

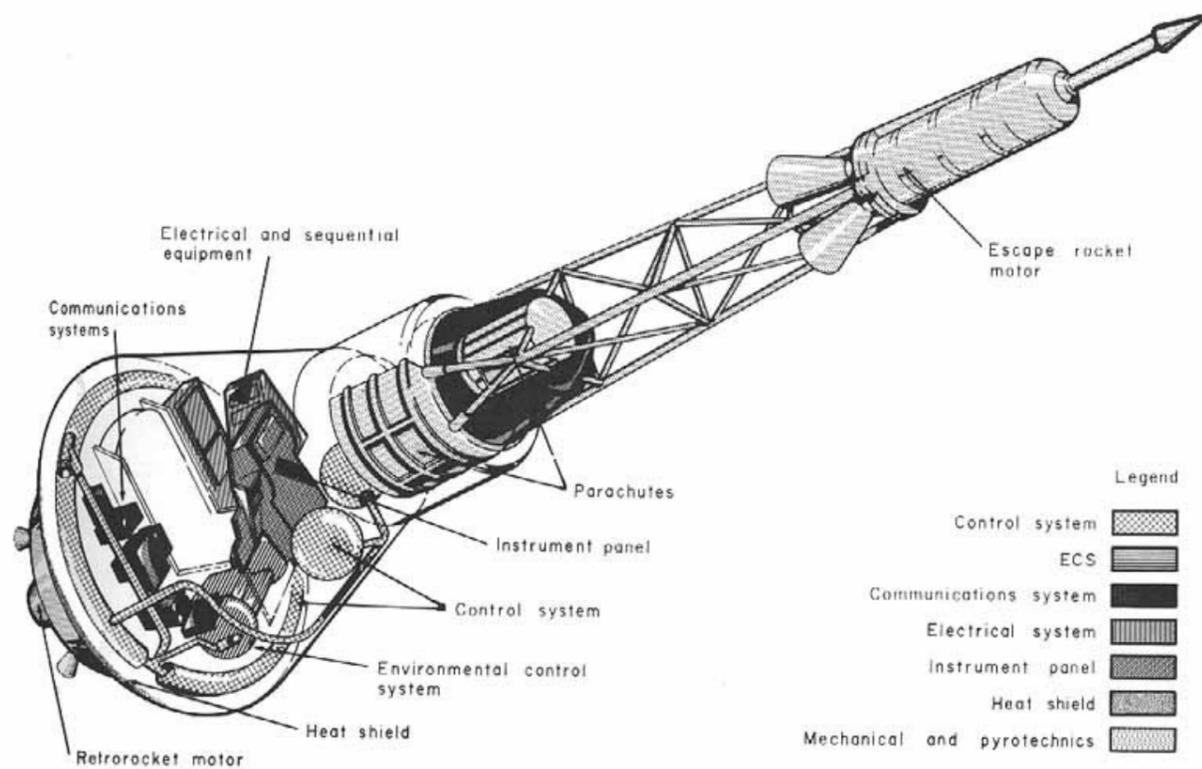
## Redstone—Mercury

Project Mercury was the NASA program that put the first American astronauts in space. Astronauts made a total of six spaceflights during Project Mercury, of which two reached space and came right back down. These are called suborbital flights and were made using the Redstone rocket as a launch vehicle. The other four flights were using the Atlas rocket and went into orbit to circle Earth. The first of those six flights was made in 1961, the last in 1963.

NASA chose the U.S. Army's Redstone liquid-fueled ballistic missile for its suborbital flights as it was the oldest one in the US fleet, having been active since 1953 and had many successful test flights. The standard military Redstone lacked sufficient thrust to lift a Mercury capsule into the ballistic suborbital trajectory needed for the project. However, the first stage of the Jupiter-C, which was a modified Redstone with lengthened tanks, could carry enough propellant to reach the desired trajectory. Therefore, this Jupiter-C first stage was used as the starting point for the Mercury-Redstone design.

The most important change in making the Mercury-Redstone a suitable vehicle for an astronaut was the addition of an automatic in-flight abort sensing system. In an emergency where the rocket was about to suffer a catastrophic failure, an abort would activate the launch escape system attached to the Mercury capsule, which would rapidly eject it from the booster. Either the astronaut or the ground controllers could initiate an abort manually.





The Mercury space capsule was built by McDonnell Aircraft, and carried supplies of water, food and oxygen for about one day in a pressurized cabin. The spacecraft's principal designer was Maxime Faget, who started research for manned spaceflight during the time of the NACA. With 100 cubic feet (2.8 m<sup>3</sup>) of habitable volume, the capsule was just large enough for a single crew member. Inside were a mere 120 controls: 55 electrical switches, 30 fuses and 35 mechanical levers. The Mercury spacecraft did not have an on-board computer, instead relying on all computation for reentry to be calculated by computers on the ground, with their results (retrofire times and firing attitude) then transmitted to the spacecraft by radio while in flight. All computer systems used in the Mercury space program were housed in NASA facilities on Earth.

