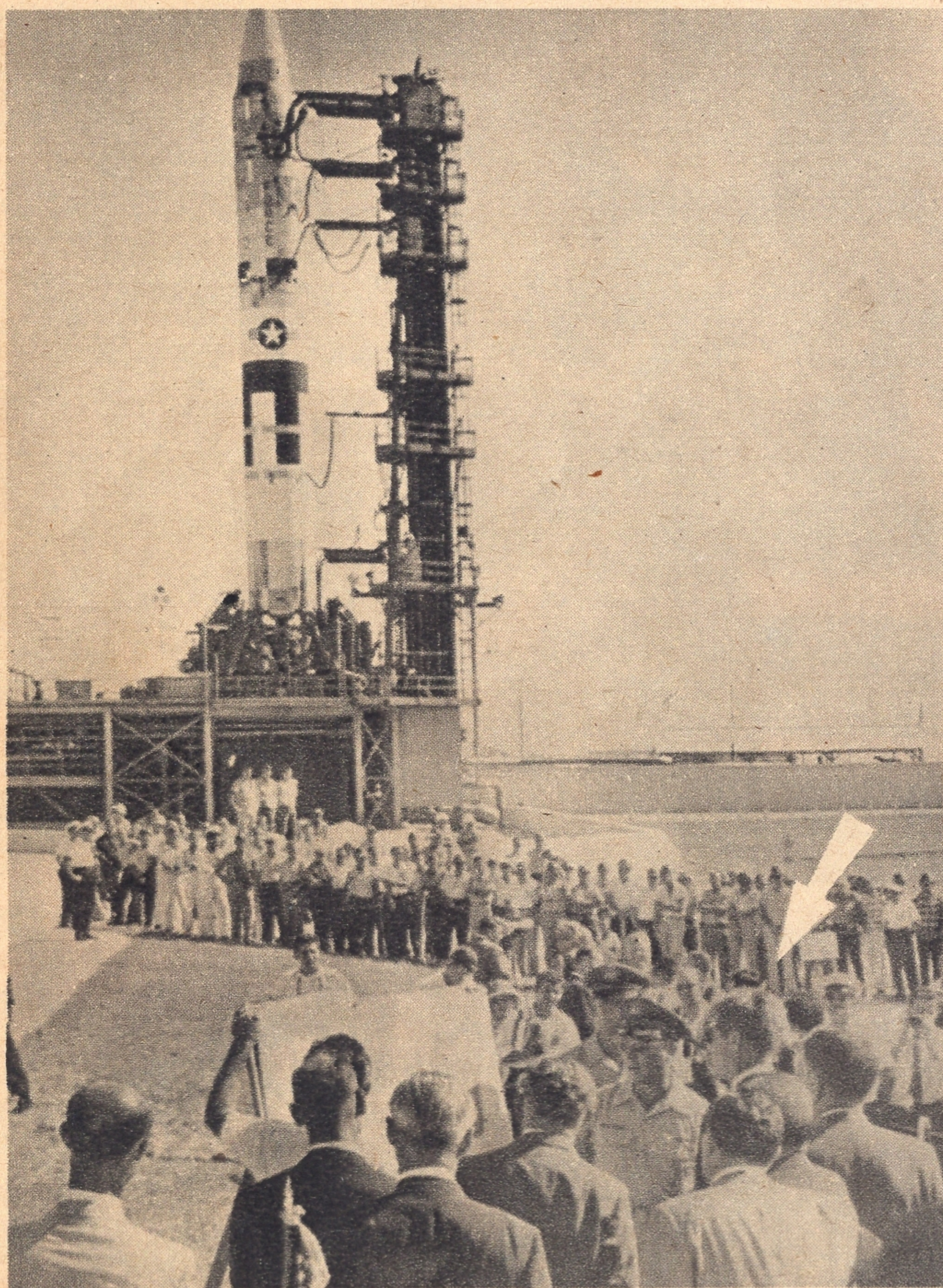


SPACE TRAVEL'S 1963 MODEL

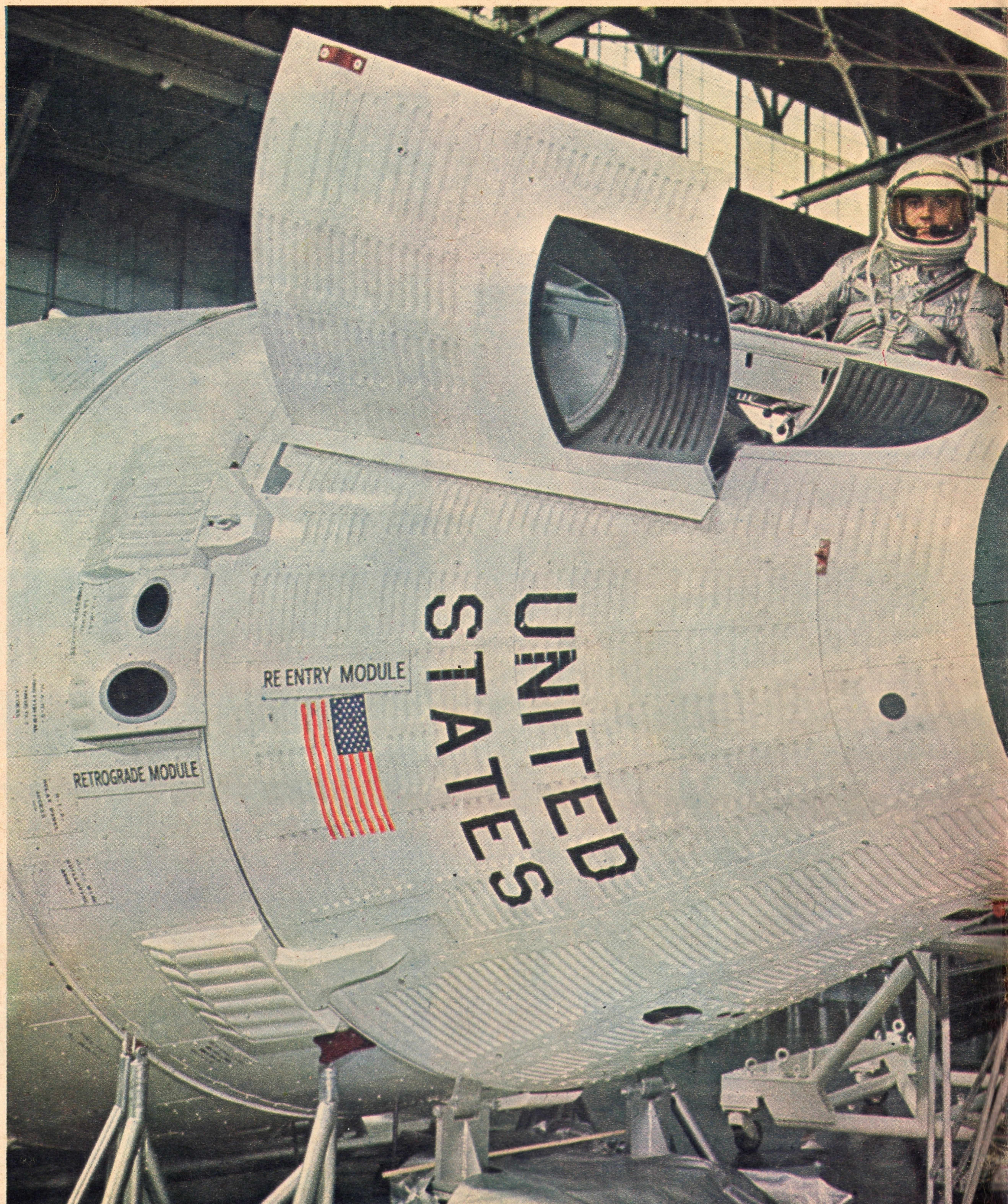
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# GEMINI-- for a rendezvous in space



President Kennedy (arrow) views the Gemini launch vehicle, the Titan II rocket, on its pad at Cape Canaveral. Later in his recent tour of space installations, the President visited Huntsville, Ala., Houston, Texas, and the McDonnell plant at St. Louis.

AP Photo



## Two-man capsule, being built in St. Louis, will be training vehicle for trip to moon

By CLARENCE E. OLSON of the PICTURES Staff

The next major phase of the United States manned space program is Project Gemini—in which, it is hoped, men will learn to live and work in the uncertainties of outer space, and to return therefrom. The two-man Gemini spacecraft that will be the vehicle for these exploits is being designed and built here in St. Louis by McDonnell Aircraft, as was the pioneer Mercury capsule. Sometime within two years the first Gemini craft is scheduled to be boosted into an orbital flight by a Titan II rocket. Earlier, a sub-orbital flight will have been made.

