

GALILEO SAR

EU contribution to Search and Rescue



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User Consultation Platform • December 2020

Open Service (OS)

- Available world wide
- Interoperational with other satellite systems
- Free of charge



Public Regulated Service (PRS)

- Member states specific users
- Robust and encrypted signals



Search and Rescue (SAR)

- European contribution to Cospas Sarsat
- Free of charge
- Worldwide coverage



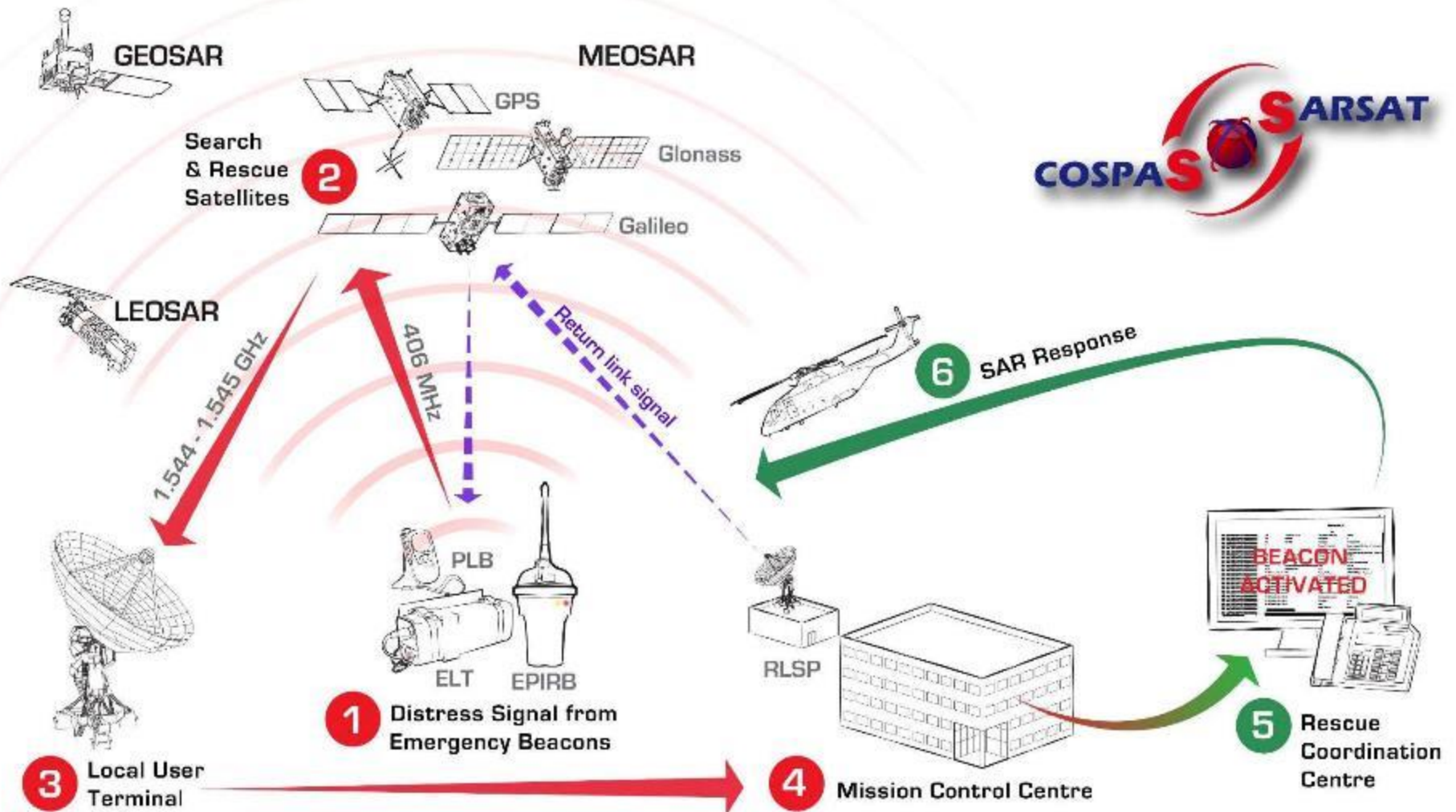
Search and Rescue (SAR)



