SPACE

Planned for Space Risks

➤ THE HAZARDS of the first United States space trip gave U. S. Navy Cmdr. Alan B. Shepard Jr. some apprehensions that he met by considering how each difficulty could be licked if it occurred.

This was revealed in a pre-flight psychiatric interview with the astronaut, the National Aeronautics and Space Administration reported at a Conference on Medical Results of the First U. S. Manned Suborbital Space Flight in Washington, D. C.

The astronaut looked at his flight as a difficult task. Although he was confident, he could not be sure of success. However, he was more concerned about performing well than about external dangers.

The medical data from the first U. S. space flight show that Cmdr. Shepard lost exactly three pounds from a few hours before the trip until three hours after the rescue. However, only minor changes were observed in body functions before and after the space trip.

During the flight itself, Cmdr. Shepard's pulse increased. At lift-off signal it was 126 and climbed during the launch to 138. During the weightless part of the flight the pulse rate decreased to 108 beats a minute. The highest pulse rate during re-entry was 132.

The respiration rate of the astronaut was between 15 and 20 breaths per minute during countdown. A peak rate of 40 occurred during the launch period, declined to 20 near the end of the weightless flight phase and rose to 30 during re-entry. On descent it fluctuated between 20 and 25 breaths per minute.

The astronaut reported no difficulties during the flight but at the time of maximum aerodynamic pressures, at Mach number 1.0, vibration was so severe the pilot stated he had some difficulty seeing for about 15 seconds.

Cmdr. Shepard reported that for future flights the vibration problem will be avoided by providing more foam rubber for the head support of the astronaut's couch. Later space capsules will also have picture windows for observation purposes.

He said the centrifuge, the procedures trainer, and testing with the Mercury spacecraft at the launching area provided the most valuable aids during the training period before the space flight. Comdr. Shepard described his flight in detail and showed the film taken aboard the rocket during the flight.

Dr. Robert B. Voas of the NASA Space Task Group reported the astronaut had carried out his tasks of checking the instruments he was assigned to do. This is indicated by the pattern his eyes follow on the film.

The Conference was co-sponsored by the National Institutes of Health and the National Academy of Sciences.

• Science News Letter, 79:373 June 17, 1961

SPACE

Moon Rocket Described

➤ THE NOVA space rocket that will carry man to the moon, as projected in President Kennedy's extraordinary Congressional message, is expected to be half as tall as the Washington Monument, or about 275 feet.

Boosters for this space vehicle will be a cluster of liquid fuel engines or a cluster of large solid propellant engines, each having a thrust of 1,500,000 pounds. The Nova will be thirty to fifty times as powerful as the Atlas booster that is scheduled to carry man into orbit around the earth at the end of this year.

The Nova will consist of a three-stage rocket with the Apollo space capsule on top for the lunar landing. The Apollo can as yet only be described in general terms since it is still on the drawing boards, George M. Low, chief of the National Aeronautics and Space Administration's manned space flight program, reported.

He told the First National Conference on Peaceful Uses of Space in Tulsa, Okla., that the craft will be very compact in order to make it as light as possible and help ease its return into the atmosphere when the moon travelers return to earth.

It is also certain at this time that the capsule will be made up of various "building blocks," or modules, each of which is used for a certain part of the flight.

The first of these building blocks is the "command center module" that will house the crew of three during launch and re-entry. It will also serve as a flight control center for the rest of the trip.

The second module is a propulsion unit that will be used as a take-off stage from the moon. This unit will also be used on earlier flights of the Apollo capsule, namely in earth-orbital flights, possibly by 1965, and in a trip around the moon without landing between 1967 and 1969.

In orbital flights this unit will be used for emergency conditions and for maneuvering in orbit. For the circumlunar trip the propulsion unit will return the space craft to earth from any point of the planned route.

For the trip around the moon, this versatile propulsion unit will provide mid-course guidance corrections. It can also place the capsule in orbit around the moon and send the capsule out of orbit and return it toward earth.

The third building block of the Apollo is a propulsion stage that will slow down the space craft as it approaches the moon and set it "gently" down on the surface. A horizontal landing on the moon is now

Lunar Landing

Lunar Take-off