

# FACT SHEET

## What is Galileo?

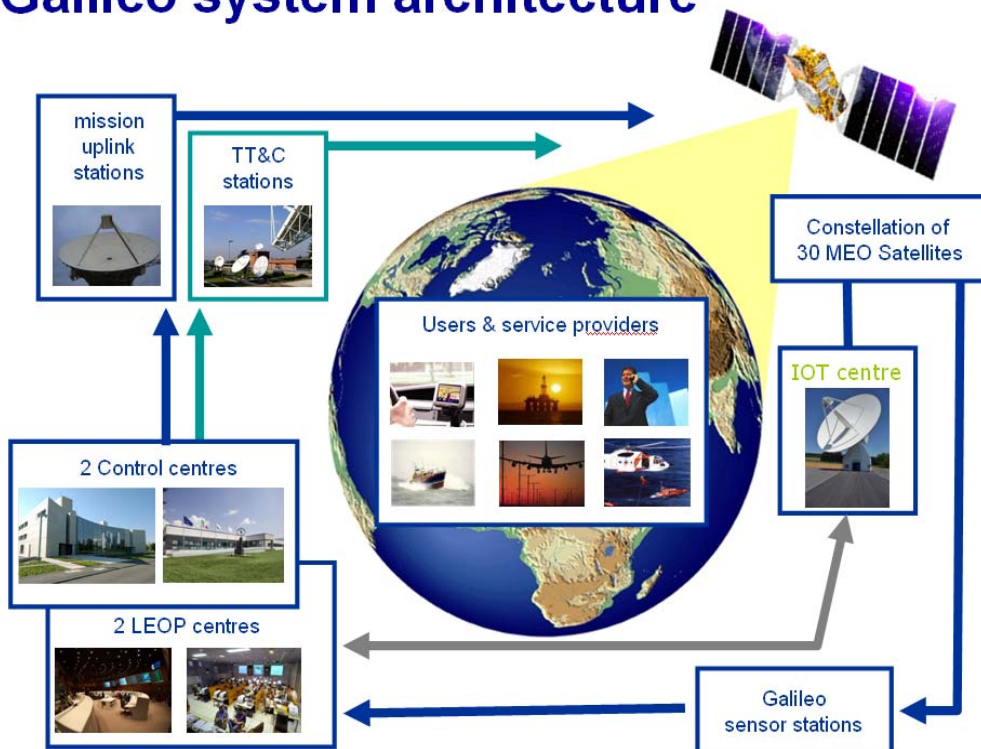


Galileo is Europe's programme for a global navigation satellite system, providing a highly accurate, guaranteed global positioning service, interoperable with the US GPS and Russian Glonass systems. It consists of 30 satellites and ground infrastructure. Galileo's modern and efficient design will increase Europe's technological independence, and help to set international standards for Global Navigation Satellite Systems (GNSS). Galileo is developed in collaboration between the European Union and the European Space Agency (ESA).

## How Galileo works

The complete Galileo constellation will consist of 30 satellites. With the satellites taking about 14 hours to orbit Earth at altitudes of 23 222 km, there will always be at least four satellites visible anywhere in the world. The 30 satellites will be in three orbital planes at an angle of 56 degrees to the equator, which will provide coverage right up to the polar regions.

## Galileo system architecture



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Galileo also depends on an extensive ground infrastructure, which will have to make sure that time and positioning data are extremely accurate – a single billionth of a second clock error means a positioning error up to a range of 30 cm. This ground

infrastructure includes sensor stations worldwide, two control centres, Mission Uplink stations, and Telemetry, Tracking and Command (TT&C) stations.

## **Two main phases of the programme**

1. During the In-Orbit Validation (IOV) phase, the system is assessed through tests, the operation of two experimental satellites and a reduced constellation of four operational satellites and their ground infrastructure. The first two Galileo satellites are being launched into the first orbital plane this year, followed by another two in the second orbital plane next year.

2. The Full Operational Capability (FOC) phase consists of the deployment of the remaining ground and space infrastructure, including an intermediate initial operational capability phase with 18 satellites in operation (the four IOV satellites plus 14 others). By 2015, 18 satellites should be in place, followed by the rest in 2020. The full system will consist of 30 satellites, control centres in Europe and a network of sensor stations and uplink stations installed around the globe.

## **Launching**

The first two satellites will be the first ESA mission launched by the Russian Soyuz rocket from ESA's launch site in French Guiana. This is a significant achievement for international cooperation. So far, the Soyuz – which has completed more than 1700 flights – has only ever been launched from Russia's own launch sites in Baikonur in Kazakhstan and Russia itself.

## **Funding**

The operational phase of the project is funded by the EU which has allocated €2.4 billion for the first 14 satellites and their ground segment. An estimated €1.9 billion will be necessary in the next multiyear EU budget period, 2014–20. The annual running costs are estimated to be about €800 million for both Galileo and its precursor system, the European Geostationary Navigation Overlay System (EGNOS), already in service to augment GPS signal accuracy across Europe.

## **Who is involved?**

The definition phase and the development and In-Orbit Validation phase of the Galileo programme are carried out by the European Space Agency and co-funded by ESA and the EU. The FOC phase is funded by the EU and managed by the European Commission. The Commission and ESA have signed a delegation agreement by which ESA acts as design and procurement agent on behalf of the Commission.

## **General information about the European Global Navigation Satellite Systems:**

[www.satellite-navigation.eu](http://www.satellite-navigation.eu)  
[www.esa.int/esaNA](http://www.esa.int/esaNA)  
[www.ec.europa.eu/enterprise/policies/satnav](http://www.ec.europa.eu/enterprise/policies/satnav)

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