Galileo High Accuracy Service

User Consultation Platform 2020

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December 1st, 2020

Organised by:

European Global Navigation Satellite Systems Agency

European Commission

Under the auspices of:

eu2020.de

EU Space Programme:

Copernicus

EGNOS

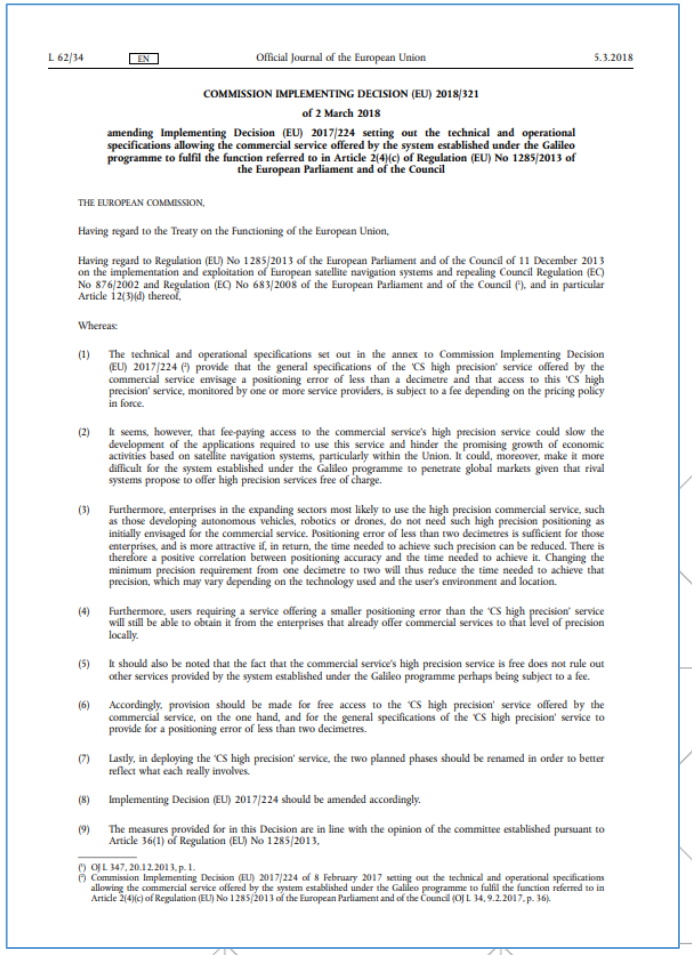
GALILEO

GALILEO HAS BACKGROUND

EC Imp Decision (EU) 2017/224 (8-02-2017) amended by (EU) 2018/321 (2-03-2018)

Implementation of the Galileo Commercial service as:

- **CS High Precision or HAS Service:** For free service. High Accuracy corrections, accuracy down to 20 cm using E6-B.
- **CS Authentication or CAS Service:** Authentication through access to encrypted codes (using a private crypto key), using E6-B for the access data and E6-C component (pilot).



L 62/34 EN Official Journal of the European Union 5.3.2018

COMMISSION IMPLEMENTING DECISION (EU) 2018/321

of 2 March 2018

amending Implementing Decision (EU) 2017/224 setting out the technical and operational specifications allowing the commercial service offered by the system established under the Galileo programme to fulfil the function referred to in Article 2(4)(c) of Regulation (EU) No 1285/2013 of the European Parliament and of the Council

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council (1), and in particular Article 12(3)(d) thereof,

Whereas:

(1) The technical and operational specifications set out in the annex to Commission Implementing Decision (EU) 2017/224 (2) provide that the general specifications of the 'CS high precision' service offered by the commercial service envisage a positioning error of less than a decimetre and that access to this 'CS high precision' service, monitored by one or more service providers, is subject to a fee depending on the pricing policy in force.

(2) It seems, however, that fee-paying access to the commercial service's high precision service could slow the development of the applications required to use this service and hinder the promising growth of economic activities based on satellite navigation systems, particularly within the Union. It could, moreover, make it more difficult for the system established under the Galileo programme to penetrate global markets given that rival systems propose to offer high precision services free of charge.