European contribution to Cospas Sarsat



The Cospas-Sarsat System



GALILEO one of the major contributor to **MEOSAR** configuration

24 SAR payloads on GALILEO satellites

3 ground stations (MEOLUT)
+ 1 under deployment



SAR GALILEO MEOLUT LOCAL FACILITIES



SVALBARD
(Norway)



LARNACA
(Cyprus)



MASPALOMAS
(Spain)

La Reunion
(France)



CLOSING THE LOOP WITH THE GALILEO RETURN LINK SERVICE

- ★ Cospas-Sarsat System is **ONE WAY** → from beacon to ground stations

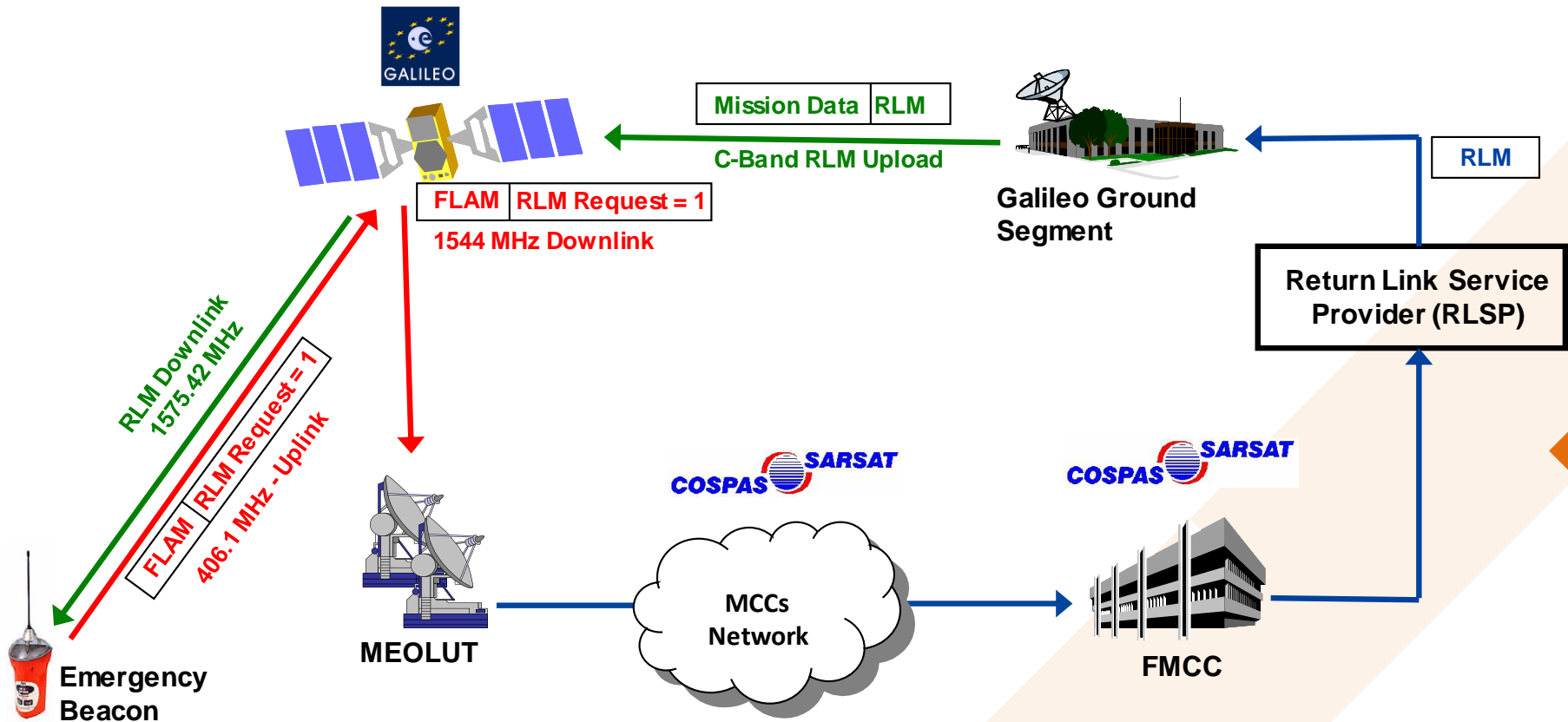


Let's hope this beacon worked properly!

