN OF A SOLENOID ARRAY CORRELATOR. Jonn G. Simon, Sylvania Electronic Systems, Needham Heights, Mass.

6/2 THE INTEGRATION OF MICROELECTRONICS AND THE PRODUCT. J. F. Hinchey, Friden, Inc., Oakland, California.

6/3 PACKAGING DESIGN OF THE APOLLO LUNA MODULE ABORT COMPUTER. Thomas B. Hibler, TRW, Inc., Redondo Beach, California.

6/4 PACKAGING A CAPACITOR READ ONLY MEMORY. C. P. del Cano and H. E. Myles, IBM Space Guidance Center, Oswego, N. Y.

AUGUST 22-25
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WEEK IN
SAN FRANCISCO

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67

Special Events Ticket Order Form

WESCON Ticket Bureau, 3600 Wilshire Blvd., Suite 1920, Los Angeles, Calif. 90005
Please send me, postpaid, the following tickets to WESCON special events:

WESCON Keynote Luncheon (August 22)	____ Tickets @ $6.00	Total $____
All-Industry Cocktail Party (August 22)	____ Tickets @ $6.50	Total $____
WEMA Annual Luncheon (August 23)	____ Tickets @ $6.00	Total $____
Women's Luncheon and Tour (August 24)	____ Tickets @ $8.50	Total $____
Future Engineers Awards Luncheon (August 24)	____ Tickets @ $5.00	Total $____
Eta Kappa Nu Awards Luncheon (August 24)	____ Tickets @ $6.00	Total $____

Please mail tickets to:

Name _____ *Company* _____

Address _____

City _____ *State* _____ *Zip* _____

Check in the amount of $ _____ *enclosed.* _____

(Orders received by Aug. 11 will be mailed; later orders will be held at Will-Call at Cow Palace.)

Advance Registration for Symposia

☐ 8th International Electronic Circuit Packaging Symposium

☐ "Microelectronics Comes of Age" Symposium

Gentlemen: Please make the following registration(s) for the Symposium indicated above. I understand that the $30 registration fee includes admission to all sessions of the symposium noted and to WESCON; a special luncheon on the first day of the appropriate symposium; and a full symposium record of the 8th IECP Symposium, or a full volume of Microelectronics Symposium paper summaries (1000 words each), as indicated.

Registration at $30 each. Check enclosed in total amount of $ _____

Make reservation(s) in the following name(s):

Name(s) _____

_____

Company _____

Address _____

City _____ *State* _____ *Zip* _____

Make checks payable to 8th IECP Symposium, or Microelectronics Symposium and mail c/o WESCON, 3600 Wilshire Blvd., Los Angeles, Calif. 90005. You will receive prompt confirmation by mail. All credentials will be held in your name at the San Francisco Hilton for pickup on first day of appropriate symposium.

Hotel/Motel Reservation Form

WESCON Housing Bureau, Fox Plaza, San Francisco, Calif. 94102
Please make hotel reservations noted below:

Hotel Choice: (First) _____

(Second) _____

Arrival Date: _____ *Time:* _____ *a.m.* _____ *p.m.*

Departure Date: _____ *Time:* _____ *a.m.* _____ *p.m.*

Type of room: Single: ____ *Double:* ____ *Twin:* ____ *Price Range:* _____

Room Occupants: _____

_____

Mail confirmation to:

Name _____

Company _____

Address _____

City _____ *State* _____ *Zip* _____

(Deposit check for $ _____ enclosed, if required.)
Reservation will be confirmed directly by the hotel.

Your Wescon Hotel/Motel Guide

To insure your accommodations in San Francisco, make your hotel choice on the reservation form below. Note some hotels require $15 deposit per room.

