ASTRONAUTICS

Giant Space Shot Effort

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➤ THOUSANDS of man years and millions of tests went into the first United States manned shot into space.

Some items in the Mercury capsule, the vehicle for the first U. S. astronaut, were tested more than 10,000 times. Among these are transistors and relays tested for shock and vibration, the National Aeronautics and Space Administration told SCIENCE SERVICE. The capsule contains seven miles of electric wires.

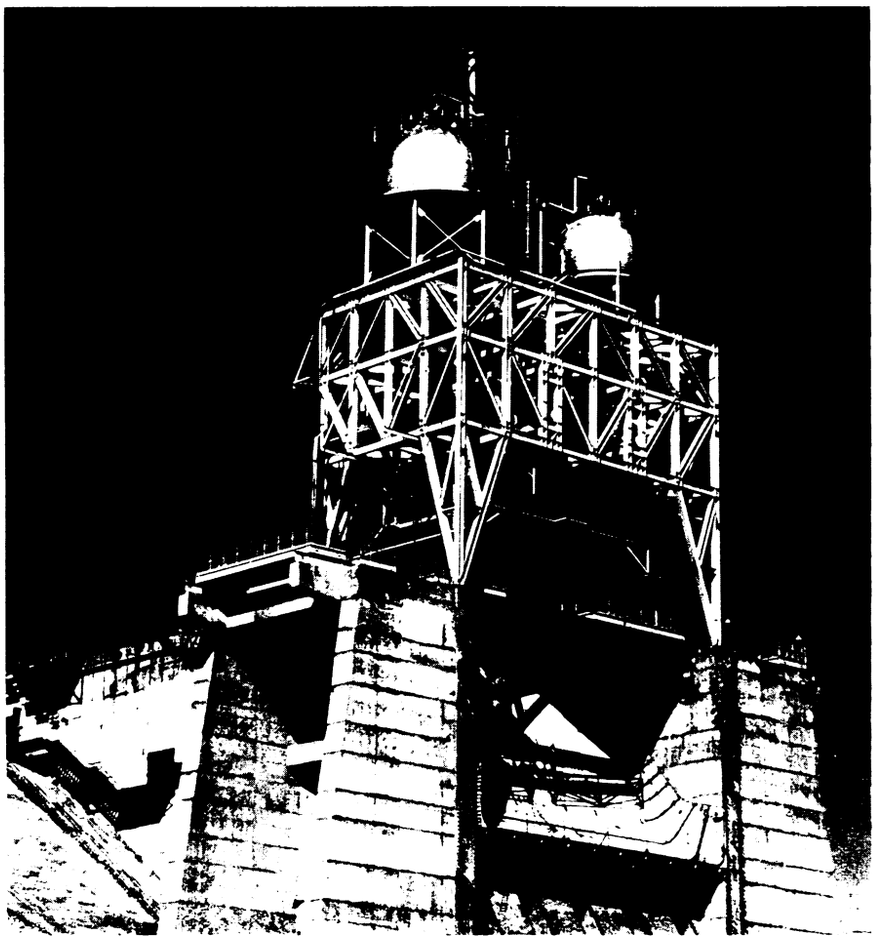
Twenty-five systems, such as escape, communication and recovery systems, are contained in the capsule that is the result of development and tests taking four and a half years, starting with the testing of nose cones. The capsule has cost about $2,000,000 a week. In the summer of 1958 the astronaut's couch was developed and tested under a gravitational pull of 25 times that of the earth.

More than 70 models of the capsule were tested in wind tunnels for a total of more than 5,000 hours. This is more testing than any aircraft or missile warhead has ever had.

The astronaut has been trained in ten trainers under all conditions similar to those in space, except that of being weightless. His pressure suit was developed from a Navy suit used for flying at altitudes of 50,000 to 60,000 feet.

More than 2,000 contractors and suppliers did work on or for Project Mercury.

Eighteen tracking stations were built by NASA around the world to track the Mercury capsule while in flight, both on its downrange 290-mile trip and later orbital flights.



***ROCKET TESTER**—Largest rocket engine test stand in the West is nearing completion at Edwards Rocket Site, Calif. Built by Rocketdyne, Canoga Park, Calif., it will test 1,500,000-pound-thrust engine now under development.*

The tracking stations will be in contact with the man in the Mercury capsule. The stations can talk to the astronaut as he passes over and he can report back to them conditions in the capsule.

All information from the stations goes to the control tracking center at Cape Canaveral by radio waves, which travel at the speed of light (186,000 miles a second). If any calculations are necessary, the information goes to Goddard Space Flight Center, Greenbelt, Md., where computing will be done and from where answers will be sent back to Cape Canaveral, which then sends the information to the astronaut in space.

The Navy's recovery program of the Mercury capsule has included the training of personnel for 5,000 pick-ups of the capsule in the ocean, without one failure. The capsule was dropped off Norfolk, Va., and the recovery crews told to "go find it."

The crews knew only that it was out there somewhere in an area 75 miles wide and 250 miles long.

Several dozen scale models of the Mercury capsule were tested at the Wallops Island, Va., test site to find how pressure and heat influenced the capsule. Following that, seven Little Joe boosters with experimental capsules were fired and tested at the same site.

At Cape Canaveral one Big Joe booster with an experimental capsule was fired for testing. Three Atlas and three Redstone rockets were also test-fired there for the Mercury project.

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PHYSICS

Magnetic Wire May Help Power From Fusion

➤ A NIOBIUM-TIN wire can be used to make permanent magnets and make the dream of electric power from controlled nuclear fusion more likely.

Drs. Charles E. Roos of Vanderbilt University, Nashville, Tenn., and George Kneip of Oak Ridge National Laboratory, Oak Ridge, Tenn., reported to the American Physical Society meeting that this material can carry ten times as much current as previous measurements indicated. A niobium-tin superconductor allows a current to flow indefinitely, and seemingly without resistance.

The niobium-tin alloy was developed at Bell Telephone Laboratories.

At temperatures more than 400 degrees below zero Fahrenheit, the wire will provide a method of maintaining very high magnetic fields without energy. It will also be useful in ion space propulsion after a space vehicle has entered outer space. The niobium-tin wire will also be extremely important in studies leading to control of thermonuclear reactions and in bubble chambers used in experiments with nuclear particles.

High magnetic fields are used in research on thermonuclear reactions to confine the extremely hot gases, since the gases would dissipate if they touched the walls of a container.

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