EDITOR’S PROFILE of this issue
from a historical perspective ...
with Paul Wesling, SF Bay Area Council GRID editor (2004-2014)

November, 1963 (mid-month):
Cover: Shown are circuit elements and characteristics of devices for optoelectronics. More on page 3.
IEEE

NOVEMBER 15, 1963
SAN FRANCISCO SECTION
INSTITUTE OF ELECTRICAL
AND ELECTRONICS ENGINEERS

TURN ON
LIGHT PULSE

SET

PC2

PC1

EL1

PC1

EL2

RESET

PC1

PC2

AC
or
DC

member 18 (Monday) PTGIT
member 19 (Tuesday) TDI, PTGSET
member 20 (Wednesday) PTGBME, PTGMIL/PTGPEP, PTGEO/PTGMTT, PTGIM, PTGR
member 26 (Tuesday) PTGEO
member 27 (Wednesday) SCVSS
member 11 (Wednesday) SCVSS

Reminder: Return reads up—suit 2210, 301 Welch Road, Palo Alto, California

Postmaster: Return requested—suit 2210, 301 Welch Road, Palo Alto, California.
Despite the tremendous speed and ravenous appetite of today's most advanced computers, scientists at Lockheed Missiles & Space Company's Computer Research Laboratories feel that there is room for a great deal of improvement. They have dedicated themselves to the discovery and development of ways to increase the speed and reliability of computers while simplifying their operation.

Though today's computer circuits are capable of operating at speeds measured in tens of nanoseconds, the useful computation rate is far slower. One of the roadblocks hindering speed is the need for the computer to wait for the carryovers from one column of figures to catch up with the main calculation. A possible answer to this problem is modular arithmetic, which avoids carryover. Based on the ancient Chinese Remainder Theorem, this concept is being re-examined at Lockheed for potential computer applications.

Lockheed's Computer Research Laboratories are studying a very broad group of related computer research areas, and the company can boast that an unusual number of its specialists are at the very forefront of their specific fields.

Among the major areas of research being undertaken at this time are basic physical phenomena, such as phonons; quantum mechanics; switching theory; residue arithmetic (number system research); threshold logic and pattern recognition; and logic design techniques.

LOOK AT LOCKHEED... AS A CAREER

Consider Lockheed's leadership in space technology. Evaluate its accomplishments—such as the Polaris missile, the Agena vehicle's superb record of space missions. Examine its outstanding advantages—location, advancement policies, creative climate, opportunity for recognition.

Then write for a brochure that gives you a more complete Look at Lockheed.

Address: Research & Development Staff, Dept. M-48 F, P.O. Box 504, Sunnyvale, California. Lockheed is an equal opportunity employer.

SCIENTISTS & ENGINEERS: In addition to positions relating to computer research, such as logical design specialists and mathematicians, other important openings exist for specialists in: Trajectory analysis • Inertial guidance • Electromagnetics • Orbit thermodynamics • Gas dynamics • Chemical & nuclear propulsion • Systems engineering • Electronic engineering • Communications & optics research

LOOK AT LOCKHEED IN DIGITAL TECHNIQUES:

Basic research toward simpler, faster, more reliable computers
JAMES D. WARNOCK, Executive Editor

Address all mail to:
IEEE OFFICE, SUITE 2210, 701 WELCH ROAD, PALO ALTO, CALIF.

Mailing office of publication: 304 Pacific Ave., Fifth Floor. Second class postage paid at San Francisco, Calif.

Subscription: $4.00 (members); $6.00 (others); overseas, $7.00 per annum.

SECTION MEMBERS! To stay on mailing list when you move, send address change promptly to IEEE National Headquarters, Box A, Lenox Hill Station, New York 21, N.Y.

contents
Merger News (Communication Div./PTGCS) .................................. 2
Meeting Calendar ................................................................. 2, 3
National News (Insurance Program, IEEE Spectrum) ....................... 3
Winter Power Meeting ......................................................... 3
Meetings Ahead (PTGMIL, PTGPEP, PTGIM, PTGIT, SCVSS, PTGED, PTGR, PTGEC) ............................................. 3, 4, 5, 6
Section Notes (Bulletin Board Notices, Regular Tuesday Luncheon) .... 4
Advertisers and Agencies .................................................... 6
Classified Advertising ......................................................... 7
Events of Interest (IEEE National Events and Papers Calls) .............. 7
Manufacturer/Representative Index, Representative Directory ........... 8