HOTELS	ADDRESS	SINGLE	DOUBLE	TWIN
*Bellevue	Geary & Taylor		13.00-16.00	14.00-18.00
*Beverly Plaza	342 Grant Ave	11.00	14.00	16.00
Californian	405 Taylor St.	12.50	15.00	18.00
Canterbury	750 Sutter St.		12.00-18.00	14.00-20.00
Cecil	545 Post St.	14.00	17.00	19.00
Chancellor	433 Powell St.		13.00	15.00
Clift	Geary & Taylor	17.00		23.00
*Commodore	825 Sutter St.	16.00-24.00	16.00-24.00	18.00-26.00
Continental Lodge	2550 Van Ness	16.75-20.75	18.75-24.75	20.75-26.75
Del Webb Townehouse	8th & Market	16.00-25.00	18.00-25.00	20.00-28.00
Drake Wiltshire	340 Stockton	12.50	15.00	20.00
*El Cortez	550 Geary		12.00-15.00	14.00-18.00
Fairmont	Mason & California	18.00-34.00	23.00-39.00	23.00-39.00
Fielding	386 Geary St.	12.00	15.00	18.00
Franciscan	350 Geary St.	10.00	12.00	14.00
Gaylord	620 Jones St.		12.00-14.00	13.00-15.00
Golden State	114 Powell St.	8.00- 9.00	10.00	12.50-14.00
Hillsdale Inn	477 E. Hillsdale (S. Mateo)			15.00
Hilton	333 Mason St.	16.00-24.00	21.00-29.00	22.00-29.00
Holiday Lodge	Van Ness & Wash.	18.00	22.00	22.00
Huntington	1075 Calif. St.		19.00-29.00	19.00-29.00
Jack Tar	Geary & Van Ness	15.00-30.00	19.00-33.00	21.00-33.00
La Salle	225 Hyde St.		10.00	11.00
Mark Hopkins	999 Calif. St.	17.00-26.00	22.00-31.00	22.00-31.00
Maurice	761 Post St.		13.00-16.00	15.00-17.00
Olympic	230 Eddy St.		14.00-16.00	14.00-16.00
Oxford	16 Turk St.		12.00-13.00	14.00
Plaza	Post & Stockton			14.00-16.00
*Ramada Inn	1250 Bayshore Highway (Burlingame)			13.00-18.00
*Richelieu	Van Ness & Geary	10.00-14.00	12.00-18.00	14.00-18.00
St. Francis	Union Square	15.00-30.00	19.00-32.00	22.00-34.00
Senate	467 Turk St.	7.00- 8.00	8.00- 9.00	10.00-16.00
Sheraton Palace	Mkt. & New Montgomery	16.50-18.00	20.50-22.00	20.50-22.00
*Sheraton Thunderbolt	101 Bayshore (Millbrae)	14.00-19.00	18.00-24.00	18.00-24.00
Sir Francis Drake	Powell & Sutter	13.00-20.00	16.00-24.00	19.00-24.00
Stewart	351 Geary St.	12.00-15.00	14.00-20.00	14.00-20.00
*Sutter	191 Sutter St.	9.00-11.00	12.00-15.00	13.00-16.00
Travelodge at the Wharf	250 Beach St.	14.00-18.00	16.00-20.00	18.00-22.00
Villa	4000 S. El Camino (S. Mateo)	17.00	20.00	20.00
Whitcomb	1231 Market St.			18.00-20.00

