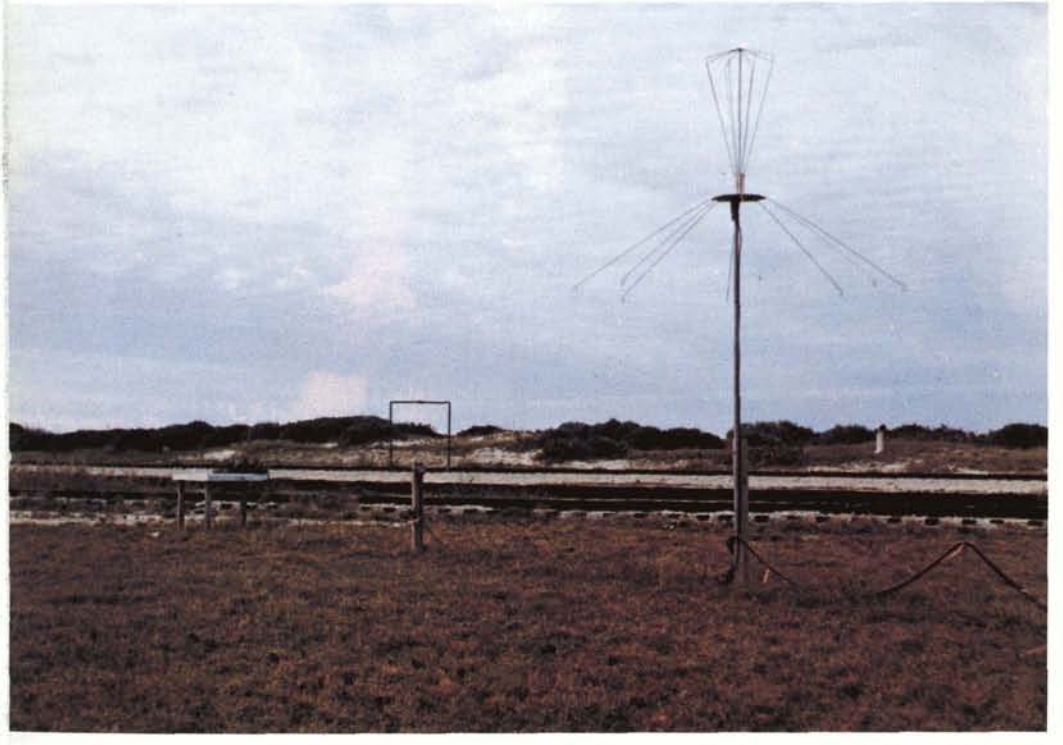
**Lightning Detector**

The antenna pictured below is part of a NASA-developed system for pinpointing the location and altitude of lightning activity in the atmosphere. Developed by Kennedy Space Center, it is called the Lightning Detection and Ranging (LDAR) system. Its original purpose was to give space launch controllers additional information on which to base launch or no launch decisions. It may also have utility in civil aviation. Last summer, NASA and the Federal Aviation Administration jointly conducted—at Patrick Air Force Base, Florida—tests of LDAR's potential as an aid to air traffic control. The results are being evaluated.

LDAR came into being as a result of an incident on an early Apollo moon mission, when a lightning strike just after launch knocked out the spacecraft's main electrical power system. The strike caused momentary loss of spacecraft instrumentation and necessitated readjustment of the instruments. As a result of this, Kennedy instituted an active program of lightning detection and measuring systems development—one of which was LDAR. It was used developmentally on both the Skylab and Apollo-Soyuz manned missions.



Lightning can be hazardous to airliners and general aviation aircraft, particularly during approaches to airports, because it could effect electronic equipment aboard the airplane. Additionally, hail and severe updrafts or down drafts, potentially troublesome, are usually associated with thunderstorm electricity. Pilot reports of lightning and thunderstorms provide some warning to other aircraft, but they identify general areas of electrical activity whereas LDAR can provide specifics as to location. LDAR has the capability of detecting electrical charge build-up in thunderstorms before the storm reaches the lightning stage. Recent developments have shown that LDAR can indicate the areas of maximum turbulence in a thunderstorm. With precise information as to the locations and altitudes of electrical discharges, air traffic controllers could route aircraft away from trouble zones.

LDAR consists of four receivers like the one below, together with computer processing and display equipment. One receiver is located at a central station and the other three are sited at points several miles away. Each receiver picks up signals emitted by electrical discharges in parts of the sky where thunderstorms are building up. The system measures the arrival times of the signals at each station. From this information, the computer can determine the points at which the signals originate. Zones of electrical activity are shown as "blips" on a display terminal, which indicates their distance, altitude and bearing from the control center.