

APOLLO SATURN V SPACE VEHICLE

Instrument Unit

Third Stage:

1 J-2 engine

200,000 pounds thrust

Second Stage:

5 J-2 engines

1 million pounds thrust

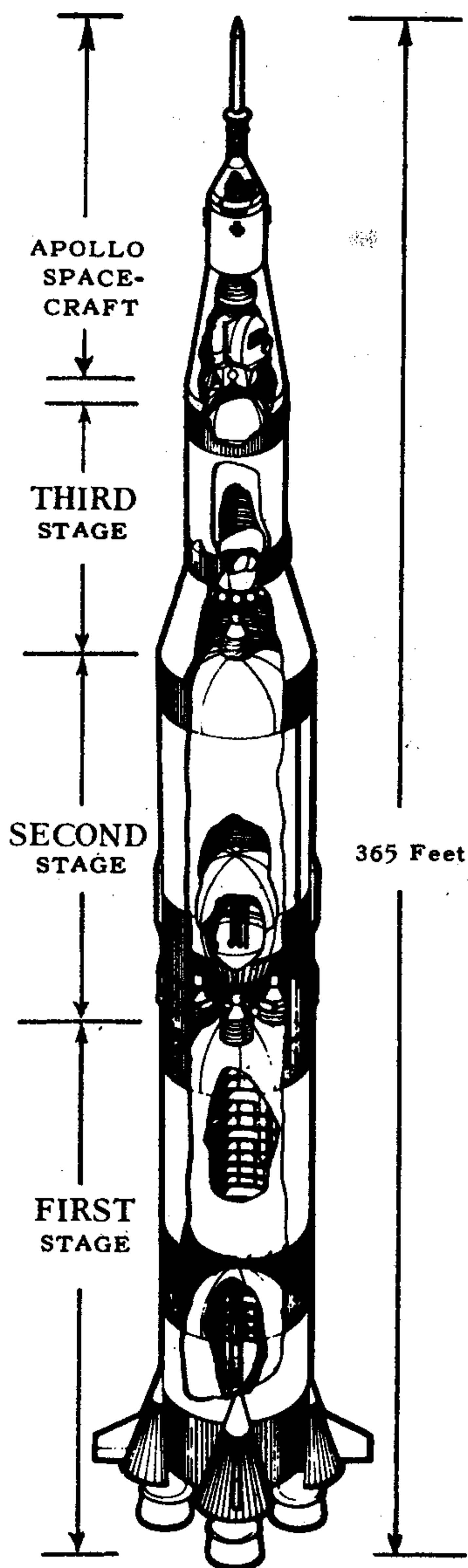
First Stage:

5 F-1 engines

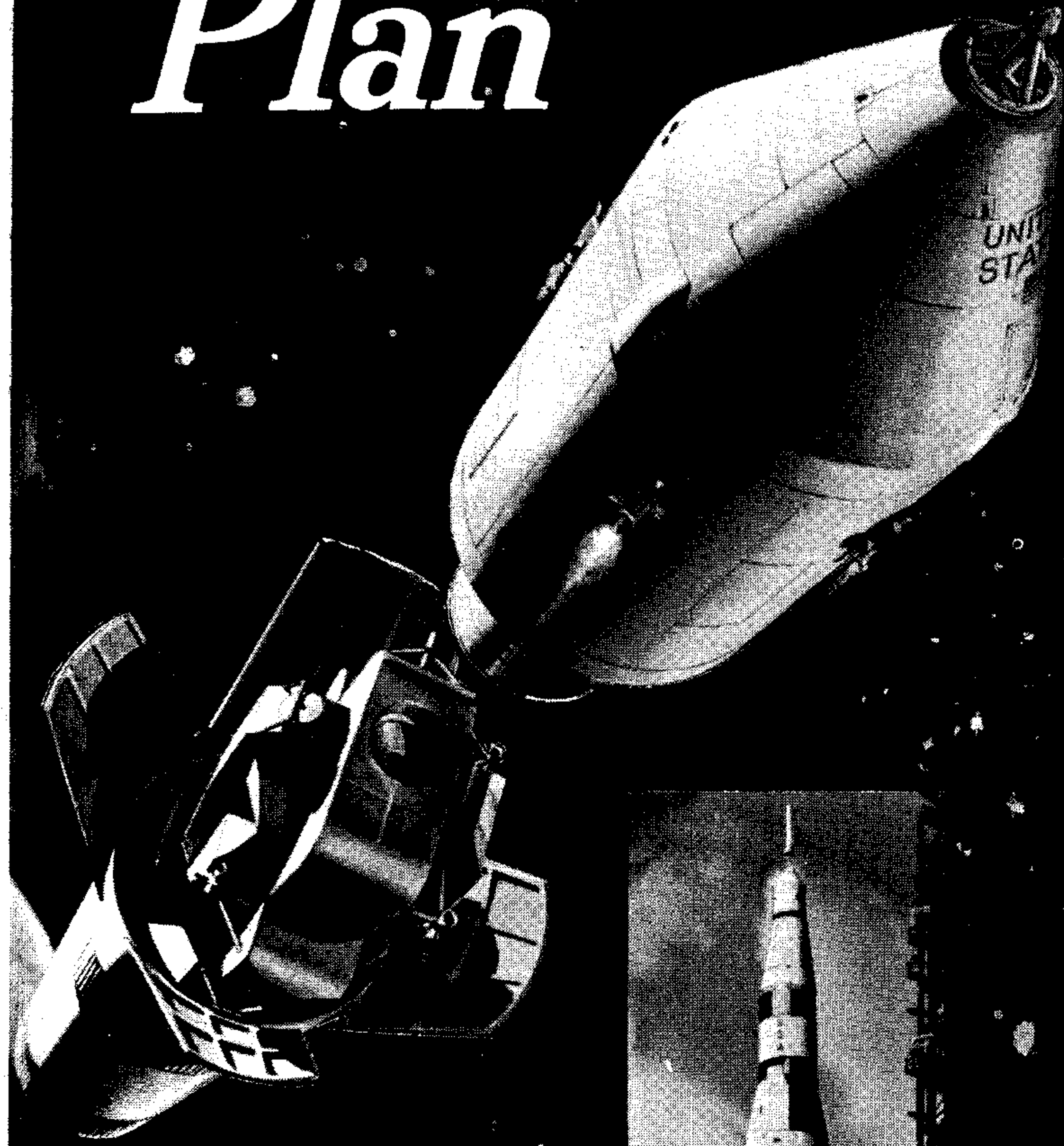
7.5 million pounds thrust

Lift-off weight:

6 million pounds



Lunar Flight Plan



MANNED FLIGHT AWARENESS

Hundreds of thousands of Americans are working on components of the Saturn V launch vehicle. Each member of this team must seek perfection. This individual perfection, when mated together into the vehicle on the launch pad, will assure a successful flight. The prestige of the nation, lives of our Apollo astronauts, and our ultimate space success depend upon a willingness of each person to do his job to the best of his ability every day.

MARSHALL SPACE FLIGHT CENTER • HUNTSVILLE, ALA.

*Man's
Greatest
Adventure*

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

"...I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to earth."

President John F. Kennedy
May 25, 1961



*"...landing a man on
and returning him*

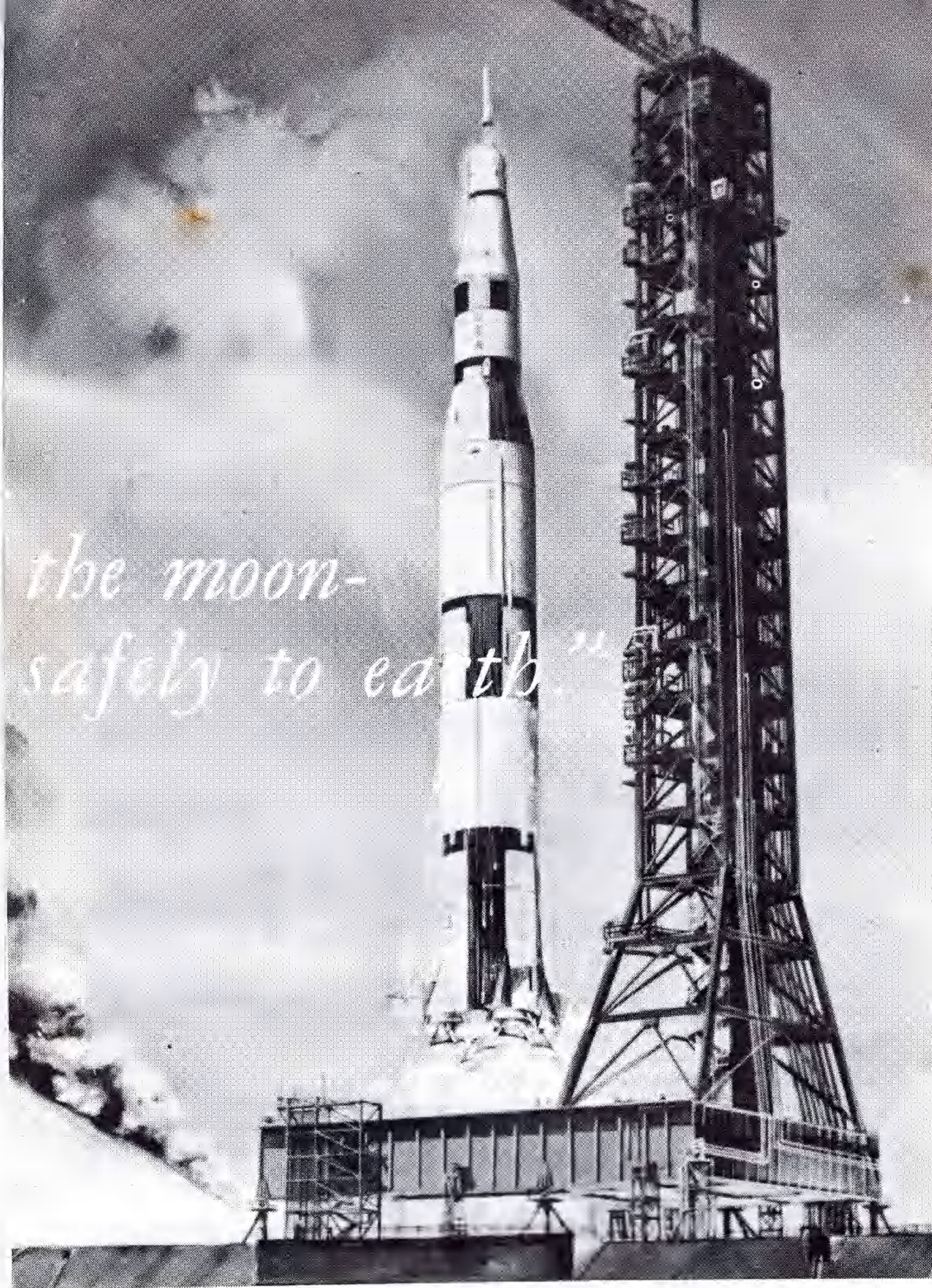
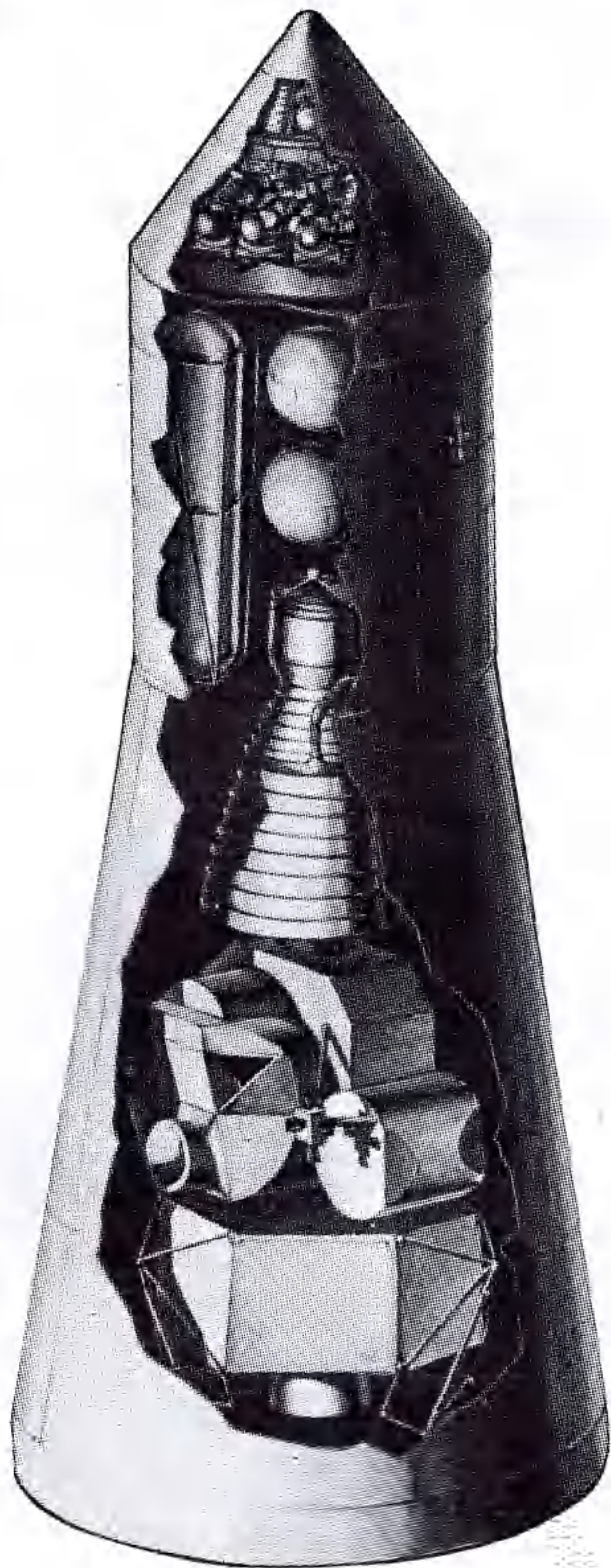
*the moon-
safely to earth."*

