

Washington View



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By: [Dee Ann Divis](#)

GPS World

In what may be the single most incomprehensible move since the Cold War, the Air Force is considering cutting monies for GPS III, putting at risk the international dominance of the U.S. global positioning system, whose signals are being incorporated into nearly every piece of Defense Department equipment more sophisticated than a rifle bullet. The proposed plan, as described by expert sources in Washington and elsewhere, is to delay GPS III by several years and use the money to bail out other space systems with cost overruns. Modernization funds for GPS IIR and IIF, including money for a new power upgrade, are also in jeopardy due to congressional budget cuts.

The impact of a delay on planned GPS improvements is serious enough. But the possible restructuring comes just as the European Union is moving to get Galileo off the ground. What makes Galileo's activities relevant to DoD deliberations is that the Galileo team has announced its intention to overlay its proposed Public Regulated Service on the U.S. military M-code. Implications for the U.S. military are vast and DoD really needs to think the GPS III decision through carefully in this context.

(See also the May 2002 Washington View column, [Military Role Emerges for Galileo](#))

By all accounts, overlaying PRS on the M-code will make it extremely difficult to jam the Galileo signal in wartime without also jamming the U.S. signal. If a Galileo signal is incorporated into equipment for foreign sale — something the European Directorate for Transportation and Energy indicated last December is desirable — then there is a possibility that equipment that cannot realistically be jammed will land in unfriendly hands. It is also possible that the U.S. could face a problem working with its allies, particularly in NATO, if the EU adopts a different navigation standard for military equipment.

Equipment based on common standards is one of the keys to working together in military coalitions, an approach that military experts have said will be more and more common. But the U.S. and the EU may fracture on navigation issues. It is now widely agreed in Europe that PRS will not just be used for ambulances and police. During a contentious two-day NATO meeting in May, the French asserted their desire to keep the military-Galileo option open.

What would a NATO split on navigation warfare policy mean? Would the U.S. shift to dual GPS/Galileo receivers? At what cost to re-equip? The EU has assured the U.S. that enemy use of Galileo can be prevented through encryption. What would encryption capability cost Galileo backers? Would the U.S. and NATO have to coordinate military decisions to jam with a civilian agency in the European Union?

And what does all this have to do with GPS III? The Galileo business case is based on the notion that its signals and service will be better than those of GPS. Enhancements to GPS, provided free worldwide, have been pointed to from the beginning as possibly damaging the business case. Galileo needs a strong business case because the program, for now, still looks to private sector funding as part of its development and operation. If placement of Galileo's PRS signal is a threat to the use of the U.S. M-code — and moving to GPS III impacts that threat — then the U.S. military needs to take this into account as it weighs its GPS III decision. With so much at stake, why is the Air Force, of all organizations, considering stalling GPS III?

Short on Bucks

The Air Force, which now makes decisions about GPS and other space systems, is short on money because of budget overruns in other programs. Washington sources consistently pointed to the Space Based Infrared System program as one huge project needing bailout. Current GPS satellites are also performing years beyond their anticipated life, making it possible to delay launching new satellites without undermining immediate system viability.

Under current plans, new satellites will only be launched when needed to replace spacecraft. Twelve IIR satellites remain to be launched and there is now a plan in place for twelve IIF satellites.

A new plan (detailed below) could add power to the military signals on both the IIRs and IIFs as a way to address anti-jamming concerns that have arisen in the last several years.

Also key, according to one source with insight into the DoD debate, is that the GPS III satellites are shaping up to be very expensive — 2 to 2 1/2 times the cost of prior satellites. The desire for new capabilities, like a vastly more powerful signal, drives costs upward. The requirements have also not been finalized and still more payloads such as a search and rescue capability are being suggested. But the more requirements, the higher the cost. “This is a satellite that would do everything for anybody. But guess what — nobody's got the money to pay for it,” said one expert. With budget shortfalls, a system that generally works fine and a warehouse full of (mostly) paid-for satellites, the inclination is to put off upgrading to GPS III and to use the money elsewhere.