Cover design is made up of elements of the technology of optoelectronics, a new field for military and space components which is the subject of the November 20 joint meeting of the PTG chapters on Military Electronics and Product Engineering and Production. For more on the field and meeting, see the Meeting Calendar and article on page 3.

san francisco section officers
Chairman: William A. Edson
Vice Chairman: John C. Beckett
Memorial Co-Chairmen: Fred MacKenzie, Stanford Research Institute, 326-6200
William Warren, Shell Development Co., OL 3-2100
Publications Advisor: Howard Zeidler, Stanford Research Institute, 326-6200
Executive Secretary: James D. Warnock, Section Office: Suite 2210, 701 Welch Rd.
Palo Alto, Calif., 321-1332

advertising
East Coast: Cal Hart, H & H Associates, 501 Fifth Ave., New York 17, N.Y., YU 6-5886
Southern California: Jack M. Rider & Associates, 1709 W. 8th St., Los Angeles 17, Calif., HU 3-0537

November 15, 1963
COMMUNICATION DIV./PTGCS

For the past several years the AIEE Communications Division and the IRE Professional Group on Communications Systems have held parallel and closely related interests. During the 1962-63 program year, considerable discussion took place between the officers of the division and the professional group concerning the desirability of actively merging the two activities. When it became apparent that the two national organizations would effect their merger, the local officers of the division and the professional group reached the decision that considerable mutual benefit would result from joining program and meeting effort. As a result, most of the meetings during the past year were combined.

During the course of the year, further discussion with members and section and division officers indicated that a formal merger of the two communications activities was a logical next step. Since there was some question as to the exact mechanism by which this should be effected, the group and division officers, with the assistance of the section executive secretary, combined their efforts as a committee to do the footwork needed to merge. This brings us to the present.

Within the next few weeks, all known past members of the AIEE Communications Division will be informed by direct mail (if their mailing address is available) and by Grid of the desirability of their formally becoming PTGCS members. In addition, formal notice of an election meeting will be given all of the advance publicity reasonably possible via our normal channels of communication in an all-out effort to be sure that everyone concerned is informed. This election will then choose officers and formally bring into existence a single, communications-oriented Professional Technical Group on Communications Systems. The support of all members and interested persons is earnestly sought to bring about the best and most useful combination of these two activities.

AL DOLE
Owen Thompson

SANTA CLARA VALLEY SUBSECTION
8:00 P.M.  •  Wednesday, November 27

Medical Electronics
Dr. Noel Thompson, Palo Alto Medical Research Foundation, Palo Alto Medical Clinic
Place: Lockheed Auditorium, 3251 Hanover St., Palo Alto
No dinner

SANTA CLARA VALLEY SUBSECTION
8:00 P.M.  •  Wednesday, December 11

Sun Seeker (Two Axis Solar Servo System)
John W. Cecil, flight control electronics, Lockheed MSC
Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto

TECHNICAL DIVISIONS

Industrial
7:30 P.M.  •  Tuesday, November 19

Precision Measurements Utilizing Servo-Manometer Techniques
Eugene Glasse, president, Exactel Instrument Co., Mountain View
Place: Pacific Gas & Electric Co., 245 Market St., San Francisco, Room 232

PROFESSIONAL TECHNICAL GROUP CHAPTERS

Bio-Medical Electronics
8:00 P.M.  •  Wednesday, November 20

Automatic Recognition of E.C.G. Abnormalities: Advances and Problems
Dr. J. von der Goeben, Dept. of Medicine, Stanford University
Place: Room M-112 Medical School Bldg., Palo Alto-Stanford University Medical Center
Dinner: 6:00 P.M., Red Cottage Restaurant, 1706 El Camino Real, Menlo Park
Reservations: Con Rader, 326-1790, Ext. 328, by November 19

Electronic Devices
8:00 P.M.  •  Wednesday, November 20

High Frequency Limitations of Transistors
Helmut Wolf, Fairchild Semiconductor
Place: Physics 101, Stanford University
Dinner: 6:15 P.M., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto (No reservation required)

