

Airborne surveillance of sea surface activities

–what technology is needed for improved effectiveness?

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Introduction

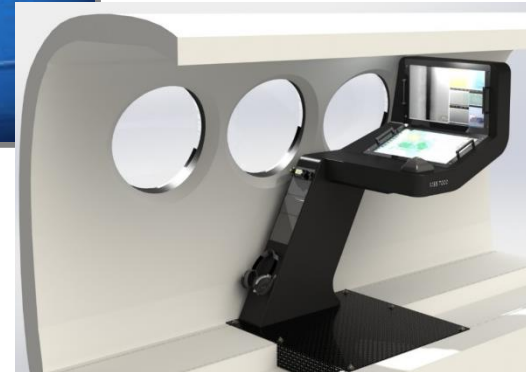
SSC Airborne Systems -> **S&T** ->



First generation developed >30 years ago



MSS 6000 launched 2006



MSS 7000



Airborne mission system

End user

Coast guard, law enforcement,
border patrol

Maritime

Surveillance system

Integration of sensors, GIS SW &
communication suite

Effective mission

Typical 2-12h flight, 1000-
5000ft, 150-250kts



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Mission types

Search & Rescue



Blue Border Control



Green Border Control



EEZ / Fishery Control



Environmental Protection



- Environmental Protection/
Oil pollution
- Green & Blue border control
- Law enforcement
- Boat traffic control (smuggling)
- Search & Rescue
- EEZ Protection/ Fishery control
- Ship traffic management
- Ice patrol



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Multi-mission systems



**Multiple
tasks during
one mission**



- **broad sensor suite which can be configured/used in different ways depending on the mission type**
- **tight integration of sensors & modular design**
- **scaling of information depending on current mission or workload**
- **filters to handle large amount for data and to present the correct data to the operator**



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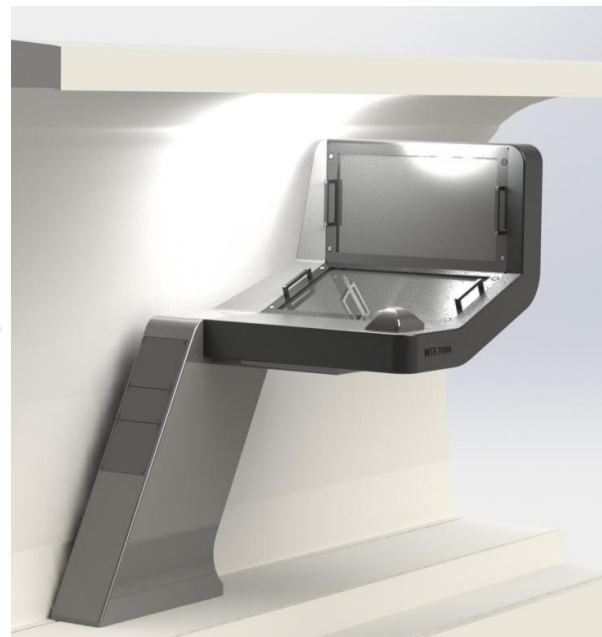
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Multi-mission systems -Tight integration

