



Leonardo Electronics

LEONARDO'S AIRBORNE, SURFACE AND UNDERWATER CAPABILITIES: FROM AWARENESS TO REACTION

Farnborough

May 23rd 2024



Electronics



Helicopters



Aircraft



Cyber & Security

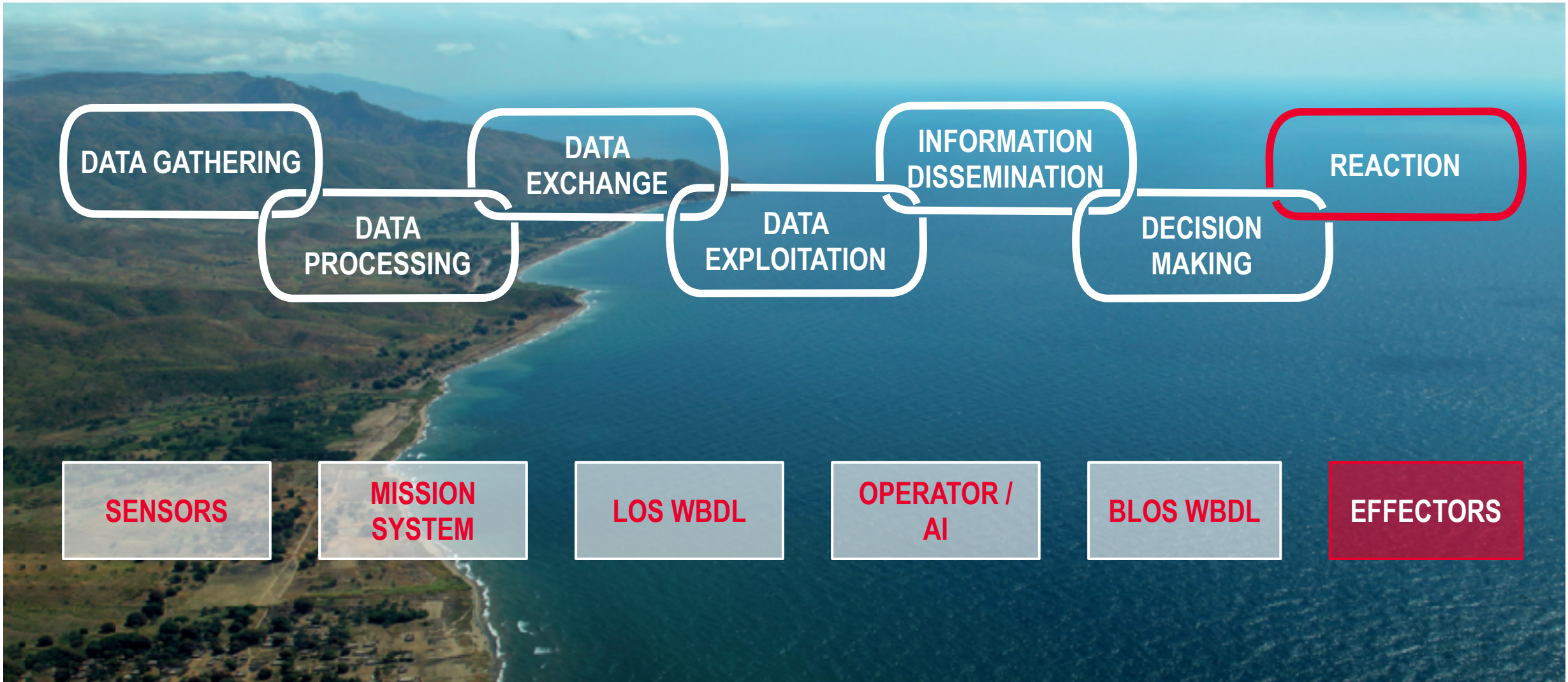


Space



Aerostructures

FROM AWARENESS TO REACTION



A MULTITUDE OF ROTARY WING PLATFORMS AND SENSORS

LARGE
AW101

MEDIUM
AW139

SMALL
AW109

UNCREWED AIR SYSTEMS
AWHERO

