



E X E C U T I V E E D I T O R I A L

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GPS System, “Challenges in Sustaining & Upgrading”: Challenges Yes, Panic No

The recent GAO Report on Global Positioning System (GPS) brings up a number of relevant issues in sustaining and upgrading the system to keep up with the challenges of meeting the expectations of both military and civilian users for this widely used system. However, this report has also raised panic flags in the minds of many people. I believe that in the fast moving world of the global Internet community, some of the projected worst-case scenarios and “gloom and doom” headlines can do significant, unwarranted damage to the perception of GPS reliability.

We started SiRF Technology in 1995 with a vision to bring the benefits of GPS to mass markets, and as a leading supplier of GPS technology to mainstream consumer devices today, our success is extremely dependent on GPS. We are a strong advocate of a robust GNSS system, where GPS is the primary driver. While the concerns raised in the GAO report need to be addressed, we also need to have a balanced perspective on the robustness of the system that has served us well so far. While I cannot speak for military or professional usage of GPS, I think it is important to put things in the proper framework from the perspective of consumer usage of GPS and look at different aspects of our GPS strategy and challenges:

Not a Time to Panic in the Short Term

The GPS system has been an extremely reliable system and in general has under-promised and over-delivered. Although only 24 satellites are promised by the Air Force for the system to be fully operational, we are getting used to seeing many more satellites as most of the satellites in orbit are proving to have much longer life than originally anticipated. It is a tribute to the robustness of their design, not a sign to panic! While these satellites will fail over a period of time, no one expects all of them to stop functioning suddenly nor simultaneously.

We have lived with GPS signal degradation before. The system was declared fully operational with 24 satellites in 1995 and it was only in year 2000 that President Clinton stopped the intentional degrading of the civilian signal (Selective Availability or SA) that reduced its accuracy to a 100 meter range. GPS was used in many applications, military and commercial, long before that. Today, the GPS signal is normally stronger than the specifications and receivers are significantly more sensitive than was the case in the mid 1990s. Companies like SiRF have also developed specialized algorithms to provide reliable location information with visibility of fewer than the normal 4 plus satellites.

In our discussions with the GAO analyst who did the simulations, we confirmed there is a 95% probability level that the total number of satellites will be 22 or higher through year 2024, unless there are further slips in the GPS III schedule. While performance may degrade slightly compared to today's standards, the modern GPS receivers will be able to function in most consumer applications with significantly fewer satellites than what we see today. Furthermore, due to the constellation dynamics, any degradation would occur only for short periods of time, and only in limited areas.

Time to Address the Longer Term Issues Now

GPS has been one of the most successful “Dual Usage” infrastructure programs funded and managed by the DoD. Today, it has become an integral part of life for hundreds of millions of consumers worldwide and is being used in applications that, in many cases, it was never even designed for, such as attaining location fixes in highly obstructed environments and even indoors. From auto navigation and E911 emergency response to wireless network synchronization, it is deployed in a broad range of consumer and enterprise applications, and impacts our daily lives in ways we may not fully realize until it has a glitch. Consumer expectation is that GPS works every where: all over the world, indoor or outdoor, and in every weather condition.

The challenge for the GPS program is not only to maintain and improve the reliability of this exemplary system, but also to enhance its capabilities to meet both the defense needs as well as the increasing consumer expectations. We have to keep in mind that while GPS is the primary system used for location awareness worldwide today, one cannot ignore the impact from other satellite systems such as Glonass (Russia), Galileo (Europe) and Compass (China) that are promising enhanced capabilities. Making timely investments into such a critical infrastructure, to address emerging needs, is very important to avoid panic later! In addition, as suggested by GAO, maintaining the leadership of GPS as the primary component of the future GNSS capability requires focus on streamlining the GPS infrastructure development and management at the highest level of the U.S. Government.

Being part of the GPS community for a long time and as member of a consumer family that is now very dependent on our GPS navigation systems, I hope that we all support its modernization.



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