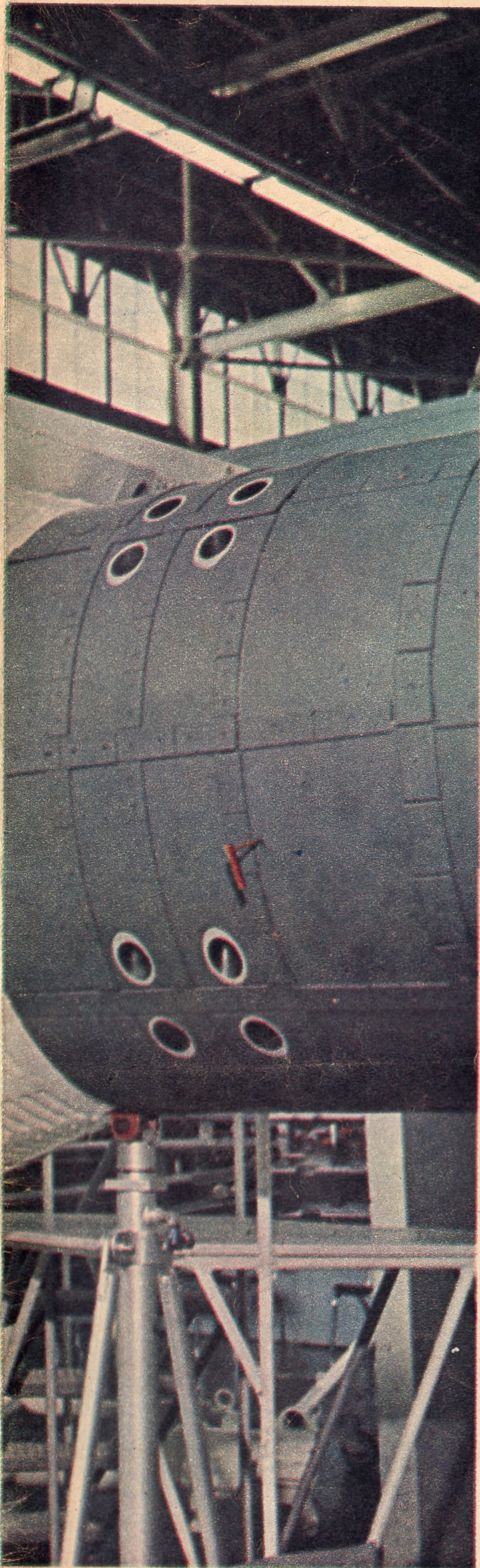
The Mercury capsule accomplished the big task of carrying a man into orbit and returning him safely to earth. Gemini will help prepare the astronauts for trips to the moon and beyond. During orbits of a week or more, they will discover some of the long-range effects of space environment on man. They will learn to maneuver and to join up with other orbiting objects. They will attempt a new landing technique utilizing a paraglider or inflatable wing that will enable the capsule to glide like a light airplane to a controlled landing. Finally, the two-seat capacity of Gemini may be used to pair experienced and novice astronauts for training.

Rendezvous in space is probably the most difficult and important phase of Project Gemini. In time the technique will be used in the Apollo project for a trip to the moon and it probably will become a standard pro-