In the following pages, the lunar orbit rendezvous method, selected by United States engineers and scientists as the best way to land men on the moon, is explained in simplified terms from launch to recovery.

Three astronauts will undertake the lunar expedition, which will last about eight days.

Their Apollo spacecraft consists of three modules.

1. The command module, with three side-by-side contour couches, houses the astronauts for most phases of the journey.
2. The service module has a rocket engine and abundant fuel for mid-course maneuvering, deboosting into lunar orbit, and for return to earth.
3. The lunar module descends from lunar orbit, lands on the moon's surface, and the upper portion returns to lunar orbit.

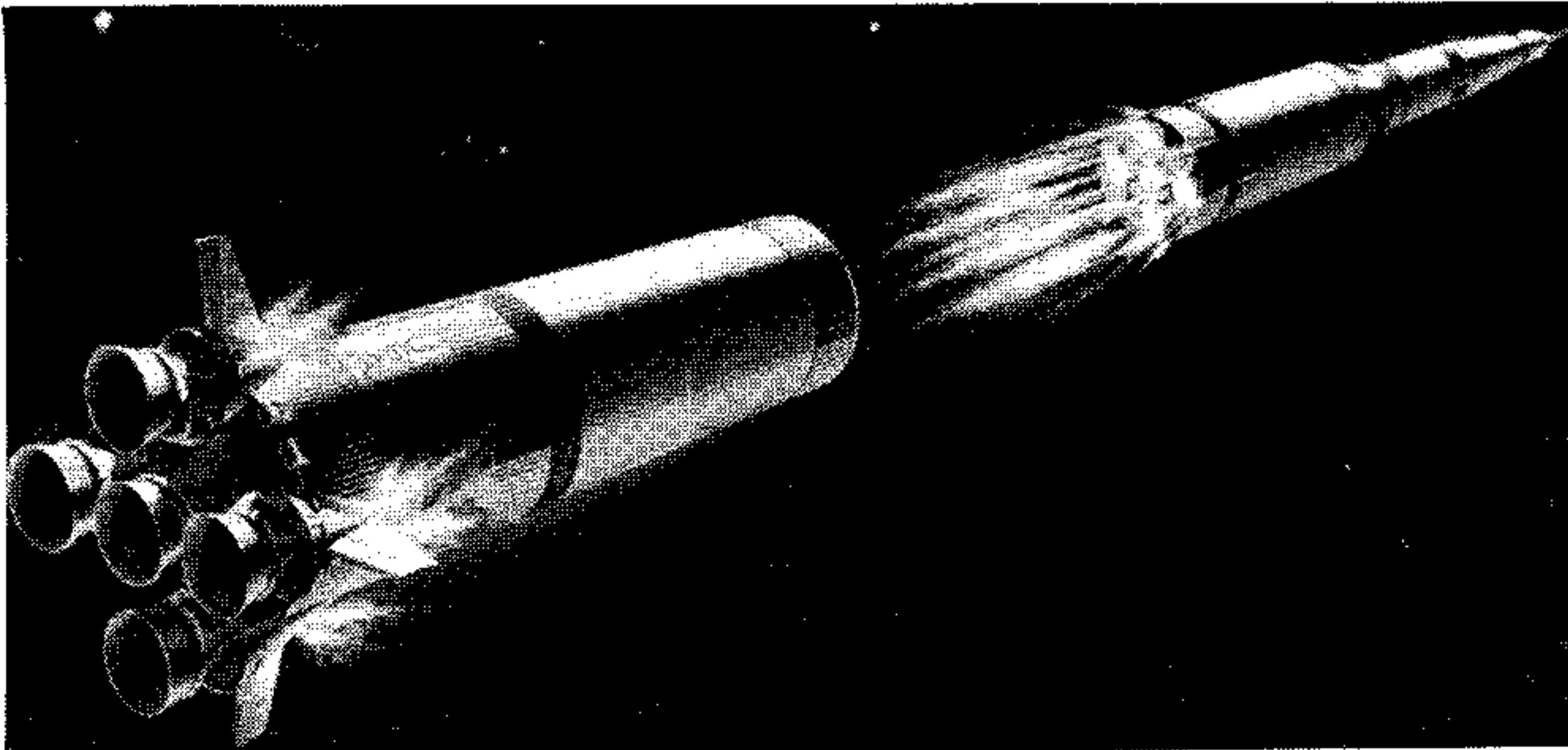


SATURN V LIFT-OFF

With three astronauts aboard, the 365-foot Saturn V blasts off from the NASA-Kennedy Space Center, Florida. The first stage develops 7.5 million pounds thrust to start the three Americans on man's most fantastic expedition. The Saturn/Apollo vehicle has been several years in development, requiring the talents of hundreds of thousands of persons in government and industry. The Marshall Center at Huntsville is responsible for the rocket; the Manned Spacecraft Center at Houston for the spacecraft, astronaut training, and mission control; and the Kennedy Space Center for assembly and launch.