(3) Furthermore, enterprises in the expanding sectors most likely to use the high precision commercial service, such as those developing autonomous vehicles, robotics or drones, do not need such high precision positioning as initially envisaged for the commercial service. Positioning error of less than two decimetres is sufficient for those enterprises, and is more attractive if, in return, the time needed to achieve such precision can be reduced. There is therefore a positive correlation between positioning accuracy and the time needed to achieve it. Changing the minimum precision requirement from one decimetre to two will thus reduce the time needed to achieve that precision, which may vary depending on the technology used and the user's environment and location.

(4) Furthermore, users requiring a service offering a smaller positioning error than the 'CS high precision' service will still be able to obtain it from the enterprises that already offer commercial services to that level of precision locally.

(5) It should also be noted that the fact that the commercial service's high precision service is free does not rule out other services provided by the system established under the Galileo programme perhaps being subject to a fee.

(6) Accordingly, provision should be made for free access to the 'CS high precision' service offered by the commercial service, on the one hand, and for the general specifications of the 'CS high precision' service to provide for a positioning error of less than two decimetres.

(7) Lastly, in deploying the 'CS high precision' service, the two planned phases should be renamed in order to better reflect what each really involves.

(8) Implementing Decision (EU) 2017/224 should be amended accordingly.

(9) The measures provided for in this Decision are in line with the opinion of the committee established pursuant to Article 36(1) of Regulation (EU) No 1285/2013,

(1) OJ L 347, 20.12.2013, p. 1.
(2) Commission Implementing Decision (EU) 2017/224 of 8 February 2017 setting out the technical and operational specifications allowing the commercial service offered by the system established under the Galileo programme to fulfil the function referred to in Article 2(4)(c) of Regulation (EU) No 1285/2013 of the European Parliament and of the Council (OJ L 34, 9.2.2017, p. 36).

Galileo HAS main characteristics

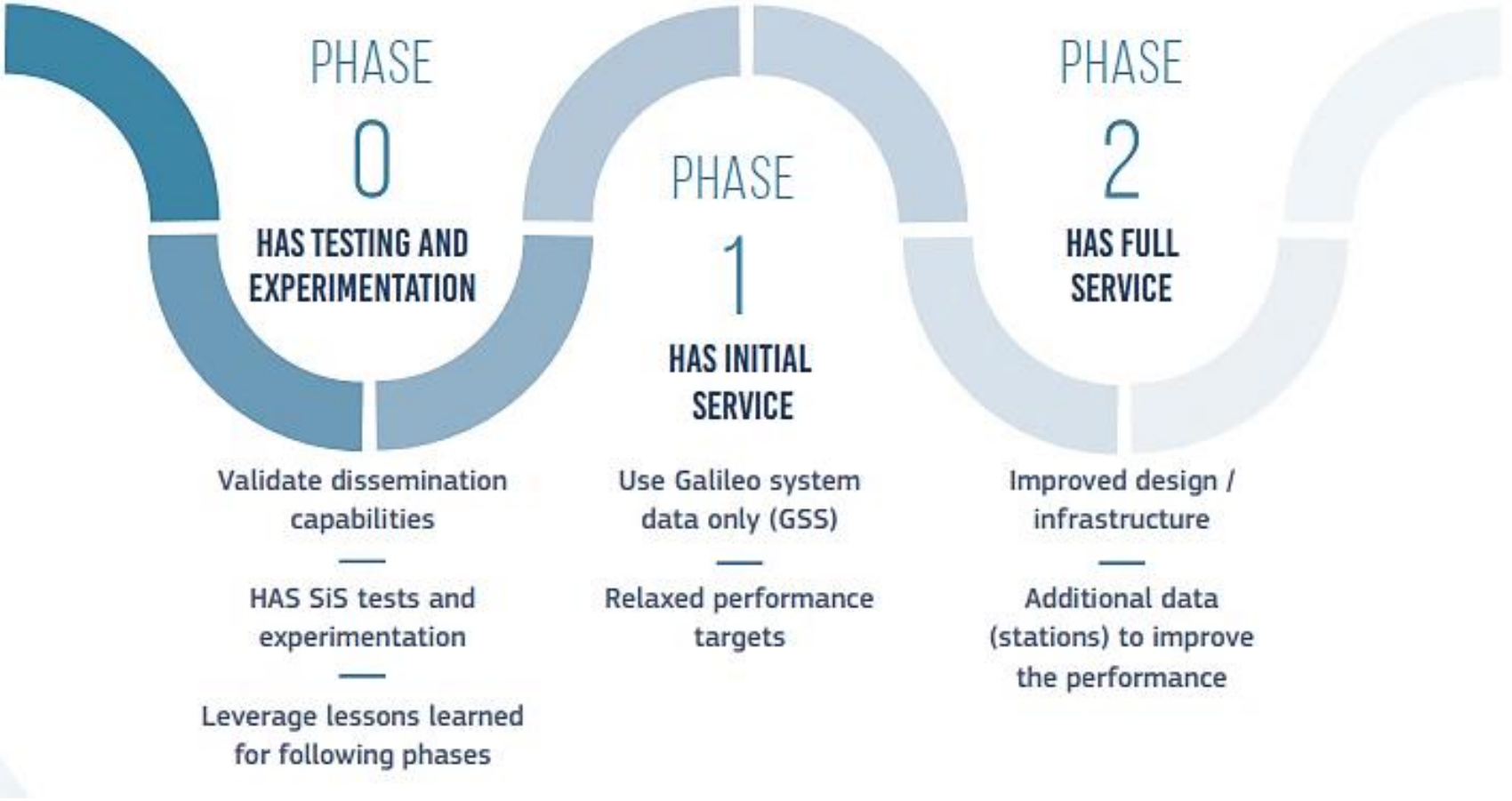
HAS	SERVICE LEVEL 1	SERVICE LEVEL 2
COVERAGE	Global	European Coverage Area (ECA)
TYPE OF CORRECTIONS	PPP - orbit, clock, biases (code and phase)	PPP - orbit, clock, biases (code and phase incl. atmospheric corrections
FORMAT OF CORRECTIONS	Open format similar to Compact-SSR (CSSR)	Open format similar to Compact-SSR (CSSR)
DISSEMINATION OF CORRECTIONS	Galileo E6B using 448 bits per satellite per second / terrestrial (internet)	Galileo E6B using 448 bits per satellite per second / terrestrial (internet)
SUPPORTED CONSTELLATIONS	Galileo, GPS	Galileo, GPS
SUPPORTED FREQUENCIES	E1/E5a/E5b/E6; E5 AltBOC L1/L5; L2C	E1/E5a/E5b/E6; E5 AltBOC L1/L5; L2C
HORIZONTAL ACCURACY 95%	<20 cm	<20 cm
VERTICAL ACCURACY 95%	<40 cm	<40 cm
CONVERGENCE TIME	<300 s	<100 s
AVAILABILITY	99%	99%
USER HELPDESK	24/7	24/7

