

## SPACE

# Improved Space Capsule

► THE LATEST space capsule has a new life raft aboard that can be tracked by radar.

If the rocket fuel burns longer than planned and the space capsule goes too far and lands where no planes or ships are waiting to make the rescue, the fact that the raft can be tracked by radar makes it easier to locate. The raft is colored international-orange and is aluminized on the inside.

The MR-4 space craft is being used in suborbital flights as well as in the first orbital shot. It is similar to, but has many improvements over, the Freedom 7 capsule that carried Cmdr. Alan B. Shepard, Jr. on the first United States suborbital space flight.

Other improvements on the capsule include a "picture window" 19 inches high that can be used as a navigational aid and for observations of cloud cover and possibly stars.

The instrument panel has also been changed at the suggestion of the astronauts for quicker and easier use. A new clamp ring fairing that holds the capsule onto the Redstone rocket has been installed to cut down on vibrations that interfered somewhat with Cmdr. Shepard's vision on the first flight.

A new type side hatch fastened by explosive bolts replaces a mechanically-operated hatch. This will enable the space pilot to open the hatch by pushing a button or pulling a cable. It can also be removed from the outside. The explosive charge provides rapid escape for the occupant in case of emergency.

The astronaut need not control the Liberty Bell manually on one axis at a time—pitch, yaw and roll—but can merely flip a switch and pull a handle to control all three axes simultaneously.

The new capsule carries two manual control systems, one called the Rate Stabilization and Control System (RSCS), the other, used on Cmdr. Shepard's flight, con-

sisting of a hand controller that directly opens and closes six gas jets, which turn the craft. Using RSCS, hand motions are translated into electrical signals to control the gas jets.

Additional personal equipment for the astronaut includes gloves with nylon-sealed ball bearing rings so he can move his wrist more freely, a new type microphone built into his plastic helmet and more foam plastic in the astronaut's couch to reduce noise and vibration, the National Aeronautics and Space Administration reported in Washington, D. C.

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## Space Dust Hazards To Be Explored

► THE SATELLITE, S-55, is scheduled to be launched late in August to find out if the tiny specks in space called micrometeoroids

will erode or in other ways destroy space craft.

The satellite, which failed to orbit at the first shot on June 29, will send back information from distances between 240 and 620 miles from earth about the make-up of the particles and the hazard they might create for space travelers. It will also record information for the design of solar cells for space craft power by comparing measurements from protected and unprotected cells.

The S-55, to be named Explorer XII if successful, will be launched from Wallops Island, Va., with a four-stage Scout vehicle, the National Aeronautics and Space Administration reported. Another purpose of the mission is to test the performance and stability of the 72-foot, 36,600-pound Scout rocket and its guidance system.

The Air Force has recently reported discovery of a layer of micrometeoroids at heights up to 102 miles above the earth's surface. The dense dust particles in the band are traveling at speeds up to 47 miles a second.

These micrometeoroids were trapped by a special rocket nose cone consisting of a pod-like arrangement of leaves opening up like the petals of a flower.

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MICROMETEOR SATELLITE—Before insertion in vacuum chamber.

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# Many U.S. Space Programs

► THE UNITED STATES is making inroads on space. It now has 13 projects going, many of which will benefit man on earth. In addition, 10 new projects are coming up.

Man in space is only one of many space programs. Project Mercury of the National Aeronautics and Space Administration was designed to test man's ability to live and perform in space, Project Apollo to carry him to the moon.

Among future NASA space projects are three moon probes: the Ranger, a lunar impact satellite; the Surveyor, a craft for soft-landing instruments on the moon to explore the surface; and the Prospector, which will pick up samples of the moon's surface and send the information back to earth.

Three other future NASA space projects of great importance are OGO, OAO and OSO. The first of these is an orbiting geophysical observatory, the second an orbiting astronomical observatory and the third an orbital solar observatory. They will respectively gather information about the earth, the stars and planets, and the sun.

Space projects already in progress include the experimental Tiros weather satellites to be followed by the operational Nimbus "weather man," both of NASA.

The Air Force Courier and NASA Echo satellites are already testing the possibilities for global communication. NASA Relay and Rebound experimental communications satellites and the Army's Advent are being planned.

The Navy Transit satellites, of which two are now transmitting, will eventually make it possible to navigate by satellite from anywhere on earth. Transit IV-A was the first atom-powered satellite.

NASA's Explorer series has sent back much information about the earth's atmosphere and space itself. The NASA Pioneer satellites have probed deep space measuring cosmic rays and magnetic fields of the earth and the moon. Pioneer V also has the record for long range communication, 22,500,000 miles.

The Air Force Discoverer series is concerned with the recovery of objects returning from space. The Navy Injun satellite, attached at launch to Transit IV-A as was Greb III, is measuring the Van Allen radiation belts. Greb III is studying solar radiation.

The Samos and Midas satellites of the reconnaissance programs are in the hands of the Air Force.

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