

WANTED: MEN AT LEAST  
ONE STEP AHEAD FOR

## **SILICON DEVICE TECHNOLOGY**

With an excellent balance of commercial and military programs, Shockley Transistor Corporation offers important rewards in satisfaction and salary to gifted engineers and scientists who can contribute to the solution of new problems in silicon device research and development.\*

Training equivalent to advanced degree, preferably Ph.D. level, in physics, chemistry, metallurgy, or E.E. and evidence of productivity through articles, patents or creative Ph.D. thesis required.

Activities include theory and experiment on semiconductor phenomena relevant to device operation, fundamental studies of impurity diffusion, device fabrication techniques including metallurgy and surface chemistry, design of electrical methods and equipment for device evaluation and control of production, applications engineering.

We would like the opportunity to tell you more about Shockley Transistor, a unit of Clevite Transistor.

*Drop us a brief biographical sketch, indicating your area of interest, and we'll reply promptly. Address Professional Placement.*

### **Shockley Transistor**

Unit of Clevite Transistor

**Stanford Industrial Park  
Palo Alto, California**

*\* It's our policy to encourage technical publications. Recent examples are: Bul. of the Amer. Phys. Soc., Vol. IV, pps. 409 and 455 (1959). "Structure and Properties of Thin Films," pps. 298-327, Wiley (1959).*

## **Fellowships and Awards**

The Educational Foundation of the American Association of University Women is offering forty fellowships for American women for 1961-62. Ranging between \$2000 and \$5000, the awards may be used in the US or abroad and are unrestricted as to age or field of study. They are open to PhD's, candidates for the doctorate who will have fulfilled all requirements except the dissertation by the time the fellowship year begins, or women who have attained professional recognition. Application forms will be available on August 1, 1960, and must be returned by December 1. For the necessary application forms write to Fellowships Office, AAUW Educational Foundation, 2401 Virginia Avenue, N. W., Washington 7, D. C. For information about international fellowships and grants available to women of other countries, write to the above address.

The Alfred P. Sloan Foundation has announced the awarding of thirty new Sloan Research Fellowships (totaling \$480 000) to regular faculty members at twenty-one universities for fundamental research in physics, chemistry, and mathematics. The initial grants are made for a period of two years but may be extended. The new fellowships were awarded under the Foundation's Program for Basic Research in the Physical Sciences and bring the total for 1960 to 119 Sloan Fellows in 44 educational institutions.

A limited number of research associateships, sponsored by the Army's Quartermaster Research and Engineering Command, will be awarded for 1960-61 through the National Academy of Sciences—National Research Council. Intended for the support of resident research by visiting scientists in several fields, including physics, biophysics, chemistry, and mathematics, the associateships are tenable only at the Quartermaster Research and Engineering Center, Natick, Mass., or the Quartermaster Food and Container Institute for the Armed Forces in Chicago. Applicants should hold a doctoral degree or its equivalent, and should have several years of research experience which has resulted in publication and recognition as established contributors in their fields. If the applicant is a foreign national, he should have full command of the English language. Stipends will be set by a NAS—NRC board for each individual and will normally provide for approximately the same spendable income as that derived from the individual's normal salary (but not to exceed \$12 000 per year). Awards will be made for one year, subject to renewal by mutual agreement for a second year. Applicants should submit biographical information, a statement of educational and professional experience, a list of scientific publications, a statement of the general nature of problem interest, the names of at least four persons who are acquainted with the individual's academic and professional experience, and assurance that a leave of absence from present work would have the approval of the institution involved. Applications should be sent to the Office of Scientific

...NEWS IS HAPPENING AT NORTHROP 

## Growing Importance of Weapon Systems Support Puts New and Vital Emphasis on Specialized Engineering

by Charles A. Kerner  
Chief Engineer, Systems Support,  
Nortronics Division of Northrop Corporation



Some of today's most vital and challenging engineering research and development work is in the area of weapon systems support. Our defense planning calls for vastly more sophisticated weapons — such as the Navy's Polaris missile, the Air Force's Sky Bolt air-launched ballistic missile, and the Army's new family of high-performance tactical weapons. Creating support systems for such weapons places new emphasis on specialized engineering talent.

Nortronics Division of Northrop Corporation, recognizing this essential relationship of weapon and support equipment, has already achieved outstanding advances in vital areas that include:

**ELECTRONICS.** Nortronics anticipated the need for rapid, automatic readiness evaluation of complex weapon systems and produced DATICO (Digital Automatic Tape Intelligence Checkout). Now operational, it is already adapted and performing for all three branches of our Armed Forces. For the Navy, DATICO serves on the Polaris project. Nortronics is developing units for missile-system checkout aboard the Polaris-firing submarine, the submarine tender, and at the Naval Weapons Annex.

