



GPS/Galileo:

Europe

Eppur si muove - or maybe not - Europe's Galileo satellite positioning system.

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Europe's Galileo satellite positioning system

The Pentagon's Global Positioning System can tell you where you are. The EU reckons it needs a rival system. The Americans are upset

AS NATO'S leaders hobnobbed cheerfully in Rome this week and half-welcomed Russia into their ranks, a storm was gathering in the heavens which could spoil the transatlantic party.

At issue is the European Union's plan to launch a network of 30 satellites, known as Galileo, that will duplicate (and, its supporters say, significantly improve) the job now done by a cluster of American military satellites called the Global Positioning System (GPS). That job is to tell everyone and everything that needs to know (from drivers, pilots or yachtsmen to falling bombs) exactly where they are.

EU governments agreed in late March to fund the first phase of Galileo: their tax-payers will put up the initial euro1.1 billion (\$1 billion) of a project whose (supposed) total cost will be euro3.6 billion, including euro1.6 billion from private companies - if these can be convinced of the plan's viability. To sceptics, the whole project is a prize example of European posturing: just when many Americans despair of their allies' willingness to spend on defence, Europe plans to hurl money at a service the Pentagon already provides, gratis, to all-comers.

Most European statements about Galileo present it as a purely civilian enterprise, designed to help geologists locate minerals, shippers track merchandise, and transport of all kinds keep better time. It will pinpoint users' locations on the globe to within a metre; for civilians, the American system now has a ten-metre margin of error. But the Americans may have cut this to three metres or less by 2008, when Galileo will be working.

Three metres or one, who cares? Some civilian users do, an EU study showed. Port authorities engaged in costly dredging projects, and the owners of snow-ploughs trying to steer safely along snow-covered roads were among the examples cited.

The other people who require pinpoint accuracy, of course, are generals. More than half of the American munitions dropped on Afghanistan, for example, had handy little strap-on kits that enable "dumb bombs" to follow GPS signals. For now, any other western

army which uses satellite guidance virtually has to rely on GPS, though in theory they could use a faltering Russian system called GLONASS.

So the advent of Galileo has huge military implications, as France, in particular, notes with quiet enthusiasm, and America observes with quiet horror. In any conflict, keeping one's own satellite-guidance systems intact, and denying such guidance to enemies, will increasingly mean victory or defeat. The advent of Galileo could make that task harder for the Pentagon.

What especially alarmed the Americans, as Paul Wolfowitz, America's deputy defence secretary, pointed out in an angry letter to his NATO counterparts at the end of last year, was a European proposal to use parts of the spectrum very close to those used by the Pentagon. This could mean interference from one system affecting another; and, worse still, it would make it harder, in the event of war, for the Americans to jam Galileo - so as to deny it to hostile forces - without disrupting GPS signals used by their own armed forces.

As for civilian applications, the choice is not just between three metres or one; it is between one system or two, with huge prizes at stake for aerospace companies. With deft handling, the row over Galileo may yet turn out to be one of those transatlantic spats - over food standards, say, or aircraft-landing rights - in which both sides issue dark warnings but draw back from an all-out clash. Many European bureaucrats see it that way; but as this row involves defence as well as economics, it could get more serious. American policy towards Galileo rests on two premises: first, there is "no compelling need" for such a system; but, second, if the Europeans see such a need, at least the rival systems must be compatible - and avoid the risk of what Washington would consider unfair trade practices. Americans fear that EU regulations might mandate the use of Galileo-based navigation systems (by aircraft, for example), distorting competition and imposing needless costs.

Since the State Department has responded to the EU decision with a call for accelerated talks, some in Europe claim that their display of strong nerves, in the face of American hostility, has been vindicated. "It's clear that the Americans didn't want Galileo to happen, because it complicates their lives - but now that it is happening, they are willing to bargain," says one European space executive.

John Pike, director of GlobalSecurity.org, a Washington-based defence consultancy, retorts that America's military establishment views Galileo with something between contempt and outright hostility. "There's no way to accommodate American concerns, except not to build Galileo," he argues. In his view, the United States has not, as yet, raised the diplomatic temperature, mainly because it doubts that Galileo is viable, and hence expects it to stumble at some point, due to costs.

It'll cost. But how much?

How likely is that to happen? For Europeans, the main point of reference is a study completed late last year by the accountants of PricewaterhouseCoopers, which gave some comfort to sceptics and supporters alike. Galileo would cost euro200m more than the commission had estimated, said the number-crunchers, but the annual revenues it could generate would be as much as euro515m by 2020. Direct revenues alone would not justify the project; but taking into account broader economic gains (air-traffic control, marine navigation and passenger-vehicle guidance), the ratio of benefit to cost would be

as high as 4.6 to one.

Supporters argue that the overall cost of euro3.6 billion is no vast outlay of public money - the equivalent of building 150km (93 miles) of semi-urban motorway; and that the scheme would create at least 100,000 new European jobs. But Americans have questioned the PWC report. Suppose Galileo is not built, and GPS continues to offer steadily improving services to civilians: how accurately can one calculate the economic consequences of that scenario? The PWC estimates assume that the Galileo networks will become operational, as planned, by 2008, before a new version of GPS becomes available. If the timetable for Galileo slips, so will any hope of having a competitive advantage.

Within several EU governments, there have been sharp internal debates about Galileo. Britain's defence ministry and treasury had their doubts; the industry ministry is in favour. And both Britain and Germany have queried the EU bureaucracy's ability to manage the project.

Britain, in particular, has insisted that all public statements about Galileo should stress its civilian applications. French and Italian officials are keen to ensure that, as well as offering purely civilian services, Galileo should emit an encrypted "public service" signal which, though not exactly military, would be provided to emergency workers such as fire brigades and ambulances. To Americans, this smells of a European bid to end America's monopoly control of satellite-guided weaponry.

On the civilian side, if the two sides' technicians can reach agreement fairly swiftly on common standards, Galileo satellites may still be able to mesh neatly with the GPS system. In particular, since one of the functions of both systems is to provide ultra-precise timing (useful for stockmarket traders and traffic-control systems), it is vital that their clocks be synchronised.

But with Boeing and Lockheed Martin due to put a new set of GPS satellites into orbit next year, the giants of American aerospace insist that it is too late for them to make big enough changes to keep the Europeans happy; the onus will be on Galileo to adopt standards compatible with the older system.

Watch this space

The main European arguments in favour of Galileo are that GPS does not work well in polar latitudes, nor in heavily built-up environments. Given the weaknesses of the American system's 24 satellites, wouldn't any user prefer to have access to a total of 54 satellites for extra accuracy?

Some American officials, including General Ed Eberhart, head of the Pentagon's Space Command, have indicated that Galileo's effect could be neutral at worst, beneficial at best - but only so long as Americans and Europeans agree on common standards and avoid hurting each other's defence interests.

It remains to be seen whether they can. This quarrel epitomises many of the institutional contrasts between the EU and the United States. On the European side, the issue has been handled by transport ministers and European Commission bureaucrats with no mandate for, or experience of, dealing with the life-or-death issues of geopolitics and war. The risk exists that the EU's permanent bureaucrats, who have a culture of sparring endlessly - but harmlessly, most of the time - with the Americans over commercial issues, could stumble into a transatlantic defence row they never quite expected.