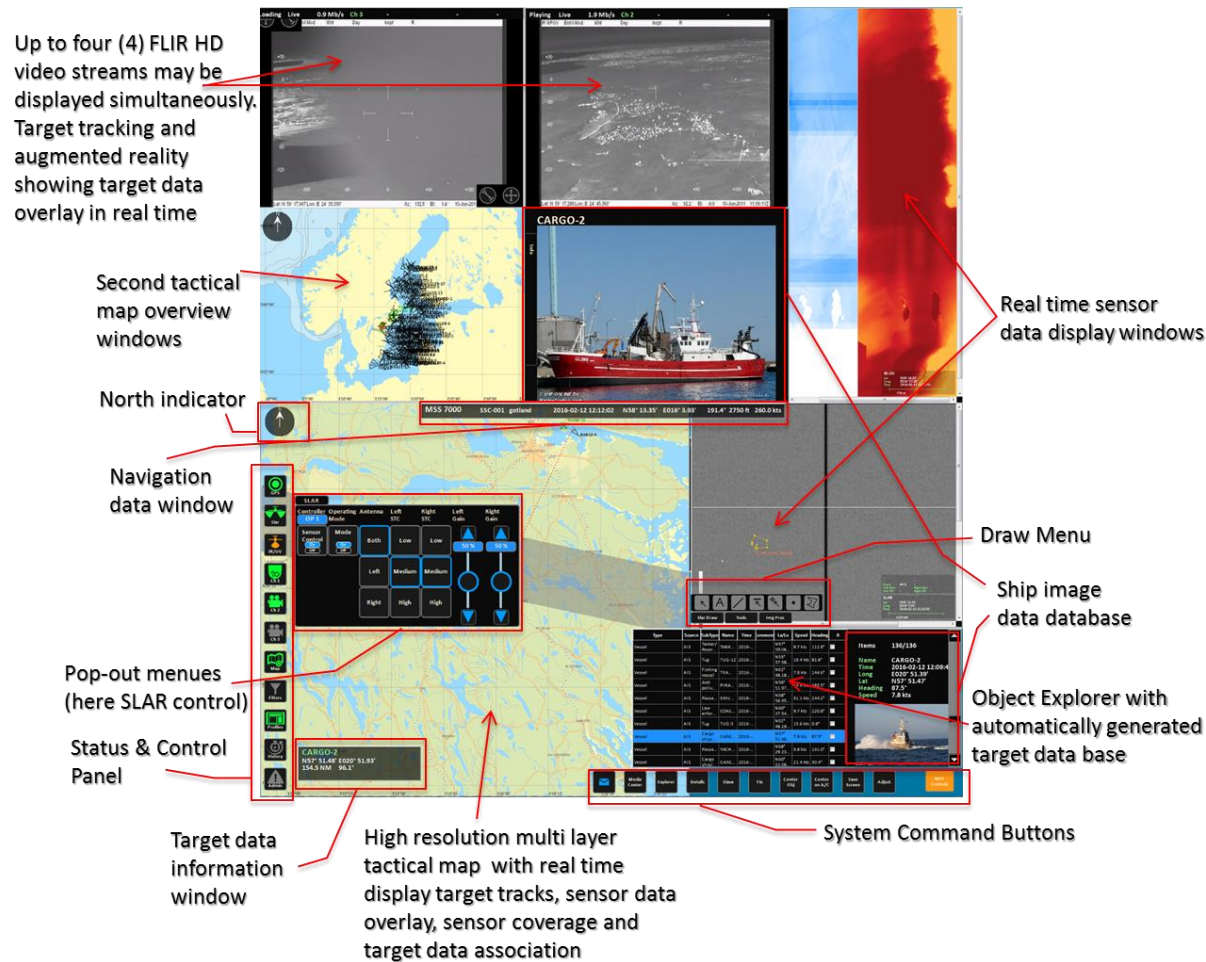


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Multi-mission systems -New operators interface



User interface is designed to handle both surveillance and search & rescue missions



Scaling, filtering & user profiles that are connected to the mission type



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Multi-mission systems -Broad sensor suite



SLAR



IR/UV-
scanner



AESA 360°
Search Radar



EO/IR



Laser fluorosensor



Cameras



Radios



Direction
Finder



AIS



Satellite Link



Sox, Nox sniffer



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Sensors –environmental protection



SLAR – Side Looking Airborne Radar
Long range detection for oil spills and targets



IR/UV scanner– IR & UV & VIS
Thermal mapping
Mapping of relative oil slick thickness
RGB imaging of water and land surfaces



Laserfluorosensor –Day & night classification
discrimination between oil and water
classification of oil/pollution (type)



Airborne sniffer
– measurement of sulfur content in vessel plume
measure of SO₂, CO₂, NO_x



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Sensors –visual reconnaissance & target identification



Search radar – Active Electronically Scanned Array (AESA)
Detection & tracking of moving targets
Target classification with ISAR
Spot SAR ground mapping and Strip SAR Imaging



EO/IR – Electro optical/ Infrared Imaging
Target identification
Target tracking
Laser ranging



Cameras –Handheld video and still cameras
Close up, high resolution images
Target identification and evidence collection



AIS transponder – Automatic Identification System
Vessel/target identification



Direction Finder
Scanning of Search & Rescue frequencies
COSPAS/SARSAT (beacon)



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Communication units –through satellite & radios



Satellite Link – Inmarsat connection

World wide coverage

Voice, data

Streaming video



Marine VHF – Communication with vessels on sea surface

Airborne VHF – Communication with other aircraft

HF – Long range communication, both voice and data

Tactical radio – For restricted communication



AIS transponder – Sending position and aircraft data on VHF for identification



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New communication requirements – for national and international cooperation

Example:



National
Authorities
i.e.



LANDHELGISGASLA ÍSLANDS
ICELANDIC COAST GUARD



KUSTBEVAKNINGEN
SWEDISH COAST GUARD



EU
Partners
i.e.



Inter-
national
partners
i.e.



INTERPOL



Third
countries



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Communication suite

- More complex communication situation
- Many different authorities are requiring information both in flight and post-flight
- Both national and international



- Broad and flexible communication suite
- Possibility to adjust the level of reporting depending on the receiver
- Data, voice & chat functionality (high speed)
- Both restricted communication standards and open standards



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Conclusion

An increasing demand for up to date information, from a wider range of end users, requires improved capability in the maritime surveillance systems:

1. **Multi-mission systems** - multi mission requires a broad sensor suite which can be configured/used in different ways depending on the mission type
2. **Broad communication suite** - many different authorities involved in missions, require broad and flexible communication suite with the possibility to adjust the level of reporting depending to the receiver



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