

Re-Baseline This!

So, if everything had gone as planned, we would have a new ground control segment (OCX) operating a new generation of satellites (GPS III) as they launch into an expanded constellation in support of modernized military GPS user equipment (MGUE).

But then the best-laid plans. . .

OCX still appears four to five years away, the first tranche of GPS IIIs are going up years late, and, as a 2015 Government Accountability Office report concluded, MGUE's acquisition strategy has been revised several times in the Air Force's quest to develop the new user equipment.

How bad is the situation? Well, so bad that the House Armed Services Committee recently zeroed out Fiscal Year 2017 funding for OCX because of the cost overruns and schedule slippage.

"Re-baselining," a term of bureaucratic art that in other quarters is known as moving the goalposts, has become a way of life for GPS. The program is always on schedule, because the schedule is always new and improved. What continual re-baselining hides, however, is that the GPS program, at 42 years of age, is suffering from a kind of mid-life crisis.

How did it come to this? A few of the culprits:

- **Changes in leadership.** As ambitious and talented military leaders climb the GPS Directorate or Air Force Space Command rungs of their careers, the typical three-year tour of duty at Los Angeles Air Force Base means a constant cycle of re-education. The GPS program has been good for upwardly mobile officers, as many colonels turned into generals, aided in part by overseeing an ever-more-popular utility. But it comes with an overhead of training costs.

- **Design decisions, technical challenges, and engineering changes.** Keeping the heavy, power-draining

Nuclear Detection System on board GPS satellites, adding multiple new signals, devising a digital signal processor, implementing inter-satellite links.

- **Loss of expertise.** A few years back, Air Force dropped a contractor, Arinc, Inc., which had advised the program office for decades, in favor of a vendor with limited GPS expertise. That reset the learning curve while the newbies got up to speed.

Another example: Along with the technical challenges, the folks responsible for designing and building every GPS satellite navigation payload suffered a steady erosion of engineering talent as ITT Industries was absorbed by Exelis and then Harris Corporation. The associated delays rippled through the whole GPS III endeavor.

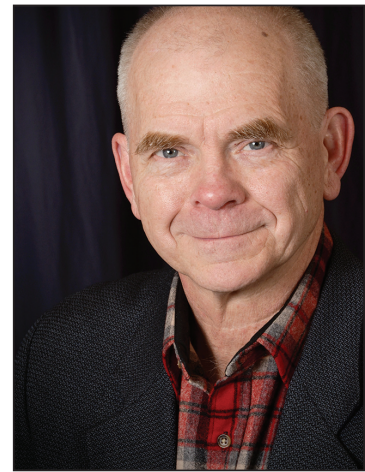
It also didn't help that a couple of years ago the Air Force cashed its GPS Independent Review Team, a group

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of experienced outside advisers authorized to take the long view. A couple of bright spots in this gloomy picture are the Aerospace Corporation and the Massachusetts branch of the MITRE Corporation. These federally funded research and development centers provide institutional memory along with day-to-day expertise in solving technical and programmatic problems.

- **Budgetary processes.** GLONASS gets its own line item in the Russian federal budget. Europe's Galileo has funding for seven years. China has five-year plans that place its BeiDou Navigation Satellite System high on the list for resource allocation.

But GPS? Rescissions, congressional hearings, new demands, GAO reviews take place from month to month, week to week, even day to day. A situation



that is made worse by the Air Force's ability to reprogram funds from GPS to the squeaky wheel or problem child or favored program of the moment.

What can be done? Well, maybe it's time to *re-baseline* the whole deal.

Obviously this can't be done by the folks holding things together in current operations, acquisitions, engineering, and system management. No one wants to rebuild a car while it's flying down the freeway at 70 miles an hour.

Perhaps the program needs to rebuild its brain trust, establish a

parallel organization that can take a longer view beyond budget cycles, leadership rotations, and engineering change orders.

Back in the 1990s, such an effort was undertaken by a blue-ribbon group supported by the National Research Council. Today, the National Space-Based PNT Advisory Board might be best positioned for such a mission.

No one wants to make any sudden moves with a resource on which industries, critical infrastructures, and nations depend. But some kind of movement is definitely needed — and soon.

GLEN GIBBONS, JR.
Editor