MOTELS	ADDRESS	SINGLE	DOUBLE	TWIN
Alfa Inn	2505 Lombard St.		18.00-20.00	20.00-24.00
*Americana Motor Lodge	7th & Mission		16.50-18.50	22.50-24.50
Baybridge Downtown	966 Harrison		9.00-11.00	13.00-17.00
Bayside Motel	2011 Bayshore Blvd.	16.00-20.00	18.00-22.00	22.00-26.00
*Becks Motorlodge	15th & Mkt. St.	12.50	14.50	18.00
*Broadway Manor	2201 Van Ness	12.00-16.00	14.00-18.00	16.00-22.00
*Cable	1450 Lombard St.	18.50-22.50	20.50-26.50	22.50-28.50
*Caravan Lodge	601 Eddy St.			20.00-24.00
*Civic Manor	825 Polk St.		14.50	16.50-20.50
De Ville	2599 Lombard St.	16.50	18.50	22.50
Downtown	111 Page St.		10.00-14.00	15.00-16.00
Doyle	1555 Union St.	11.50-14.50	12.50-15.50	17.50-20.50
El Rancho	1100 El Camino (Millbrae)	14.50	16.50	16.50 18.50
*Fishermans Wharf Travelodge	1201 Columbus Ave.	20.00-22.00	20.00-22.00	22.00-26.00
*Flamingo City Center	7th & Mission Sts.		16.50	18.50-22.50
*Francisco Civic Center	364 - 9th St.		15.50-17.50	20.50-22.50
Hilton Inn	International Airport	16.00	21.00	21.00
Imperial 400	222 S. Airport Blvd. (So. San Francisco)		12.00	14.00
Knights Rest Motor Lodge	3rd & San Bruno Aves. (San Bruno)	10.00-12.00	12.00-14.00	14.00-18.00
*Lanai	2353 Lombard St.		16.00	22.00
*Laurel Motor Inn	Presidio & Calif.	14.00-16.00	16.00-18.00	17.00-22.00
Manor	2358 Lombard St.		15.00	19.00
Nob Hill	1630 Pacific	12.00-16.00	15.00-18.00	16.00-20.00
Oasis	900 Franklin	14.00	16.00-18.00	16.00-18.00
Ocean Park Motel	2690 - 46th Ave.		12.00	15.00
*Rancho Lombard	1501 Lombard St.		16.50-18.50	18.50-26.50
Red Coach Motor Inn	Polk & Eddy Sts.			22.50-24.50
*Richelieu	Van Ness & Geary		18.00-22.00	18.00-22.00
*Safari	860 Eddy St.	12.50-14.50		16.50
S. F. Downtown Travelodge	790 Ellis St.		14.00	16.00-18.00
*Star	1727 Lombard St.		14.00-18.00	
Van Ness	2850 Van Ness		12.00-14.00	14.00-16.00
*Villa Roma	1212 Columbus Ave.	24.00	24.00	24.00

**Hotels and motels requiring $15.00 deposit per room*

Wescon67

Western Electronic Show and Convention

SF HILTON, AUG. 23-24

The "Microelectronics Comes of Age" Symposium, a "spin-out" from a highly successful tutorial lecture series held last fall in the Boston area is now tied-in with WESCON. Twenty-eight freshly-prepared papers will be given in San Francisco, August 23 and 24.

The latest directives from the D.O.D. on microelectronics standards and a brand new view of the military and non-defense industries' use of microwave circuit applications are but two subjects to be presented during the timely seminar.

According to S. M. Stuhlbarg, seminar chairman and manager of the microelectronics facility for Raytheon at Bedford, Mass., "the objective of the seminar is to present up-to-date and objective views of the microelectronics field, so as to better assess the benefits of this expanding technology when applied to present or future development and production tasks."

As a cross between a refresher and instructional course, the seminar will offer both a quick injection of knowledge on microelectronics to executives and generalist, as well as making both controversial and practical illustrations of the current state-of-the-art available to the specialist.

Keynoting the affair will be Ed Keonjian, Grumman Aircraft Engineering Corp. A well-traveled microelectronics specialist for his company, Keonjian's presentation will bring an international flavor to the seminar.

Samples of the new material to be offered in abundance during the seminar, include M. Penberg's view on a unique hybrid approach that his company, Aerojet-General, will not even release until the day of his presentation.

Of great interest will be the new commercial applications of thick films as seen by R. C. Early, General Electric Company; a listing of parts that are now available by M. Ohanian, Raytheon Company, and a report by R. Eggleston on how microbonding

MORE MICROELECTRONICS

has progressed.

A special report on the Bell Laboratories applications of thin-films to touch-tone telephones will be included in a talk by W. D. Moyers, Lockheed Electronics.

