

GPS Satellite 20 Years On-orbit

GPS Block IIA-10 (SVN-23), built by Boeing (formerly Rockwell Corporation), was launched on 26 November 1990 and set healthy to navigation and timing users on 10th December 1990. The satellite was the first in the series of GPS IIA satellites to be launched with a design life of 7.5 years. To-date the satellite has operated longer than any other satellite and predicted to last another 12-18 months.

"Boeing has a solid history of delivering satellites that live beyond their contractual lives," said Craig Cooning, vice president and general manager of Boeing Space and Intelligence Systems. "The same commitment that was evident with the first GPS IIA satellite in 1990 lives on in Boeing's newest GPS satellite, GPS IIF. The first of 12 GPS IIF satellites entered service on 26th August. One important device on GPS IIF is the atomic clock, and we are very satisfied with its performance, which is the highest in the history of the entire GPS fleet."

The satellite has provided many years of service to users around the world. In the 1st year of service, there appeared to be a flaw in the satellite's solar array drive, a device that keeps the solar arrays trained toward the sun. At that point, the 2nd Space Operational Squadron (2SOPS) in Colorado Springs began to manually slew the solar arrays. After fourteen years of manually slewing, that technique became problematic and the satellite was put in standby mode. About three years later, 2SOPS decided to try the satellites' auto track feature again. Much to the surprise of everyone, the satellite functioned adequately and even improved over time. To this day, it still has all four reaction wheels operating and one of the best atomic clocks in the remaining group of GPS IIA satellites.

Modernisation efforts are underway to provide new space-based capabilities to ensure GPS remains the standard for positioning, navigation and timing service worldwide. GPS will deliver sustained, reliable GPS capabilities to the warfighter, our allies and civil users. The GPS constellation remains healthy, stable and robust with 31 operational satellites on-orbit, 11 IIA, 12 IIR, 7 IIR-M and 1 IIF. The IIR-M satellites have additional modernised signals, one on L1 frequency and two on L2. The IIF satellite has all the new modernised signals plus improved accuracy through advanced clocks, a longer design life than previous GPS satellites and a new operational third civil signal (L5) to be used for commercial aviation and safety-of-life application. The next GPS IIF satellite is expected to launch in 2011. GPS III, a new generation of GPS satellites, will implement improvements in timing and positioning, accuracy, signal strength, integrity, design life and interoperability. These improvements are being implemented based on high-heritage technology as part of a low-risk, high-confidence programme. In the future, directional cross-links and directional spot beam will be added to further enhance the constellation performance.

These enhancements will contribute to improved accuracy and assured availability for military and civilian users worldwide. The first GPS IIIA satellite is projected to be available for launch in 2014.