Sputnik 1 launches, October 4, 1957

Suzanne Deffree - October 04, 2018

The Soviet Union’s Sputnik 1 was launched into an elliptical low Earth orbit from Baikonur, Kazakhstan, on October 4, 1957, making it the first successful artificial satellite and marking the start of the Space Race.

The satellite traveled at about 29,000 kilometers per hour, taking 96.2 minutes to complete each orbit. It transmitted on 20.005 and 40.002 MHz frequencies, which were monitored by amateur radio operators throughout the world. Such monitoring efforts were encouraged by the Soviet Union as well as various amateur radio organizations.

The satellite was a 585 mm diameter sphere, assembled from two hemispheres which were hermetically sealed using o-rings and connected using 36 bolts. It weighed in at 83.6 kilograms.

The hemispheres were covered with an aluminum-magnesium-titanium, 1-mm-thick heat shield. It has been said that the shield was highly polished so that the craft could be seen from Earth with a telescope. (See photo above of a replica of Sputnik 1 at the US National Air and Space Museum; Source: NASA)

The satellite carried two antennas, each of which had an almost spherical radiation pattern so that the satellite beeps were transmitted with equal power in all directions, making reception of the signal independent of the satellite's rotation.

The power supply consisted of three silver-zinc batteries. Two of the batteries powered the radio transmitter and one powered the temperature regulation system. Although they were expected to fade out in two weeks, they worked for 22 days, allowing the signals to continue until October 26, 1957.

Sputnik 1 burned up on January 4, 1958, as it fell from orbit upon re-entering Earth's atmosphere, after traveling about 60 million km (37 million miles) and spending about three months in orbit.

The success shook emotions in the United States. Many Americans had believed, influenced by propaganda, that the US was technologically superior to its Cold War rival. Although there were various other factors involved, the fact perceived by many was that the Soviet Union had reached new and astonishing technological heights with Sputnik 1, giving it an advantage in terms of exploration as well as military and defense. President Eisenhower coined the term “Sputnik Crisis”
to describe the situation and spurred action. Such action inspired a generation of engineers and included:

- Congress passing the National Defense Education Act less than a year after the Sputnik launch. The four-year program poured billions of dollars into the US education system. In 1953, the government spent $153 million, and colleges took $10 million of that funding; however, by 1960 the combined funding grew almost six-fold because of the act.

- The Advanced Research Projects Agency (ARPA) was established by February 1958 to speed US progress. Now known as DARPA, the agency reported directly to the Secretary of Defense.


- The National Science Foundation appropriation was increased to $134 million in 1959, almost $100 million higher than the year before, dramatically increasing support for scientific research. By 1968, the National Science Foundation’s budget would stand at nearly $500 million.

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