New Mission for NASA Hawaii Tracking Station

The NASA Hawaii Tracking Station at Kauai, Hawaii, in operation since 1961, has assumed a new full-time mission in direct support of scientists studying the movements of the Earth's crust and variations in its rotation rate, according to Crustal Dynamics Project Manager John M. Bosworth, Code 901.

For nearly 30 years the station served as a tracking and data acquisition facility for Earth-orbiting satellites and the space shuttle as part of the Goddard-managed Spacecraft Tracking and Data Network. Most of this ground network has been replaced by the Tracking and Data Relay Satellite System which employs a trio of satellites at synchronous altitude to relay communications to and from low-orbiting satellites and the Space Shuttle to a single ground station complex in White Sands, New Mexico.

Facility Renamed

Most of the individual NASA Hawaii facilities located in the Kokee State Park are being transferred either to the state or the adjacent U.S. Navy Pacific Missile Range Facility. NASA will retain one key facility, the nine-meter S-band antenna facility, which has been renamed the NASA Kokee Park Geophysical Observatory (KPGO).

Since October 1, 1989, KPGO has been assigned this new mission in support of GSFC's Crustal Dynamics Project. On a near daily schedule, KPGO joins with other observatories in the continental U.S., Japan, China, Chile, Australia, and several other countries to make ultra-precise positional measurements using the space geodetic technique called Very Long Baseline Interferometry (VLBI).

In VLBI, several radio telescopes (observatories) simultaneously receive signals from extra-galactic radio sources called quasars. Using hydrogen maser frequency standards and the most precise clocks in the world, the difference in time of arrival of the signals due to the slightly different path length from the quasar to each VLBI observatory can be determined with a precision of 0.00000000001 second. Their relative positions can be measured to better than 0.4 inch (1 centimeter).

Ultraprecise Measurements

These ultraprecise positional measurements, when made repeatedly over several years to decades, allow scientists to plot the contemporary motion of the tectonic plates (the enormous pieces of the Earth's crust which move slowly with respect to each other). They also are able to monitor the very complex variations of the Earth's spin rate and the wobble of the spin axis. This gives insight, unavailable before this time, into global geophysics and the underlying forces that lead to Earthquakes. VLBI measurements which have been made at KPGO since 1984 show clearly that the Hawaiian islands, located on the Pacific plate, are moving at a rate of approximately 3.5 inches (8.5 centimeters) a year with respect to the North American plate.

VLBI Experiments

KPGO participates in VLBI experiments sponsored by both NASA and the U.S. Naval Observatory and is one of the most active of more than 30 VLBI observatories in the world. KPGO also is a principal ground station for two other programs. One is the Department of Commerce PEACESAT program, which provides medical, educational and cultural satellite communications between Hawaii and remote islands around the Pacific basin. The other is the NASA scientific satellite project, called the Interplanetary Monitoring Platform (IMP)-8, which monitors the Earth's magnetic field and the solar wind. This facility has been operated for NASA by the Bendix Field Engineering Corporation since 1970 and is under the direction of Clyde Cox.

Amid the Heat and Traffic, GROC Carries a Torch

If you looked out a window several weeks ago, you may have noticed a curious sight, a runner carrying—a torch? Yes, a torch. No, it was not the Olympics. It was the Torch Run, a nine-day event that gave more than 200 runners the opportunity to carry the torch through all areas of Maryland, from the state capitol in Annapolis to western Frostburg. On July 20, this same torch kindled the flame at the opening ceremonies of the Sixth Annual Maryland Sports Festival at Frostburg State College.

Fifteen heat resistant souls—that's 30 hot soles—braved the 80 degree Maryland heat, and customary humidity to carry the torch through Goddard on its way to the sports festival.

ANYONE NEED A LIGHT?—Goddard's Running and Orienteering Club (GROC) carries the torch around GSFC, on its way to Frostburg State College in Frostburg, MD. Pictured are (left to right): Peter Hiu, Loren Linstrom, Mark Baugh, Bob Phillips and Emil Kirwan.

On July 12, Bowie Mayor Pro Tempore Fred Robinson handed-off the torch to Goddard's Running and Orienteering Club (GROC). GROC runners carried it into and around most of Goddard. Later in the day the torch was passed to members of