Two films will be screened. R. Lia of IBM will show a view of the 360 computer assembly (a microassembly production using thick films) and E. Hall, MIT, will bring his film on apollo computer reliability.

New to the seminar is V. Gelnovatch's "Microwave Circuit Applications," which is an outgrowth of the enthusiasm generated for this subject at the IEEE's spring Solid States Circuits Conference. Though the speaker is from the U.S. Army Electronics Command, Fort Monmouth, the talk will extend beyond the military application boundaries and encompass commercial uses.

According to Stuhlbarg, the talk on "Large Scale Integration" by Dr. J. Lathrop, Texas Instruments, is expected to be well attended by computer specialists. The seminar will conclude on a high note as Glen R. Madland, another authority on integrated circuits, views the future.

The seminar is a WESCON extra-fee event, priced at $30, including a digest of the talks and one luncheon. The entire two-day event will be audio taped for possible subsequent use by the IEEE Continuing Education Committee.

Jules Rothman, Ikor, is chairman of G-PMP and organizer of several of the sessions. S.M. Stuhlbarg, Raytheon, directed the series at MIT and is speaker in 1/1 "Terminology and Classifications." J. J. Staller, Sylvania, will discuss "Current and Future Packaging Methods."

MICROELECTRONICS COMES OF AGE

AUG. 23-24, SF HILTON

The *Microelectronics Comes of Age* symposium has as its purpose to ensure an up-to-date and objective view of the microelectronics field and to assess the benefits of this expanding technology when applied to present or future development and production tasks.

1
An Introduction to Microelectronics

Wednesday, August 23, 8:30-9:10 a.m.

Keynote Address: MICROELECTRONICS IN PERSPECTIVE. E. Keonjian, Grumman Aircraft Engineering Corp., Bethpage, L. I., N. Y.

1/1 TERMINOLOGY AND CLASSIFICATIONS. S. M. Stuhlbarg, Raytheon, Bedford, Mass.

2
The Hybrid Approach

Wednesday, August 23, 9:10 a.m.-Noon

Session Organizer: Wayne Martin, RCA, Burlington, Mass.

2/1 THIN FILM NETWORKS. M. Penberg, Aerojet-General Corp., Azusa, Calif.

2/2 THICK FILM NETWORKS. R. C. Early, General Electric Co., Lynchburg, Va.

2/3. MICROCOMPONENT PARTS AND ASSEMBLY. M. Ohanian, Raytheon Co., Bedford, Mass.

2/4 MICROBONDING. R. Eggleston, Kulicke & Soffa, Inc., Ft. Washington, Penn.

2/5 MICROASSEMBLY PRODUCTION TECHNIQUES USING THIN FILMS. W. D. Moyers, Lockheed Electronics, Plainfield, N. J.

2/6 MICROASSEMBLY PRODUCTION TECHNIQUES USING MULTICHIPS. J. Welty, Amelco Co., Mountain View, Calif.

2/7 MICROASSEMBLY PRODUCTION TECHNIQUES USING THICK FILMS. R. Lia, IBM, Hopewell Junction, New York.

3
The Monolithic Approach

Wednesday, August 23, 1:00-5:00 p.m.

Session Organizer: Carl H. Worembrand, Adage Inc., Boston, Mass.

3/1 BASIC THEORY. H. C. Lin, Westinghouse Molecular Electronics, Baltimore, Maryland.

3/2 PROCESSING. C. Awad, Raytheon Semiconductor Operation, Mountain View, California.

3/3 DESIGN PARAMETERS. R. E. Bohn, Sylvania Semiconductor, Woburn, Mass.

3/4 BI-POLAR DIGITAL CIRCUIT APPLICATIONS. W. R. Rhoades, Hughes Aircraft Co., Fullerton, California.

3/5 MOS-FET CIRCUIT APPLICATIONS. M. Sussman, General Instruments Corp., Newark, New Jersey.

