

MINI-CAPSULES

Near-earth orbit escape

Three designs for space-escape vehicles have been proposed to the Air Force by North American Rockwell Corp.

The mini-sized escape capsules would be capable of returning two to three men safely to earth from either a reusable shuttle in near-earth orbit or from a two- to six-man orbiting space station. It would not be used in Apollo moon or planetary missions.

The capsules could be stored within the mother ship, either as an integral part that could double as a pilot-copilot station, or as a separate vehicle that could be activated within seconds in case of an emergency.

Life support supplies and equipment for 24 hours in orbit and for at least 48 hours after return to earth could be provided in a shirt-sleeve environment, says North American. Short- and long-range communication systems, tracking signals and propulsion systems for directional control and escaping from orbit are required instruments.

Designs of the capsules vary from a rigid structure with clamshell-type doors and a spherical bottom to cone-shaped systems. Of the latter design, one is inflatable with a metal fabric skin covered with a flexible heat shield, the other is mechanically rigid, opening like an umbrella. They vary in size from seven to nine feet in diameter and four to five feet high.

SPACE RESEARCH

International conference in U.S.S.R.

The thirteenth annual meeting of COSPAR, the Committee on Space Research of the International Council of Scientific Unions, met this week in Leningrad, U.S.S.R.

Since 1958, scientists have met annually to exchange results of space research. This will be the first year, however, in which world scientists discuss their experiments and analyses of moon material from the manned lunar landings.

The National Aeronautics and Space Administration, which has repeatedly made gestures for cooperation with the Soviet Union for such exchange, sent 32 scientists and administrators to Leningrad: among them are Astronaut Neil A. Armstrong of Apollo 11 and Dr. George Low, Deputy Administrator for NASA. One hundred other United States scientists also attended the conference.

USER TAXES

Help for the airways

The 1970 Airport Airway Development Act, signed by the President last week, will provide \$3 billion for air-travel improvement over the next five years, largely from user taxes. A minimum of \$250 million annually is earmarked for both air-carrier airports and airway-development programs. The development programs include acquisition, establishment and improvement of air navigation facilities under the Federal Aviation Act of 1958.

General aviation airports will receive \$30 million a

year. And two types of grants, one for airport systems planning, another for airport master planning are allocated at least \$15 million annually.

A Senate version of the bill, directing funds for airport terminal improvements such as people- and baggage-movers, did not make the final version.

User taxes to fund the program include an increase from five to eight percent in passenger ticket rates, an additional \$3.00 per person leaving the country, a tax on gasoline and jet fuel used in noncommercial aircraft, and a five percent tax on cargo waybills.

Other revenue sources include a \$25 registration fee for all aircraft and additional charges on take-off weight for jet and piston-powered aircraft over 2,500 pounds.

SPACE SHUTTLE

First powered landing

The first powered-landing tests of the wingless aircraft—a prototype of a space shuttle—were scheduled at the National Aeronautics and Space Administration's Flight Research Center, Edwards, Calif., this week.

The flat-bottomed HL-10 (SN: 8/16/69, p. 124), one of three wingless designs tested by NASA and the Air Force, has flown 35 times. Its single 8,000-pound-thrust rocket engine has propelled it to maximum altitudes of 90,303 feet at 1,227 miles per hour.

The powered landing required replacement of the single engine with three 500-pound-thrust rockets to enable a pilot to reduce to 6 degrees the steep 22-degree-approach path angle of the unpowered glide-landing.

The wingless vehicles develop aerodynamic lift from their body shape and velocity, and aerodynamic control from their rear fins.

The brother of the HL-10, the older M2-F2, is of opposite design; it has a rounded bottom and flat top. After crashing in 1967, a third fin was added, and the M2-F3 is now ready for initial tests. Both craft were designed by the Norair Division of the Northrop Corp.

A third test vehicle, the X-24A (SN: 4/4, p. 343) was built by Martin Marietta for the Air Force.

HELICOPTERS

The VTOL answer

A new helicopter, the S-65-200, could be the answer to the growing traffic problems in the nation, claims Merrick W. Hellyar, supervisor of commercial operations analysis at Sikorsky Aircraft.

By 1975, his company could have in operation 40 new three-engine craft with an 86-passenger capacity each. These could move 7.6 million travelers annually, he says. The helicopters would fly a 14-route system between cities such as Boston, New York, Philadelphia, Baltimore and Washington.

A smaller version of the S-65 series recently took 28 passengers from London to Paris in record time (SN: 5/16, p. 481).

Another aspect of the proposal is that essentially no new facilities would have to be built. The direct shuttle flights would increase air traffic without saturating air space, says Hellyar. They need only minimal requirements for terminal space.