ESA 4S Announcements Of Opportunities

Space-based End-to-End Solutions for Aviation or Maritime Safety Critical Communications and Surveillance

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4S - Space Systems for Safety and Security

Today’s speakers

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Agenda

1. ESA ARTES '**Space Systems for Safety and Security**' (4S) Strategic Programme Line
2. 4S Maritime and Aviation Strategy for 2026 – 2028
3. 4S New Announcements of Opportunities
4. Submission and Implementation process
5. Other 4S opportunities on maritime and aviation safety and surveillance
6. Q&A

4S?

ESA

⇒ Connectivity and Secure Communications Directorate (CSC)

CSC - 3 main strategic axes, with specific Strategic Programmes and teams :

- Optical & Quantum
- 5G/6G – Space Systems based on 5G/6G NTN (Non-Terrestrial Networks) part of the standards

⇒ *4S – Space Systems for Safety and Security*

Space Systems for Safety and Security (4S)

CYBERSECURE AND RESILIENT

DIGITAL INFRASTRUCTURE

CRITICAL INFRASTRUCTURES

SECURE & RELIABLE OPERATIONS

TRANSPORTATION

SAFETY

Air, Land and Sea

4S

SPACE SYSTEMS FOR

SAFETY AND SECURITY

Institutional & public bodies PARTNER
in building their SATCOM RESPONSE to their needs
Industry PARTNER
in developing and marketing their
4S solutions and services

INNOVATION &

COMPETITIVENESS

GOVERNMENTAL OPERATIONS

Administrations, police, emergency services, coast guards, ...

PUBLIC SAFETY

RAPID RESPONSE TO

DISASTERS AND CRISES

ESA 4S way forward related to Maritime & Aviation (2026-2028)

ESA 4S aims to support the development and in-orbit validation of
European systems-of-systems for aviation and maritime critical communications and surveillance to be deployed in a pre-operational configuration by 2030

ESA is closely **collaborating** to reach this goal with Maritime (e.g. EMSA) and Aviation (e.g. EuroControl, SESAR, EC) institutional bodies

Already a set of private-led aviation and maritime initiatives ongoing and supported by CSC/4S

In addition, to further support European innovation and service offering, with 3 axes of work to pursue this **2030 objective** over the critical 2026-2028 period:

1. **In-orbit service and technology demonstrations** – demonstrate added-value of innovative techno / services to stakeholders
2. **Overall system architecture** – what is the optimal space-based system-of-systems for maritime / aviation in Europe?
3. **Critical building blocks development** – prepare “missing” technologies / elements for future space-based infrastructures

Maritime & Aviation – Key Systems & Use Cases

Any system enabling critical maritime / aviation use case(s) is of high interest

Maritime

Critical Communications

System / Technology

VHF Data Exchange System
IMT (5G / 6G)
GMDSS
Broadband constellations
...

Use Cases
Non-exhaustive

Search and Rescue
MSI Broadcasting
Operations Optimization
Autonomous Vessels

Domain Awareness

System / Technology

VHF Data Exchange System
RF monitoring (incl. AIS)
Tip-&-Cue / Data Fusion
...

Use Cases
Non-exhaustive

AIS Spoofing
Dark Vessels
Secure Reporting
Ship-to-Ship Transfer

Aviation

Critical Communications

System / Technology

Space-based VHF
L-Band (e.g. IRIS, LDACS)
IMT (5G / 6G)
Broadband constellations
...

Use Cases
Non-exhaustive

ATS Voice / Data, Oceanic / Continental
AOC Voice / Data, Oceanic / Continental
TBO
C2 for UAVs

Surveillance

System / Technology

ADS-B
GNSS-independent system
...

Use Cases
Non-exhaustive

Airplane/UAVs Tracking
GNSS Jamming
TBO

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Thematic Announcements of Opportunities

Objectives

Objective is to quickly **mature and demonstrate solutions**, and / or perform **pre-operational service demonstrations** towards next generation of **satcom infrastructure for Aviation and Maritime Traffic Management and Safety**.

Considered essential to secure the buy-in of public, regulatory and policy-makers stakeholders, as well as private investors, which is critical for the later development and deployment of full-scale satellite communications infrastructures.

Outcomes to be delivered by **end-2027 – early 2028**, to feed preparation of next European steps.

Thematic Announcement of Opportunities

Scope

AO#1 – **Space-based end-to-end solutions for aviation/ATM safety and critical communications**

AO#2 – **Space-based end-to-end solutions for maritime safety and critical communications**

AO#3 – **Space-based end-to-end solutions for maritime surveillance and domain awareness via detection and processing of vessels' AIS RF emissions**

- ✓ In-orbit test and demonstration of system concepts, infrastructures, technologies and / or in-orbit demonstration of end-to-end services, based on a pre-operational system configuration.
- ✓ Tests and Demonstrations using existing system(s), a system developed and deployed as part of the activity, or a mix of both.
- ✓ Maturation of key technologies (R&D) can be included in the activity.

AO #1 – Space-based End-to-End Solutions for Aviation / ATM Safety and Critical Communications

Target areas

- ✓ ‘Hyperconnected ATM‘ concept, whereby non-safety “off-the-shelf” air-ground links available in an aircraft could be used in addition to safety links to support safety communications.
- ✓ Critical communications for innovative use cases, such as UAVs.

Example of relevant systems / technologies / use cases

- ✓ C-band and / or S-band for aviation critical communications,
- ✓ Addition of non-safety links to aviation safety links (e.g. S / Ka-bands),
- ✓ Command-and-control for UAVs.

