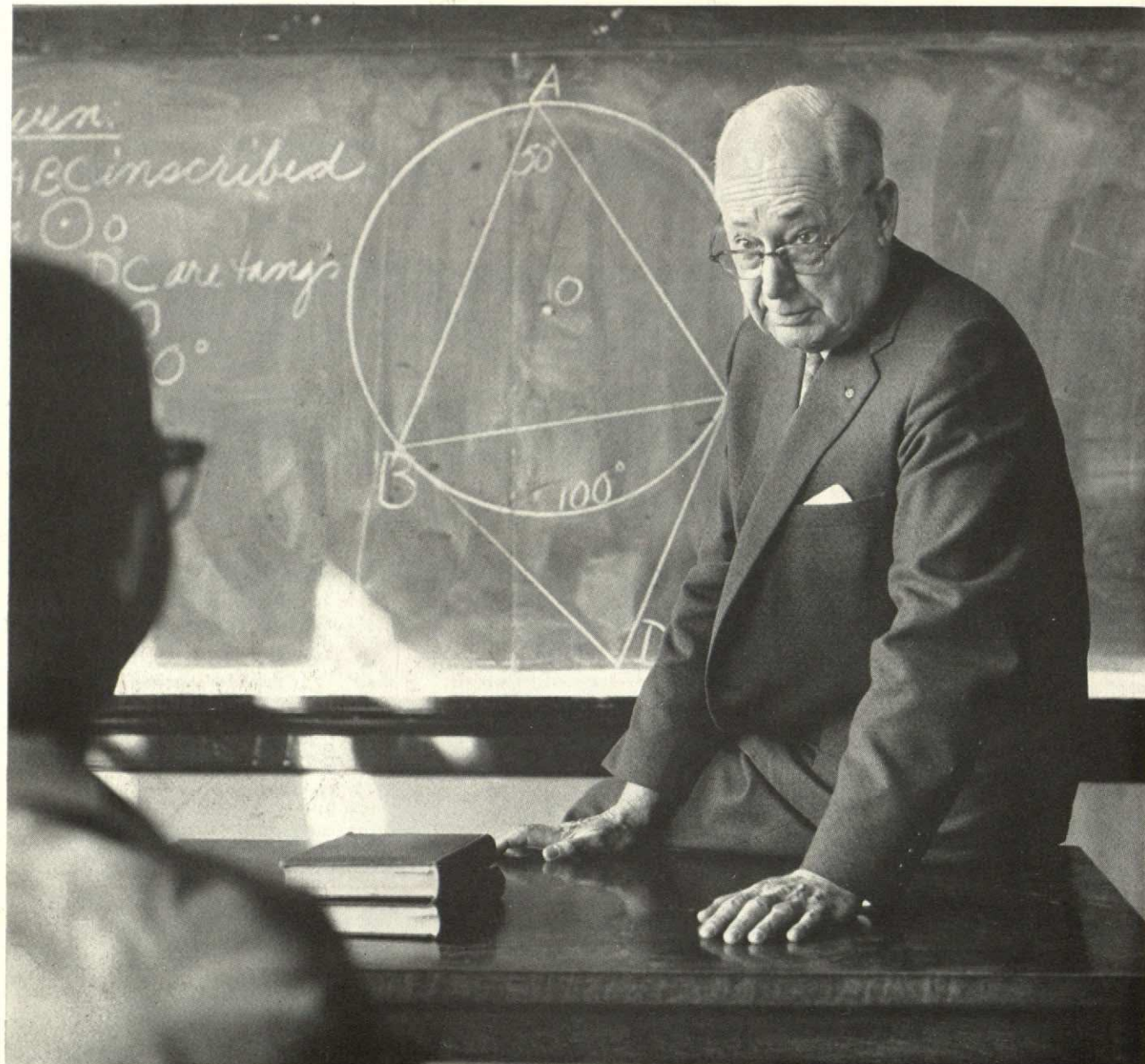


TECHNOLOGY

REVIEW

November 1957



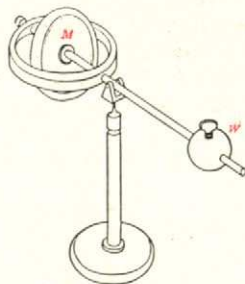


*A Teacher affects eternity...
he can never tell where his influence stops*

... wrote historian Henry Brooks Adams—a truth that today demands universal recognition. America is losing to industry many of those best able to inspire and mold youthful minds—the dedicated teachers of high school subjects prerequisite to engineering training. The value of a teacher's influence in a boy's selection of a career cannot be over-estimated,

yet all too often the rewards of teaching are more spiritual than material. Compensation fitting the importance of their work can help keep teachers in their classrooms, where they prefer to be.