3/6 LINEAR CIRCUIT APPLICATIONS. J. Gifford, Fairchild Semiconductor, Mountain View, Calif.

3/7 MICROWAVE CIRCUIT APPLICATIONS. V. Gelnovatch, U. S. Army Electronics Command, Ft. Monmouth, New Jersey.

4
Interconnection and Packaging Technology

Thursday, August 24, 8:30 a.m.-Noon

Session Organizer: Donald Sherman, Raytheon Co., Andover, Mass.

4/1 CURRENT AND FUTURE PACKAGING METHODS. J. J. Staller, Sylvania Electric Co., Needham, Massachusetts.

4/2 LARGE SCALE INTEGRATION. J. Lathrop, Texas Instruments, Dallas, Texas.

4/3 MECHANICAL WIRING TECHNOLOGY. L. Katzin, Jet Propulsion Laboratory, Pasadena, Calif.

4/4 MULTI-LAYER WIRING TECHNOLOGY. A. Levy, RCA, Van Nuys, Calif.

4/5 THERMAL MANAGEMENT. J. R. Baum, Motorola, Inc., Government Products Division, Phoenix, Arizona.

4/6 FUTURE MANUFACTURING METHODS. Maurice Nelles, University of Virginia, Charlottesville, Virginia.

5
Reliability and Cost Effectiveness

Thursday, August 24, 1:00-3:25 p.m.

Session Organizer: Jules A. Rothman, Ikor Inc., Burlington, Mass.

5/1 MICROELECTRONICS RELIABILITY. Eldon Hall, MIT Instrumentation Laboratories, Cambridge, Massachusetts.

5/2 RELIABILITY CHARACTERISTICS OF INTEGRATED CIRCUITS. D. I. Troxel, RCA, Camden, New Jersey.

5/3 COST EFFECTIVENESS. H. Gunther Rudenberg, A. D. Little, Inc., Cambridge, Mass.

5/4 THE DOD VIEW. Ernest C. Wood, Department of Defense, Wash. D. C.

Wescon67

ANNUAL
COCKTAIL
PARTY

WESCON's big party is the traditional gathering place for friends and colleagues from throughout the nation. This year, the setting will be the magnificent Grand Ballroom of the Fairmont Hotel, high atop Nob Hill in San Francisco.

The time is 6 to 8 p.m., Tuesday evening—at the close of WESCON's opening day. The $6.50 price includes unlimited drinks—and unlimited enjoyment, too. Be sure to join the hundreds who will be saying, "See you at the cocktail party." (A word to the wise: Order tickets now!)

6
A Look into the Future

Thursday, August 24, 3:30-5:00 p.m.

Session Organizer: Jules A. Rothman, Ikor Inc., Burlington, Mass.

6/1 SYSTEMS OF THE FUTURE. W. W. Gaertner, Gaertner Research Inc., Stamford, Conn.

6/2 THE FUTURE OF INTEGRATED CIRCUITS. Glen R. Madland, Integrated Circuit Engineering Corp., Phoenix, Ariz.

The Science Film Theater will screen about 20 outstanding scientific and engineering motion pictures daily in a special "theater" in the east exhibit hall. There is no admission charge for the program, which is repeated each day of the show.

Four years' service as a volunteer director of WESCON was noted recently with presentation of plaque to Hugh P. Moore, president of Computer Equipment Corp., (right), by John S. McCullough, vice president of Litton Industries' Components Group and president of WEMA.

events of interest

PERECSCUPAC

The Purdue Energy Research and Education Center and the Santa Clara University Power Advisory Council will offer a short course in computer models and mathematical techniques for power system engineering, August 14-25 at Santa Clara.

Sessions will consist of lectures on mathematical modeling of networks, formulation of flow graphs and the discussion of Fortran procedures in developing specific programs. The material has been developed principally by Prof. El-Abiad of Purdue University and his colleagues over the past 10 years. In addition, material, techniques and programs developed by others and printed in technical publications and journals will be discussed. All participants will be encouraged to use the EE dept.'s computing facilities, which include an IBM 1620 with disc file and time-shared SDS-940. The cost for the two-week session will be $300.

