

Tracking by Satellite

Turtle tracking and elephant chasing are among the chores for Nimbus' IRLS.

In what could become one of the most widespread applications of space technology, a Nimbus weather satellite to be orbited early next year will track an iceberg in the Arctic, weather balloons launched from Texas, and an airplane over the Caribbean. It will follow a truck driving across the United States and help pave the way for the day biologists can use orbiting spacecraft to track difficult-to-follow animals such as sea turtles, whales, elephants, caribou and polar bears.

"We're in the Buck Rogers era," says George D. Hogan, the National Aeronautics and Space Administration's man behind the Interrogation, Recording and Location Subsystem, which is to fly on the next two Nimbus meteorological satellites. "But we aren't quite ready to track anything as small or as unstable as a bird."

The IRLS subsystem calls for electronic radio packs to be attached to earth-based objects. It was primarily developed to send weather information—temperature, pressure and humidity readings—from remote ground stations to an orbiting Nimbus, which could report the data to weathermen on its next pass over the United States.

By interrogating each electronic pack from two or more different spots in space, the satellites are expected to be able to pinpoint the location of each ground-based data-gathering device. By tracking the devices, they will also track the attacheses.

On the first of the two, Nimbus B, several agencies in addition to NASA will participate in the experiment:

- The National Center for Atmospheric Research in Boulder, Colo., plans to launch balloons with IRLS packs from Palestine, Tex., with the major interest being tracking and tracing winds.

- The Air Force Weather Service plans to install one unit in a hurricane-hunting aircraft that will operate in the Caribbean. Nimbus is to track the aircraft and test the concept for instant return of wind and sea state data to the mainland. An IRLS pack will also be placed on an ice island called T-3 in the Arctic, leading toward the day when satellites can warn ships of approaching icebergs and produce data on Arctic currents.

- The Naval Oceanographic Office

will have an IRLS pack located on a buoy moored in several thousand feet of water in the Virgin Islands near the equator. This device is primarily to send weather data from the area, although consideration is being given to freeing the buoy to track currents.

- At the other end of the world, in the Antarctic, the National Science Foundation plans to place one of the devices on the ship USS Eltanin. Nimbus is to return weather data from that area as well as test the satellite's use in helping ships plot positions.

NASA plans to attach one of the packs to a van which will be at the Pacific Missile Range for pre-launch checkout. After Nimbus is successfully orbited, it is to track the van across the country as it is driven back to Goddard Space Flight Center in Maryland.

Two other stations will be located around Goddard as reference points so scientists can determine the accuracy of the system and how close together two separate stations can be placed before they appear as one.

Other researchers are expressing an interest in using the new technology for non-weather applications. A scientist at Woods Hole Institute wants to build his own IRLS ground packs and attach them to drifting buoys to plot Gulf Stream currents. Another agency is thinking of attaching one to a raft and having two turtles drag the raft to Ascension Island.

Hogan predicts that most biologists will wait for their migration experiments until the fourth Nimbus, Nimbus D, is launched, probably early in 1970. By then, he said, the electronic packs will be reduced in size and weight, making them more practical to attach to animals. Still, troubles are likely.

"If I were an elephant, I'd try to knock something off me that I didn't want on," Hogan said. "The antenna is the biggest single problem. It must be stable, and an elephant, caribou or bird just isn't a stable platform."

If these problems can be overcome, however, numerous practical benefits could result. The navigation system used by whales or sea turtles could steer submarines. Whatever guides ducks and geese southward in winter and north in summer may be useful to aircraft. The caribou's system may aid guidance methods for land vehicles.

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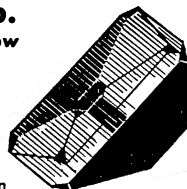
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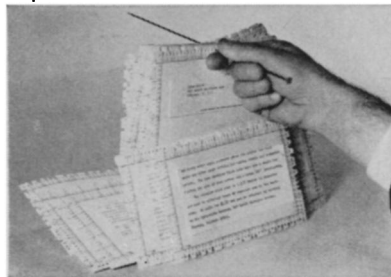


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