America gains every time teaching is chosen as a career. It also gains whenever a teacher finds it possible to remain in the profession.



BECHTEL CORPORATION

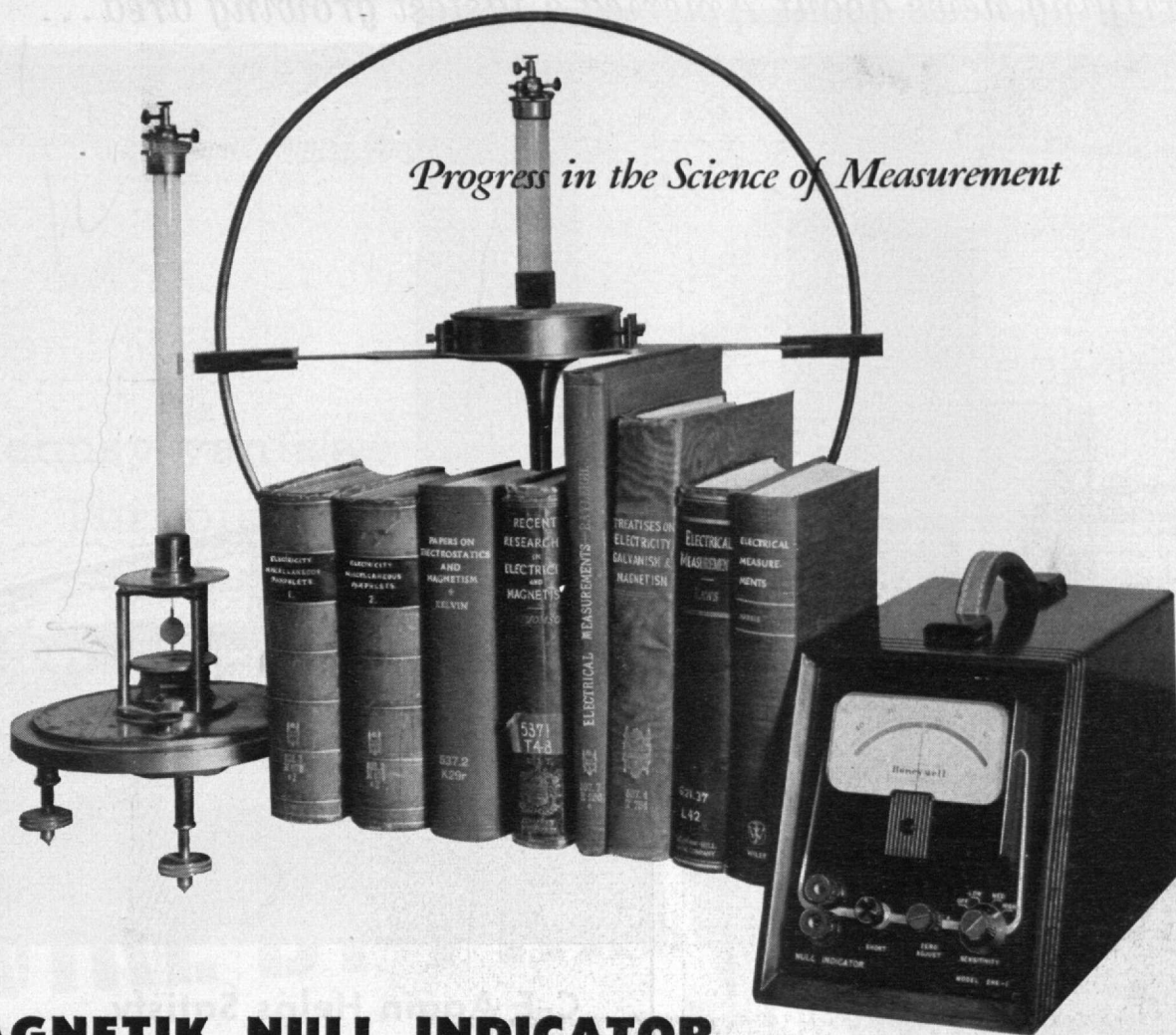
ENGINEERS AND BUILDERS FOR INDUSTRY

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Progress in the Science of Measurement



