

The start of the American Space Exploration

Project Explorer

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

It was October 4th 1957. The Soviet Union had launched the first Earth orbiting satellite, the Sputnik 1, and Americans were astonished to find that they were way behind in the space race.

Werner Von Braun received the assignment to design and build a rocket to launch a satellite into Earth's orbit while JPL (Jet Propulsion Laboratory) at Pasadena, California, received the assignment to build a scientific satellite to ride on it.

The mission designation was Satellite 1958 Alpha 1 and it was the first United States earth satellite built as part of the program for the International Geophysical Year 1957-1958.



Launch of Explorer 1

As previously said the satellite was designed and built by the Jet Propulsion Laboratory (JPL) of the California Institute of Technology under the direction of Dr. William H. Pickering and housed an experiment designed and built by Dr. James Van Allen of the State University of Iowa.

It was launched from LC-26 at Cape Canaveral Missile Annex, Florida, at 03:48 GMT on February 1st 1958 by a Juno I vehicle. This launcher was a modified Jupiter -C ballistic missile designed, built, and launched by the Army Ballistic Missile Agency (ABMA). The Jupiter-C was a direct descendant of the German A-4 (V-2) rocket originally developed in 1955-1956 as a high-performance rocket for testing purposes.

The Jupiter-C has its origins in the United States Army's Project Orbiter in 1954. The project was canceled in 1955 however, when the decision was made to proceed with Project Vanguard.

It detected what it was named as the Van Allen radiation belt which until then had only been theoretical. It returned data until its batteries were exhausted after nearly four months and remained in orbit until 1970. The Explorer series continued with more than 90 scientific spacecraft.



Explorer 1 payload

The total weight of the satellite was 13.37 kg, of which 8.3 kg were instrumentation. In comparison, the first Soviet satellite *Sputnik 1* weighed 83.6 kg.

Data was transmitted to the ground by two antennas. A 60 mw transmitter fed a dipole antenna operating on 108.03 MHz, and four flexible whips forming a turnstile antenna fed by a 10 mw transmitter operating on

108.00 MHz.

The payload consisted of a cosmic ray instrument, several temperature sensors and a couple of micrometeorite impact detectors.

The spacecraft didn't have a recorder and not all the data transmitted was received in the ground as the tracking network coverage hadn't been completed yet.



Antenna near JPL

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