

Aerospace Notes

SPACE FLIGHT

Nuclear space plane

A nuclear-powered space plane that could use the atmospheres of such planets as Venus, Mars, Jupiter and Saturn as filling stations has been conceived by two University of Florida nuclear engineers.

The vehicle, according to Prof. Glen J. Schoessow and Dr. S. P. D. Smith, could run its nuclear engine on any of the gases commonly found in planetary atmospheres—nitrogen, oxygen, hydrogen and methane. By replenishing its fuel supply from atmospheres along its way, the craft would eliminate the need for carrying an entire round-trip supply.

The space plane would be able to use the gases in either of two ways: it could inject them directly into its nuclear core to provide thrust through a turbojet or ramjet, or it could liquefy the gases and feed the super-cooled fluid into the reactor for even more power as a rocket. First use of the craft would probably be as an unmanned probe.

AEROMEDICINE

Australian pilot survey

An Australian study of jet airliner pilots reveals that even short-acting barbiturates can have hang-over effects on performance.

This finding was part of a broad air crew health study carried out by the Commonwealth Aeronautical Research Laboratories. Though stimulants such as amphetamines have no place in normal air operations, the ARL says, they might be usable in emergencies when alertness has to be maintained despite lack of sleep.

It was also determined, after examination of more than 700 airline and senior commercial pilots aged 40 and over, that the incidence of incipient glaucoma (an eye disease which can cause blindness) in pilots was only about one-tenth of that in the general population.

The ARL is presently examining the carriage of mentally ill people by air. Recent new aeromedical services in Australia include an air ambulance service in New South Wales and a flying public health nurse in Western Australia.

SPACE QUARANTINE

Emergency isolation spacesuit

A Biological Isolation Garment (BIG) is being considered for use in the event that the Apollo astronauts returning from the moon do not land near the recovery forces and are forced to leave the spacecraft.

Intended to protect earth from possibly dangerous organisms brought back from the moon, a BIG for each astronaut would be dropped from a helicopter to the crewmen, who would then don them and await the recovery team. The BIG is a one-piece, loose-fitting garment with an attached headpiece. A built-in respirator filters the astronaut's exhaled air.

Sea trials have already been run in the Gulf of Mexico,

in which technicians spent many hours evaluating the suit's comfort, mobility and safety.

Following recovery, the astronauts will enter a special Mobile Quarantine Facility aboard the prime recovery vessel, where they will remain until they are transferred to the Lunar Receiving Laboratory at the Manned Spacecraft Center in Houston for a stay that could last a month.

SPACE SPINOFF

Space antennas go groundward

Storable tubular masts and antennas of a type developed for use on the Mercury, Gemini and Apollo spacecraft are now being evaluated by U.S. and Canadian military authorities for use on the ground.

Called STEMs, for Storable Tubular Extendible Members, the antennas are formed as flat metal ribbons, then heat treated so that they will automatically curl into rigid, cylindrical masts when released from thin flat reels.

The STEMs, developed by de Havilland Aircraft of Canada, have been ordered for testing by the U.S. Army, Navy and Bureau of Mines, and the Canadian Army. One use being considered for a modified STEM is as a tunable one-quarter-wave radiating monopole antenna. Other possibilities include use as probes in laboratories and geological drill holes.

AIR SAFETY

Rocket-stabilized ejection seat

A new type of ejection seat, reportedly adaptable to all Air Force jet aircraft, has been successfully tested by Douglas Aircraft Co. at Long Beach, Calif.

The seat uses a standard ejection charge to catapult the seated pilot from the cockpit, but a small vernier stabilization rocket then cuts in to maintain the seat's head-up orientation.

SPACE TESTING

Meteorite simulator

A common device used to simulate spacecraft-damaging meteorite impacts is the light gas gun, which compresses hydrogen gas in a long tube to accelerate tiny projectiles to thousands of feet per second. A new plasma-powered device, being developed at the University of Michigan in Ann Arbor, reportedly can do the same thing in much less space and at one-tenth the cost.

Instead of a 100- or 200-foot tube, the Michigan device uses a barrel only three and a half inches long, which is replaced after every firing. One firing of the plasma gun costs about \$100, compared to about \$1,000 for a light gas gun. Present test velocities are up to about 35,000 feet per second, in the upper range of light gas guns, and the plasma gun's developers expect to get up to about 50,000 fps.

The device, which fires nylon projectiles, is being developed for NASA.