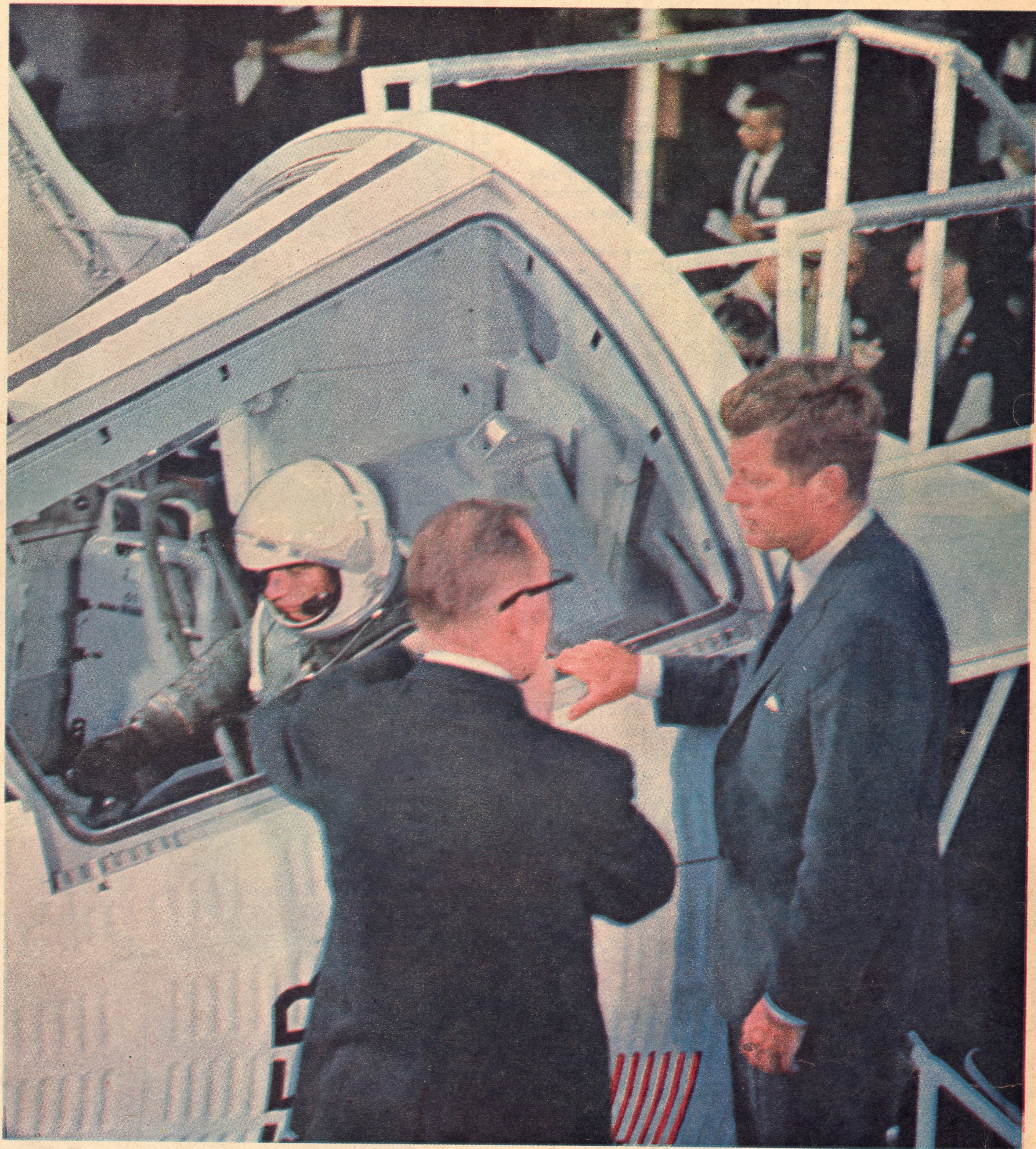
cedure for most space ventures. Current plans for the first U.S. space rendezvous call for the launching of an Agena D booster rocket into a circular orbit 150 miles high. Then, the Gemini spacecraft will be launched into an elliptical orbit with a high point touching, or nearly touching, the orbit of the Agena. The Gemini orbit will be shorter and the Gemini will gradually catch up with the Agena. The two finally will arrive together at the point where the orbits cross. By this time, an electronic computer and radar will have determined the complex mathematical and physical problems involved in shifting the orbit of Gemini. At the precise second, rockets on the Gemini craft will fire to circularize its orbit, making it swing into the orbit of the Agena rocket. If the two craft come within 250 miles of each other, they should be able to complete link-up by intricate jockeying.

Once the rendezvous is made, the Gemini will maneuver in orbit using the power of the Agena. Then it will uncouple and fire its retrograde rockets for the return to earth. When this rendezvous technique is perfected, it will permit use of smaller rockets to launch separate segments of a large spacecraft for assembly in orbit. It will be used in the Apollo project when the main craft "parks" in orbit around the moon while a small "moon bug" takes the astronauts to the surface of the moon and then back again to the rendezvous with the Apollo.

Photos By DAVID GULICK of the PICTURES Staff



Wearing an astronaut's space suit, McDonnell engineer Albert J. Wiegand stands by the Gemini spacecraft engineering mockup. Behind the re-entry module where astronauts sit side-by-side is the retrograde module and, beyond it, the large equipment module (partly visible). Both units are jettisoned before the return to earth. Black nose portion contains a drogue (stabilizer) parachute, inflatable paraglider and radar equipment. Launch weight (with all modules attached) is classified, but it is obviously much greater than that of the Mercury series. Re-entry weight is more than two tons, twice that of a Mercury capsule. NASA has ordered 12 Geminis.



Walter F. Burke, McDonnell vice president and general manager of the Gemini and Mercury projects, briefs President Kennedy on equipment inside the pilots' compartment. Astronauts sit in separate ejection seats to be used for escape in an emergency. One hatch has been removed. During advance test flights, the astronauts may depressurize their compartment, open the hatches and, with special pressure suits, venture into the void outside the spacecraft.

## ON THE COVER

Model of the Gemini overshadows its predecessor, the Mercury spacecraft at left. Extra fuel and equipment for flights of up to two-week duration are carried in two detachable modules behind the 7½-by-12-foot re-entry module. In the foreground is an adapter for the Agena D rocket that will be linked to the Gemini during rendezvous in space. Small control rockets in the Gemini will use hypergolic fuels, liquids that ignite when brought together. Gemini, or the twins, is a zodiacal constellation and the source of an old Roman oath now corrupted to the expression, "by jimminey."