Further information: Prof. J.A. Peterson, School of Engineering, University of Santa Clara, Santa Clara, Calif. 95053. Telephone: (408) 296-3360, Ext. 226, 227.

events of interest

FALL URSI/A&P MEETINGS

The 1967 URSI meeting will be held October 16-18 at the University of Michigan, Ann Arbor, in conjunction with the October 17-19 1967 IEEE International Antennas & Propagation Symposium. Papers are solicited in all theoretical, experimental and development fields of interest to URSI and A & P. URSI authors are invited to submit, in duplicate, 200 word abstracts. G-AP authors are invited to submit 400 to 600 word summaries. Deadline: August 1. Mail to: Dr. T. B. A. Senior, Radiation Laboratory, University of Michigan, 201 Catherine St., Ann Arbor, Mich., 48108.

Housing requirements in San Francisco for visiting engineers and executives will exceed those of a national political convention.

information theory

ATHENS, ANYONE?

Quite a few seats are still available on the west coast charter flight to the 1967 International Symposium on Information Theory planned for Sept. 11-15 in Athens, Greece. Leaving Los Angeles on Sept. 6 for Amsterdam and returning from Brussels to Los Angeles on October 6, the flight is open to all IEEE members and families. The round-trip fare is approximately $345, and connecting flights to and from Athens have been arranged. For additional details write: Flight Chairman, Los Angeles Council, IEEE, 3600 Wilshire Blvd., Los Angeles, Calif. 90005. Tel: (213) 387-1203.

professional notes

REGISTRATION EXAMS

Deadlines announced by California Board of Registration for Civil and Professional Engineers, 1021 O St., Rm. A-102, Sacramento, Calif. 95814:

May 1, 1968, final filing date for engineer-in-training examination to be held August 3, 1968 (required before taking professional examination).

December 2, 1967 and July 1, 1968, final filing dates, respectively, for professional examinations to be held April 6, 1968 and November 2, 1968.

events of interest

FJCC, ANAHEIM, NOV. 14-16

The 1967 Fall Joint Computer Conference will be held November 14-16 at the convention center in Anaheim, Calif. Digital, analog, hybrid technology, hardware, software, systems, and applications will be covered. L. Charlie Hobbs, president and senior consultant of Hobbs Associates, Inc., Corona Del Mar, Calif., is general chairman. Technical program chairman: Harry T. Larson, P.O.Box 457, Costa Mesa, Calif. 92627.

service notes

NAVY NEEDS ENGINEERS

The U.S. Navy Civil Engineer Officers Direct Appointment Program seeks applicants 26 to 38 years of age with degrees in electrical engineering, preference being given to those with graduate degrees. Five years' experience is required; credit is given for years in graduate study. Appointees will be obligated to serve on active duty for two years following completion of 17 weeks of training at Newport, R.I., and Port Hueneme, Calif., and to retain their commissions for six years. Information: Lt. J. L. Tisdale, Western Division, Naval Facilities Engineering Command, San Bruno, Calif. (telephone: (415) 871-6600, Ext. 312).

continuing education

SOLID STATE ELECTRONICS

San Jose State College will offer a summer program on solid state electronics for engineers and engineering managers from July 10 to August 4. Emphasis will be on developing a practical facility with an understanding of solid state devices and circuitry, and will cover mathematical foundations, semiconductor principles, network analysis, semiconductor devices and basic circuits, amplifier performance characteristics and design, device selection and design, and microelectronics.

The four week course will be a full-time on-campus program limited to twenty participants including five days of lectures a week, class discussions, problem sessions, study periods, and extensive reading and problem-solving assignments. Dr. Abe Sheingold will be the technical coordinator. All necessary texts and notes will be provided. Total registration fee is $600 and registration forms may be obtained from Prof. Paul F. Williams, Coordinator, Continuing Education, School of Engineering, San Jose State College, San Jose, Calif. 95114.

