



Linking space to user needs

EU Space Contribution to Search And Rescue

Space as an enabler for Governmental services: Showcasing the potential for Maritime and Security services

09 October 2024

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Outline



- EUSpace and European Agency for the Space Programme (EUSPA)
- COSPAS-SARSAT
- SAR/Galileo Contribution and Differentiators
- Some EUSpace Projects
- Looking Ahead





EU Space Programme 2021-2027

EU Space activities under one umbrella





Galileo Services





Galileo Services and Products

- Open Service (OS)
- Public Regulated Service (PRS)
- High Accuracy Service (HAS)

Positionning Navigation Timing

• Search And Rescue (SAR)

And Rescue

Search





EUSPA's Engagement with End Users

- **EUSPA's Role**: Ensures EU space services' utilisation by end users, including authorities and citizens
- **Implementation and Adoption**: Moves beyond intention statements to concrete measures for real-world application
- Engagement with Market Actors:
 - Facilitates dialogues between EUSPA, market actors, and solution providers
 - Ensures space services meet practical needs and are integrated into user workflows
- Impact:
 - Aids in tailoring space services to specific requirements of various user groups
 - Enhances the accessibility and relevance of EU space services for societal benefits





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COSPAS-SARSAT

- Distress radio beacons (ELTs for aviation use, EPIRBs for maritime use, and PLBs for personal use) which transmit signals during distress situations;
- Instruments on board satellites which detect the signals transmitted by distress radio beacons;
- Ground receiving stations (Local Users Terminals), which receive and process the satellite downlink signal to generate distress alerts;
- Mission Control Centres (MCCs)_which receive alerts produced by LUTs and forward them to Rescue Coordination Centres (RCCs), Search and Rescue Points Of Contacts (SPOCs) or other MCCs.



รวด



COSPAS-SARSAT MEOSAR Evolution







COSPAS-SARSAT MEOSAR Evolution

MEOSAR

+ Pros

- High number of interoperable satellites
- Global coverage
- Real time detection and location
- Single burst detection and location
- Near-real-time detection
- New functionalities (e.g. Galileo RLS)

- Cons

- More costly space segment (but SAR is a piggyback payload)
- More costly ground segment (if classical pointing antenna)



Galileo SAR Antenna 8 kg



Galileo SAR Transponder 7 kg – 60 Watts

SAR represents only 1% of GALILEO programme cost



COSPAS-SARSAT Initial Configurations

LEOSAR

+ Pros

- Detects low powered beacons
- Polar coverage

- Cons
 - Wait time (minutes to hours)
 - SARP on board processing: fixed coding
 - Ageing satellites

GEOSAR

+ Pros

Near-real-time detection

Cons

- Coverage limited to +-70°
- Fixed geometry (potential terrain blockage)
- No Doppler location





COSPAS-SARSAT Beacons











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SAR/GALILEO One of the major contributors to the MEOSAR

27 SAR payloads within GALILEO constellation!

4 Ground Stations (MEOLUT)

Galileo contributes to C/S Alert Detection (Forward Link Service)

Galileo 1st provider of <u>Distress Acknowledgment to End Users</u> (Return Link Service)



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SAR/GALILEO Ground Segment





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SAR/GALILEO Ground Segment – MEOLUT Facilities



SVALBARD (Norway)





LARNACA (Cyprus)

New - LA REUNION (France)



MASPALOMAS (Spain)





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Galileo System: Distributed Infrastructure



SAR/GALILEO – Return Link Service (RLS)





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Return Link Service Adoption

- Operational since January 2020 in its Initial Operational Capability (IOC)
- 64th Council of Cospas-Sarsat (17-26 March 2021) authorised the upgrade to Full Operational Capability
- RLS beacons can be sold with all country codes (provided that the country has approved the RLS protocol)





SAR/GALILEO – Towards Full Operational Capability

- Coverage over Indian Ocean (via Reunion SAR/Galileo MEOLUT)
- Redundant Mission Control Centre (Spanish MCC)
- Additional Calibration and Reference Beacons for SGS

<u>Upcoming Service Definition Document</u>





SAR/GALILEO Performances (MPL)

Availability of Successful Location within 5 [km] - Single Burst



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SAR/GALILEO Performances (Metric)

Availability of Successful Location within 2 [km] - From 1 to 12 bursts





SAR/GALILEO Performances (MPL)

95 th percentile of Dissemination Latency; measured from the I/F RLSP-GMS to Signal received on ground									
Month [2023]	TLS	SBG	AZO	MAS	LNC	RUN	KER	SSF	
July	11	9	9	9	11	13	9	N/A	
August	15	11	9	11	15	15	13	N/A	
September	9	15	9	13	9	15	9	N/A	
October	11	11	15	15	11	13	13	N/A	
November	17	17	17	17	17	17	17	17	
December	13	13	15	13	13	15	9	15	



SAR/GALILEO Performances: Stay Informed !

- Quarterly Performance Reports
 - January March 2024
 - <u>April June 2024</u>
- Published on the web site European GNSS Service Centre



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COBALT











PHOENIX

Total EU Funding: 464378,57 EURDuration: 56 monthsMarket Segment: Maritime and Inland Waterways	Ocean Signal Limited is a British worldwide leader in designing and manufacturing Satellite and Terrestrial Emergency Rescue Beacons based upon VHF/UHF, Digital Selective Calling, Automatic Identification Systems, GNSS and battery technologies. Supplying products to four main markets: Commercial Marine, Leisure
Differentiator: SAR	Challenges • Develop a new core beacon platform for global and local rescue
Call Topic: MEOSAR Beacons	 Combine a Personal Locator Beacon (PLB) with built-in Automatic Identification Service (AIS) for maritime applications Integrate the Return Link feature utilizing LED indicators Deliver the lowest cost PLB available with the smallest possible form Outputs Developed a 406MHz MEOSAR Personal Locator Beacon Incorporated the 'First Generation' COSPAS-SARSAT 406MHz waveform Created the rescueME PLB3 device with AIS man overboard (MOB)
	capability Integrated blue, LED, RLS, indicator, and AIS for local rescue
	 Enables instant detection by nearby vessels Provides position and ID using satellite link for global rescue Offers wider level of protection and higher probability of rescue

TAUCETI









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SAR/GALILEO – Beacon Command Service

- Enable Aircraft/Ship Owners to remotely Test/Activate/Deactivate Beacons (via RLS, additional and optional means)
- Initial use case: aviation (MH370, AF447), unresponsive crew
- New EUSpace Project aimed at Commercial Vessels (on top of VDES)



GAMBAS Demonstration



Distress Position Sharing is to be activated during a SCENARIO related to



- 3 Field Tests completed:
- Athens, GREECE
- Barcelona, SPAIN
- Lomé, TOGO

GAMBAS // EUSPA User Consultation Platform 2022// Oct. 3rd 2022





Conclusions

- European Space Programme is key contributor to MEOSAR FOC
- SAR/Galileo operational since 2016,
 - High Performance for Detecting and Locating Users in Distress
 - Continuous Evolution (RLS) & Improvements (Resilience)
 - Major Differentiators (BCS, DPS, TWC)
- **EUSPA Collaboration with Industry:** Working with the industrial downstream sector through Research & Innovation (R&I) projects that strengthen capabilities in space technology and application.
- **Engagement and Contact**: for further question or to get in touch for collaboration, information, or to explore opportunities within the EU Space Programme you can write to <u>galileo.exploitation@euspa.europa.eu</u> or <u>market@euspa.europa.eu</u>





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Get in touch with us

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