



ESA ARTIST'S CONCEPT BY J. HUBERT

Europe's evolving security and technology-independence policy could force the removal of Chinese-built search-and-rescue payloads from the initial Galileo navigation satellites now under construction.

## European Officials Poised To Remove Chinese Payloads From Galileo Sats

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**T**he European Commission appears set to order the builders of the initial four Galileo navigation satellites, now in final assembly, to remove their Chinese-built search-and-rescue payloads as part of an evolving security and technology-independence policy, European government and industry officials said.

Similar motivations will prevent the builders of the full 30-satellite Galileo constellation from purchasing search-and-rescue terminals from Canada's Com Dev despite Canada's status as an associate member of the 18-nation European Space Agency and Com Dev's acknowledged expertise in the technology, officials said.

Galileo program managers, anticipating a commission ruling they say they still have not received, have begun designing replacement hardware that would have the same weight as the Chinese gear and would not further delay delivery of the four Galileo In-Orbit Validation spacecraft.

The four satellites are in final assembly and test by a manufacturing consortium led by Astrium Satellites and Thales Alenia Space. Their launch date has recently slipped to early 2011 for the first two, and mid-2011 for the remaining pair.

A European Union decision to offload the Chinese-built hardware could serve as a metaphor for the European Commission's relations with China in the Galileo program.

When Galileo was viewed as

a private-sector development with public-sector financial participation, European Commission program managers sought Chinese participation in pursuit of Chinese cash in the short term and privileged access to China's market for positioning and timing applications in the longer term.

That business model collapsed, however, and Galileo was transformed into a 100 percent taxpayer-financed project. Galileo's managers also became aware of the security considerations implicit in the construction of a global positioning, navigation and timing satellite network.

China was, in effect, disinvented from Galileo, a decision that was reinforced by China's move to build its own global system,

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called Beidou/Compass.

At the Munich Satellite Navigation Summit here March 10, a Chinese government official bluntly asked the European Commission why it no longer wanted to work with China, and when China's cash investment in Galileo would be returned.

Paul Verhoef, the European Commission's satellite navigation program manager, sought to explain.

Europe's decision to invite China to invest in Galileo, Verhoef said, "was with a number of purposes in mind, and in a different context. Some nations [outside Europe] wanted to participate in the construction of the system as part of a public-private partnership. But Galileo subsequently was made into a public procurement with public-procurement rules."

Verhoef added: "China's ambitions also had changed. China originally said it was designing its own smaller, regional system for military use. Then China moved to a global civil system. It is one thing to work together in one context. It is quite another in another context. But our two systems can still cooperate."

The former Galileo partners are now embroiled in a dispute over the radio frequencies their separate navigation constellations will use for their encrypted, quasi-military service, which for Galileo is called the Public Regulated Service (PRS). Chinese officials refer to their PRS equivalent simply as the Authorized Service.

Satellite navigation system sponsors would

like to be able to locate their government-only service on radio spectrum not used by any other navigation system. That way, they can jam all other navigation signals in a conflict zone or during an emergency while retaining the use of their own service.

"For the authorized service, spectral separation is beneficial," said Jiao Wenhai of the China Satellite Navigation Office in Beijing during a March 10 presentation here. "But due to the limits of the spectrum, it is difficult to achieve."

China has begun deploying its Beidou/Compass satellites. The full system is designed to include five geostationary-orbit satellites, three satellites in inclined geosynchronous orbit for northern coverage and 27 satellites operating in medium Earth orbit. An initial capacity to serve Asia is expected to be in place by 2012, with full system deployment by 2020, Jiao said.

In an interview, Jiao said that despite some two years of negotiations with Europe and the United States to find separate spectrum slices for the U.S. GPS military code, Europe's PRS and the Chinese Authorized Service, no solution has been found because of the physical limits of available radio spectrum.

Europe and the United States agreed on the locations of their encrypted services in 2004. Verhoef said Europe and Russia — whose Glonass constellation is nearing full in-orbit operational status — are "well advanced" on the issue. "We're still in discussions with China," he said.

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