CREWED UNCREWED TEAMING & AIR LAUNCHED EFFECTS
AW159 & UAS

RADARS

MAIR

STORE MANAGEMENT COMPUTER

FCC

DISTANCE MEASURING EQUIPMENT

COMPACT RADAR ALTIMETER

WBDL

LASER WARNING RECEIVER

DOPPLER VELOCITY SENSOR

OWS

EO/IR

ULISSES ASW



A MULTITUDE OF FIXED WING PLATFORMS AND SENSORS

LONG RANGE SURVEILLANCE
ATR72

LIGHT ISR
ATOS

FIGHTER

HEAVY TACTICAL UNCREWED
FALCO EVO

MALE
XPLORER

GABBIANO RADARS

MAIR

FCC

WBDL

STORE MANAGEMENT COMPUTER

IRST

EO/IR

ULISSES ASW

COMPACT RADAR ALTIMETER

LASER WARNING RECEIVER

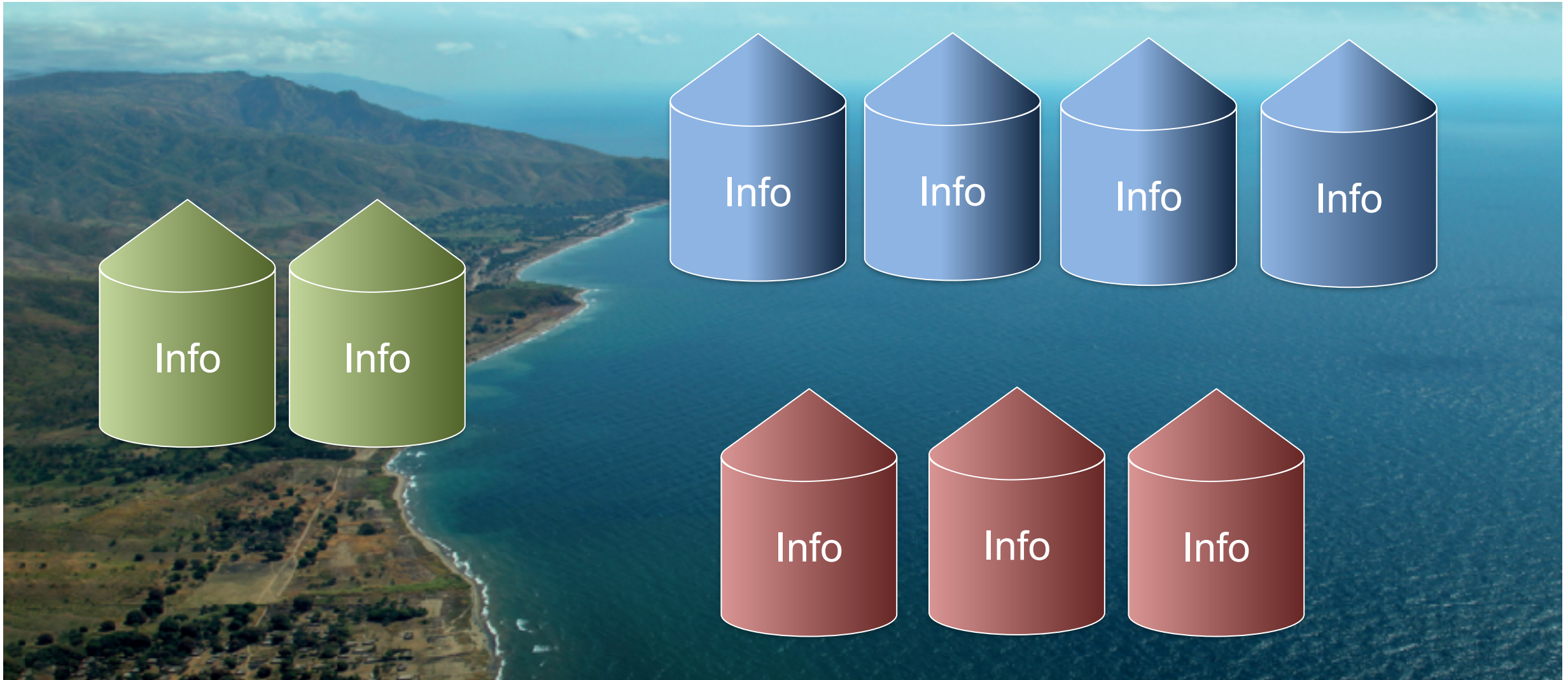
GRIFO RADARS



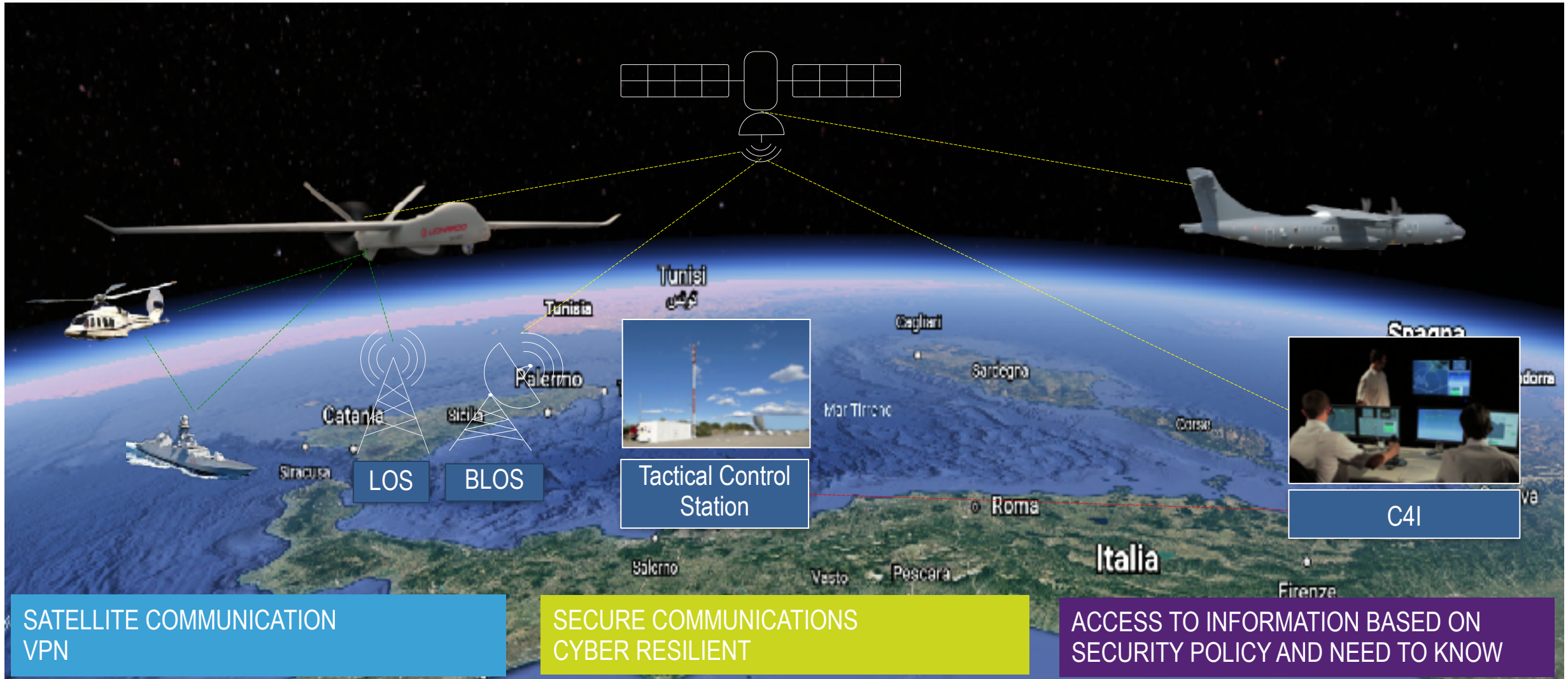
ATOS MISSION MANAGEMENT SYSTEM



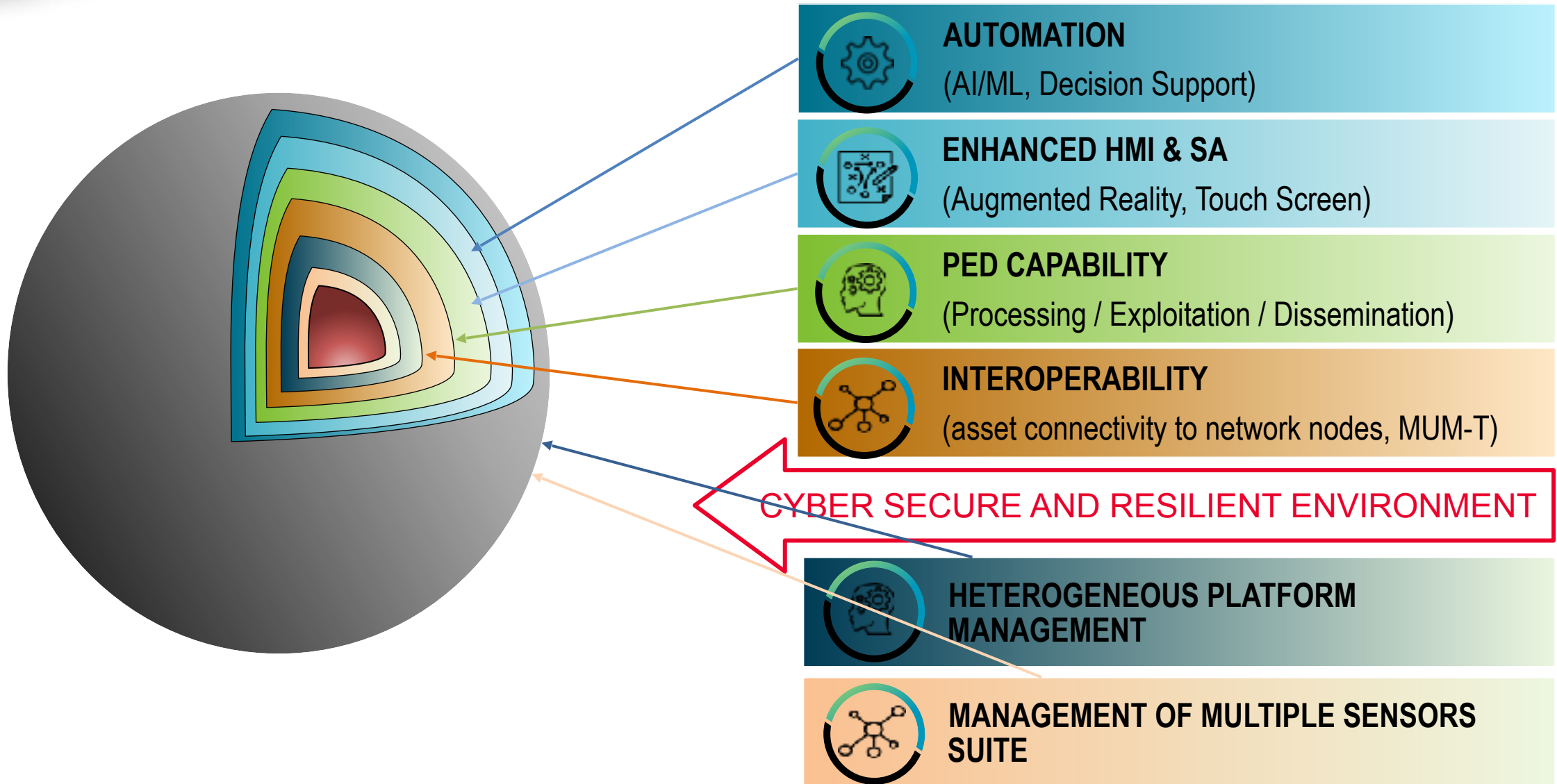
TRADITIONAL INFORMATION MANAGEMENT



TODAY INFORMATION MANAGEMENT









SURVEILLANCE CAPABILITIES IN THE DIGITAL ERA



ATOS - AIRBORNE MISSION SYSTEMS

Airborne Tactical Observation and Surveillance (**ATOS**) system is an **advanced, modular, scalable**, airborne Command and Control (**C2**) system that integrates and manages various sensors and sub-systems in order to perform **ISR/ISTAR/ASW/ASuW** missions. Designed to support **interoperability** aspects in a multi domain context with a **common HMI**. Advanced **AI algorithms** are integrated in the system to increase efficiency of sensor processing and decision making.



