

## GEOPHYSICS

# Satellite Spotting Sites

Western Hemisphere Conference on the International Geophysical Year is told of planned locations for radio and optical stations to track the earth satellites.

► OBSERVATIONS of man-made earth satellites by scientists in countries outside the United States were planned in Rio de Janeiro for the first time.

How foreign observers can help track the paths of earth-circling moonlets was discussed by representatives of most South and Central American countries, as well as the U. S., Canada and Mexico. The satellites will be launched during the International Geophysical Year, or IGY, which starts next July 1.

The Western Hemisphere Conference, called to discuss and settle plans for IGY, will be followed by another in Barcelona in September to which all 50 nations participating in IGY will send delegations. The Barcelona meeting will be the last before IGY starts.

IGY is an international effort to probe the earth, its seas and skies, aimed at giving man a better understanding of the planet earth. The program will be the most intensive and extensive scientific venture ever made, involving thousands of scientists around the world.

Most eye-catching of the hundreds of planned experiments are the launchings of basketball-sized spheres to circle the earth at its outmost atmospheric fringe. Many scientists foresee the tiny, unmanned satellites as but the first step in man's eventual conquest of space.

Other investigations, however, are also important.

The Antarctic will be opened up as never before. Some 10 nations will set up at least 45 observing stations, and the White Continent's population will zoom to an estimated 1,000, not including Emperor Penguins.

It is expected that the Antarctic continent will never in the future be without some human inhabitants.

Weathermen are sure their coordinated studies of how fast and where air masses move will result in much improved weather forecasts, both daily and long-range.

More reliable radio communications are promised from experiments probing the structure of the earth's atmosphere, from causes of auroras to the effects of giant explosions on the sun.

The Rio Conference was sponsored jointly by the International and Pan-American Committees for the International Geophysical Year. U. S. participation in IGY is directed by a special national committee of the National Academy of Sciences, with University of California physicist Dr. Joseph Kaplan as chairman.

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► THE SITES from which optical and radio observers will spot the man-made satellites to be launched during the International Geophysical Year starting next July 1 were made public for the first time at the Western Hemisphere Conference on IGY.

To intercept the satellite's radio signals at each passage, at least nine of the Minitrack stations will form a chain along the 75th meridian, Dr. John P. Hagen of the Naval Research Laboratory, Washington, D. C., reported to the international gathering. These are the minimum needed and "additional stations" would be desirable, he said. Dr. Hagen is director of Project Vanguard, name assigned to the satellite launching program.

Dr. Hagen listed the locations as: Blossom Point, Md., U.S.A.; Fort Stewart, Ga., U.S.A.; Batista Field, Havana, Cuba; Coolidge Field, Antigua Island; Rio Hata, Panama; Mt. Cotopaxi, Quito, Ecuador; Ancon, Lima, Peru; Antofagasta, Chile; Peldehue Military Reservation, Santiago,

Chile; and Naval Electronics Laboratory, San Diego, Calif., U.S.A. (not on 75th meridian).

The ground radio stations will include a precision array of several antennas and a complex electronics installation requiring an operating staff of ten technicians.

Hugh Odishaw, executive secretary of the U. S. National Committee for the IGY, revealed some of the sites for optical observing stations.

"Desirable locations," he said, include: White Sands, N. M., U.S.A.; Cocoa Beach, Fla., U.S.A.; Venezuela or Netherlands Antilles; Quito, Ecuador (with radio observations); Antofagasta, Chile (also with radio observations); Cordoba, Argentina; Bloemfontein, South Africa; Australia; Maui, T. H.; southern Japan; India or Pakistan; Egypt or east edge of Mediterranean, and southern Spain or French Morocco.

Finding and tracking the satellite will be done both optically and by Minitrack radio. A simplified Minitrack system that can be built by amateurs and universities will also yield "very useful data," Dr. Hagen pointed out.

The Minitrack system makes use of established principles of radio interference. By comparing the path length from the satellite's transmitter to one station with the path length to a second antenna, the earth-circling moonlet can be located in its orbit.

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## METEOROLOGY

# Hurricoon for Hurricane

► HURRICANES will be photographed this year with hurricoons, giant Skyhook plastic balloons carrying a camera gondola. The first hurricoon will be launched soon to take photographs of a hurricane for a period of 12 hours at 80,000 feet, Malcolm D. Ross of the Office of Naval Research reports in *Research Reviews*.

A "fortunate high-altitude wind reversal" that occurs during summer in the latitude of the United States allows a crude form of navigating the hurricoon.

Development of the camera-carrying balloon is one prong in the all-out battle being waged this year by the Weather Bureau, Air Force and Navy to learn about the destructive tropical storms. Aim of the intense studies, which will also include photographing the storms from a rocket, is to cut down the staggering losses in lives and property that have resulted from past hurricanes.

Hurricoons will be launched, probably from Weeksville Naval Air Facility, N. C., in advance of a hurricane, and allowed to rise to a predetermined altitude of 30,000 to 70,000 feet where they would move east over the ocean in a westerly wind flow.

"When a hurricoon has arrived at an appropriate position offshore, it will then climb on radio command above the 'turn-

around-point' between easterly and westerly flow and start its return journey toward the coast in the opposing wind stream above 80,000 feet," Mr. Ross explains.

By proper planning, the balloon is expected to turn coastward about daybreak, and it will then start making its unique photographic record of the tropical storm's swirling air mass. After the balloon-borne gondola has passed inland, the instruments will be parachuted to earth and retrieved for their information.

Although the first versions of the hurricoon will carry photographic equipment to record cloud formations over a 320-square-mile area, Mr. Ross suggested later models may use television to give an immediate picture of the hurricane.

The cameras for photographing hurricanes from rockets will run for approximately 330 seconds. Although these photographs from 100 miles up will be "spectacular," they will yield only a momentary record of the storm and adjacent cloud formation.

The hurricoon flights will provide a continuing record of one picture every minute for 12 hours or more. This will provide meteorologists and others basic data not available by other means.

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