MAGNETIK NULL INDICATOR

Today's Version of the D-C Galvanometer

The D-C Galvanometer was essential to the historic experiments in electricity conducted by men like Galvani, Ampere and Lord Kelvin. However, the dense stray fields of today's electrical world combined with the need for greater speed and accuracy in the laboratory and on the production line place a heavier burden on the present day galvanometer. The Honeywell Magnetik Null Indicators are today's most practical version of the D-C Galvanometer. Not only do they combine magnetic and electronic elements which make them insensitive to stray pickup; but they have 3 discreet ranges, a linear scale for deflection measurements, fast response and the ability to withstand overloads as high as 100,000 times full scale deflection. Model 2HG-1P (shown above) is available as a portable unit. Model 2HG-1R (not shown) is designed for rack mounting. Write for Bulletin NI-1, Minneapolis-Honeywell, Boston Division, Dept. 1, 1400 Soldiers Field Road, Boston 35, Mass.

MINNEAPOLIS
Honeywell 
BOSTON DIVISION

PERFORMANCE CHARACTERISTICS

ISOLATED INPUT: Input terminals are isolated from chassis and circuit ground.

HIGH SENSITIVITY: 2 Microvolts per division, 0.003 Microamperes per division.

HIGH CONVERTER FREQUENCY: 2500 cps carrier, insensitive to 60 or 120 cps pickup.

LOW NOISE LEVEL: Less than 2 Microvolts equivalent input.

EXCELLENT STABILITY: Zero drift less than 1 division per hour.

INDEPENDENT OF LINE VOLTAGE: No observable drift or change in sensitivity for line variations from 105 to 125 volts.

PROPORTIONAL DEFLECTIONS: Linearity over full scale range is 5%.

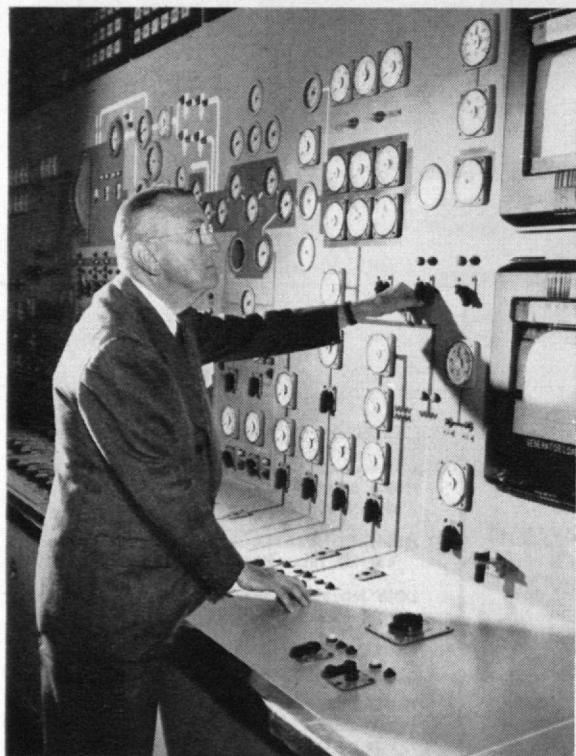
POLARITY SENSITIVE: Zero-center mirror-scale meter for polarity sensing measurements.

QUICK READING: Time constant of less than 1 second.

RUGGED: Not damaged by over-range of 45 volts d-c.

LOW MAINTENANCE: Only one vacuum tube. No moving parts except meter.

Electrifying news about America's fastest growing area...



Edward F. Barrett, LILCO's Chairman of the Board—for whom the new station was named—throws the switch coupling station to the company's transmission network.

C-E Again Helps Satisfy A Skyrocketing Demand For Power

The postwar years have seen the Long Island Lighting Company challenged to meet the electrical demands of the fastest growing area of its size in the United States. The new Edward F. Barrett Station, shown above, represents this progressive utility's recently dedicated addition to the system's generating capacity. Ten years ago, Barrett's single generating unit could have provided power for *all* of LILCO's customers. Today, however, it accounts for only one-fifth of the capacity of the Company's five generating stations. And, with an eye to the future, provisions have been made to allow expansion of the ultra-modern Barrett plant to *six times* its present capacity.