Classified Advertising

CLASSIFIED ADVERTISING RATES

IEEE Members: $25 per inch. Non-members: $30 per inch. Not commissionable. Closing date for August issue classified only: July 17. August circulation: approximately 40,000, including all members in 11 western states (Region 6) and 10,000 bonus distribution on floor at WESCON.
Write or call: Ernesto A. Montano, IEEE Grid, Suite 2210, 701 Welch Rd., Palo Alto, Telephone (415) 327-6622.

POSITIONS AVAILABLE

PRODUCTS

DUE TO LACK OF INTEREST
TOMORROW WILL BE CANCELLED

That's nice. A decision.
(One more day and I'd be out of doodle pads.)

What a place! Everything is going for me.
(Slept through every stimulating staff meeting this week.)

Passed the buck on several major decisions.
(I didn't order that gross of clip boards.)

Won the Division's paper plane design contest.
(Mine flew.)

Promoted to Division Manager.
(Alright, she's the boss's daughter. So what?)

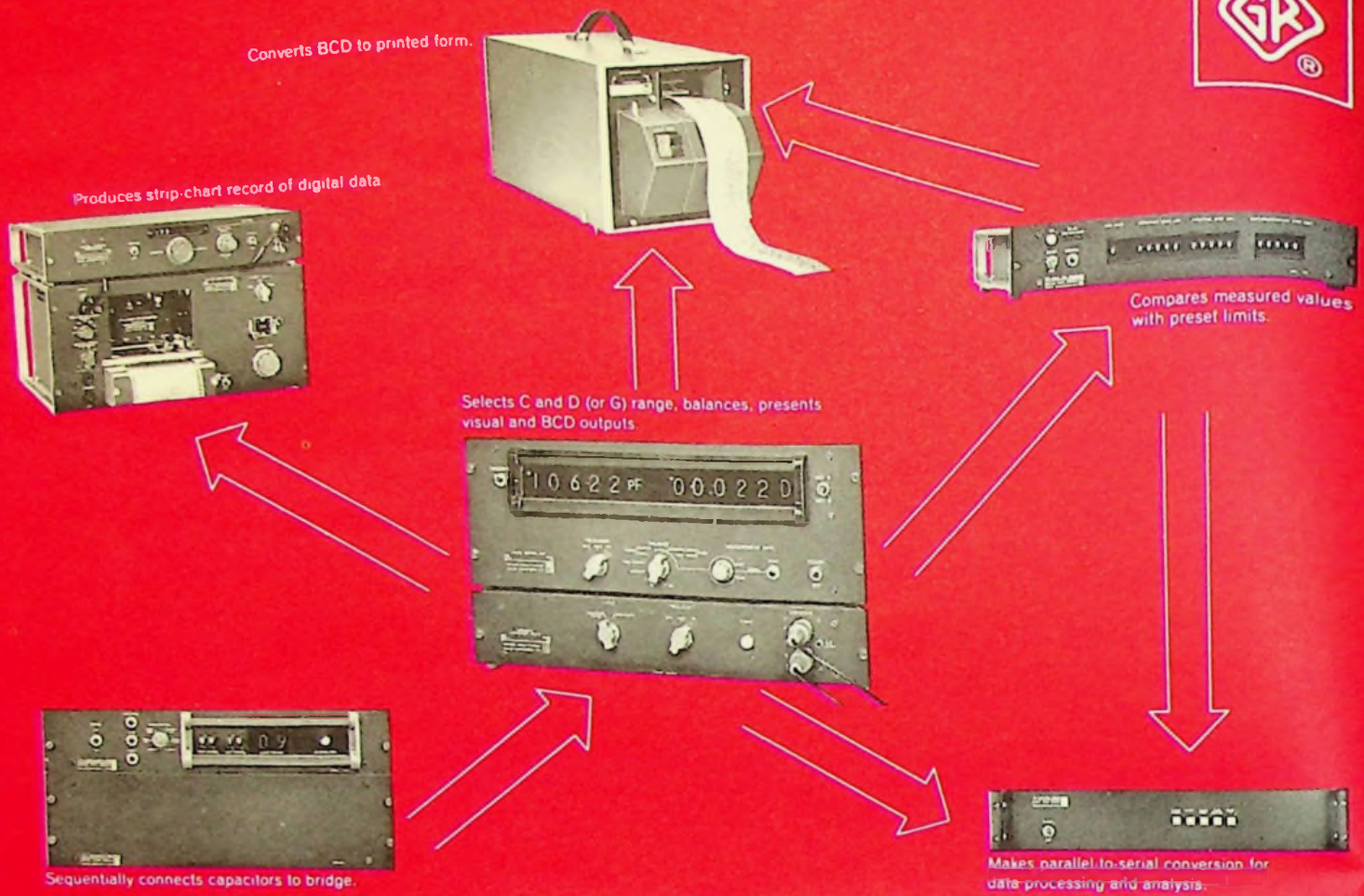
What a Place. All I need now is -
-- more doodle pads? -- a hammock? --
more clip boards? -- paper turbos? --
a new boss? -- a job -

