

Technology Notes

MATERIALS

Self-Destroying Rockets Planned

Sounding rockets that destroy themselves in midair after releasing their payloads, in order to prevent their falling on people or property below, are predicted within two years by the U.S. Army Missile Command.

The "falling mass hazard" has been studied by the Army since more than a decade before the first U.S. satellite was successfully orbited. The danger limits launches of high altitude probes to certain angles and a limited number of sites.

The Army has been testing a wide range of materials for the self-destroying rocket cases, including paper, nylon, rayon, plastic and fiberglass. Contracts for the construction of actual components are expected to be awarded soon.

AERONAUTICAL ENGINEERING

New Engine Cheaper and Quieter

A simpler jet engine—cheaper, lighter, and, by accident, quieter—has been developed in Great Britain.

The Rolls-Royce Trent engine has fewer moving parts than its sisters, and therefore generates less noise. More important to its designers, if not to those who live around airports, it cuts 10 percent from the fuel bill, and an equal amount of weight and cost.

This is achieved by adding a third compressor fan. Each compressor section rotates on its own shaft, at the speed best suited to its job, so variable inlet vanes and stator blades are unnecessary. Although the Trent is relatively small, Rolls-Royce feels the principle is applicable to engines up to 50,000 pounds of thrust.

AVIATION

U.S. SST Needs the Concorde

Though the U.S. supersonic transport will be 500 miles per hour faster than the Anglo-French Concorde, the U.S. plane would only save 20 minutes on London-to-New York flights, according to a member of the British Parliamentary and Scientific Committee.

"On stage lengths of 1,500 miles, only five minutes would be saved," said Sir Ian Orr-Ewing at a special British-American Chamber of Commerce meeting on the future of supersonic transports.

The Concorde is necessary even to the U.S., he said, if only because without competition, nations which did not like or could not afford the U.S. version would have no alternative but to buy from the U.S.S.R.

Certification for the Concorde is expected by 1971, he said, by which time eight aircraft should be in the air and 12 more nearly completed. "The timing of the U.S. SST is less certain," Sir Ian observed, but if the button were pressed in Washington today, it must be at least three years behind, and it could be more.

Space Notes

LAUNCH VEHICLES

Space Role for Minuteman

The newest in the line of missiles to be recast as space vehicles (among others are Atlas, Redstone, Titan, Scout) is the Minuteman 1 ICBM, aided by a solid-propellant fourth stage.

An ironic possibility is that the new Air Force booster might find NASA its chief user, since the USAF satellite program is at present amply supplied with Atlas missiles.

A likely candidate for the fourth stage is the Burner II, an Air Force module that became operational this month. The four-stage Minuteman, says the Air Force, could put a 300-pound satellite (about the weight of a TIROS) into a 900-mile circular orbit.

LUNAR RESEARCH

Splitting the Take from the Moon

When the first samples of rock from the moon are brought back to earth (SN: 2/18), they will be divided among no fewer than 110 eager scientists, even though they will total only about 50 pounds.

Following a month-long quarantine at the Lunar Receiving Laboratory in Houston, the samples will be trans-

ported to laboratories across the U.S. and in England, Germany, Canada, Japan, Finland and Switzerland. Among the minerals the scientists will be looking for are radioactive uranium, strontium and thorium, as well as diamonds, aluminum and mercury.

PROPULSION

Low-voltage Electric Rocket Engine

An electric rocket engine that can run on low solar cell voltage has been successfully tested for more than 400 hours by the National Aeronautics and Space Administration.

The compactness and reliability of electric rockets make them ideal for attitude control of satellites or for providing repeated nudges to keep synchronous satellites in position. Their high voltage requirements, however, have in the past called for large, heavy power supplies that have prevented their use in space.

NASA's engine, being tested at Lewis Research Center in Cleveland, is called a magnetoplasmadynamic (MPD) arc thruster. An electric arc heats the argon or xenon propellant until it is ionized into a plasma, which is then forced through a "nozzle"—is actually a cone-shaped magnetic field—to produce thrust. Thrust of up to 1.5 millipounds has been produced, with specific impulses of up to 1,300 seconds.