MISSION PLANNING		Powerful Mission planning system
MISSION FOLLOWING		Data collection and data processing
MISSION REPLANNING		Re-planning “on the Fly” capability
NEAR-REAL TIME ANALYSIS		Data fusion and correlation
EXPLOITATION		Data exploitation feature
DISSEMINATION		Data dissemination feature



ATOS CONFIGURATIONS

KEY DRIVERS

- Fully integrated **modular** and **scalable** architecture
- **Common operating picture** across all mission assets
- Advanced, **flexible** and **open architecture** to allow integration of Leonardo sensors and equipment and/or those of 3rd parties
- Latest generation operational **Human Machine Interface (HMI)** to efficiently manage the workload of the mission operators
- **Touch screen gestures** supporting the common operating picture



Micro-UAV



Mini-UAV



RUAV



UAV



SHORT RANGE
RW AND FW



LONG RANGE
FIXED WING



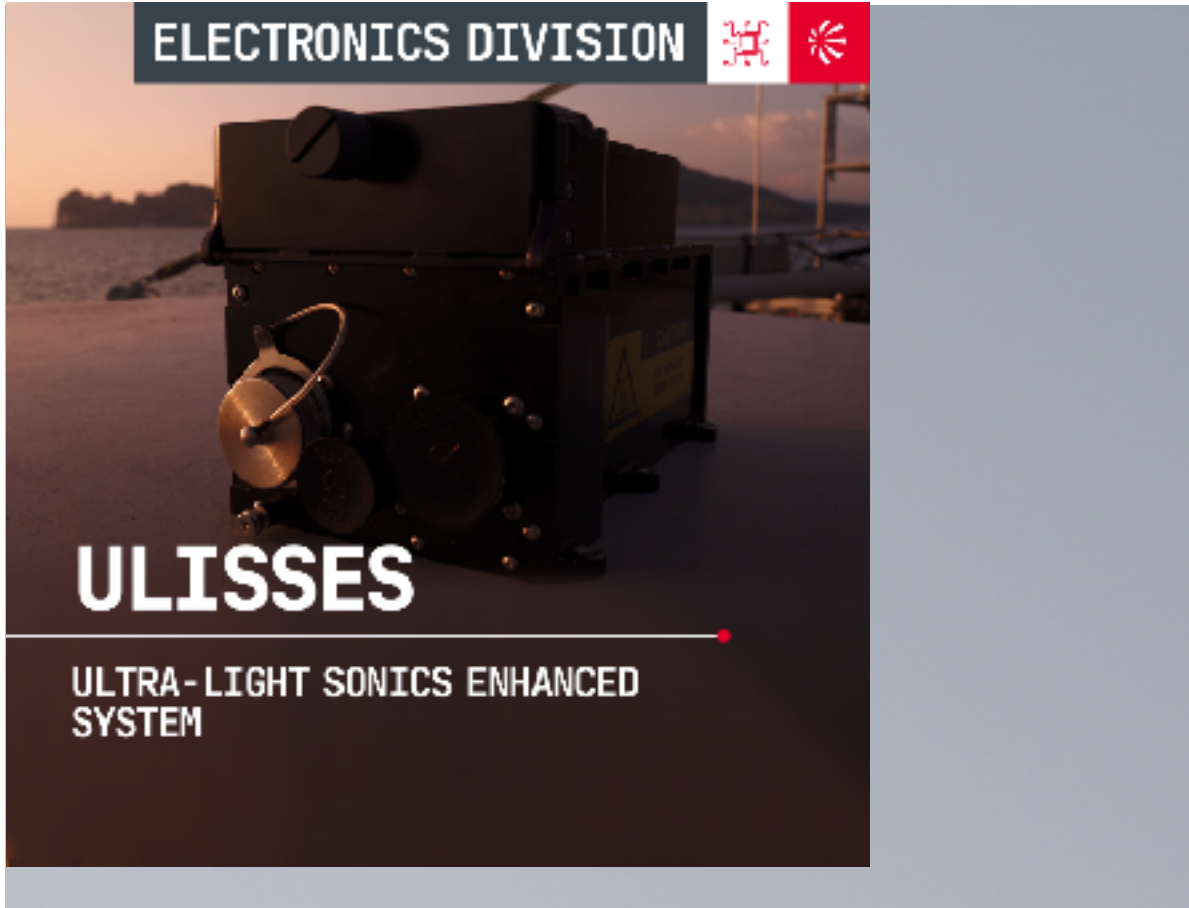
ATOS AIRBORNE MMS – A SUCCESS STORY



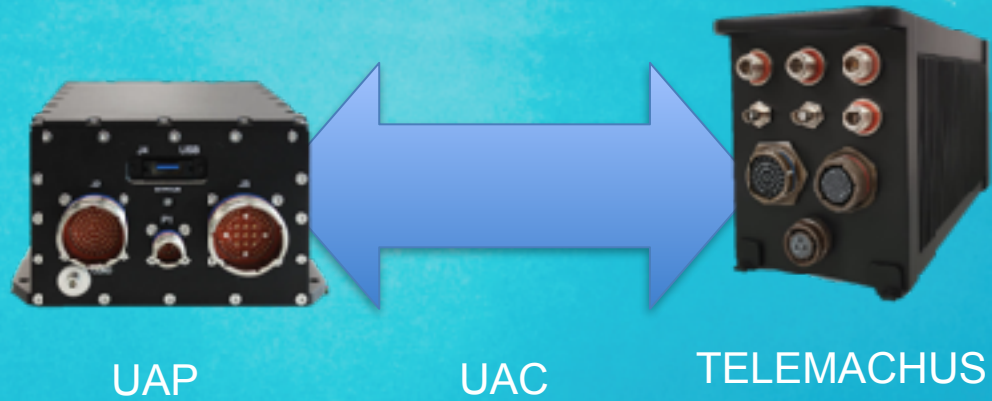
ULISSES SONIC SYSTEM



ULISSES – LIGHTWEIGHT POWERFUL SONIC SYSTEM



ULISSES OVERVIEW



Ultra Light Sonics Enhanced System (ULISSES) is the latest version of the Acoustic System developed by Leonardo Electronic Division for Anti Submarine Warfare (ASW) applications.

Specifically conceived to be lightweight and compact (SWaP), it is built on a “state of the art” Software and Hardware architecture.

The modular and scalable design with its flexible architecture, make it possible to employ ULISSES on a wide range of platforms, ranging from Manned/Unmanned Fixed or Rotary Wings aircrafts.



ROTARY WING WITH OR WITHOUT DIPPING SONAR



ROTARY WING UAS