Electronic Computers
8:00 P.M.  •  Tuesday, November 26

Automatic Data Acquisition and Inquiry System
Donald Hamilton, ADA computer operations supervisor, Lockheed Missiles and Space Company, Sunnyvale
Eldon Wesley, western regional product assurance administration, Radio Corporation of America, Los Angeles
Place: General Electric Computer Laboratory, 310 De Guigne Drive, Sunnyvale
Dinner: 6:30 P.M., Old Plantation, El Camino and Bernardo, Sunnyvale (No reservation required)

Information Theory
8:00 P.M.  •  Monday, November 18

Spectral Properties of a Binary Random Progress
James A. McFadden, visiting professor, Elec. Eng., Stanford University
Place: Stanford Research Institute, Bldg. 1, 333 Ravenswood Ave., Menlo Park
Dinner: 6:00 P.M., Melon's Steak House, 630 Donohoe, East Palo Alto
Reservations: Mrs. Kelly, 326-6200, Ext. 2945, by November 15

2—grid

November 15, 1963
Instrumentation and Measurement
8:15 P.M. • Wednesday, November 20

Automatic Transistor Testing
Charles Askanas, manager, instrument division, Fairchild
Place: Hewlett-Packard, 1501 Page Mill Road, Palo Alto
Dinner: 6:00 P.M., L'omelette, 4170 El Camino Real, Palo Alto
Reservations: 985-8233

Military Electronics
8:00 P.M. • Wednesday, November 20
(Joint meeting with PTGPEP, see below)

Product Engineering and Production
8:00 P.M. • Wednesday, November 20

Opto Electronics: A New Technology for Military & Space Components
W. Brooks, Opto Electronics Devices, Inc.
Place: Lockheed Auditorium, 3251 Hanover St., Palo Alto
Dinner: 6:00 P.M., Rick's Swiss Chalet, 4085 El Camino Way, Palo Alto
Reservations: Victor Conrad: 326-4000, Ext. 2212

Reliability
8:00 P.M. • Wednesday, November 20

Field Trip to International Business Machines, San Jose
Tour directed by R. A. Shaw, IBM Manager, Quality Control
Place: IBM, Monterey and Cottle Roads, San Jose

Space Electronics and Telemetry
8:15 P.M. • Tuesday, November 19

PCM Decommutation
Charles Jamgotchian, Telemetrics, Los Angeles
Place: Lockheed Auditorium, Bldg. 202, 3251 Hanover St., Palo Alto
Dinner: 6:15 P.M., El Camino Bowl, 2025 El Camino Real, Mountain View
Reservations: Robert H. Light, 968-6211, Ext. 2024, by noon, November 19

National News

IEEE Insurance Program
Complete information kits on the IEEE insurance program, including the group life insurance plan for members and their eligible dependents (underwritten by New York Life Insurance Co.) and accidental death and dismemberment coverage for members and their spouses (underwritten by American Casualty Co.), may be obtained by writing to: Administrator, IEEE Insurance Program, 1120 Connecticut Ave., N.W.–Suite 920, Washington, D.C.

IEEE Spectrum
Beginning January 1, 1964, all members of the IEEE except students will receive, as part of their membership, a new publication, the IEEE Spectrum, devoted to news of the institute and technical articles of general interest.

Electrical Engineering will be discontinued with the December, 1963, issue. Proceedings of the IEEE will continue to be published on a subscription basis only for $6.00 per year for members and will become more technical and specialized. Student members will continue to receive the IEEE Student Quarterly.

Meeting Ahead

Optoelectronics is a technology which combines optical elements, light emitters, and photosensitive materials to yield solid-state devices with application in information systems for both signal processing and data display. The recent improvements in electroluminescent (EL) and photovoltaic (PC) materials as well as new fabrication techniques have made practical the application of optoelectronic devices for military and space systems. Display devices are, perhaps, the best-known part of the optoelectronics technology.

W. Brooks, product specialist at Opto-Electronic Devices, Inc., will review the status of this technology, discuss its future potential, and demonstrate several O/E devices at the joint meeting of PTGPEP and PTG MIL on November 20 in the Lockheed auditorium.

Meeting Ahead

Winter Power Meeting
The IEEE Winter Power Meeting will be held February 2-7 at the Statler-Hilton Hotel, New York City. The event takes over the 1964 date of the former AIEE Winter General Meeting and offers a week-long technical program on power apparatus and systems.

It sets the stage for the IEEE International Convention of March, 1964, provides a regular annual forum on power systems subjects, and brings new unity to technical activities of the Power division.