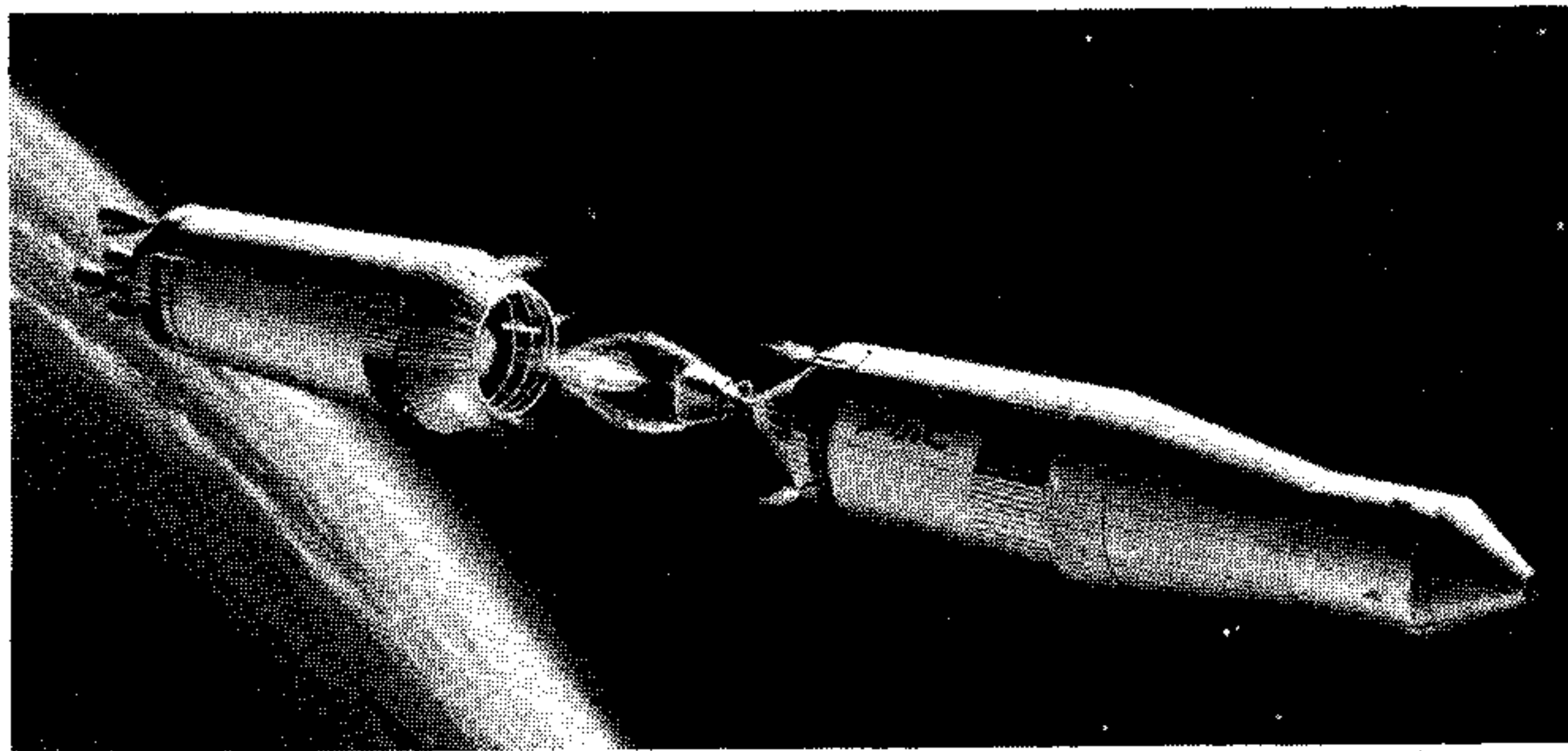
DOCKING IN TRANSIT

SECOND STAGE IGNITION



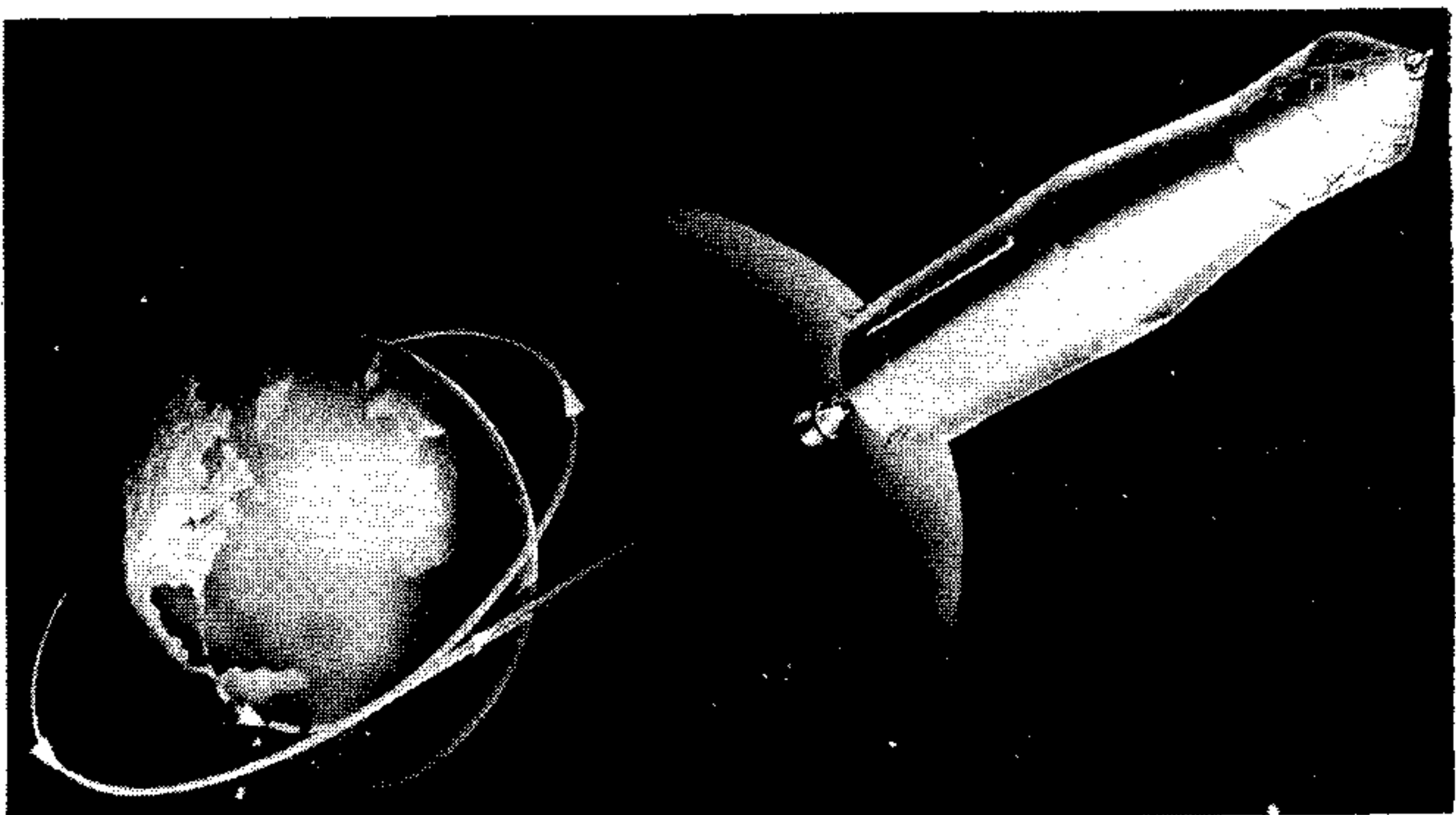
The first stage drops away after about 2½ minutes and the one million-pound thrust second stage ignites.

