SPACE

Ranger Space Shot Slated

➤ THE UNITED STATES is almost ready to launch a spacecraft with the same basic design that later will be used in vehicles destined to rough-land instruments on the moon, then to make soft landings on the moon and planets.

Ranger I, however, will not be aimed at the moon. It will zoom off on a long curve into space, probably traveling 685,000 miles from the earth before it gets back into the earth's atmosphere and burns up. The round trip may take 58 days.

There is even a slim chance that the Ranger may reach earth-escape velocity and go into orbit around the sun.

Chief aim of the Ranger I shot, National Aeronautics and Space Administration says, is developing and testing "basic elements of spacecraft technology" needed for follow-up moon and planet missions. Ranger's complex system has 19,520 working electronic parts.

Besides the basic tests, Ranger has another important scientific goal. It will carry instruments for studying cosmic rays, magnetic fields, and radiation and dust particles in space.

The standard, or near-standard, spacecraft design was developed by engineers at Jet Propulsion Laboratory, Pasadena, Calif., operated for NASA by California Institute of Technology.

Ranger is basically hexagonal (six-sided). The hexagon has been termed the bus, because it will be used as an omnibus for carrying scientific instruments. The nature of the "passengers" will change in succeeding shots, but the basic craft form is believed sufficiently versatile to handle all succeeding unmanned missions.

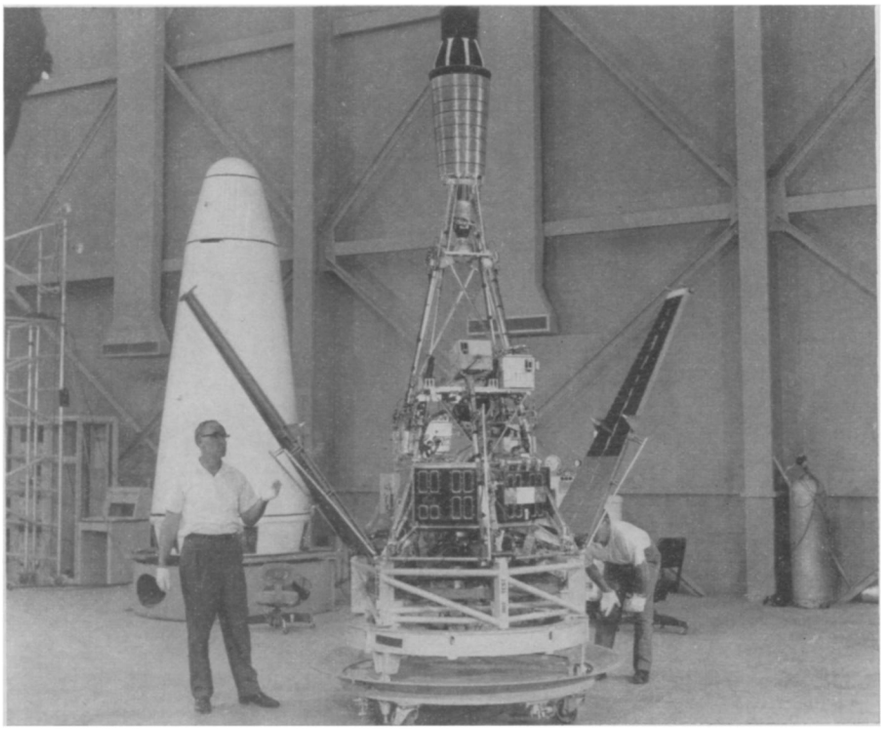
Using experiments with a prototype proof test model to guide them, Ranger's builders began work on the actual flight model last February. The flight version was shipped from Pasadena to Cape Canaveral in late May. Final ground tests have been completed.

Ranger I is 11 feet long and about five feet in diameter at the base of the hexagon. In cruise position, with solar panels extended, it is 13 feet long and 17 feet wide. It weighs 675 pounds.

Ranger I has two radio transmitters and two antennas, one at the front and the other at the base. The base antenna is aimed at the earth, to assure transmission of data from far out in space.

The 8,680 cells in the two solar panels may pick up enough energy from the sun to generate 210 watts of electricity. If the attempt to collect solar power to keep Ranger operating is not a success, a silver zinc battery inside the hexagon will run the craft for two days.

Ranger will be launched by an Atlas-Agena B rocket, marking the first use of a new combination of two rockets used individually in earlier space shots.



SUN-POWERED SATELLITE—The solar panels shown on either side of this Ranger spacecraft will be locked in place facing the sun during flight so that they can continuously deliver solar power to meet the craft's needs during orbit.

All three Atlas engines will be burning at liftoff from Cape Canaveral's pad 12. Some five minutes later, when the last of the three burns out, Ranger should be up about 80 miles and some 350 miles down the Atlantic Missile Range.

Next, during a 25-second coast phase, explosive charges release the Ranger-carrying Agena from the Atlas. A pneumatically controlled pitch maneuver puts the vehicle into an attitude horizontal to the earth before Agena's single engine starts. When the engine first cuts off after two and one-half minutes, the vehicle should be in a nearly circular "parking" orbit around the earth, 100 miles up.

This coasting stage lasts for about 14 minutes. The Agena's engine then operates for another 90 seconds. Two and one-half minutes after final engine shutdown, and about 25 minutes after liftoff, springs separate the Agena from the spacecraft.

At this point the Ranger should be traveling at 23,800 miles an hour, a speed that will place it in a "highly eccentric" earth orbit. The farthest away the orbiting Ranger will be from the earth is estimated at 685,000 miles, and its nearest approach to the earth is estimated at 37,500 miles.

About one hour after launching, Ranger is expected to be in a position allowing its hinged solar panels to lock onto the sun and feed the craft's power demands.

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TECHNOLOGY

Rise in Transistor Sets Seen as Boon to "Voice"

➤ NATIVES of many remote and underdeveloped areas are hearing radio broadcasts for the first time, thanks to the rapid spread of low-cost receivers requiring only a few cheap batteries and no power lines.

Officials of the Voice of America hail the transistorized sets as a welcome means of acquiring new listeners to America's story to the world via VOA, the U.S. Information Agency's international broadcasting service.

But the rise in receiver sales—and a corresponding 13% rise in shortwave broadcasting throughout the world—has also opened up vast new potential audiences for VOA's major competitors. They are Radio Moscow, Radio Peking, and the United Arab Republic's "Voice of the Arabs."

VOA hopes to meet the challenge through a long-range program that calls for ending current coverage deficiencies and "boosting signal strengths in the more important target areas where competition is greatest."

Recent Congressional action has helped. Legislators approved a $24,000,000 domestic plant at Greenville, N. C., for better transmission to relay stations in Europe and the Mediterranean area, and a new $13,000,000 relay station now being built near Monrovia, Liberia, in Africa.

Communists have been jamming VOA Russian-language broadcasts since 1948. United States technicians have fought buzz saw and siren noises with new electronic devices, high-power transmitters, high-gain antennas, simultaneous broadcasts of the