Additional information may be obtained from Edward C. Day, assistant staff secretary, IEEE, Box A, Lenox Hill Station, New York 21, N.Y.

Power-oriented section members are reminded that a completed subscription order form for Power Apparatus and Systems automatically makes them members of the San Francisco chapter of the Professional Technical Group on Power now being formed. If they have not yet completed the order form recently mailed, they are urged to do so and mail it with a check for $6.00 to the section office. Additional forms and explanatory news letters are available from the office.

Meeting Ahead

Spectral Properties
The complete determination of the spectral density of a binary random process requiring a detailed knowledge of the probability laws of the axis crossings will be discussed by Prof. James A. McFadden at the November meeting of the PTG on Information Theory chapter.

A member of the faculty at Purdue University, Dr. McFadden became a full professor there in 1961. He has spent his summers at Lincoln Laboratory, Bell Telephone Laboratories, and at the applied research laboratory, Sylvania Electric Products, Waltham, Mass. He is currently a visiting professor at Stanford University.
ENGINEERING MANAGERS and ENGINEERS  
B.S., M.S., Ph.D.  

Exceptional Opportunities for  
CIRCUIT DESIGNERS  
SYSTEMS ENGINEERS and SALES ENGINEERS in  
Digital and Analog Instruments and Computers  
Data and Telemetry Systems  
Communications Systems  
Control and Servo Systems  
Microwave Devices  
Microcircuitry  
Microwave Tubes  

For personal and confidential referrals to our Client Companies' Management & Engineering Staffs, at no charge to you, submit resume or phone for appointment  

NORTHERN CALIFORNIA PERSONNEL  
(a technical agency)  
220 CALIFORNIA AVE.  
PALO ALTO  
DA 6-7390  

MEETING AHEAD  
MEDICAL ELECTRONICS  
The general field of medical electronics today will be covered by Dr. Noel Thompson, Palo Alto Medical Research Foundation of the Palo Alto Medical Clinic, at the November meeting of the Santa Clara Valley Subsection.  

Dr. Thompson is chief of the medical electronics division of the foundation and a part-time physician with the clinic. He holds an M.D. from UCLA and an M.S. in electrical engineering from Stanford University, having earned these degrees in 1955 and 1961, respectively, following undergraduate work at Stanford. His unique background has led to broad experience in designing research equipment and wide publication in the field.  

MEETING AHEAD  
TRANSISTOR LIMITATIONS  
The high-frequency limitations of transistors will be the subject of Helmut Wolf, Fairchild Semiconductor, at the November meeting of the PTG on Electron Devices chapter.  

Improvements in transistor technology have brought them into consideration for use at frequencies above 1,000 megacycles. Several factors determine the upper frequency limit of transistors. The influences of geometrical tolerances, diffusion profiles, choice of the semiconductor, and the efficiency of heat removal from the active area of a transistor on the frequency limitation and on the high-frequency output power will be discussed, together with circuit configurations necessary to operate transistors at several gigacycles.  

Present and possible future work leading to more competitive transistors operating at higher powers and higher frequencies will also be discussed.
ERIK A. LINDGREN & ASSOCIATES, INC.
Shielding Specialists For Over Ten Years

Lindgren RS ENCLOSURES have no equal in terms of SHIELDING effectiveness over the greatest range!

The Lindgren organization is the sole manufacturer of DOUBLE ELECTRICALLY ISOLATED RF ENCLOSURES in the United States. Top technical experience is the guarantee of the best quality RS ENCLOSURE built. These rooms are the result of the concentrated skills of specialists building DOUBLE ELECTRICALLY ISOLATED RS ENCLOSURES. Their judgment and know-how are vital factors, which result in higher attenuation or more DB per dollar.

For complete information contact:

WHITE AND COMPANY
788 Mayview Ave.
Palo Alto, Calif.
Tel. DA 1-3350

Ceramics to infinity

Wesgo capability can provide an endless number of shapes and forms in quality high alumina ceramics for your most demanding applications.

Dense, vacuum-tight Wesgo alumina ceramics, with up to 99.5% Al₂O₃, are strong, hard and abrasion resistant. They offer high thermal conductivity, exceptional chemical inertness and superior electrical properties at microwave frequencies—even at high temperatures.

Wesgo ceramics are available in sizes and shapes to meet your individual specifications. Manufacturing is to tight dimensional tolerances; parts are of uniform density, free from internal and surface defects. All are quality controlled to meet unparalleled performance standards.