Zero GPS III Budgets?

According to well-placed sources in both the industry and the defense communities, tens of millions of dollars may be shifted from GPS III to cover non-GPS program cost overruns. The sources who talked with GPS World did not agree on the amount involved and all noted that the matter was still being debated. One source with knowledge of the Air Force debate said that \$50 million was being moved from the GPS III program to cover non-GPS programs overruns. Two well-placed industry sources said, however, that the Air Force was considering cutting GPS III

monies from fiscal years 2004, 2005 and 2006 — perhaps zeroing out the budget altogether. Such a cut would be around \$400 million, said one insider. Should the FY04-FY06 money be cut, then the actual program start date would likely be FY07, and the first GPS III would be launched around 2015, said one source. A more likely scenario, said another, is that a compromise will send some money to GPS III while some would be reallocated to other space programs.

GPS III and IIFs

Though the possible cuts to GPS III come as a significant surprise, it is not news that the GPS III contract has been in flux. Part of the reason for the delays was a proposal to forego building the second half of the planned buy of GPS IIF satellites and proceed directly to the next generation of spacecraft. Both IIR contractor Lockheed Martin and IIF contractor Boeing won \$16 million contracts to develop ideas for the GPS III constellation. An outside bidder, Spectrum Astro of Gilbert, Arizona, also came forth — getting some government funds, but largely spending its own money — to develop and offer its ideas.

Under the current plan, an interim set of GPS III requirements will be jointly developed by the military and civil communities. They will finalize their choices at a meeting in early July. The requirements will be presented to DoD's Joint Requirements Oversight Council in early August and to the Defense Space Acquisitions Board on August 22. The interim requirements will act as a technical baseline for selection of a GPS III contractor. The request for proposals will come out at the end of August, and a contractor will be selected in early 2003. The contract will be a winner-take-all award and the RFP will be open to all three companies, or anyone else who wants to bid, said Lieutenant-Colonel Bob Hodgkiss, the Air Force Program Element Monitor and team lead for GPS. Should GPS III receive funding as planned under this schedule, the first launch would be in 2010. Interestingly, it appears that only two test satellites may be bought through FY07

Flexible Power and IIFs

Boeing is building the first six IIF satellites (three were bought in FY 97 and three more in FY98). Should everything go forward, three more modernized satellites will be bought in FY05 and the final three in FY06, said Hodgkiss. "Modernized" includes adding the new civil and military signals and a new flexible power capability for the military signals. Boeing has been selected to modernize the first six IIFs satellites as well — but does not actually have a final contract to do so. They have a contract that sets a cost ceiling and are still negotiating some specific costs and technical specifications. The "definitizing" process, covering the cost of modernizing the first six satellites and setting price options for modernization of the second six, is scheduled to be completed by July, said Hodgkiss. As things stand now, assuming money is available (read further for information on this), all twelve IIFs will be built.

The decision to go ahead with the IIFs was based in part on the flexible power plan — a program to add power that could be used by one or the other of the two military signals to help break through potential enemy jamming. Flex-power would enable roughly 8 db of power to be switched to one of the two military signals in a spot beam. Though this would likely weaken the other signal, and the capability is far from as much as 27 db postulated for the GPS III satellites, the Flex-Power plan does meet some immediate military needs. Therefore the decision was made

to add Flex-power to both IIFS and IIRs and not move immediately to GPS III. However, that capability is still being developed. At least one source believed it may be problematic to get all the power hoped for in the Flex-Power plan.

IIRs

While the Air Force considers whacking the “out year” budgets, the House and Senate Armed Services Committees have taken a chunk out of the fiscal year 2003 budget request now working its way through Congress. If sustained, the cuts will impact plans to modernize IIFs and IIRs. The original plan was to try to modernize all 12 remaining IIRs, making them IIRMs (“M” indicating the new military signal capability). Also to be added would be the second civil signal and the flexible power capability.