Mercury flights were launched from Cape Canaveral Air Force Station in Florida. The capsule was fitted with a launch escape rocket to carry it safely away from the launch vehicle in case of a failure. The flight was designed to be controlled from the ground via the Manned Space Flight Network, a system of tracking and communications stations; back-up controls were outfitted on board. Small retrorockets were used to bring the spacecraft out of its orbit, after which an

Overleaf: Mercury-Redstone 2 (MR-2) launch with chimpanzee Ham aboard, 31 January 1961. Monkeys had been flown into space before, but Ham was the first higher primate to test a spacecraft.  
Credit: NASA

ablative heat shield protected it from the heat of atmospheric reentry. Finally, a parachute slowed the craft for a water landing. Both astronaut and capsule were recovered by helicopters deployed from a U.S. Navy ship.

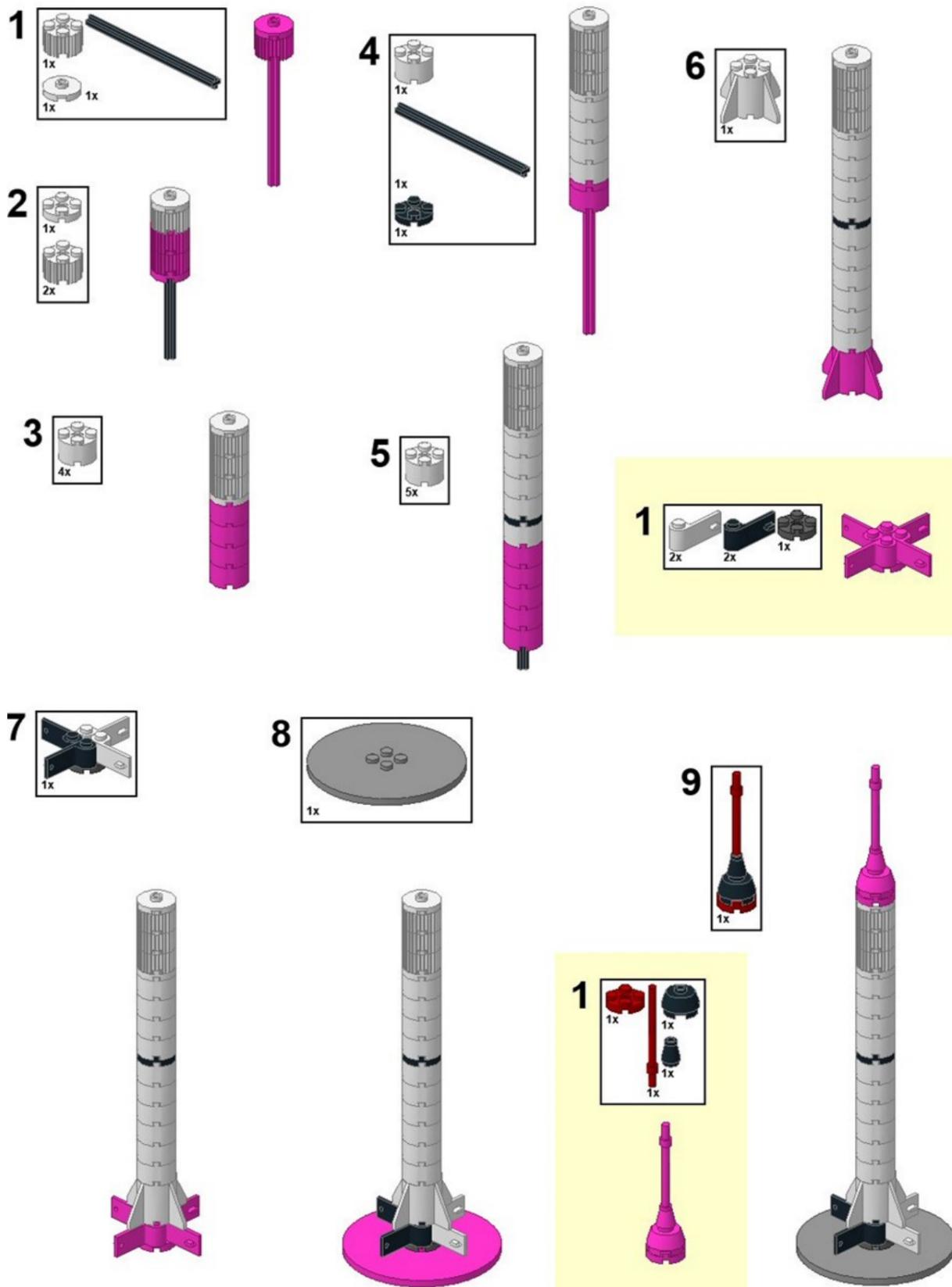
The Mercury project gained popularity, and its missions were followed by millions on radio and TV around the world. Its success laid the groundwork for Project Gemini, which carried two astronauts in each capsule and perfected space docking maneuvers essential for manned lunar landings in the subsequent Apollo program announced a few weeks after the first manned Mercury flight. In keeping with the classic theme of naming things, the project was named Mercury after the Roman messenger of the Gods.