Write today for a brochure describing these premium ceramics or Wesgo’s precious metal brazing alloys

WESGO — Where Quality is the Chief Consideration

WESTERN GOLD & PLATINUM COMPANY
Dept. G-11, 525 Harbor Blvd., Belmont, California
LYtell 3-3121  Area Code 415

meeting ahead

INDUSTRIAL TOUR

The International Business Machine complex, located at Monterey and Cottle roads in San Jose, will be covered by speakers and a tour during the November 20 meeting of PTGR.

This San Jose complex houses the basic research lab, advanced development lab, development lab, western regional education center, and the manufacturing and assembly plant for small and intermediate-size computers using disc-type storage units. In addition, disc storage units used in any IBM computers built within the U.S. are manufactured here. The education center trains IBM sales personnel, customer engineers, and executives of customer companies. In addition, it offers job training and personal development programs for IBM employees.

The job training and the quality control methods used in manufacturing, assembly, and testing of equipment to maintain the inherent reliability of the equipment design is of special interest to the Reliability Technical Group. Of equal interest is the training given to the IBM customer engineers to improve the maintenance techniques, thus keeping any equipment downtime to a minimum resulting in a high availability.

November 13, 1963

grid — 5
ASSISTANCE TO TECHNICAL FIRMS
FOR BUSINESS INSURANCE PLANNING

WEN BROWN, M.B.A., Stanford, 1963 Member Million Dollar Round Table

- Profit Sharing
- Pensions
- Deferred Compensation
- for Executives
  - Group Hospitalization and Surgical
  - Life and Accidental Death
  - Weekly Payments for Sickness or Accident
  - Major Medical Coverage
  - Disability Income
  - "Split-Dollar" Plans
  - Key Man Insurance
  - Stock Redemption
  - Business Continuation
  - Sole Proprietor
  - Partnership
  - Corporation
  - Estate Cost Reimbursement
  - Salary Continuation
  - Personal Estate Planning

WEN BROWN
701 Welch Road, Suite 2222
Palo Alto, California
326-1554 Res. 854-5509

GARGANTUAN INVENTORY of Transistron SILICON TRANSISTORS

We stock a wide, wide range of quality Transistron silicon transistors. Small signal, medium power, intermediate power, high power and PNP types. In a full selection of packages. Call for immediate delivery at OEM prices.

INDUSTRIAL DISTRIBUTORS
FORTUNE electronics inc.
2280 PALOU AVE • SAN FRANCISCO 24, CALIF. VALENCIA 6-8811

meeting ahead
DATA ACQUISITION

System application and technical implementation problems involved in the design and construction of large-scale automatic data acquisition and inquiry systems will be presented at the November meeting of the PTG on Electronic Computers.

Donald Hamilton of Lockheed will discuss the original problem, i.e., obtaining data regarding work in progress with minimum lag time, that led to the development of Lockheed's ADA (Automatic Data Acquisition) system. Examples of this type of problem are shop order location, purchase order status, and material inventory status. The resulting system uses over 200 special input stations (usually operated by a factory production work) which presently transmits an average of 32,000 messages each day. Mr. Hamilton has been with the ADA project from the early planning stages and is presently ADA computer operations supervisor.

Eldon Wesley of RCA, manufacturer of the ADA system, will discuss the technical problems and results in the system implementation. It is essentially a real-time system operating around the clock. Special input devices for data entry and inquiry were developed, together with their buffers and computer-input scanners. The system uses two RCA 301 computers, one for processing incoming data or inquiries, and one for updating the various files and preparing data for output. The system is designed to operate at a reduced capability if one of the 301's is off the air for any reason. Wesley is the western regional product assurance administrator in charge of keeping the ADA system functioning correctly.

Advertisers & Agencies

Andrew Corp. .............................................. 4
Frank C. Nahser, Inc. ............................... 10
Wen Brown ............................................. 6
Brill Electronics ........................................ 1
G. Cockley & Co. ................................. 6
Eitel McCullough, Inc. ......................... 7
Cunningham & Walsh, Inc. ........................ 12
Electro Scientific Industries, Inc. ..................... 6
Ken Webber, Advertising .............................. 5
Fortune Electronics, Inc. ......................... 6
Bremsick Co., Inc. ............................... 6
General Radio Co. ............................... 4
E. Moore Sales Co. ............................. 4
Lockheed Missiles & Space Co. .......... Cover 6
Hal Stivins, Inc. ...................................... 2
National Press ......................................... 6
Northern California Personnel ..................... 4
Tech-Stok, Inc. ......................................... 7
Writing and Advertising, Inc. ...................... 5
Western Gold & Platinum Co. .............. 5
L.C. Cole Co., Inc. ............................... 5

WHAT DO YOUR DOODLES TELL ABOUT YOU?