Combustion Engineering has played a major part in LILCO's phenomenal growth. In the past ten years, the utility has purchased eight large C-E boilers—seven of which are now in service. When the eighth unit goes into service next year, these boilers together will supply steam to generate nearly 900,000 kilowatts.

This record of *continued* acceptance by one of the country's outstanding utilities is further evidence not only of Combustion's leadership in steam generation but also of its ability to serve you—whether you need boilers for a giant power station or a small industrial plant.

COMBUSTION ENGINEERING

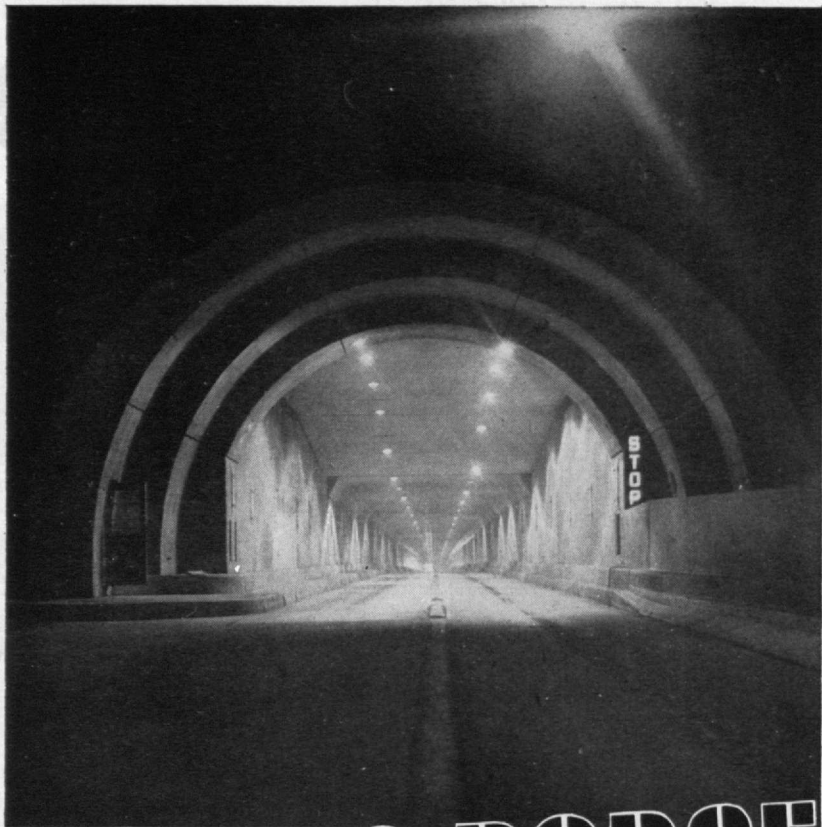
Combustion Engineering Building • 200 Madison Avenue, New York 16, N. Y.



C-100

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

Pennsylvania's
Turnpike...
Model for
Modern Motoring



WIRE BY PHELPS DODGE

When the Pennsylvania Turnpike opened in 1940, it was the first modern highway of its kind in the East. Since then, it has earned a reputation as a model super-highway whose design combines a free flow of traffic with a low accident rate.

One of the requirements for the Turnpike tunnels, interchanges, approaches and portal buildings was an electrical system of the highest quality. That's why Phelps Dodge building wire and rubber insulated, neoprene-jacketed cable was installed. For 17 years, this wire and cable has been giving the Turnpike dependable, trouble-free service.

On every wiring job where top-quality performance, expert workmanship and experienced "know-how" are called for, *it pays to rely on Phelps Dodge and your Phelps Dodge distributor!*



**PHELPS DODGE COPPER PRODUCTS
CORPORATION**

SALES OFFICES: Atlanta, Birmingham, Ala., Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Fort Wayne, Greensboro, N. C., Houston, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Washington, D. C.

[illegible]

● Western Electric has major manufacturing plants located at Chicago and Decatur, Ill., Kearny, N. J., Baltimore, Md., Indianapolis, Ind., Allentown, Pa., Winston-Salem, N. C., Buffalo, N. Y., North Andover, Mass. Distribution Centers in 30 cities. Installation headquarters in 16 cities. General headquarters: 195 Broadway, New York, N. Y. Also Teletype Corporation, Chicago 14, Illinois.

world at Western Electric

AS THE world's largest manufacturer of communications equipment our continued progress depends greatly on our engineers. They have a key role in the production of some 50,000 types of apparatus and component parts that Western Electric makes in a given year.

