aerospace notes

AVIATION SAFETY

Lights signal runway runout

The sudden appearance of a row of alternate red and white lights will warn pilots at major airports that they have only 3,000 feet of runway left, under a newly adopted Federal Aviation Administration standard.

The lights will extend down the center of the runway from the 3,000- to the 1,000-foot mark. All-red lights will mark the last 1,000 feet. Existing all-white center lights can be red-filtered at about $500 per installation, the FAA estimates.

Initial installations are planned only for airports with low-visibility flight operations; later they will extend to all runways equipped with centerline lighting.

COMMUNICATIONS

Radio range upped for 747

The range of routine air-to-ground radio communications on the upcoming Boeing 747 giant jet will be as much as 30 percent greater than that on today's jet transports, predicts an airline electronics engineering official.

Equipment being developed for the 747 will provide high-quality voice communications on VHF bands to ground stations up to 400 miles away, according to Ben F. McLeod, director of electronic engineering for Pan American World Airways. The VHF air-to-ground range of today's jetliners is from 200 to 300 miles.

Special antennas and other equipment, now being tested in flight on existing jets, will enable 747 and supersonic transport pilots to obtain VHF ranges of more than 5,000 miles, says McLeod, using communications satellites stationed over the Atlantic and Pacific Oceans.

NAVIGATION

Visibility from aircraft studied

What appears to be a clear day to the ground observer looking up may not be a clear day to the observer in an aircraft looking down. This is the conclusion of an 18-month Air Force study which involved more than 72,000 observations covering much of the Northern Hemisphere.

Making observations for the Air Force's Cambridge Research Laboratories were pilots and crewmen of the Strategic Air Command, Military Airlift Command, weather reconnaissance squadrons, the U.S. Navy and Pan American World Airways.

The participants were asked to make observations at five different angles and to report on the probability of seeing the ground, horizon or sky.

The researchers found that chances of a clear line of sight are much smaller than they had predicted mathematically. In one case, a predicted 75 percent likelihood turned out to be more like 20 percent.

The researchers believe that the disparity between sighting up from and down toward the earth is due largely to the presence of thin clouds. To a ground observer, these clouds would seem almost transparent because of backlighting from the sun, though they might still be thick enough to obscure the ground from above.

STRUCTURAL DESIGN

Space arm resists twisting

An expandable arm for use in a variety of earth, space and military applications has been developed by Martin Marietta Corp., Denver, Colo.

The arm, resembling an erector set frame, is an extendable boom device of collapsible diamonds that can be extended to a length 10 times its retracted size.

It can be powered pneumatically, hydraulically, electrically or by mechanical springs.

Tests have reportedly shown the arm to be much more resistant to twisting and bending than other known space boom devices such as telescoping tubes.

The arm was developed as a means of deploying antennas and other equipment from spacecraft and as a tool to conduct remote soil-sampling experiments. It could also, according to Martin, be designed into a portable frame for shelters, an emergency bridge or a retractable maintenance or firefighting platform.

AIRPORT DESIGN

Making room for the giant jets

The steps that may be necessary to enable present airports to handle the giant Boeing 747 jetliner are outlined in a recent report by the Federal Aviation Administration.

Though the 747 is being designed to take off and land on today's runways, airport modifications will be necessary to facilitate its handling and maneuvering on the ground. The jet is scheduled to begin commercial service in about 1970.

Taxiways for the 747 may need widening to provide clearance between the airplane wheels and the edge of the pavement. Entrance taxiways should be located at each end of the runway, since the 747 cannot make a 180-degree turn on a standard 150-foot-wide runway strip. Additional paving may be needed in apron areas to permit clearance around other aircraft for the jet's 195-foot wingspan and 231-foot length.

The report makes no mention of airport modification that may be needed to handle almost 500 passengers from a single plane.

REMOTE SENSING

Refrigerator cools satellite sensors

A 35-pound refrigerator, designed to keep satellite-borne infrared sensors cool for maximum efficiency, is being developed for NASA by Lockheed Missiles and Space Co., Sunnyvale, Calif.

Infrared sensors, which enable satellites to make night photos of earth while also allowing increased daytime coverage, work by detecting minute temperature differences among distant objects. The cooler the sensor can be kept, the more sensitive it will be.

Lockheed's refrigerator is cooled by a block of frozen argon gas, kept solid in an insulated vacuum container; heat is carried away from the sensor by carbon dioxide. The device will reportedly be able to keep a sensor cooled to below minus 430 degrees F. for an entire year.