FIXED WING



VESSELS



FIXED WING UAS



ULISSES COMPONENTS (UAP)



TELEMACHUS
TX/RX UNIT

Telemachus is the V/UHF Rx/Tx unit:

- Sonobuoys Command Function
- Open Architecture (integration of UAC)
- Interface Off-The-Shelf Antennas



ULISSES
ACOUSTIC
PROCESSOR
(UAP)

THE UAP is the core of the ULISSES Subsystem:

- Perform sonobuoy processing
- Interface the sonic operator through Full HD monitors
- Interface the Digital Sonobuoy Transmitter/Receiver unit
- Provide the Fill Gun and Classified Library Central Clear capability.
- Provide a recording service of long-term data/signals storage for off-board and on-board analysis

The UAP is a Baseplate Conduction cooled, 28Vdc powered equipment

#	Equipment (LRU)	Weight (Kg)	Power (W)	Size (mm)
1	UAP	6.5	110	179x169x307
2	Telemachus	11.0	180	258x144x407
	Total	17.5	290	



ULISSES COMPONENTS (UAC)



TELEMACHUS
TX/RX UNIT

Telemachus is the V/UHF Rx/Tx unit:

- Sonobuoys Command Function
- Open Architecture (integration of UAC)
- Interface OTS Antennas



VME



VPX

- ULISSES acoustic processing has been integrated on a single board module named Acoustic Card (UAC).
- For specific applications, where weight and size are major installation constraints, the ULISSES Acoustic Card (UAC) provides the complete ULISSES Acoustic processing embodied in a Single Board Computer that can be installed into a pre existent equipment where a free slot and UAC interfaces are already available.
- Communication with ground equipment performed via Ethernet interface
- Based on Intel Architecture, is already available on VME, VPX form factors, other specific standards can be provided on request