● To our engineers falls the monumental task of developing manufacturing operations and of planning the installation of telephone central office equipment across the nation. They devise the new machines, tools and methods needed to do our job. They also shoulder the major responsibilities in carrying out the defense contracts the government has asked us to take over — major projects like the Nike guided missile system and SAGE, the continental defense system.

● In the course of their technical work, engineers participate in such broad managerial functions as production, merchandising, installation, and many others. What's more, we have a record of promotions from within. It's not surprising, therefore, that fifty-five percent of the college graduates in our upper levels of management have engineering degrees.

● Naturally we do everything possible to encourage and speed the professional development of our engineers. Just recently, for example, we inaugurated a full-time off-the-job Graduate Engineering Training Program at special training centers, a program with few parallels in American industry.

● The new engineer moves into the first phase of this program, **Introduction to Western Electric Engineering**, four to six months after he joins us and devotes nine weeks of study to such technical subjects as communications systems, military electronic systems, product design principles. He takes part in the second phase, **General Development**, after the first year on the job. In this phase he devotes nine weeks to courses in human relations, semantics, engineering statistics, electronics, measurements and instrumentation, systems circuit analysis. The third phase, **Advanced Development** (4 weeks per year), is available to selected engineers and is geared to the individual to help develop his creative engineering abilities; goes deeply into such subjects as magnetics, computer applications, electronic switching, radar fundamentals, feedback control systems and technical paper writing.

● Besides this company-wide program, a number of our divisions offer individual engineering courses in their own specialties. We also sponsor a Tuition Refund Plan for out-of-hours study at nearby colleges. Open to all employees, this plan helps our engineers study for advanced degrees at Company expense.

● Truly there's an engineer's world here at Western Electric . . . one in which engineers in every field of specialization can expect to grow.

OPPORTUNITIES FOR ENGINEERING GRADUATES

*(Supervisory and administrative
opportunities exist in each field)*

Analysis for manufacturing operations:

Machine and tool requirements—M.E., E.E.; Space requirements—M.E., I.E.; Test facility requirements—E.E.; Personnel requirements—I.E.; Electric power, light and heat requirements—E.E.; Raw material requirements—Chem. E., Met. E., Phy. Sc.; Procedures and processes—M.E., I.E.; Time and Motion Studies—I.E.; Investigation of manufacturing difficulties—M.E.; Quality control—M.E., E.E.

Planning telephone central offices:

Equipment requirements — E.E.; Power and cable requirements—E.E.

Development and design:

New machines and tools—M.E., E.E.; Material handling methods—M.E., I.E.; New equipment and processes—M.E., E.E.; Repair shop methods—M.E.; Testing facilities—E.E.; Testing methods—E.E.; Job evaluation studies—I.E.; Wage incentive studies—I.E.; Production control studies—I.E.; Improved chemical processes—Chem. E., Met. E., Phy. Sc.; New application for metals and alloys—Chem. E., Met. E., Phy. Sc.; Raw material test procedures—Chem. E., Met. E., Phy. Sc.; Service to military on electronic devices—E.E.

For further information write: Engineering Personnel, Room 1034, 195 Broadway, New York 7, N. Y.

Western Electric



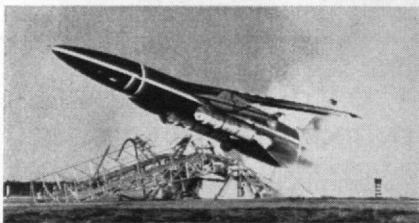
MANUFACTURING AND SUPPLY

UNIT OF THE BELL SYSTEM

FIRST SNARK SQUADRON ACTIVATED

Snark Guided Missile Becomes Operational

HAWTHORNE, CALIF.—The United States Air Force has announced that its first Northrop Snark SM-62 intercontinental guided missile squadron will be activated late this year. The Snark will be the first such missile to come into operational use.