SWIRLS indicate that you are active and aggressive, and desire to boost your volume and profits with well-conceived promotion material.

INSIDE BOXES indicate that you enjoy good company, and would like the companionship of smart, impressive letterheads and other business stationery.

TRANSPARENT CUBES suggest a logical mind—one that would like more facts about the best methods of producing attractive, effective advertising.

THE LOGOMARK means that you have been thinking right because the firm it represents can aid you in solving your graphic arts problems. Just call

THE NATIONAL PRESS
Design • Lithography • Printing • Publishing
850 HANSEN WAY • PALO ALTO • PHONE 327-0880

DEVELOPMENT ENGINEER WANTED

Design Engineer with strong, versatile background in semi-conductor circuit design. He will be primarily responsible for the development of supporting instrumentation, such as detectors, instrument generators, data logging devices and servo and automatic instrument control circuits and hardware.

Position requires a minimum of three years industrial practice and BS or higher degree in electrical engineering.

ESI specializes in advanced metrology including supporting and accessory instrumentation. Company is management owned, with a growing and secure future. Excellent fringe benefits, including profit sharing. An equal opportunity employer.

Call or write:
ELECTRO SCIENTIFIC INDUSTRIES
13900 N.W. Science Park Drive, Portland, Oregon
Phone 646-4141, Area Code 503

n o v e m b e r 1 5 , 1 9 6 3
November 21—MAECON Symposium on Measurement and Instrumentation, Hotel Continental, Kansas City, Mo. Kansas City Section, IEEE.

PAPERS CALLS

November 15—Seminar on Writing Improvement Programs for Engineers, Delmonico Hotel, New York, Feb. 24-25. Charles A. Meyer, RCA, Harrison, N.J.


RHO ASSOCIATES
Incorporated
Dr. Robert H. Okada
Consultants
in
Solid State Circuitry, Systems,
Prototype Development, Analysis
Product Improvement
917 Terminal Way, San Carlos, Calif.
593-7570

Eimac’s microwave activity continues to soar ahead with an increasing demand for our new products in communications, missiles and space and ordnance.

This demand has created openings for Microwave Tube Development and Project Engineers for both high and low power applications. The engineers we are seeking are capable of contributing to the design and development of new microwave devices and should have a BS or MS in EE, ME or Physics and at least two years experience in microwave tubes or associated devices. Some positions are open for engineers who can deal effectively with their technical counterparts in custom engineering departments to determine new applications for microwave tubes.

Successful candidates for these positions will be associated with technical staff members noted in the industry and will work with the very latest equipment. They will also receive recognition for individual accomplishments since Eimac’s engineering activity is organized in small groups for technical effectiveness. Eimac is located on the San Francisco Peninsula—an area noted for its pleasant living, fine educational institutions and recreational facilities.

Interested? And can you qualify? Send a detailed resume today to Manager, Engineering Placement, 203 Industrial Way, San Carlos, Cal.
MANUFACTURER/REPRESENTATIVE INDEX

Artweil Electric, Inc. .......................... G. S. Marshall Co.
1485 Bayshore Blvd., San Francisco; 586-4074


Adcom Corporation .......................... W. K. Geist Co.

AD-YU Electronics Labs, Inc. .......... Carl A. Stone Assoc.

Aerotech ...................................... Jey Stone & Assoc.

Airborne Instruments Lab. ................. Wright Engineering

Alfred Electronics .......................... Maxon Electronics

Ameray Corporation .......................... White & Co.

American Nuclear Corp. ..................... McCarthy Assoc.

Antlab, Inc. ................................. Jey Stone & Assoc.

Applied Magnetics Corp. .................... The Sorhan Co.


Arizona Instruments .......................... West Eleven

Arnold Magnetics Corp. ..................... Walter Assoc.