THIRD STAGE IGNITION



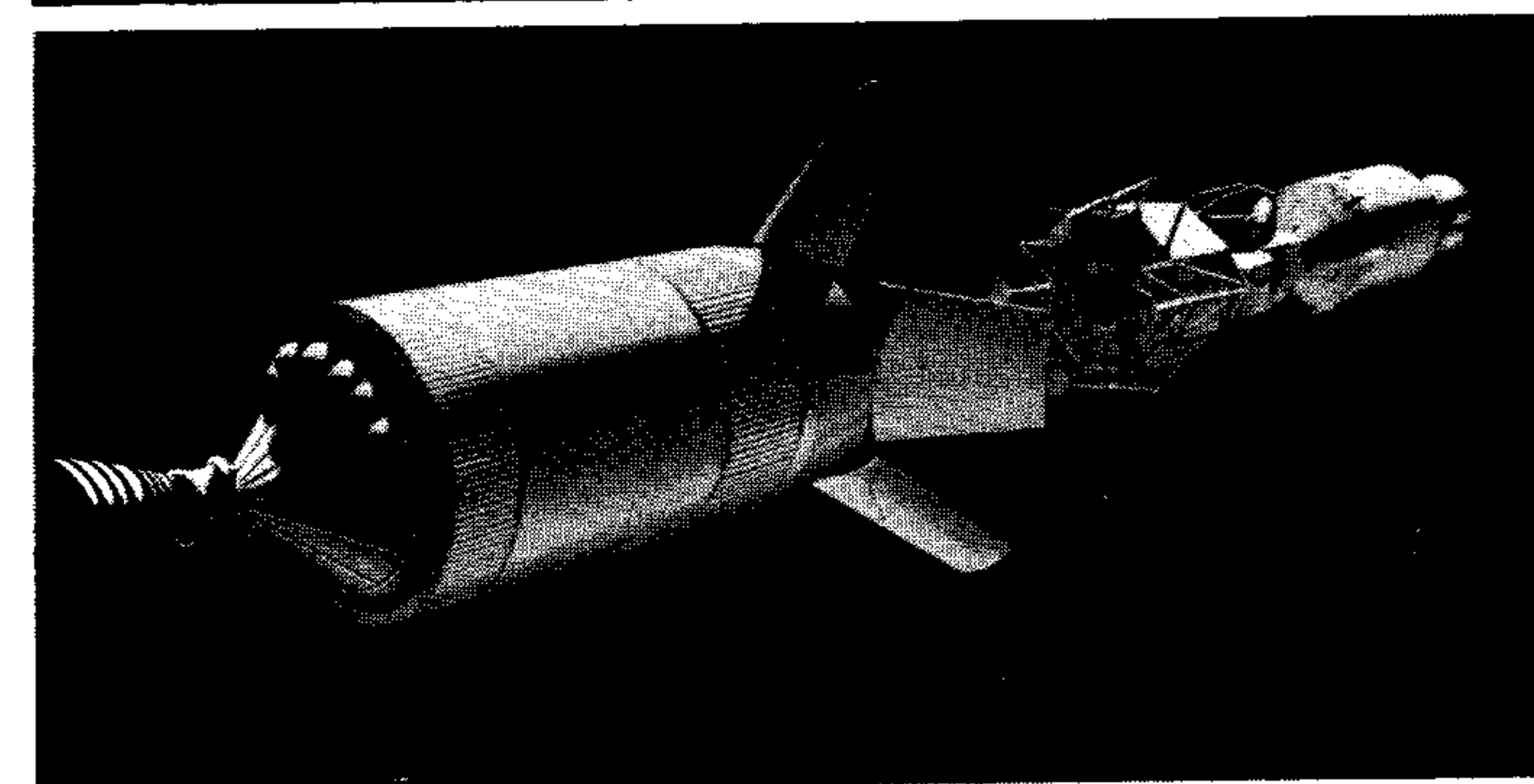
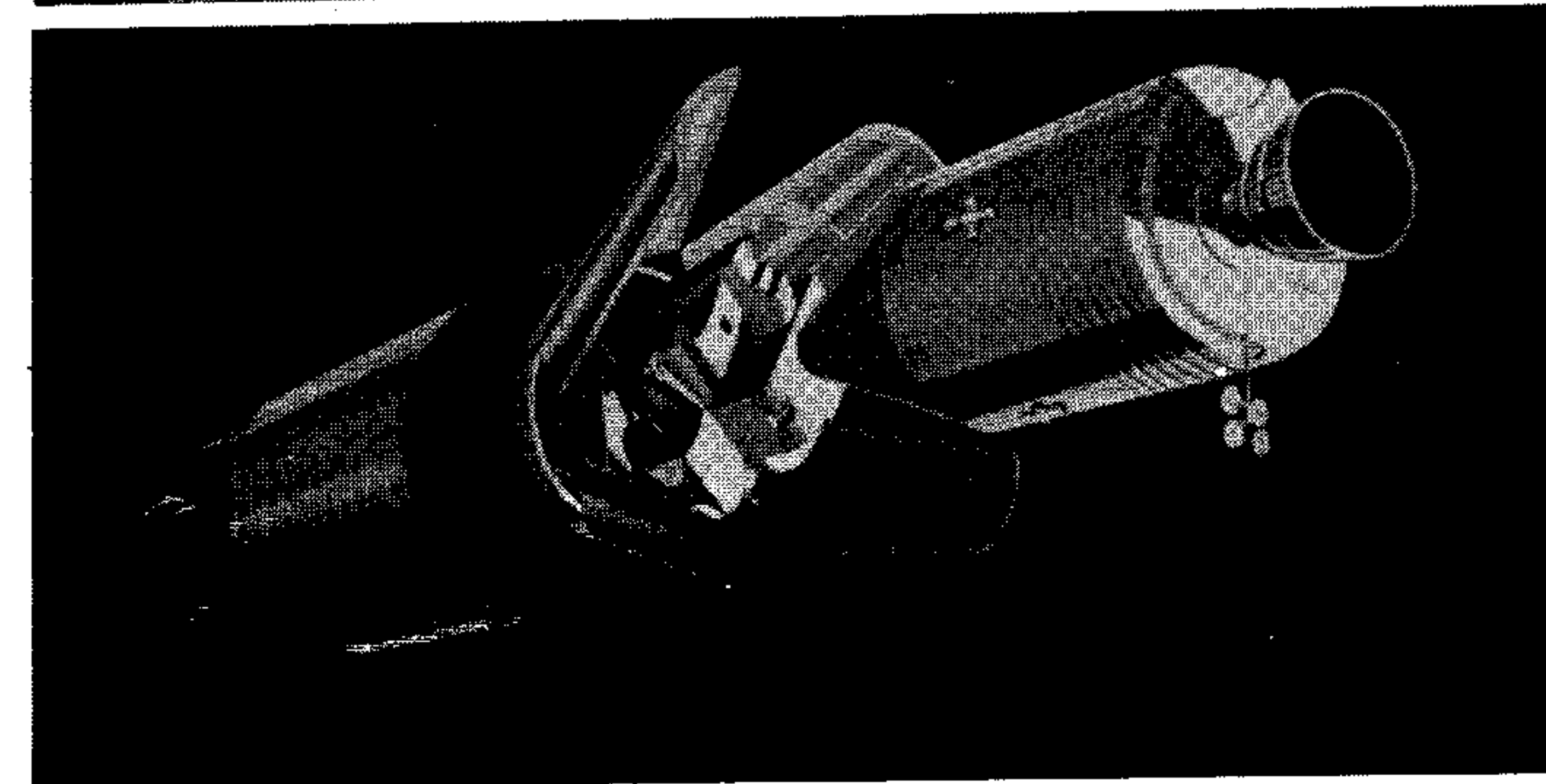
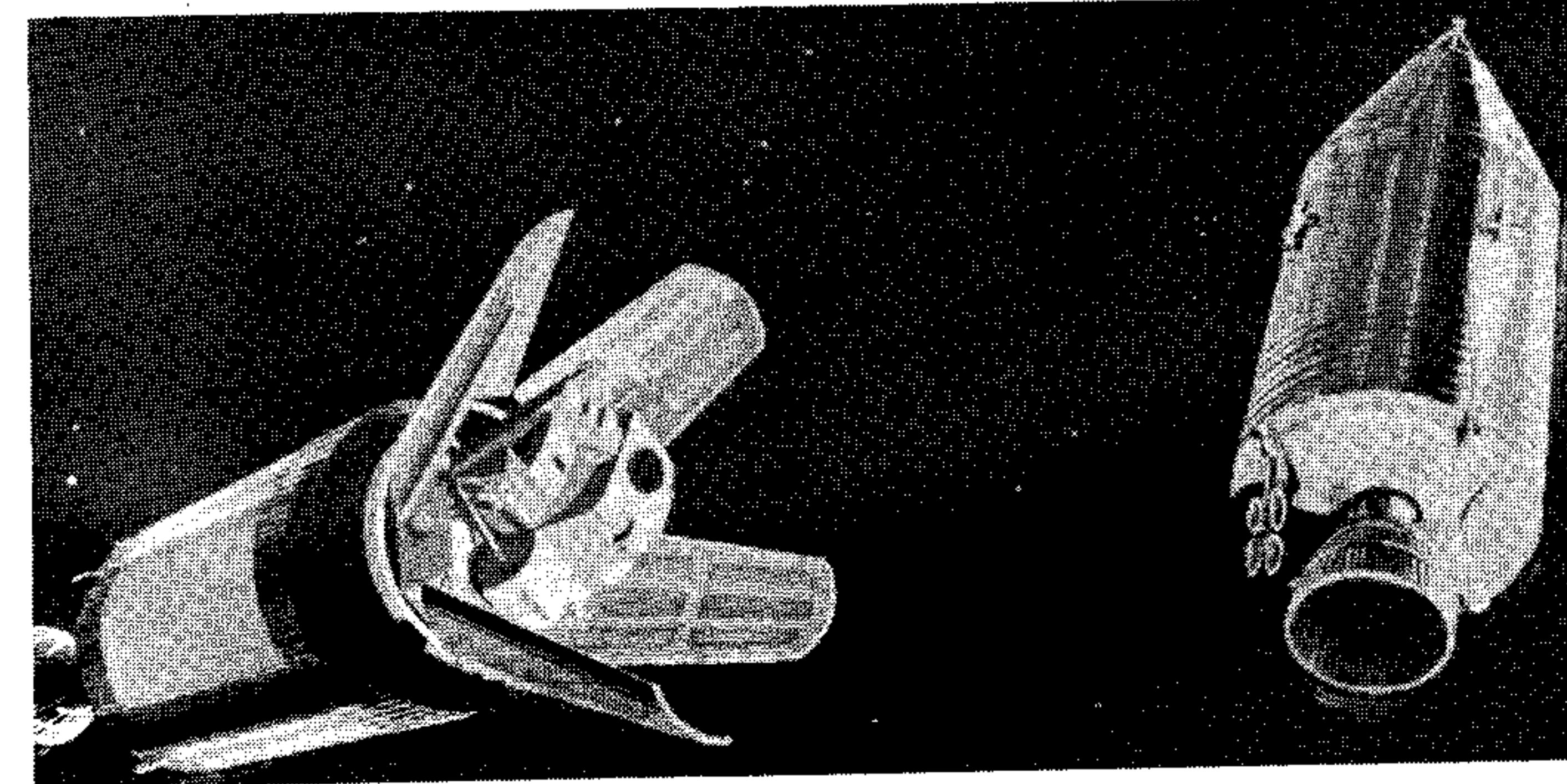
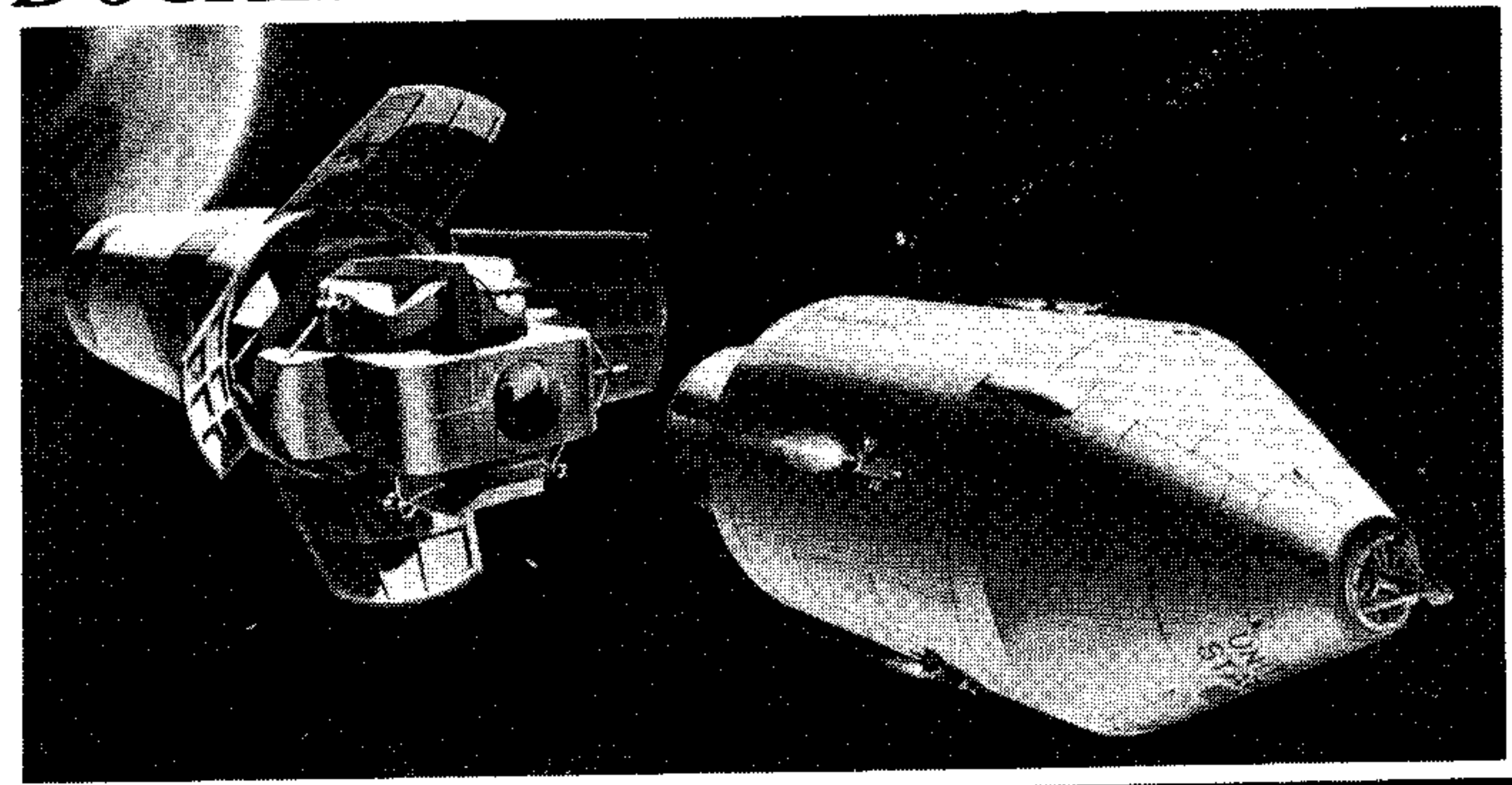
The second stage burns out and drops away after about 6½ minutes, and the 200,000-pound-thrust third stage ignites.