- ★ The SAR/GALILEO Return Link Service provides a **RETURN LINK MESSAGE (RLM)** → from ground to the beacon in distress
- ★ The RLM provides the users in distress an acknowledgement that the alert has been **detected** and **localized**

SAR GALILEO RETURN LINK SERVICE

RETURN LINK SERVICE: unique feature of GALILEO Operational since January 2020



- The beacon receives the automatic acknowledgment when its alert has been detected and localised.
- Since January 2020 in **Initial Operational Capability (IOC)**
- Beacons coded in a limited list of countries which adhered to C/S rules for RLS IOC phase
- Worldwide coverage

More info:

<https://www.gsc-europa.eu/sites/default/files/sites/all/files/Galileo-SAR-SDD.pdf>

SAR GALILEO RETURN LINK SERVICE

List of countries that can sell RLS beacons with their own country code.

Country or Territory	Limitations	Country Code (MID)	Specific Country Regulations
Croatia	Allowed for all beacon types	238	S.007
Cyprus	Allowed for all beacon types	209	S.007
Cyprus	Allowed for EPIRBs only	210, 212	S.007
Denmark	Allowed for all beacon types	219, 220	S.007
Faroe Islands (DK)	Allowed for all beacon types	231	
France	Allowed for all beacon types depending on the use. Restrictions may exist per Country Code (see *)	226*, 227, 228*, 329, 347, 361, 501*, 540, 546, 578, 607*, 618*, 635*, 660, 745	S.007
Germany	Allowed for EPIRBs and ELTs only	211, 218	S.007
Greece	Allowed for all beacon types	237, 239, 240, 241	S.007
Greenland (DK)	Allowed for all beacon types	331	
Iceland	Allowed for all beacon types	251	S.007
Ireland	Allowed for PLBs only	250	
Israel	Allowed for all beacon types	428	S.007
Italy	Allowed for all beacon types	247	S.007
Latvia	Not allowed for EPIRBs	275	S.007
Liechtenstein	Not allowed for EPIRBs	252	S.007
Norway	Allowed for PLBs only	257, 258, 259	S.007
Spain	Allowed for EPIRBs only, with restrictions	224, 225	S.007
Sweden	Not allowed for ELTs	265, 266	S.007
Switzerland	Not allowed for EPIRBs	269	S.007
United Kingdom	Allowed for all beacon types	232, 233, 234, 235	S.007

SERVICES ALREADY DECLARED



Galileo OS Service Definition Document

Version 1.1, May 2019

Galileo Open Service Signal In Space Interface Control Document (OS SIS ICD)

Version 1.3, August 2018



Galileo Search and Rescue Service Definition Document

Version 2.0, January 2020

Ionospheric Correction Algorithm for Galileo Single Frequency Users

Version 1.2, September 2016



THANK YOU

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<http://ec.europa.eu/galileo>

BACK-UP SLIDES

<http://ec.europa.eu/galileo>

SAR GALILEO FORWARD LINK PERFORMANCES

FORWARD LINK Performance parameter	MPL Value	observed
Forward Link Service availability	>99%	99.9%
Valid message detection probability after a single transmitted burst	>99%	99.7%
Location probability after 1 transmitted burst	>90%	99.3%
Location probability after 12 transmitted bursts ~10 min	>99%	99.7%
Location accuracy (within 5km) after 1 transmitted burst	>90%	98.6%
Location accuracy (within 5 km) after 12 transmitted bursts ~10 min	>95%	99.1%

RETURN LINK Performance parameter	MPL Value	observed
Return Link Service availability	>95%	100%
RLS Delivery Latency within 15 min	>99%	99.94%
RLS Reception Probability	>99%	99.76%

Since service declaration
Galileo system took an average of **37s** to deliver the RLM

More info:

<https://www.gsc-europa.eu/electronic-library/galileo-service-performance-reports>
<https://www.gsc-europa.eu/news/galileo-return-link-service-delivers-excellent-performance>