A job? A CAREER!!!!!!!!!

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

SYSTEMS STUDIES
SYSTEMS CIRCUIT DESIGN
MECHANICAL ENGINEERING
MANUFACTURING ENGINEERING

If your career interest is in any of the above categories please send your resume in complete confidence to IEEE Grid Bulletin,
P.O. Box 22, Palo Alto, California.
We are an equal opportunity employer.

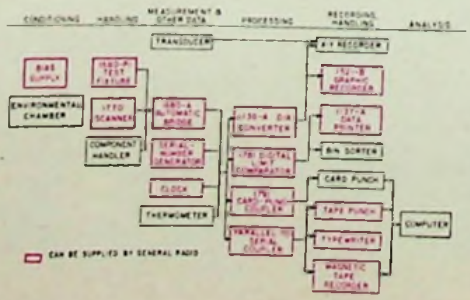


Push for Automatic Measurements

These are the basic building blocks for a variety of automatic capacitance-measuring systems that can test capacitors at rates as high as 120 per minute. Such systems are used for production testing and sorting, incoming inspection, zero-defects quality-assurance programs, and environmental-test runs for design evaluation. Cost analyses by owners of 1680 systems indicate savings of up to 80% or more on the per-unit cost of component inspection over manual methods.

The heart of each system is GR's 1680 Automatic Capacitance Bridge, which automatically selects C and D (or G) range, balances, and displays measurements in digital form. Measurement range is 0.01 pF to 1000 μF and basic accuracy is 0.1% of reading for C and G, 1% of reading ±0.001 for D. Price is $4975 in U.S.A.

Other system components designed around the 1680 bridge are shown below:



Three of these instruments are new:

Type 1770 Scanner System, for sequential connection of many capacitors to the bridge; modular construction permits up to 100 input channels; guarded connection; six operating modes; visual display and BCD output of channel number. Price dependent upon requirements; about $3500 for a guarded, 50-channel model.

Type 1781 Digital Limit Comparator, makes possible fully automatic capacitor sorting; compares BCD output of the 1680 bridge with limits of C and D (or G), preset on the 1781 front panel; GO/NO-GO visual indication and relay-contact output. Price, $1625 in U.S.A.

Type 1791 Card-Punch Coupler, a parallel-to-serial converter for driving an IBM 526 Card Punch from the BCD output of the 1680 bridge and other digital instruments; 22-digit capacity. Price on request.

An automatic capacitor-test system produced by General Radio.

For additional information, call one of the following offices:
Mountain View — (415) 948-8233
Los Angeles — (213) 469-6201
San Diego — (714) 232-2727

GENERAL RADIO
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