PARKING ORBIT, LUNAR TRAJECTORY



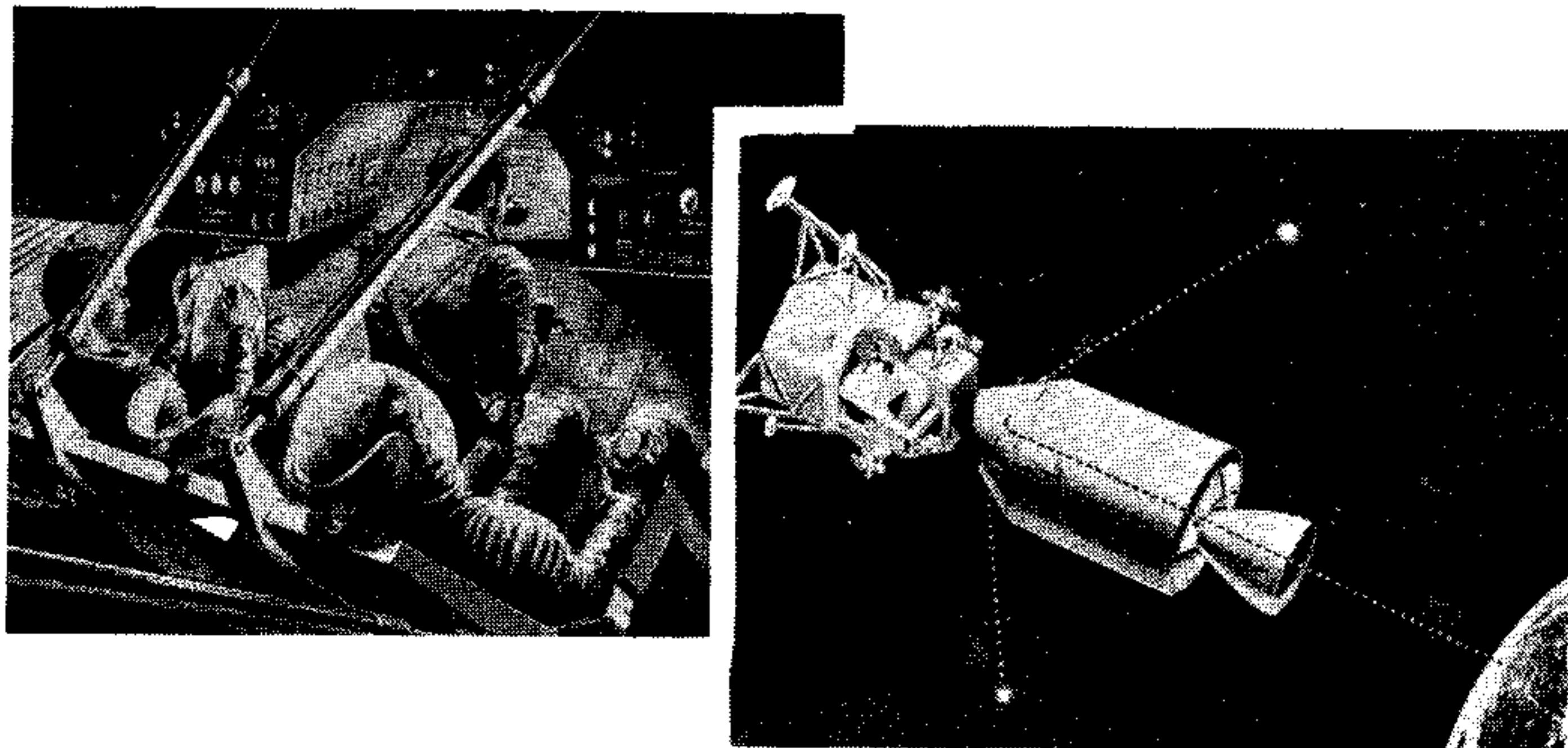
The third stage burns about 2 minutes, and places itself and the spacecraft into an earth "parking" orbit.

After a thorough checkout of men and equipment, the "go ahead" is given and the third stage re-ignites at the proper time to reach earth escape velocity.



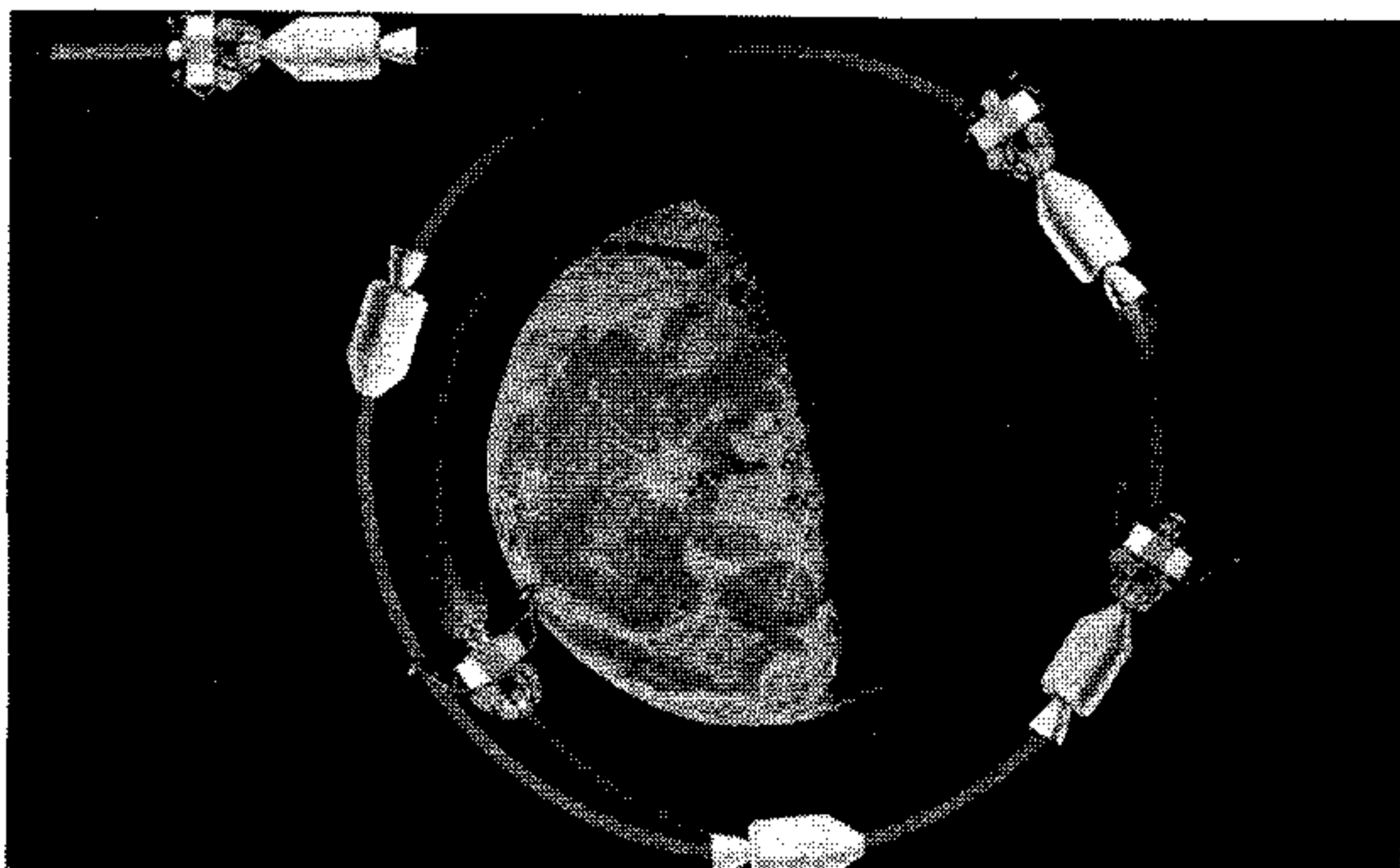
As the spacecraft and third stage coast toward the moon, the combined command and service modules push away, turn around in space, dock with the lunar module, and pull the lunar module away from the third stage.

MIDCOURSE MANEUVER



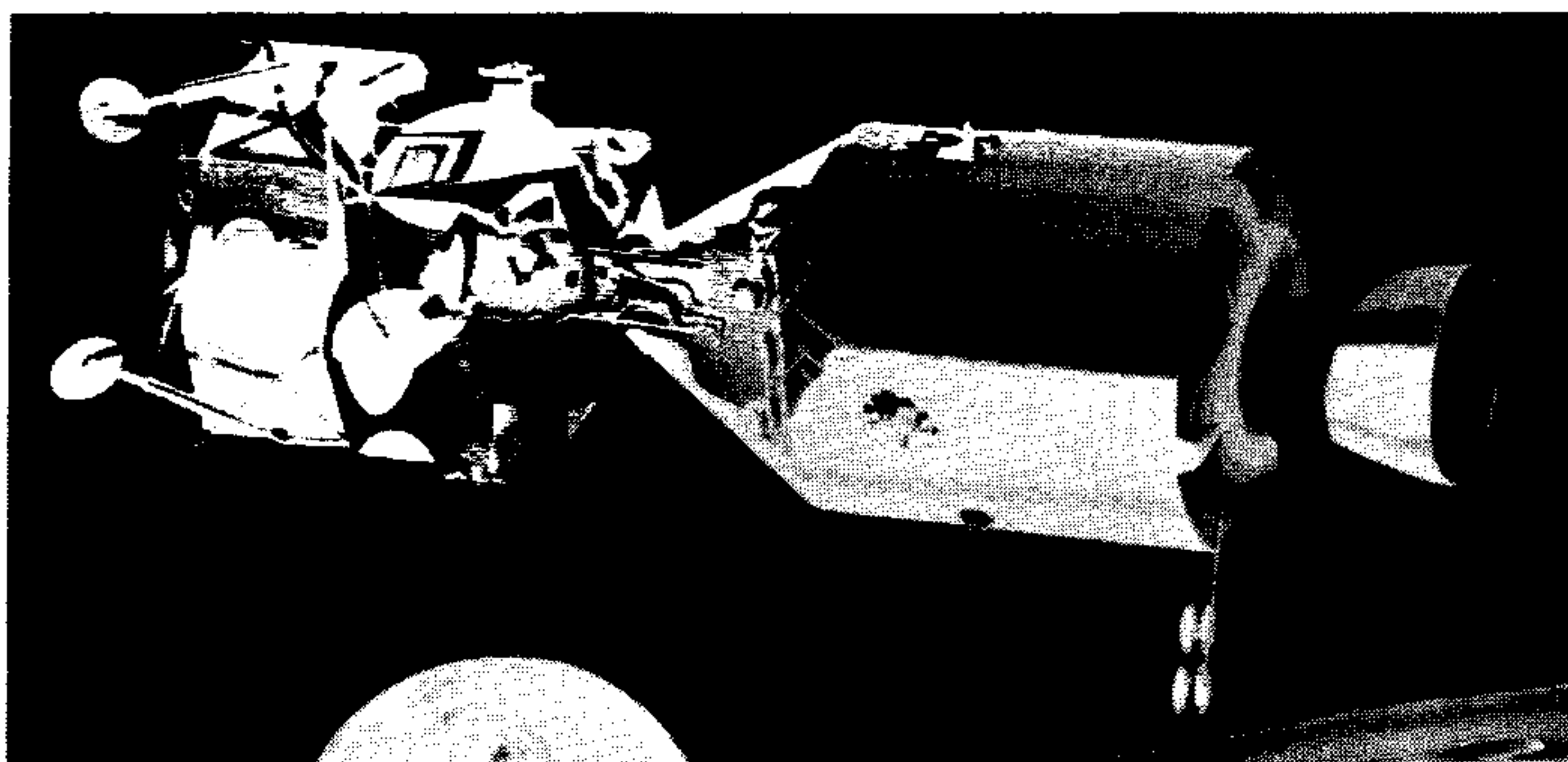
Astronauts inside the command module determine their course and, if necessary, fire the service module engine to make the proper corrections. They are now coasting toward the moon.

