ENGINEERING

Cryogenic Gyro Promises Pinpoint Navigation

ACCURATE navigation in space and pinpoint guidance for intercontinental missiles is promised by a spinning sphere about the size of a golf ball that floats without mechanical support in a vacuum and has an operating temperature of about 456 degrees below zero Fahrenheit.

It is called a cryogenic gyroscope because it capitalizes upon strange qualities developed by metals when chilled to nearly absolute zero, which is 459.7 degrees below zero Fahrenheit.

The device will be so accurate that golfers could make a hole-in-one every time if they could use it on their clubs.

Being developed by the General Electric Company under an Army contract, the spinning sphere will float on a magnetic field. Engineer Karl F. Schoch said this suspension system is virtually frictionless. Another magnetic field will grip the sphere and make it spin.

Feasibility was proved with an earlier device, and engineers now are completing the experimental cryogenic gyro. Its purpose is to determine design and performance data, Mr. Schoch said. But it promises to be the forerunner of others that in three to five years could be used on missile-launching submarines and railroad flatcars. These gyros could give exact latitudes and longitudes upon which precise missile guidance depends.

Still further developments may adapt the cryogenic gyro to built-in guidance systems for space-going rockets and navigation systems for manned space ships. Because it is virtually free of friction, the cryogenic gyro would be particularly useful on long space voyages that would require it to run years at a time. Conventional gyros would wear out before these long trips were completed.

The problem would be to keep it cold. Mr. Schoch said the gyros could be charged with a small quantity of liquid helium for short flights. Liquifying equipment would be needed for long flights. However, such equipment probably can be made small and light.

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ASTRONAUTICS

Urge Space Probe to Test For Possible Martian Life

A SPACE PROBE passing within some 600,000 miles of Mars might show if life exists on the planet.

The probe could scan Mars, sending back to earth information about the spectra in the three to seven micron region, two California Institute of Technology scientists reported to the first International Space Science Symposium in Nice, France. The spectra would be correlated with the visual light and dark areas of Mars, Drs. Richard W. Davies and Max Gumpel said.

Even if not more than a few thousand "bits" of information were transmitted to earth, the experiment would be "significant," Dr. Davies reported.

This is because the earth's atmosphere blocks most of the infrared light in the spectrum band between one and 100 microns. Some breaks in this atmospheric block have already permitted detection of what may be carbon-hydrogen bond molecules on Mars, indicating the existence of organic life.

Origin of the organic molecules is still an open question, the Caltech scientist said. More infrared reflection spectra of biological materials are needed, particularly in spectral regions where molecules of biological origin have very definite characteristics. Two strong reflection peaks due to carbon-oxygen stretching have been found in the six micron region. This region on Mars could only be tested with a space probe since it is blocked by the earth's atmosphere.

Another suggested space probe experiment is measuring the light polarization of Mars. A single pass around Mars could result in polarization measurements that would give important information on the sizes of particles in the Martian atmosphere, the scientist said.

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Questions

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GENERAL SCIENCE—What research for safe storage of atomic wastes was conducted by the AEC in 1959? p. 102.

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