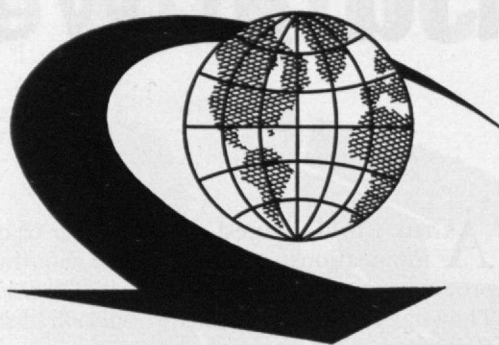
The squadron, to be assigned to the Strategic Air Command, will be equipped with the high-altitude, jet-propelled Snark missile capable of delivering a nuclear warhead.

The exact site for the new missile unit was not disclosed but SAC officials emphasized that missile units will be so positioned as to reduce problems of noise and to insure that missiles, if ever fired, will not pass over heavily populated regions.

No missiles will be launched from operational sites except in case of attack. For training purposes missile crews will practice actual firing at an established range such as Patrick Air Force Base, Florida.

The Snark missile squadron will be manned by some 500 officers and men. Personnel are now undergoing training in the operation and maintenance of the Snark at Northrop.

The engineering division at Northrop continues in its development work on the Snark while they are in production. Other advanced projects in manned and pilotless flight are also in various stages of development at Northrop's new multi-million dollar engineering and science center in Hawthorne... all of them vital to the defense of America and other countries of the free world.



missile engineers

As space becomes the missile engineer's province the demand for highly competent talent is ever present. Each development uncovers other areas for advanced study.

Beneath the imposing skyline at Northrop, engineers in the new multi-million dollar Engineering and Science Center are tackling today the problems of tomorrow's flights into space.

Scientists and engineers at Northrop have many accomplishments to their credit, including the USAF-Northrop SM-62 Snark intercontinental guided missile, first such weapon system to become operational with the Strategic Air Command. Research continues on preliminary and advanced projects involving missile guidance and controls, propulsion, flight test engineering, and similar areas of prime importance.

Northrop's 18 years of experience in pilotless flight is seldom matched by other manufacturers in the aircraft or missile fields. This reputation is a principal reason why experienced engineers and scientists have joined the Northrop Engineering Division. As work progresses on the USAF Snark and other vital missile projects career opportunities become available for qualified missile engineers.



NORTHROP

Northrop Division of Northrop Aircraft, Inc.

Engineering Industrial Relations, Dept. 4600-A7
1041 East Broadway, Hawthorne, California

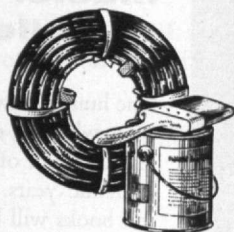
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... ribbons or ropes

... house paints or hoses



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CAB-O-SIL® ... this unique colloidal silica, in extremely small quantities, greatly improves large numbers of products. The best flow control agent available, it's especially remarkable for its

unusual combination of properties. Used for rubber, paint, varnish, printing ink, plastics, lubricants, cosmetics, many other products.

PT® PINE TAR PRODUCTS ... these versatile quality controlled materials improve the performance of a wide variety of products, including: rubber, paint, cordage, oakum and insecticides.

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howard hughes fellowships

Ten awards are open to candidates interested in studies leading to a Doctor of Philosophy or Doctor of Engineering degree or in conducting post-doctoral research.

Each Fellowship provides a cash award of not less than \$2000 . . . a minimum salary of \$2500 for summer or part-time work . . . up to \$1500 for tuition, books, and research expenses . . . and moving and transportation costs. Eligibility is based on the completion of one year of graduate work in physics or engineering, and qualification for graduate standing at California Institute of Technology, University of California (Berkeley), or Stanford University. Application closing date: January 15, 1958.

master of science fellowships

One hundred awards are open to participants who will complete courses leading to the Master of Science degree within 2 academic years. Tuition, admission fee, and books will be provided. During the summer they will have the opportunity to work with experienced Hughes scientists and engineers, while receiving salaries based upon their ability and technical experience.

Applicant must receive his B.S. degree during the coming year in Aeronautical Engineering, Electrical Engineering, Mechanical Engineering, or Physics. Participant may request his graduate school from the following six institutions: University of Southern California, UCLA, Stanford University, University of Arizona, Purdue University, or West Virginia University.

*Write, specifying appropriate fellowship, to:
Office of Advanced Studies*

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RESEARCH AND DEVELOPMENT
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