ENTERING LUNAR ORBIT

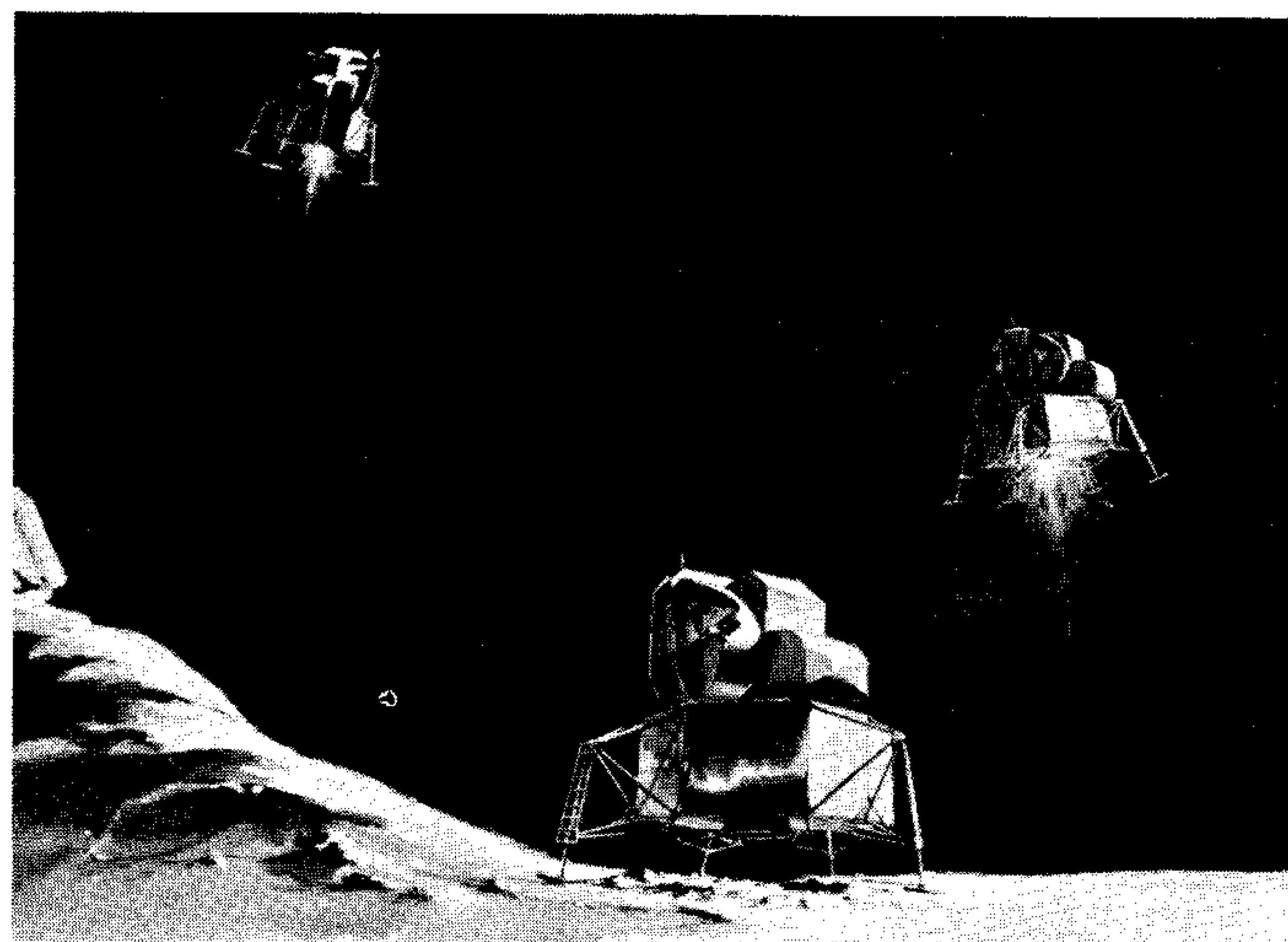


Approaching the moon, the service module engine -- now pointed in the direction of the moon -- is fired for about six minutes to brake the spacecraft into a circular lunar orbit.

TRANSFER TO LUNAR MODULE



After the orbit is firmly established, and all systems pass another checkout, two of the astronauts crawl through the docking hatch into the lunar module. The module uncouples from the "mother" ship and begins the landing maneuver.



LANDING MANEUVER

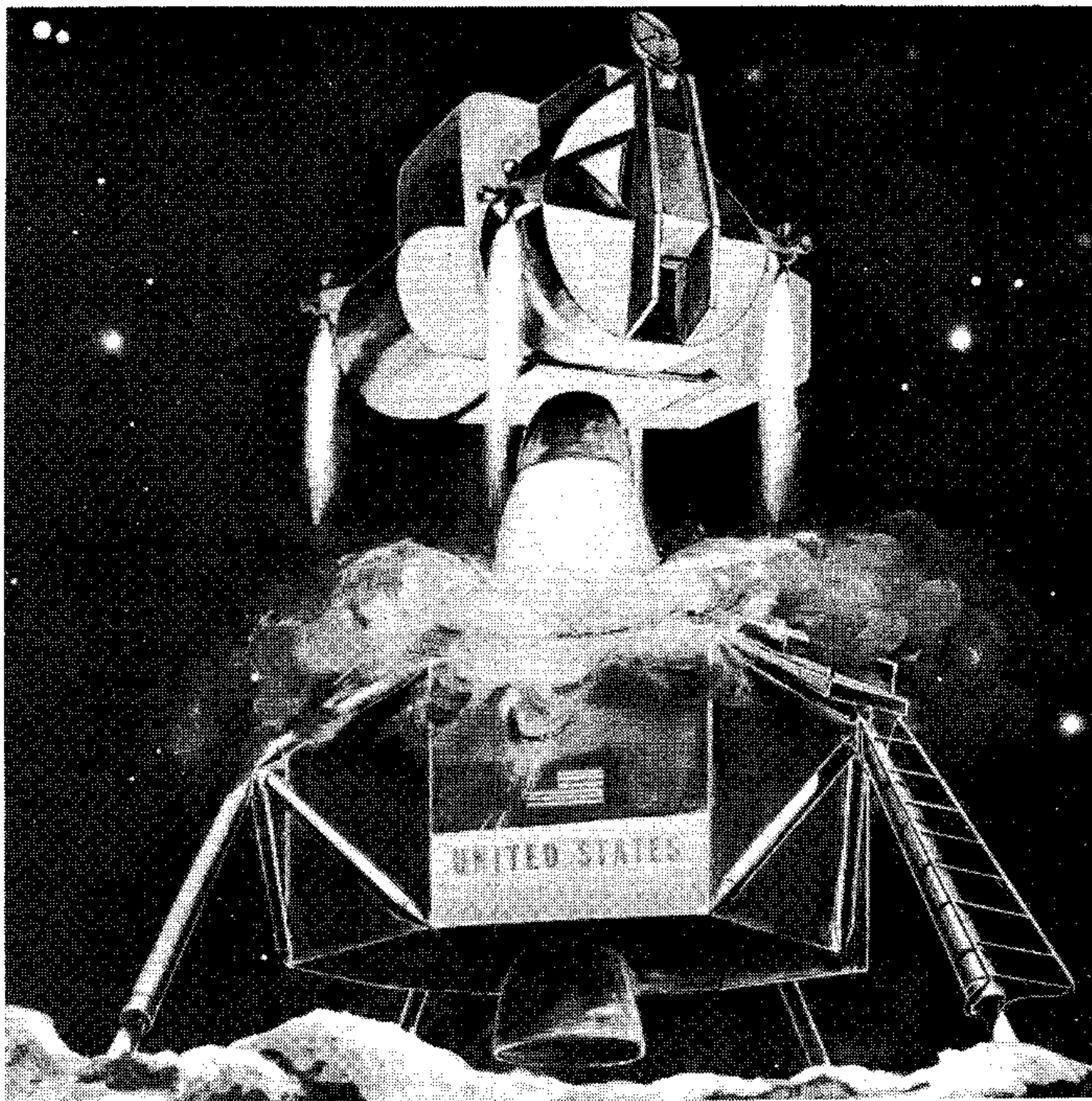
The engine in the landing stage is fired up to lower the astronauts toward the lunar surface. The descent engine allows the astronauts to maneuver horizontally and vertically, like a helicopter, in making the lunar touchdown.



ON THE MOON'S SURFACE

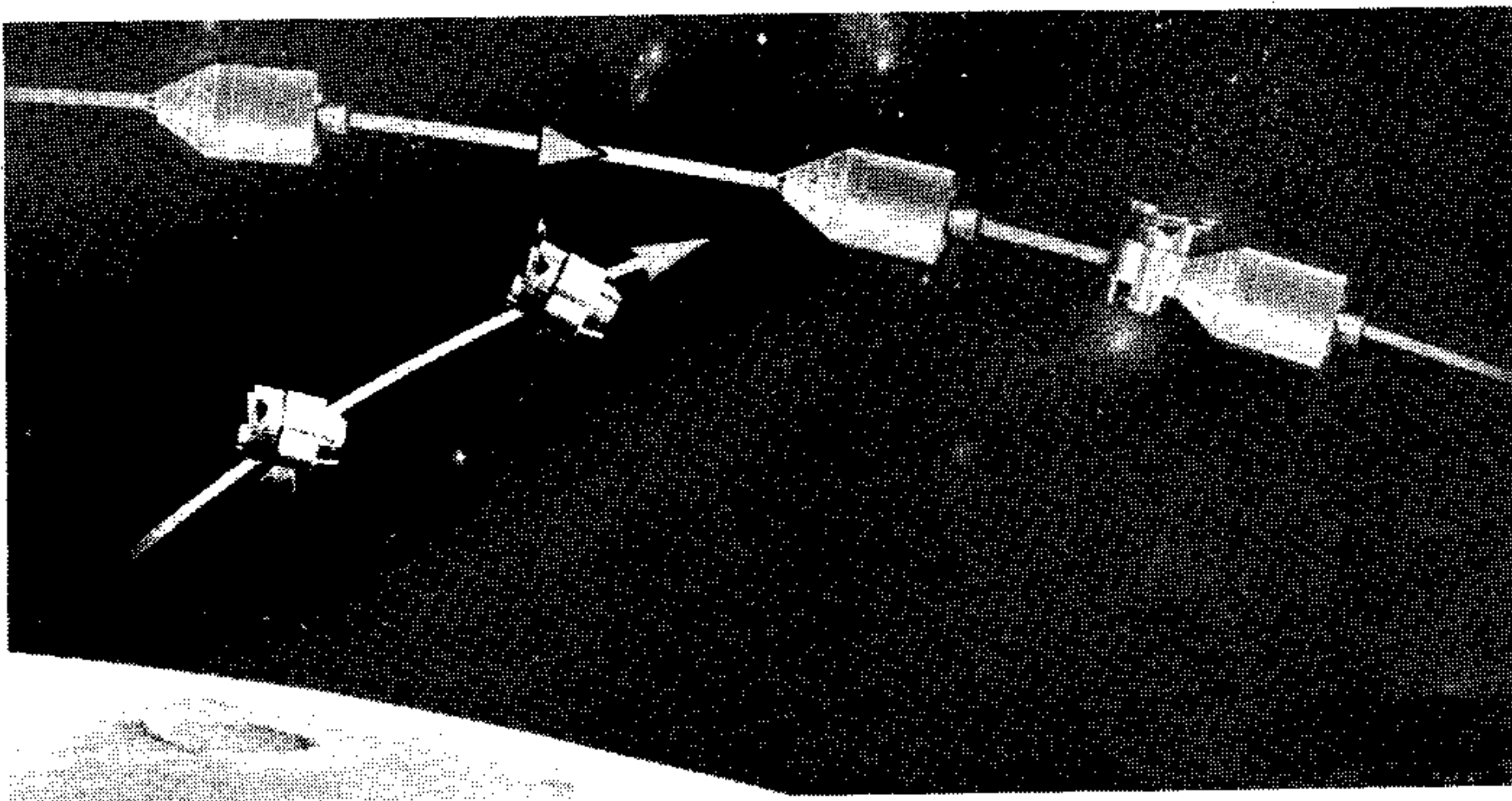
The astronauts disembark together. They will probably make two excursions outside the vehicle. They will make photographs, collect samples, and conduct other experiments. A "live" television broadcast to earth is planned. Experiment packages will be left on the moon that will send information back to earth for several months.