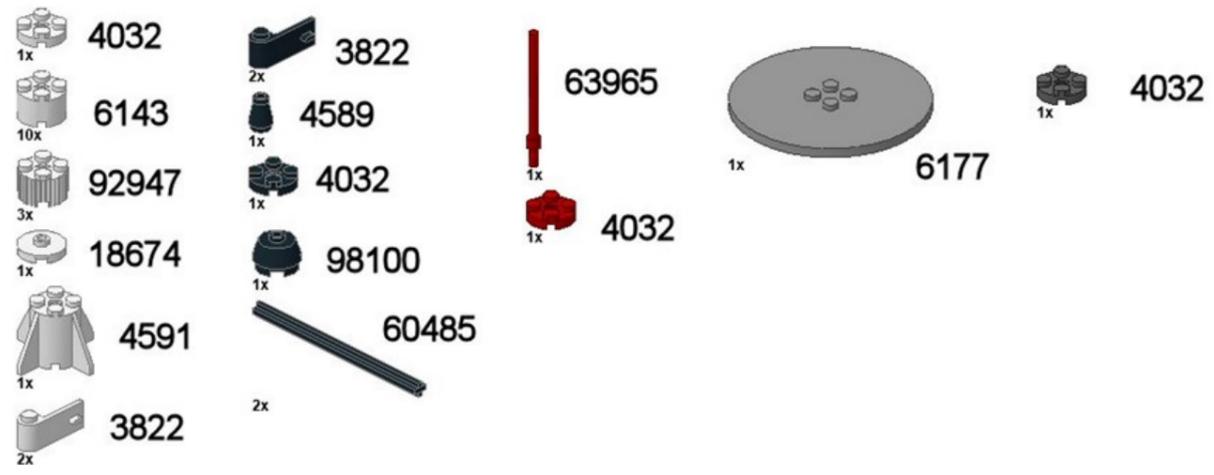


A camera aboard the "Friendship 7" Mercury spacecraft photographs Astronaut John H. Glenn Jr. during the Mercury-Atlas 6 spaceflight, 26 February 1962.  
Credit: NASA

## Datasheet Redstone-Mercury

| General            |   | First stage  |   |
|--------------------|---|--------------|---|
| Name               | Mercury-Redstone Launch Vehicle           | Engines      | 1 Rocketdyne A-7  |
| Function           | Human-rated sub-orbital launch            | Thrust       | 414.34 kN (93,147 lbf)  |
| Manufacturer       | Chrysler Corporation                      | Isp          | 235 sec   |
| Country of origin  | United States                             | Burn time    | 155 seconds   |
| Cost per Launch    | 4.930 million.                            | Fuel         | LOX/ethyl alcohol   |
| Family             | Redstone                                  | Gross mass   | 28,440 kg (62,690 lb)   |
| <b>Size</b>        |   | Empty mass   | 3,125 kg (6,889 lb)   |
| Height             | 25.41 m (83.38 ft)                        | Length       | 17.58 m (57.67 ft)  |
| Diameter           | 1.78 m (5.83 ft)                          | Diameter     | 1.77 m (5.80 ft)  |
| Width              | 4.19 m (13.74 ft)                         | Model        |   |
| Mass               | 30,000 kg (66,000 lb)                     | Year Created | 2017  |
| Stages             | 1   | Author       | Grand Passmore  |
| <b>Capacity</b>    |   | Parts count  | 29  |
| Payload suborbital | 1,800 kg (4,000 lb)                       | Diameter     | 4,8 cm  |
| Payload to LEO     | -   | Height       | 22,8 cm   |
| Payload to GEO     |   | Weigth       | 25,8 g  |
| Payload to TLI     |   | Link         | <a href="https://ideas.lego.com/projects/d061bd70-11e7-4805-b5a7-dcfa21d15030/updates?project_updates_page=3">https://ideas.lego.com/projects/d061bd70-11e7-4805-b5a7-dcfa21d15030/updates?project_updates_page=3</a> |
| Payload to escape  |   |              |   |
| Launch history     |   |              |   |
| Status             | Retired                                   |              |   |
| Launch sites       | Launch Complex 5, Cape Canaveral, Florida |              |   |
| Total launches     | 6   |              |   |
| Successes          | 5   |              |   |
| Failures           | 1   |              |   |
| Partial failures   |   |              |   |
| First flight       | November 21, 1960                         |              |   |
| Last flight        | July 21, 1961                             |              |   |
| Notable payloads   | Mercury Capsule                           |              |   |







Copy the graphic and wrap it around your model. Print as a sticker or use a small piece of tape to fixate it in order to give your rocket the markings of the Mercury Redstone.