

## SONIC BOOMS

### SSTs effect on cathedrals

The potential effects of sonic booms on cathedrals are being studied by the British Ministry of Technology. They are being aided by engineers from the Royal Aircraft Establishment at Farnborough and Southampton University's Institute of Sound and Vibration Research.

The investigation will involve detailed examinations of the structural histories of some of the great cathedrals of Europe, including Westminster Abbey, the Winchester and Canterbury cathedrals and 10 more. Vibration propagation may sometimes be measured by setting off small explosions outside the cathedral walls.

The miniature blasts will do no damage to the buildings, the researchers emphasize, nor will they interfere with normal daily activity. The major part of the survey will consist of measuring vibrations in the walls and foundations due to everyday conditions. There will be no heavy machinery or flights by aircraft involved.

## ENGINE DESIGN

### Supersonic jet nozzles studied

Problems of inlet and exhaust nozzle design for turbojet engines in future supersonic aircraft are being investigated by researchers at the Lewis Research Center of NASA in Cleveland, Ohio.

Among the areas to be covered in the 18-month program, which began this month, are methods of adjusting inlets, in flight, from their subsonic to supersonic configurations and back, and changing of the exhaust throat area when adding an afterburner.

Part of the testing will be done with models in the center's eight-by-six-foot wind tunnel. At speeds of just about the speed of sound, however, which are critical to the aircraft designer, interference caused by the sonic shock waves reflecting from the tunnel walls limits ground testing to very small models. An F-106B jet fighter has therefore been borrowed from the Air Force and fitted with two under-wing pods to hold the engines on which the various nozzle designs will be tried.

## DATA PROCESSING

### Ultrasonic pulses enables high-density memory

An experimental computer memory designed for aircraft and space vehicles uses pulsed ultrasonic energy for rapid storage and retrieval of up to one billion bits of data per cubic foot.

By contrast, according to J. Warren Gratian and Richard W. Freytag of General Dynamics Electronics in Rochester, N.Y., who invented the device, a billion-bit ferrite core memory would have to be as big as a truck.

Called FAME, for ferro-acoustic memory, it uses ultrasonic pulses generated as rapidly as two million per second to enter data onto hair-thin wires, selected by a series of transistor switches. A brief pulse of electrical current then creates a magnetic field around the wire, causing the pattern of ultrasonic pulses to become fixed

at specific points in the form of electromagnetic charges.

The stored data is read out by sending another ultrasonic pulse down the wire, so that it assumes a pattern identical to the stored one. According to the inventors, FAME could provide as much as a 100-fold increase in the amount of data that could be stored aboard future aerospace craft.

## AIR TRANSPORTATION

### STOLport guidelines issued

The promising but lagging future of short takeoff and landing (STOL) aircraft (SN: 9/7, p. 299) has been given a boost by the Federal Aviation Administration. The FAA has issued guidelines for the development of STOL airport facilities.

The new recommendations are subject to change as more operating experience is gathered, the agency points out. So far present suggestions call for runways 1,500 feet long (compared to 6,000 feet or more for conventional planes), 100 feet wide and capable of supporting aircraft weighing up to 150,000 pounds. This is more than the maximum landing weight of even a stretched 727 jet, and far more than that of a DC-9, which indicates the confidence of the FAA in STOL designs that are not yet off the drawing board.

The guidelines also call for the end of each runway to have an extra 150-foot-long paved overrun, plus 1,000 feet of obstruction-free clear zone. This compares with about 200 feet of overrun and a 2,500-foot clear zone for a typical conventional runway.

## LUNAR TRANSPORTATION

### Moon buggy could be manned or automatic

Despite post-Apollo budget squeezes, space engineers are still designing unusual vehicles for getting around on the lunar surface. One of the latest is a battery-and-solar-cell-powered buggy which could either carry an astronaut or be operated by remote control from earth.

Designed by Grumman Aircraft Engineering Corp. in Bethpage, N.Y., the vehicle would be stowed in the lower part of the Apollo lunar module. The manned version could range over a seven-mile radius at 10 miles per hour, while the unmanned version, using its solar cells, is expected to operate for six months and cover 750 miles.

## SATELLITE COMMUNICATIONS

### Central America's first ground station

Panama has become the first country in Central America with its own operational communications satellite ground station.

Traffic with North American countries began early this month, following the first communications, which began with Chile on Sept. 1. Europe was added on Sept. 16.

The station is designed for the Intelsat II and III satellite systems, and was designed and built under a \$5 million contract from Intercontinental de Comunicaciones por Satélites, S.A.