LIFT OFF FROM THE MOON



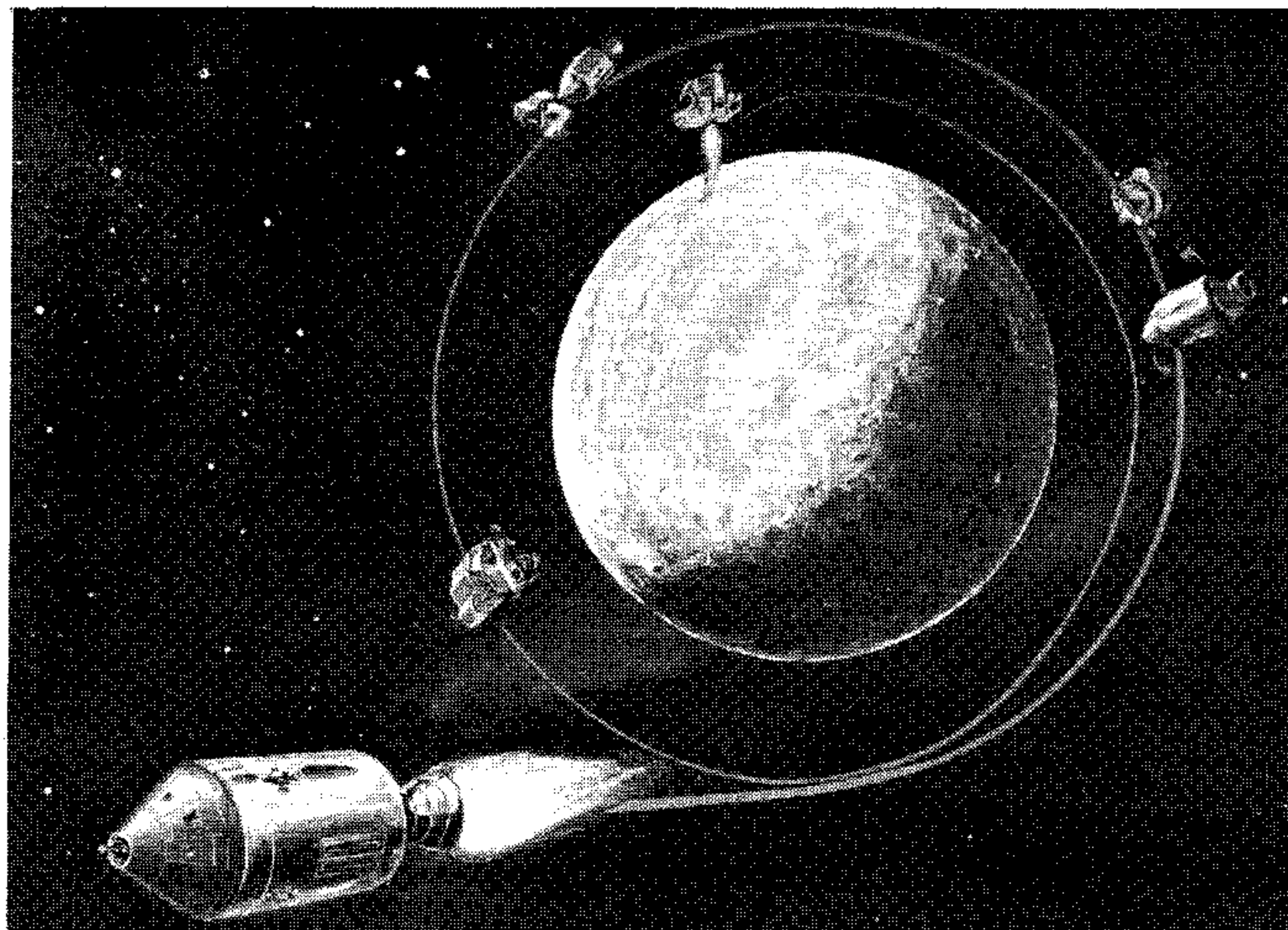
Leaving the lunar surface, the landing stage of the module serves as a launch pad for the module's ascent stage. The launch must be timed so that the two astronauts meet the command and service module "mother" ship, which has remained in lunar orbit with the third astronaut aboard.

ORBITAL RENDEZVOUS



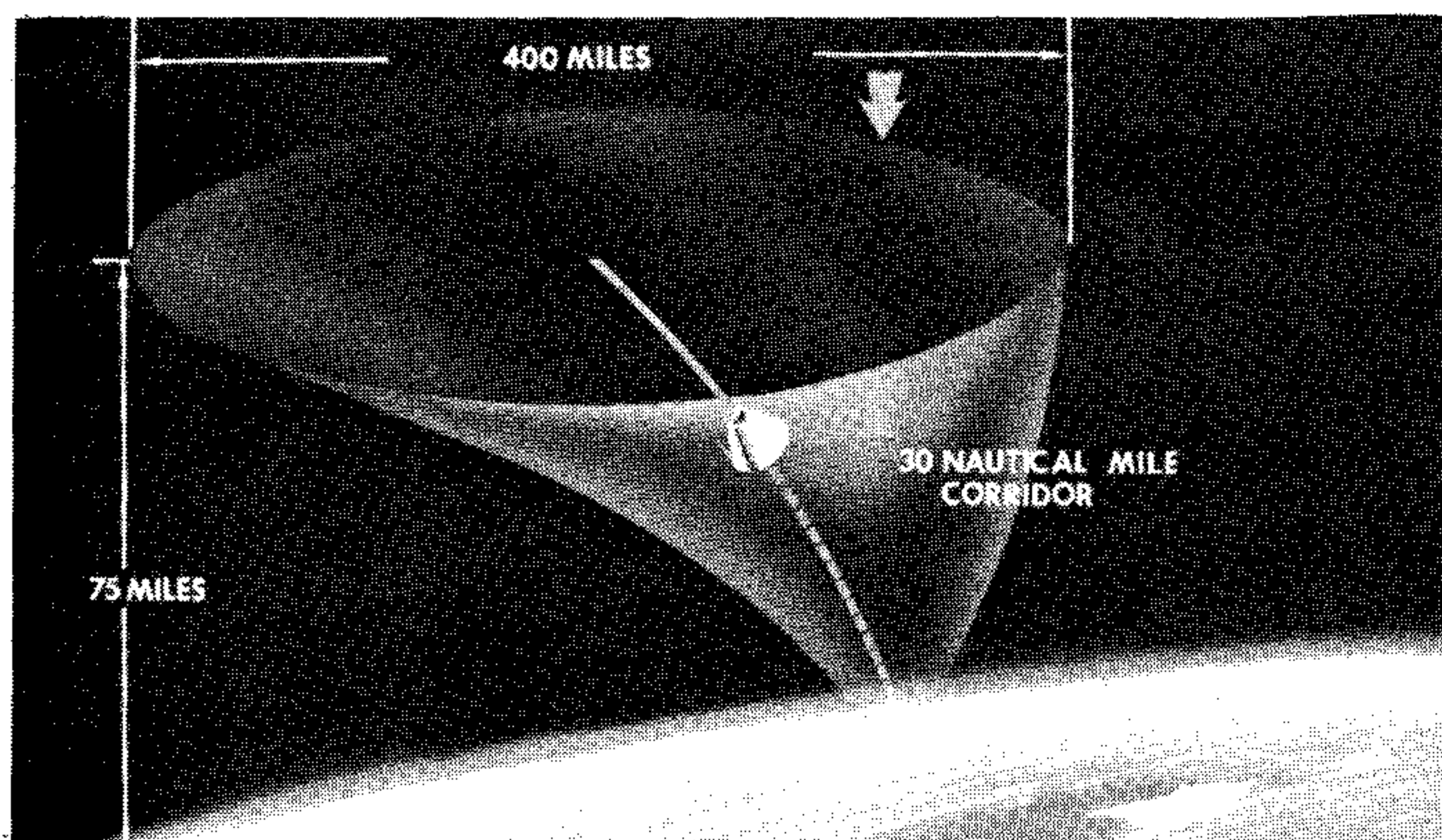
The astronauts rendezvous with the mother ship and, after link-up, crawl back into the command module. The empty lunar module is separated and left in lunar orbit.

