

# Europe adds two more satellites to Galileo sat-nav system

December 17 2015

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A picture taken on December 17, 2015 shows a Soyuz rocket blasting off from the European space centre at Kourou, French Guiana

Europe on Thursday launched another two satellites for its multi-billion-euro Galileo sat-nav system, a rival to America's GPS, the European Space Agency (ESA) said.

The launch of satellites 11 and 12 in the Earth-orbiting constellation

brought Europe a step closer to providing initial navigation services next year.

"With today's launch, Europe has doubled the number of its Galileo satellites in orbit in just nine months," ESA director general Jan Woerner said in a statement.

"Along with the ground stations put in place around the globe, this brings Galileo's completion within reach. Initial Galileo services are scheduled to begin within next year."

The orbiter duo was taken aloft a Russian Soyuz rocket from Europe's spaceport in Kourou, French Guiana, at 1151 GMT, and released into orbit at an altitude of nearly 23,500 kilometres (14,600 miles), the agency said.

The project should ultimately comprise about 30 orbiters, including a number of spares.

Initial services can start once 16 are in place—hopefully after a four-satellite launch in the second half of 2016, Arianespace chief executive Stephane Israel told AFP this week.

The project, which will also provide crucial search-and-rescue services, has been plagued by delays, technical glitches and budgetary difficulties.

The launch of orbiters seven and eight in March this year was about three months late to allow for a probe into an August 2014 mishap that sent satellites five and six into a lop-sided orbit.

The pair have since been manoeuvred into a better, more circular path.

The mishap was blamed on frozen fuel pipes on board the Soyuz rocket's

fourth stage, called Fregat—a problem the European Space Agency says has since been fixed.

The launch of satellites five and six, meant to have been the first fully operational Galileo orbiters, had itself been delayed by more than a year due to "technical difficulties".

The first four orbiters were launched in 2011 and 2012.

The European Commission has budgeted seven billion euros (\$7.56 billion) for the project until 2020.

The remaining satellites will be launched using a combination of Soyuz rockets, which can take two into space at a time, and Europe's own Ariane 5 ES launcher, which is being adapted to handle four.

The first Ariane launch is scheduled for next year, followed by one each in 2017 and 2018.

There will be one Soyuz launch in 2018 as well—bringing the total to 26 satellites, sufficient for full operation, launch firm Arianespace has said.

A decision on additions will be taken next year.

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Citation: Europe adds two more satellites to Galileo sat-nav system (2015, December 17)  
retrieved 12 May 2024 from <https://phys.org/news/2015-12-europe-satellites-galileo-sat-nav.html>

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