Galileo HAS addresses both traditional and emerging markets and applications

The main target of HAS are **emerging applications** such as autonomous vehicles, drones or robotics, and other applications where 20cm positional accuracy is sufficient:

Markets	Applications
Geomatics	GIS/Mapping, Cadaster in rural areas (Land consolidation), Hydrographic survey and Vessel navigation, Off-shore exploration
Agriculture	Guidance, VRA-Low applications, Farm machinery positioning, Site-specific data analysis applications
Aviation	Drones: Positioning System (Urban), Drones: Navigation System (Urban) Drones: Geo-awareness System, Airport – integrated surface management systems
Road	Autonomous driving, Safety-critical applications
Consumer Solutions	LBS, Gaming, Health, AR for leisure, Commercial (Geo marketing and advertising), AR Professional, Robotics- High GNSS use
Rail	Cold Movement Detection, Odometer Calibration, Door Control Supervision, Infrastructure surveying, Gauging surveys, Structural monitoring
Maritime	Merchant Navigation and Pilotage operations in Ports, Pilotage operations in IWW, Port operations, Port bathymetry, Riverbed survey, Coastal Seabed survey, Offshore supply vessels with dynamic positioning, Port Terminal Cranes and Straddle Carriers navigation, Autonomous Surface Vessels
Space	Precise orbit determination (e.g. for autonomous formation flying and in-orbit rendezvous and docking), Attitude determination, Civilian launchers (e.g. for precise orbit injection)

Galileo HAS will be gradually rolled out as of 2020



Survey

- Target applications
- HAS Performance
- Dissemination channels
- Support Functions
- Barriers and incentives

SCAN ME

https://ec.europa.eu/eusurvey/runner/HAS_SurveyUCP2020

Questions?