Vanguard 1 solar powered satellite

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The satellite has traveled 196,990 revolutions of the Earth or 5.7 billion nautical miles in the past 50 years, equivalent to the distance from the Earth to beyond the planet Pluto and halfway back.

TheUnited Stateslaunched Vanguard 1 onMarch 17, 1958, fromCape Canaveral,Florida, as part of the opening salvoes in the Space Race. The Soviets had earlier launched Sputniks 1 and 2, while theU.S.had managed to get Explorer 1 into orbit.

The U.S. Army, U.S. Air Force and U.S. Navy collaborated to track, build and launch Vanguard. Official responsibility for the satellite fell to the Naval Research Laboratory (NRL), which based the design on German V-2 and Viking rockets used to probe Earth"s upper atmosphere.

Vanguard"s solar technology paved the way for other U.S. satellites that have launched since — the early satellite"s solar cells operated for about seven years, while conventional batteries powering another onboard transmitter lasted just 20 days.

The satellite fell silent in 1964 after its last solar cells died, but continues to allow scientists to discover the effects of the sun, moon and atmosphere on satellite orbits. NRL researchers used many of the lessons learned from the original Vanguard tracking system to build a Space Surveillance System that can detect unannounced, radio-silent satellites passing over theU.S.

Scientists originally estimated that Vanguard would have a life expectancy of about 200 years. Now the estimate stands at 2,000 years, meaning that Vanguard should see many more anniversaries to come.

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Science fiction had long considered solar cells as standard equipment for powering satellites. It seems Arthur C. Clarke, the renowned science fiction writer, first came up with the idea. Back in 1945 Clarke came up with the idea of three space stations to provide a worldwide communications network. Improvements in solar-electric devices would make it possible for these satellites to have continuous power in space.

The Signal Corps immediately contacted Hoffman Electronics, the only company in America manufacturing silicon solar under a license from Bell. Dr. Morton Prince and Eugene Ralph, whose live interviews can be

seen on this website, built the first arrays according to Signal Corps specifications.

Once the arrays were delivered to the Signal Corps, Ziegler and his staff encased them into clusters well protected by heavy glass to withstand "shock and vibration and the [vicissitudes] of space travel."

To test the modules for serviceability in space, the Signal Corps, in cooperation with the Navy, attached cells clusters to the nose cones of two rockets and then launched them high enough to simulate the environment in which a satellite would orbit.

In both firings, the solar cells operated perfectly. While in space, the Signal Corps reported, "Their power was sufficient for satellite instruments...and they were not affected by the temperatures of skin friction as the rockets passed through the atmosphere at more than a mile per second."