

Aiming to the Moon

Project Ranger

This essay is dedicated to my wife, Estrella, and daughters, Raquel and Sara, for their help and encouragement throughout this effort.

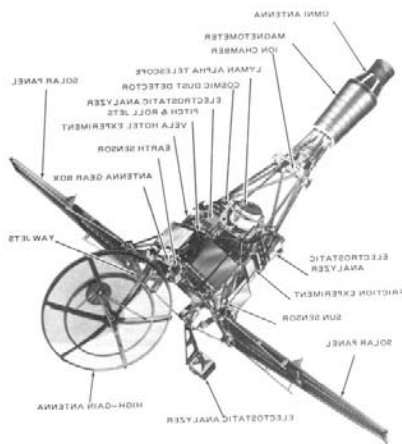
Decision to go the Moon had been taken but our knowledge of our satellite was far from being adequate for such an endeavor and thus, program Ranger was developed, its objective: to obtain close-up images of the lunar surface.

The idea was to send the craft in a direct trajectory to the Moon and take pictures and send them back to Earth until destroyed by the impact.

The initial design goes back to the beginning of 1959 and it was conducted by JPL. It is obvious that NASA was already thinking in sending a man to the Moon as soon as practical.

This initial design phase was divided into three “blocks” each one being more complex, with different mission

objectives and more advanced technology than the previous.



Ranger Block 1 Spacecraft

Block 1 mission was comprised of two launches which were not intended to go the Moon; they would be placed into Earth’s orbit to test the Atlas-Agena launcher.

- Ranger 1, launched 23rd August 1961.
- Ranger 2, launched 18th November 1961.

Both launches failed as neither attained a stable Earth’s orbit due to problems with the launch vehicle; the spacecrafts were not able to stabilize or collect solar energy and soon they decayed.

Block 2 mission was comprised of three launches that would go to the Moon.

- Ranger 3, launched 26th January 1962.
- Ranger 4, launched 23rd April 1962.
- Ranger 5, launched 18th October 1962.

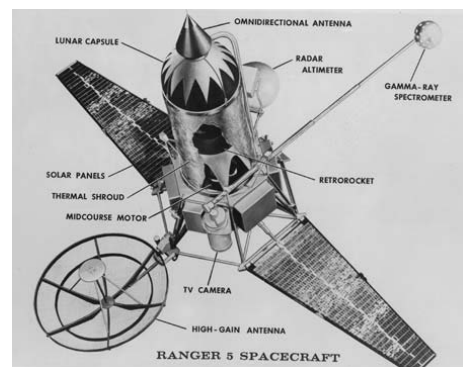
The three missions demonstrated good performance of the new launch vehicle, Atlas-Agena B, and adequacy of the S/C design, but there were other problems that caused the failure of all.

Ranger 3 had problems with both, launch vehicle and S/C and missed the Moon by 36,000 km.

Ranger 4 had a good launch but the S/C failed totally.



Ranger launch on an Atlas-Agena



Ranger Block 2 Spacecraft

Ranger 5 also missed the Moon.

No significant information was recovered from any of the three except for the tracking of the seismometer capsule on Ranger 4 to impact, thus validating the communications and navigation systems.

The S/C carried a TV camera, a radiation detector, and a seismometer in a separate capsule. This capsule was packed in an especial container and carried a small rocket motor to slow down the impact velocity and be able to survive its impact on the Moon's surface.

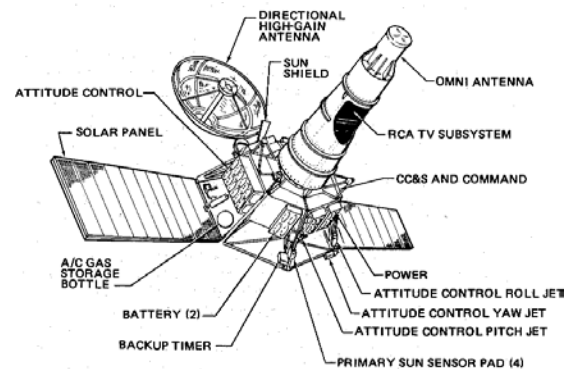
It was also discovered that a type of diode was prone to malfunctions in the conditions of space. This may have been responsible for some of the failures.

Block 3 mission was comprised of four launches all going to the Moon.

- [Ranger 6](#), launched 30th January 1964.
- [Ranger 7](#), launched 28th July 1964.
- [Ranger 8](#), launched 17th February 1965.
- [Ranger 9](#), launched 21st March 1965.

Ranger 6 impacted the Moon as predicted but cameras failed.

Ranger 7 impacted the Moon 31st July 1964 at 13:25:49 GMT in the Mare Cognitum (10.35°S 20.58°W).



Ranger Block 3 Spacecraft

Ranger 8 impacted the Moon 20th February 1965 at 09:57:37 GMT in the Mare Tranquillitatis (2.67°N 24.65°E).

Ranger 9 impacted the Moon 24th March 1965 at 14:08:20 GMT in Alphonsus Crater (12.83°S 2.37°W).

These block 3 S/C were equipped with a TV camera that would reveal landscapes smaller than the best Earth telescopes could show. Ranger 6 had a flawless flight, except that the television system failed during flight and could take no pictures.

The TV system was redesigned and the next three Rangers were completely successful. Ranger 7 photographed its way down to target and sent more than 4,300 pictures from six cameras. The images obtained showed that the dominant features were the craters. Big craters had small ones inside and these had tiny impact pockmarks.

Ranger 8 gathered some 7,000 images while Ranger 9 obtained 5,800.

Note: All photographs depicted in this essay are from public Internet publications and, in no way, they will be used to collect any income.