

Early Orbit Checkout Extended for IIR-20(M)

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The following is a press release from Los Angeles Air Force Base.

Release Number: 020609

6/16/2009 – LOS ANGELES AIR FORCE BASE, Calif. — The U.S. Air Force is investigating the cause and effects of signal distortions observed from the GPS IIR-20(M) spacecraft launched on March 24, 2009. Routine early orbit checkout procedures determined that GPS IIR-20(M) signals were inconsistent with the performance of other GPS IIR-M satellites. The signal distortion was initially observed as an elevation-dependent bias in ranging measurements from GPS monitor stations.

Worldwide GPS users are not affected since this satellite is still in early orbit checkout and has not been introduced into the operational constellation.

A dedicated response team of Air Force and contractor experts are wrapping up their investigation of the cause. An extensive series of on-orbit signal quality measurements and ground tests clearly indicate that GPS IIR-20(M)'s observed behavior is related to the interface for the L5 demonstration payload. The demonstration payload, which is powered on and operating exactly as expected, successfully brought into use the L5 International Telecommunication Union frequency filing, ensuring the frequency allocation will be available to support future L5 users.

The Air Force team has identified several parameters in the GPS IIR-20(M)'s navigation message that can be adjusted to correct the bias and bring the satellite into compliance with the GPS Performance Standards. Over the next several months the team will be testing, analyzing and evaluating any potential impacts the corrective actions may have on both military and civil GPS user equipment. The test strategy implements engineering analysis, modeling and simulation, and testing of real-life GPS receiver equipment to the greatest extent possible to ensure that there will be no inadvertent impacts to GPS users.

The Air Force expects to complete testing around the October 2009 timeframe. GPS IIR-20(M) will be introduced as a healthy satellite

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into the operational constellation at that time if no major issues are observed during the receiver testing campaign. Users will be kept informed of the status of GPS IIR-20(M) via standard Notice Advisory to Navstar Users (NANU) messages.

The GPS constellation remains healthy, stable, and robust with 30 operational satellites. The Air Force has high confidence there is no related concern with the remaining IIR vehicles or the upcoming GPS IIR-21(M) mission. The Air Force is executing a nominal processing flow for an August 2009 GPS IIR-21(M) launch opportunity.

The Air Force remains committed to ensuring a continued high level of GPS service and capability, maintaining GPS as the premier provider of positioning, navigation, and timing for military and civilian users throughout the world.

The Space and Missile Systems Center, located at Los Angeles Air Force Base, Calif., is the U.S. Air Force's center of acquisition excellence for acquiring and developing military space systems including GPS, military satellite communications, defense meteorological satellites, space launch and range systems, satellite control network, space based infrared systems, intercontinental ballistic missile systems and space situational awareness capabilities.

The Wall street Journal had a different take:

Wall Street Journal, 06/17

NEW GPS SATELLITE GLITCH RAISES CONCERNS ABOUT ACCURACY: Technical problems are degrading the accuracy of signals from the latest GPS satellite launched by the Pentagon, sparking concerns among U.S. military and aerospace industry officials that the next generation of the widely-used satellites could face similar troubles. The Air Force's Southern California space acquisition center on Tuesday announced that a Global Positioning System satellite, manufactured by Lockheed Martin Corp. and launched in March, is experiencing performance problems in orbit. It hasn't become part of the "operational constellation" of more than two dozen other GPS satellites, and is slated to undergo a battery of tests expected to stretch through October to try to resolve the problems, according to an Air Force press release. The GPS system, which serves both military and civilian users, provides precise time and location coordinates for everything from military missile launches and "smart" bombs to automated bank-teller machines to aircraft, ships and everyday vehicles. The Lockheed satellite is the first to include a new civilian frequency – dubbed L5 – designed for, among other things, use by future nationwide air-traffic control systems. But that signal, part of the test package, apparently is interfering with other signals from the satellite and reducing their accuracy, according to industry and Air Force officials. The degraded signals are accurate only to about 20 feet, versus about two feet for typical GPS signals, industry officials said. The issue is significant, according to these

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officials, because it could complicate deployment of a new family of Boeing Co. GPS satellites currently being built that also feature the L5 signal. Concerns over signal quality come barely weeks after a Congressionally-ordered study raised a red flag about potential erosion of GPS accuracy in the next few years due to launch delays and other challenges. The Pentagon responded by minimizing the potential risk, arguing that significant spare capacity remains on orbit and on the ground to handle unexpected problems.

The party line from the wing is that it can be fixed. I am not so sure. See

http://groups.google.com/group/sci.geo.satellite-nav/browse_thread/thread/3bd0f7b7ec7e7286/996b6bbae20c05f2?q=

October is an interesting target date for completing the analysis. First, October is in the next fiscal year. Second, it is after the OCX award. I wonder what is lurking under that rock? The JPL Kalman Filter comes to mind but that is a different topic.

The Wall Street journal seems to be asking if near and far field antenna testing has been done on the IIF bird. When I am asked by a customer how much testing they need my response is always "how much money do you have?". Then we get into a serious discussion. I am not knocking the wing for not doing near and far field testing on IIR-20 (M) but they sure as heck better be doing it on the Block IIF now.

--Mike Jr
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