**MECHANICAL GROUND HANDLING SYSTEMS.** One example: The Army's Hawk. Nortronics produced the first integrated design of mobile launcher and tracked self-propelled loading vehicle. On other projects, Nortronics relates its experience to develop special handling vehicles for forthcoming weapon systems.

**OPTICAL SYSTEMS.** Nortronics physicists, optical designers, mechanical and electronic engineers pioneer advanced techniques to solve the missile industry's and the Armed Forces' highly complex optical problems. These include special image-producing systems and convert-

ing infrared into visual images; optical sights; range finders and fire control systems for ground vehicles, shipboard and aircraft weapons; and reconnaissance systems.

**COUNTERMEASURES AND EXPLOSIVE ORDINANCE.** On classified projects and in modifying and applying known penetration aids, Nortronics meets the demands of future weapon systems. Areas of emphasis: weapon systems integration and tactical analysis, dynamics, design and test, and ballistics.

Nortronics organizes its Systems Support engineering staff on a project basis which permits a complete spectrum of specialists to concentrate their efforts in each primary area of development. Aiding these scientists and engineers in technological depth is the Systems Engineering group which provides comprehensive systems analysis and synthesis studies. With facilities and resources of the entire Northrop Corporation at his disposal, the specialist at Nortronics is encouraged to create the most advanced contributions in his field.

*Current papers by Nortronics  
scientists and engineers include:*

"Integration of Missile Ground Support Equipment" by I. Trowbridge and W. B. Van Horne. "Toward Universal Test Systems" by R. Gray. "Radial Distortion: Its Calibration, Computation in Non-Gaussian Image Planes, and Compensation" by Dr. K. Pestrecov.

*For copies of these papers and additional information about Northrop Corporation, write:*

**NORTHROP**   
CORPORATION

Department V7-1300-32, P.O. Box 1525  
Beverly Hills, California

## HONEYWELL RESEARCH CENTER

### ANNOUNCES THE FORMATION OF A DEEP OCEAN RESEARCH UNIT

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433 North 34th Street  
Seattle 3, Washington

# HONEYWELL

FIRST IN CONTROLS

Personnel, National Academy of Sciences—National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C.

The American Academy of Arts and Sciences is again offering three \$1000 prizes to be awarded to the authors of unpublished monographs, one each in the humanities, the social sciences, and the physical and biological sciences. For the purpose of these awards the Academy defines a monograph as a "scholarly contribution to knowledge, too long for an article in a learned journal and too specialized for a general book". Manuscripts will be evaluated by a nine-man committee of fellows of the Academy, with three members representing each of the fields in which the prizes are to be given. The deadline for receipt of manuscripts is October 1. Full details may be obtained on request by sending a stamped self-addressed envelope to the Committee on Monograph Prizes, American Academy of Arts and Sciences, 280 Newton Street, Brookline Station, Boston 46, Mass.

## Facilities

Two universities, Cornell and California, have recently established their own specialized centers for research on space problems. In each case the project is staffed by faculty members from several scientific and engineering departments of the university.

The Cornell University Center for Radiophysics and Space Research, organized late last year under the direction of Thomas Gold, professor of astronomy, physics, and electrical engineering, will eventually have access to what is expected to be the world's most powerful and largest radar antenna. The instrument, with an aluminum mesh saucer 1000 feet in diameter and capable of sending 420 Mc signals at a peak power of 2.5 million watts, is to be constructed in Puerto Rico within the next two years under the sponsorship of the Defense Department's Advanced Research Projects Agency. Scientists at the Center will also have at their disposal two other new installations, a radio astronomy receiver to be located south of Ithaca and a transmitting station to be constructed on the outskirts of the Cornell campus. In addition to Prof. Gold, the staff includes Henry G. Booker, who is the Center's associate director, and James P. Cox, Trevor R. Cuykendall, Kenneth I. Greisen, Philip Morrison, Edwin E. Salpeter, Henri S. Sack, Edwin L. Resler, Jr., and Paul F. Weaver. The design of the Puerto Rico radar unit was carried out by several faculty members in Cornell's School of Electrical Engineering under the direction of William E. Gordon.

On the Berkeley campus of the University of California, according to an announcement made in February, an interdisciplinary Space Sciences Laboratory has been established in temporary quarters in buildings recently vacated by the University's Department of Astronomy. In recognition of the growing need for coordinated research in the various areas of science re-