Any proposal dealing with other systems / technologies will be assessed as far as they address critical coms for aviation.

AO #2 – Space-based End-to-End SatCom Solutions for Maritime Safety and Critical Communications

Target areas

- ✓ VDES infrastructure and end-to-end VDES-based services.
- ✓ Hyperconnected maritime safety infrastructure, whereby non-safety "off-the-shelf" links available could be used in addition to safety links to support safety communications.
- ✓ New use cases, such as MASS (Maritime Autonomous Surface Ships).

Example of relevant systems / technologies / use cases

- ✓ Representative end-to-end VDE-SAT demonstrations of critical services (e.g. scalable MSI broadcasting),
- ✓ Large-scale interoperability tests between VDE-SAT operators and / or with VDE-TER actors,
- ✓ Addition of non-safety / non-maritime specific links to maritime safety links (e.g. S / Ka-bands),
- ✓ Command-and-Control for autonomous vessels.

Any proposal dealing with other systems / technologies will be assessed as far as they address critical maritime communications.

AO #3 – Space-based end-to-end solutions for maritime surveillance and domain awareness via detection and processing of vessels' AIS RF emissions

Objective is to assess and demonstrate the performances of new / emerging system, technology and service concepts addressing current maritime domain awareness challenges, based on detection (from space) and processing of vessels' AIS RF emissions.

Example of relevant use cases

- ✓ Vessel detection, geolocation and identification
- ✓ Spoofing detection

Due to current regulatory constraints, demonstrations can only rely on AIS / VDES signals. This could be expanded in the future and lead to amendments to this AO.

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Main principles

- ✓ Activities to be implemented in the frame of ARTES 4.0 'Technologies and Products for C&G, Optical and Quantum Communication – ScyLight, **Space Systems for Safety and Security (4S)** and 5G/6G and Sustainable Connectivity **Standard Call for Proposals**' (**AO 4-40017**)
  - Tender action package available on esa-star Publication
  - Industry-initiated Call for Proposals

- ✓ Based on a **non-competitive process**
  - Each proposal is to be **evaluated independently**, based on its own merit (direct negotiation).
  - ESA can place as **many contracts** as good proposals received if supported by their respective national delegations

- ✓ Only proposals from companies or organisations – be it as Prime or as Subcontractor – residing in ESA Member States participating in the ARTES 4.0 4S programme can be considered (Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, United Kingdom and Canada).

Submission Process

2 Steps: submission of an **Outline Proposal** followed by submission of a **Full Proposal**

- ✓ Outline Proposal templates available at Documents | ESA CSC (use “Templates for Co-Funded Technology and Product Developments with procurement”).
- ✓ Outline Proposals shall be submitted through the OSIP Platform.
- ✓ In case of a positive assessment from ESA, the bidder is invited by ESA to submit **via** esa-star its Full Proposal along with the **Authorisation of Funding from the relevant National Delegation(s)**

Timeline & contact information

This initiative opened in November 2025 for an initial duration of one year.

Outline Proposals can be submitted at any time.

Outputs should be ready **by 2027 – early 2028** to enable the preparation of next European steps.

All relevant information / documents can be found on 4S Webpage - ESA 4S Announcements Of Opportunities on Maritime and Aviation

Industry may contact ESA (at ARTES-4S@esa.int) for further information or questions all along the process.

Outline Proposal Evaluation Criteria

- Consortium technical and commercial experience in related system, technology, product and/or service development.
- Credibility of the technical solution and relevance of the activity wrt. 4S opportunity's scope and objectives, quality and completeness of programme of work.
- Credibility of the business case.
- Adequacy of deliverables, schedule and risks management.
- Adequacy of cost and funding, value for money.

Co-funding

ESA will co-fund the activity on behalf of its Member States.

The maximum amount of co-funding will depend on :

- ✓ Activities phases
- ✓ Type of entities
- ✓ Relevant National Delegation's decision

Development Phase	ESA maximum Co-Funding Level		
	Non-SME	SME	Universities or Research Institutes with no commercial interest in the product or system
Definition Phase	50%	80%	50% [up to 30% Development Phase cost]
Technology Phase	75%	80%	100% [up to 30% Development Phase cost]
Product Phase	50%	80%	50% [up to 30% Development Phase cost]
Demonstration Phase	50%	80%	50% [up to 30% Development Phase cost]

Authorisation of Funding letter

Formal authorisation from the National Delegation(s) of the companies involved is required at the time of submission of the Full Proposal.

Full Proposals submitted without the Authorisation of Funding will not be admitted for evaluation.

Please initiate discussions with your National Delegate(s) as early as possible, preferably before Outline Proposal submission to ESA.

Contacts of the National Delegations can be found at National Delegations | ESA CSC

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Other Current 4S Opportunities for Maritime / Aviation

Multiple **ESA-initiated, fully-funded R&D activities issued / under preparation**

- ✓ 3A.226 - Towards an infrastructure supporting the hyperconnected vessel – ITT closing on 03/02/2026 – esa-star Publication
- ✓ 3A.227 - Towards an infrastructure supporting the hyperconnected aircraft – ITT closing on 28/01/2026 – esa-star Publication
- ✓ 5A.096 - Onboard Automatic Identification System Spoofing Detection Module for Low-Latency and Reliable Maritime Surveillance – Work Plan 2026 under IPC approval
- ✓ 3D.039 - Secure Maritime Communications Solutions over VHF Data Exchange System – Work Plan 2026 under IPC approval

More ESA-initiated activities expected in the 4S 2027 Work Plan

Q&A session

esa
→ THE EUROPEAN SPACE AGENCY

Please use the ‘chat’ function

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