

Defense Matters

Leadership, Trust, and Integrity

The Underpinning of Why GPS is Still the GNSS Gold Standard

It serves no purpose for me to state that GPS is being challenged as the world's premier space-based PNT service. It is. But the foundation by which civil GPS has been made available to the world free of charge, since it was declared operational over 28 years ago, continues to keep it on a pedestal as the world's predominant space-based PNT system. It remains the system that all competitors are compared to – it is still the GNSS Gold Standard.

The Challenges

We live in a complex world of ever-increasing global competition where nations are focused on generating competitive advantages to enhance their national security and their economic prosperity.

Space-based PNT is an enabler for both these goals, and China's BeiDou is aggressively working to displace GPS and the United States as the world's premier space-based PNT provider.

China's goal is undoubtedly being pursued to further both their military capabilities and their global economic power. But China has one critical, underlying, foundational obstacle that will be problematic to overcome, and that is, to gain the world's trust.

From the perspective of projecting military might, Assistant Secretary of Defense for Space Policy, Dr. John F. Plumb (the ION's Congressional Fellow, 2005), stated at the 38th Space Symposium held in Colorado Springs, Colorado this past April, "China is the Department's pacing challenge in space – and that the pace is fast." He went on to state "China already employs a robust space-based reconnaissance capability, and its satellite navigation system provides position, navigation, and timing services."

From the perspective of stimulating the Chinese economy, BeiDou is being advertised as playing a key role in China's "One Belt One Road," plan to advance and extend their nation's railways, highways, agriculture, seaports, and energy corridors by financing similar major infrastructure initiatives in many countries.

As Dr. Plumb noted, BeiDou's fielding has been fast paced and has evolved rapidly from what was first thought to be used primarily for China's armed forces. However, today BeiDou's open service is available globally just like GPS, Galileo, and GLONASS – but will it be able to dethrone GPS?

If the fielding of space-based PNT capabilities is viewed as a business competition, there is no question that GPS is the system that other GNSS contenders are continually compared to.

The Competition's Approach

In the business world, if you beat your competition, the fruits of that achievement will result in more market share. If you have more market share, you will have more customers. More customers will bring you higher sales and profit.

But viewing the challenges to GPS from the business perspective – there are other things to consider. GNSS competitors are doing all they can to differentiate their services from what GPS offers.

A Google search using the query, "Which is better GPS or BeiDou?" yields this result, "The BeiDou constellation has more satellites than GPS or any other system. It also has more than ten times the monitoring stations in other countries than have been deployed for GPS. As a result, in many places, particularly in the developing world, BeiDou's accuracy is much better."

But a Google search query of "Which is trusted more, GPS or BeiDou?" results in multiple finds that are silent on the word "trust" and emphasize claims of BeiDou being more accurate, providing more coverage, etc. The takeaway – trust is earned – is not something that can be claimed.

The Playing Field

Most of the unsophisticated public who use PNT services, whether they know or care, have no awareness of how their respective PNT needs are being met.

How "GPS" fits into their applications is transparent to them. Their user equipment is expected to work and the underlying technology is expected to provide the expected results with no special selections or options required. It just happens. Trust has been established; it has been earned.

It is also not an exaggeration to suggest



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that when 99% of the public say “GPS”, it universally applies to any or all the systems collectively. Knowing or caring what system is used is not important or even considered – they trust their device to work. If it doesn’t work, GPS may or may not be blamed. But if they are presented with a bad location or their device results in an incorrect address – then the blame likely falls uniquely on GPS with no thought given to the underlying mapping company or the environment they are in, e.g., multi-path, interference, etc.

Moving Forward

In contrast, China is hiding more and more data from the rest of the world. China’s recent abrupt decision to halt releasing data on its soaring youth jobless rate in China is just one of the latest signs the Asian giant is increasingly restricting sensitive information – especially when it’s unflattering to the nation’s faltering economy.

On the contrary, in the United States,

yearly Gallup polls going back 30 years have asked adults to rank their confidence levels in trust of major U.S. societal institutions. These institutions include the military, police, businesses, schools, churches, banks, newspapers, television, justice system and Congress. Over the last 30 years the military has consistently ranked as one of the most trusted institutions. The least trusted institution for many years – Congress, but that is another story.

The “trust” acquired since GPS became operational in the mid-1990s has not only been earned, but it has become ubiquitous and expected. Here again, the unsophisticated public may or may not be aware, but that trust is traceable uniquely to the leadership and integrity of the stewards of GPS, the providers of GPS, the U.S. military, and more specifically the U.S. Air Force and since 2020, the U.S. Space Force.

The civil GPS services available today still have challenges to overcome. The on-

orbit performance of the various blocks of satellites with various signal enhancements continues to surpass their design lives. Considering this and other competing factors, this extended service life has slowed the pace of launching and making available expanded signals under the 20 plus year modernization effort, but the underlying service provided by GPS continues to be the competitor to beat.

With 2023 noted to be the 50th anniversary of the Air Force gaining approval to proceed with the GPS concept, the hundreds, if not thousands of people who have contributed to the fielding of this great system can be proud of what they have accomplished. GPS is still the GNSS Gold Standard.

End Note: In early September of this year the U.S. Space Force, now stewards of GPS, announced their new mission statement – “secure our Nation’s interests in, from, and to space.” Clearly, GPS fits into each of these three domain mission areas. ✨

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Hilton Waikiki Beach
Honolulu, Hawaii

Where East
Meets West
in the Global
Cooperative
Development
of Positioning,
Navigation and
Timing

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