Arra ........................................... West Eleven

Astrodata, Inc. ................................ Maxon Electronics

Astron (Skeltie Electronics) Corp. ............ Long Autronics Co.

Ballantine Labs, Inc. .......................... Carl A. Stone Assoc.

Barnes Engineering Co. ...................... Costello & Co.

Bausch & Lomb, Inc. ......................... Perlmuth Electronics

Beckman/Berkeley Division ................. V. T. Rupp Co.

Beckman/Stevens Evans, Inc. .............. V. T. Rupp Co.

Behlman/Invar Electronics ................ T. Louis Slitzer Co.

Blew Knox .................................... The Sorhan Co.

Block Associates, Inc. ...................... W. K. Geist Co.

Boonshaft & Fuchs, Inc. ..................... W. K. Geist Co.

Boonton Electronics Corp. .................... D'Ohallan Assoc.

Borg Equipment .............................. Recht Assoc.

Bryant Computer Products ................... Costello & Co.

Burr-Brown Research Corp. .............. W. K. Geist Co.

California Instruments Corp. .......... V. T. Rupp Co.

Century Electronics & Instruments .... V. T. Rupp Co.

Chrono-Log Corp. ......................... West Eleven

CircuitDyne Corp. ......................... T. Louis Slitzer Co.

Clarex Corp. ................................ Maxon Electronics

Comcor, Inc. ................................ Maxon Electronics

Communication Electronics ................. Costello & Co.

Components Engineering & Mfg. Co. ...... Premence

Components for Research .................. White & Co.

Computer Instruments Corp. .............. Components Sales

Computer Measurements Co. ............... Maxon Electronics

Continental Sensing, Inc. ............... Birnbaum Sales Co.

Dana Laboratories, Inc. ..................... McCarthy Assoc.

Datamec Corporation ........................ Maxon Electronics

Datapulse, Inc. ............................. O'Hallan Assoc.

Decker Corporation .......................... Costello & Co.

Diamond Antenna & Microwave Corp. ..... Wright

DI/AN Controls, Inc. ...................... Wright Engineering

Digital Electronics, Inc. ................... Peninsula Assoc.

Digiconics Corp. ............................ Components Sales Calif.

Duncan Electronics, Inc. ................. Birnbaum Sales Co.

Dyna-Plex Corp. ............................. Walter Assoc.

Dynatrac Electronics Corp. .............. G. H. Vaughan

Eckel Corporation ........................... White & Co.

E-H Research Laboratories, Inc. .... V. T. Rupp Co.

Eico-Elma ................................... Schwarzchild Assoc.

Electra Manufacturing Co. ............... Birnbaum Sales Co.

Electro Assemblies, Inc. ............... Birnbaum Sales Co.

Electro Products ........................... G. S. Marshall Co.

Electronic Products Corp. .............. West Eleven

Electronic Products, Inc. ............... Jay Stone & Assoc.


E M I ......................................... O'Hallan Assoc.

Empire Devices, Inc. ...................... Carl A. Stone Assoc.

Eppley Laboratory, Inc. ................... W. K. Geist Co.

Fabri-Tek, Inc. ............................. Costello & Co.

Fabricast Inc. ............................. Costello & Co.

Fairchild/Dumont Instruments ........... J. T. Hill Co.


Fil-Shield Div. of Filtron, Inc. .......... Carl A. Stone Assoc.

Filters, Inc. .................................. Comprar San Francisco

Flow Corporation ........................... G. H. Vaughan Co.

Fluke Mfg. Co. ... John McCarthy Assoc.

Franklin Systems, Inc. ..................... Carl A. Stone Assoc.

Frenchtown Porcelain Co. ............... Comprar San Francisco

Frequency Engineering Lab. ............. West Eleven


Globe Industries ........................... Long & Assoc.

Gruenberg Electric Co. ..................... Peninsula Assoc.


Hammer Electronics ....................... McCarthy Assoc.

Harden Electric, Inc. ...................... Long & Assoc.

Helicopter Corp. ........................... Premence, Inc.

Holt Instruments Laboratories .......... W. K. Geist Co.

Hughes Aircraft Co., Instruments .... Walter Assoc.

Impact-O-Graph Corp. ....................... White & Co.

Inland Meter Corp. .......................... Costello & Co.

International Resistance Co. ........... I. Logan & Assoc.

ISO/Server, Inc. ............................ McCarthy Assoc.

