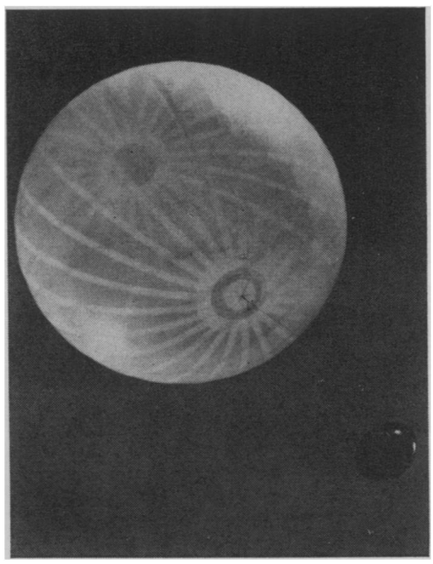


NCAR

'GHOST' BALLOON

METEOROLOGY

Weather Balloons Aloft

Miniature weather stations in the form of constant-pressure balloons carrying electronic equipment have been launched from New Zealand

➤ SMALL balloons which are being launched from Christchurch, New Zealand, will help scientists keep track of wind patterns in the Southern Hemisphere.

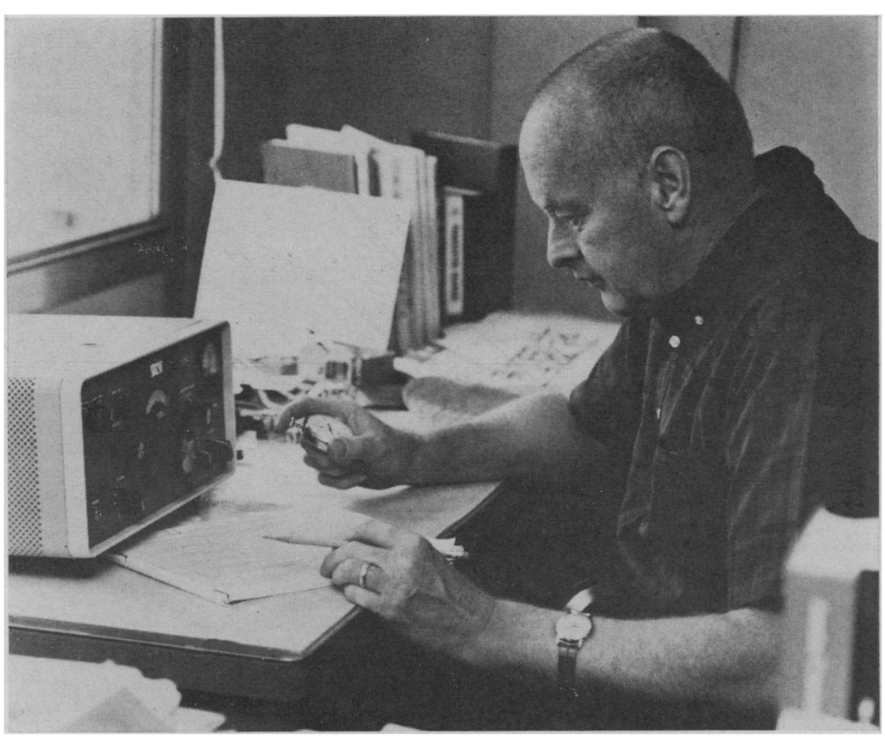
The constant-pressure balloons are designed to float around the hemisphere at a pre-determined level. They are part of a test to find out if a balloon-borne electronic system could gather the information needed to provide a "moving picture" of the weather almost as soon as it happens.

Each balloon in the system is, in effect, a miniature weather station that reports such information as temperature, air pressure and humidity. In the system envisioned for the future, an earth-circling satellite would interrogate each balloon, then relay the observations to ground stations.

In the test system, six stations are tracking the balloons. The high-frequency radio receivers can be used to locate any balloon within 4,000 miles of the station.

Constant-pressure balloons are one of the most promising methods of obtaining global weather observations at several levels in the atmosphere. The project, called GHOST, for Global HOrizontal Sounding Technique, is a joint venture of the United States and New Zealand. It is being managed by the National Center for Atmospheric Research at Boulder, Colo.

The pilot test is sponsored by the National Science Foundation and the Environmental Science Services Administration of the Department of Commerce. It is designed to learn whether small balloons can be built to remain aloft for more than a few days.



NCAR

BALLOON WATCHER—Robert Frykman of the National Center for Atmospheric Research (NCAR), Boulder, Colo., is shown monitoring the flight of a weather balloon, like that shown in the picture at the upper left, which reports information on temperature, air pressure and humidity to meteorologists on the ground.

Successful, long-lasting balloon flights hold the key to eventual worldwide use of the GHOST system. During the test, balloons are being launched to circle the hemisphere at altitudes of 20,000, 40,000 and 80,000 feet.

In addition to gathering weather information, the test program is designed to learn whether or not the balloons will cluster in particular areas and to acquire information on the planetary circulation in the Southern Hemisphere at various altitudes.

GEOPHYSICS

Satellites to Assist Study of Earth's Shape

➤ THE SIZE and shape of the earth are being measured, with the help of satellites, by far flung teams of U.S. scientists in Greenland, Iceland, Norway, Scotland and Denmark.

In June, the investigations will really swing into high gear, with the scheduled launching of the Passive Geodetic Explorer Satellite (PAGEOS) and the addition of a 41-station worldwide satellite tracking network.

Currently, the Echo I and Echo II satellites are being used to help triangulate the distances between points on earth. This is done by measuring the precise distances and angles between two points on earth and one of the satellites.

The more earth-distances that are exactly known, the better a picture of earth can be assembled. Such measurements have already been used to support a theory that the island of Bermuda has moved northward since its formation. Satellite measurements have also helped define the earth's radius accurately within a foot (3,963.203 miles).

A limitation to measurements with Echo I and II is the height of the satellites' orbits. The higher the satellite, the greater the line of sight, and the more accurate the measurements.

Echo I is only 1,054 miles above the earth at its highest point, while Echo II never rises above 814 miles. PAGEOS, however, will travel in a circular orbit 2,500 miles up.

Although PAGEOS will be launched by the National Aeronautics and Space Administration, the earth-measuring is being done by the Environmental Science Services Administration (ESSA) of the U.S. Department of Commerce.