Last year Congress cut advanced procurement funds from the IIR program, saying it was not appropriate to use “advance” funds to upgrade an existing program. This year’s Administration request asks for regular procurement dollars for the IIRs. Because of scheduling considerations, DoD now expects to be able to modernize only 10 of the remaining 12 satellites, Hodgkiss told GPS World. Others close to the program believe it more likely that only eight will be upgraded. Modernization funds for the first eight were allocated in the FY02 budget. Hodgkiss said that funds were requested in FY03 budget for the other two spacecraft. If that money is not provided, the satellites will be launched as is. It is not clear when the unmodified satellites would be launched, however, and it is conceivable, he said, that they would be at the end of the IIR series or in the middle of the sequence of launches. The first IIRM launch has slipped a bit from its original March 2003 date. Assuming all goes smoothly, it will now likely be in the summer, perhaps August, of 2003. Of course, things seldom go smoothly . .

Modernization Budget Cuts

As implied earlier regarding advance procurement funds, money in different accounts must be used differently. So far, neither the advance procurement request nor the regular procurement money requested for upgrades has been cut. However, the House Armed Services Committee has proposed a \$49 million cut from GPS Research Development, Testing and Evaluation funding. The Senate proposed a total cut of \$40 million of to the RDT&E account. (They added \$10 million back but only to specifically fund a third GPS launch in FY03). Hodgkiss said that DoD has asked for restoration of the funds, and that the nature of the funds be changed so that some remains RDT&E and some becomes procurement dollars. One inside source said that DoD made a decision on the Flexible Power Plan late in the budget game and did not get details to staffers on the two committees before the cuts were made. DoD hopes to get the funding restored once congressional staffs have reviewed the flex-power plan. Without this funding, however, the power enhancement efforts on both the IIRs and the IIFs will be delayed until FY04. No decisions have been made on which satellites might be upgraded should the budget cuts be sustained, said Hodgkiss.

Will GPS Get the Money?

With the war and anti-terror efforts and the economic downturn, there is no question that the budget is tight. It is also an election year, and members of Congress like to campaign on all the bacon they have brought back to their districts. Unfortunately, GPS does not quite fit into a

“pork” package. Unlike road projects or dams, GPS satellites do not provide lots of new, high-profile local jobs.

On the other hand, the Flex-Power program saves immediate dollars and should seemingly get the OK from Congress. The question remains, however, as to whether the Air Force will redirect GPS III funding. As noted earlier, the Air Force now has fuller authority over GPS funding. Following the recommendations of the Space Commission — a group chaired by Donald Rumsfeld until he became Secretary of Defense — space assets were consolidated within the Air Force. That is, main budgetary decisions have been taken out of the office of the Secretary of Defense and delegated two steps down to Peter Teets, undersecretary of the Air Force and head of the National Reconnaissance Office. Teets is responsible for recruiting, training, and equipment for the Air Force and for managing its \$68 billion budget. (Teets was president and CEO of IIR contractor Lockheed Martin from 1997 to 1999.) Several experts have suggested that the consolidation has weakened the ability of GPS to get the money it needs by taking budgetary decisions out of the office of the Secretary of Defense. The repositioning does add at least a layer of bureaucracy, though one DoD expert noted that GPS might be able to get its needs reviewed earlier.

Should GPS III Get the Money?

Yes. Yes. Yes. The system is aging. The upgrades are important to both civil and military service. Everyone, especially the Department of Defense with its hundreds of systems, needs a robust GPS constellation. GPS was not tagged as a “critical infrastructure” for nothing. The issue with the Galileo PRS service/M-code is critical. DoD has to at least take this aspect of the global landscape into consideration before making precipitous decisions. It may be that the U.S. and the EU will work it out. The truth is that neither side looks like they are trying very hard — it’s the Cold War all over again. But if GPS III can hurt Galileo and Galileo can hurt GPS — then perhaps this form of mutually assured destruction will get both sides to the table.