James Knight Co. .......................... G. S. Marshall Co.

Jetronics Labs. ............................ Goodrich & Assoc.

Keithley Instruments ..................... T. Louis Slitzer Co.

Kewaunee Scientific Equipment ........ White & Co.

Kemet Co. .................................. G. S. Marshall Co.

Kepco, Inc. ................................. V. T. Rupp Co.

Kinetics Corporation ...................... The Sorhan Co.

KRS Electronics ............................ V. T. Rupp Co.


Labs, Inc. .................................. Costello & Co.


Laboratories ............................... The Sorhan Co.

Lasso Associates, Inc. ..................... McCarthy Assoc.

Lithoallan Assoc. ......................... Walter Assoc.

Long & Associates, Inc. ............... 505 Middlefield,

Redwood City; 369-3324

McDonald Associates ...................... 716 Wilshire Blvd.,

Santa Monica; 394-6610

Moxon Electronics ....................... 15 - 41st Avenue,

San Mateo; 346-7961

O'Hallan Associates ............... 3521 E. Bayshore,

Palo Alto; 326-1493

Peninsula Associates ..................... 1345 Hance St.

Redwood City; 544-2521

Representative Directory

Artweil Electric, Inc.
1485 Bayshore Blvd., San Francisco; 586-4074

Components Sales California, Inc.
Palo Alto; 326-5317

Geist Co., W. K.
Box 746, Cupertino;
968-1608, 253-5433

Long & Associates, Inc.
505 Middlefield,
Redwood City; 369-3324

McDonald Associates
716 Wilshire Blvd.,
Santa Monica; 394-6610

Moxon Electronics
15 - 41st Avenue,
San Mateo; 346-7961

O'Hallan Associates
3521 E. Bayshore,
Palo Alto; 326-1493

Peninsula Associates
1345 Hance St.,
Redwood City; 544-2521

Birnbaum Sales Company, Inc.
626 Jefferson Ave.,
Redwood City; 368-7757

Costello & Company
535 Middlefield Road,
Palo Alto; DA 1-3745

Goodrich & Assoc., James L.
60 Allston Way,
San Francisco; 6V 1:3874

Marshall Company, G. S.
708 Warrington Road,
Redwood City; 364-9023

McCarthy Associates
1011-E Industrial Way,
Burlingame; 342-8901

Compar San Francisco
1817 Bayshore Highway,
Burlingame, 697-6244

Dynamic Associates
1011-D Industrial Way,
Burlingame, 344-1246

Hill Company, J. T.
4117 El Camino Way,
Palo Alto; 327-0211

Kurt Associates, Inc.
1011-C Industrial Way,
Burlingame; 342-8901

Lakewood Mfg. Co.
15 - 41st Avenue,
San Mateo; 346-7961

Lasso Associates, Inc.
3521 E. Bayshore,
Palo Alto; 326-1493

Peninsula Associates
1345 Hance St.,
Redwood City; 544-2521
Nine low-cost G-R Oscillators give you continuous frequency coverage from 20 cycles to 2 Gc plus spot coverage to 7.425 Gc. By selecting appropriate oscillator and power supply combinations, you can create signal sources that provide maximum power, optimum frequency stability with minimum residual fm and am, a modulated signal (either pulse or square wave), or an amplitude-regulated output for sweep applications.

Choose your combination

VLF - LF - MF - HF - VHF - UHF - SHF

General-purpose power supplies. Provide highest output at lowest cost.

- Designed for use with R-F Oscillators Type 1209-A, $70
- Designed for 1210-C Type 1203-B, $55

Regulated power supplies for improved stability

- Has regulated plate-voltage supply Type 1201-B, $95
- Both heater and plate supplies are regulated Type 1267-A, $170
- Automatically maintains output constant as oscillator frequency is varied. Ideal for mechanical-sweep application. Not recommended for 1201. Type 1263-B, $180
- To produce 100% pulse and square-wave modulation at 1 kc or from 20c to 100 kc with external pulse sources. Not recommended for 1208 and 1211. Type 1264-A, $285

Write for Complete Information

GENERAL RADIO COMPANY
WEST CONCORD, MASSACHUSETTS

Sales Engineering Office in SAN FRANCISCO: 1186 Los Altos Avenue, Los Altos, California
James G. Hussey • Donald M. Vogelar
Tel: 415 948-8233 • TWX: 415 949-7964