LEAVING LUNAR PARKING ORBIT



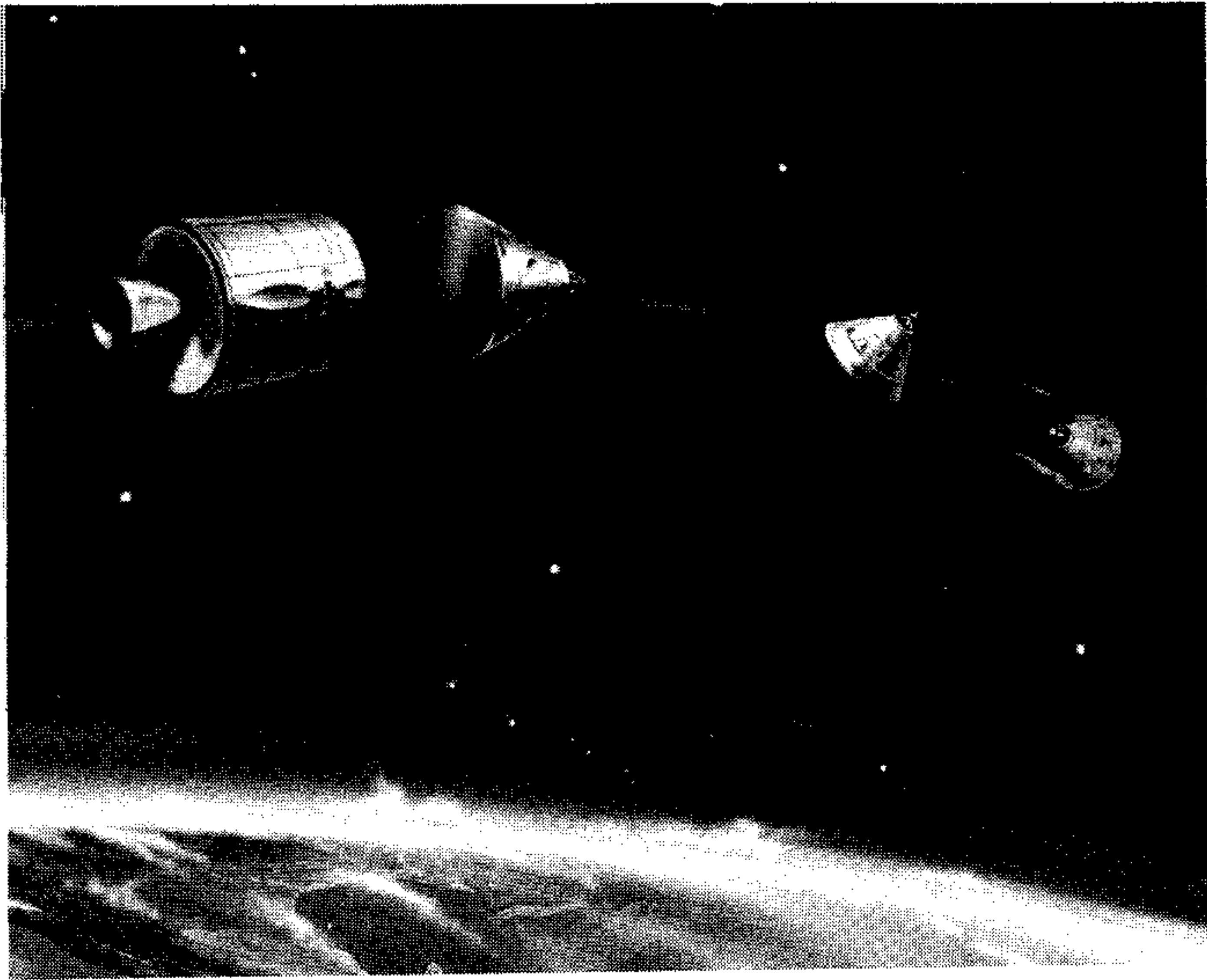
After another checkout, the service module engine is ignited, pushing the spacecraft away from the moon into a trajectory toward the earth.

REENTRY CORRIDOR



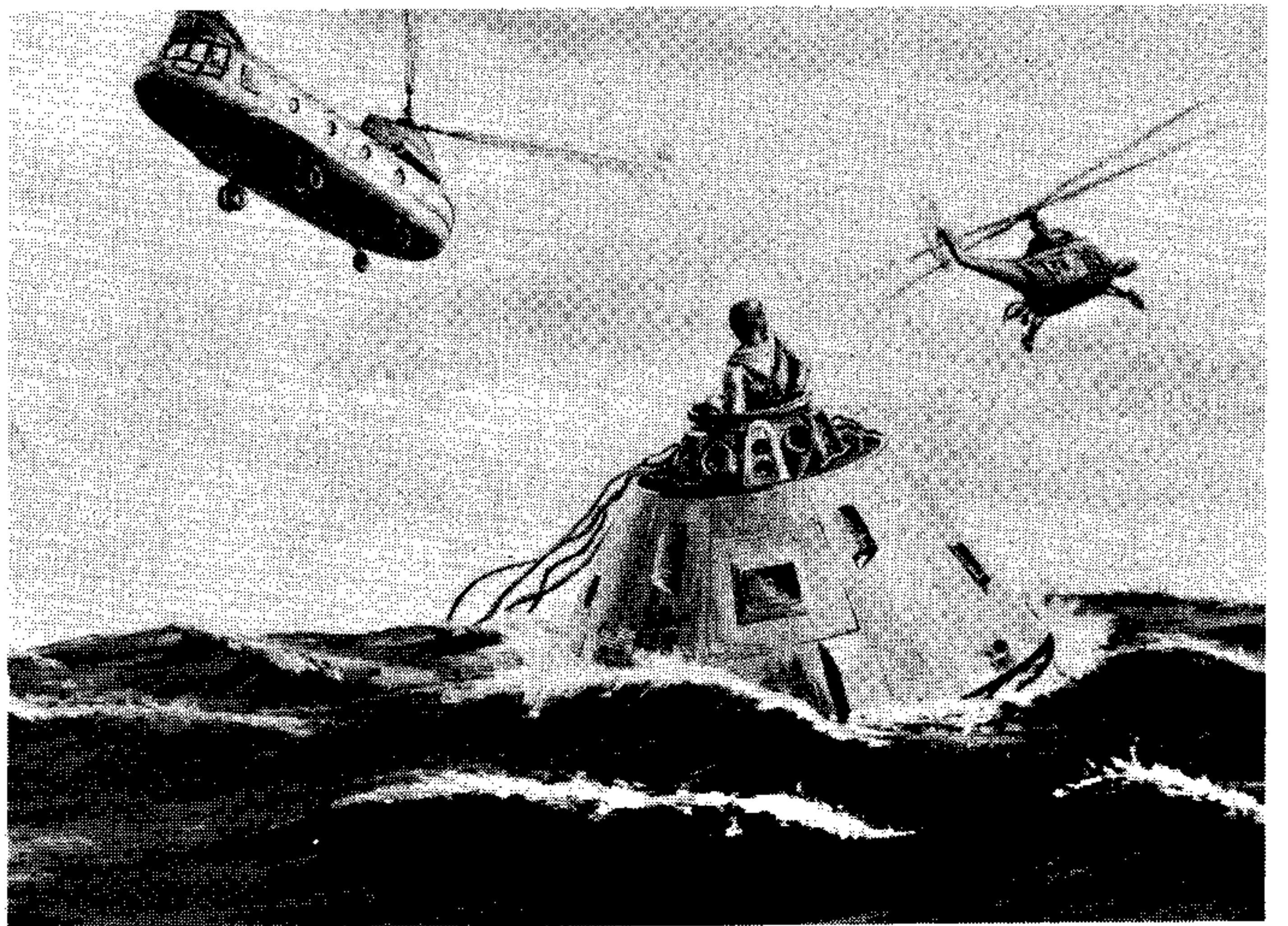
High precision is necessary in the approach back to earth. Too shallow an approach and the earth might be missed entirely; too steep an approach and the spacecraft might plunge directly into the atmosphere and burn.

APOLLO REENTRY SEQUENCE



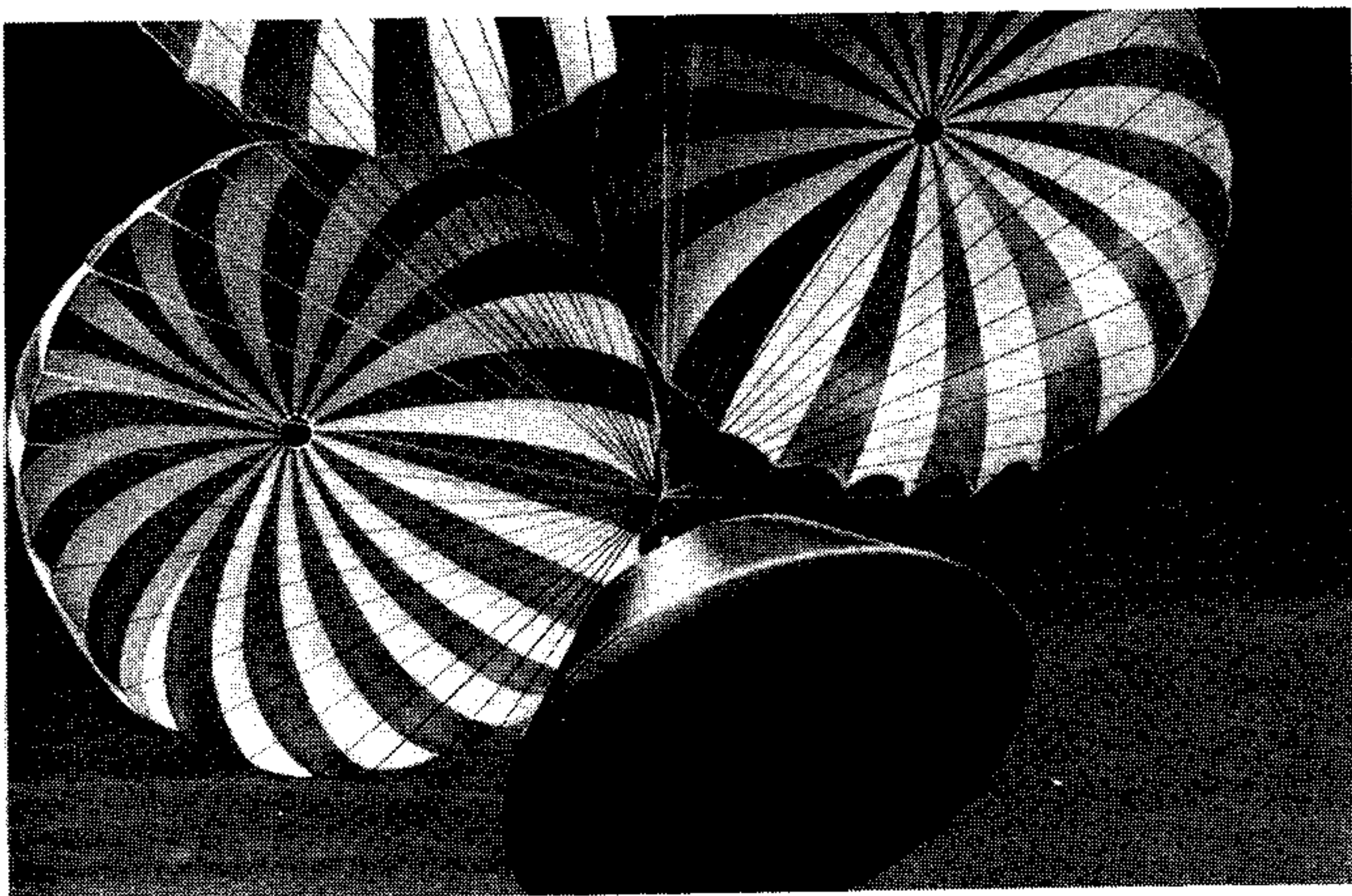
Prior to entering the earth's atmosphere, the service module is jettisoned. The command module turns around, facing its blunt end with heat shield forward.

RECOVERY



The landing and recovery will be made on water and recovery crews will take over as in previous manned flights. Here, the historic expedition splashes back into the ocean. Pick up helicopters hover nearby.

DESCENT



The atmosphere slows the incoming spacecraft, and three large parachutes float it to earth.



"One of the most significant milestones in space exploration... will be a manned lunar landing. I think none of us today can really imagine just how significant that day will be in the eyes of future generations. The nation with the vision, the capability, and the determination to achieve it will be recognized for its leadership as long as the history of man is recorded."

Dr. Wernher von Braun