#	Equipment (LRU)	Weight (Kg)	Power (W)	Size (mm)
1	Telemachus + UAC	11.6	180	258x144x407
	Total	11.6		

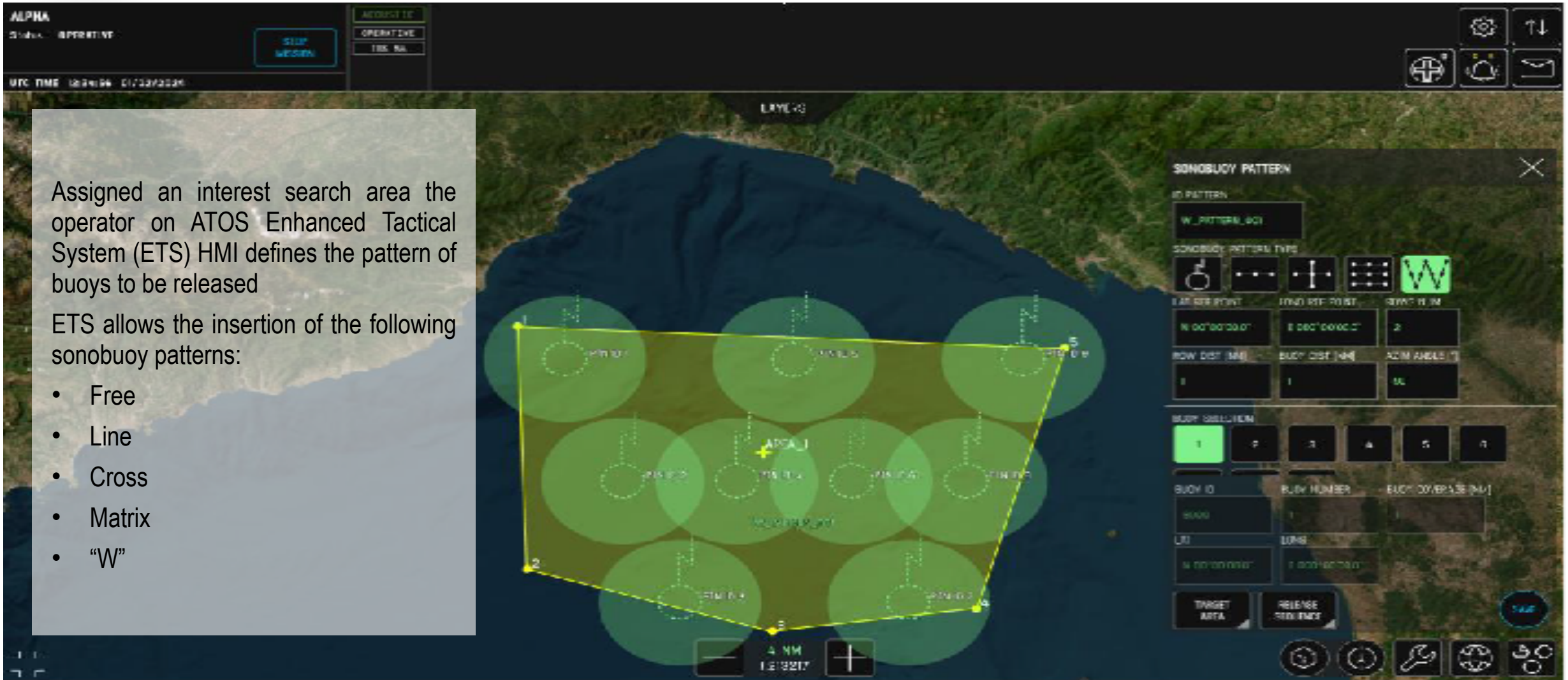


ATOS ACOUSTIC MISSION

Assigned an interest search area the operator on ATOS Enhanced Tactical System (ETS) HMI defines the pattern of buoys to be released

ETS allows the insertion of the following sonobuoy patterns:

- Free
- Line
- Cross
- Matrix
- "W"



ATOS ACOUSTIC MISSION

The right panel allows to:

- Configure the pattern geometry;
- Define the Release Sequence;
- Associate an Interest Area

A preview of the buoy coverage area is displayed on Tactical Situation when ROD data is evaluated

The screenshot displays the ATOS Acoustic Mission interface. The main view is a tactical situation map showing a buoy coverage area (green circles) over a body of water. The coverage area is defined by a yellow polygon with vertices labeled 1 through 5. A yellow star labeled 'AREA 1' is located within the coverage area. The interface includes a top panel with 'ALPHA' status, 'STOP' and 'RESUME' buttons, and 'ACCEPTED', 'OPERATIVE', and 'TRK. NA.' buttons. The right panel, titled 'SONOBUOY PATTERN', contains configuration options for ID PATTERN, SONOBUOY PATTERN TYPE, RELEASE POINT, END RELEASE POINT, ROW DIST, BUOY DIST, ACQ AREA, BUOY SEQUENCE, BUOY ID, BUOY NUMBER, BUOY COVERAGE, and buttons for 'TARGET AREA' and 'RELEASE SEQUENCE'. The bottom panel shows a scale of 4 NM and various navigation controls.



THE REACTION



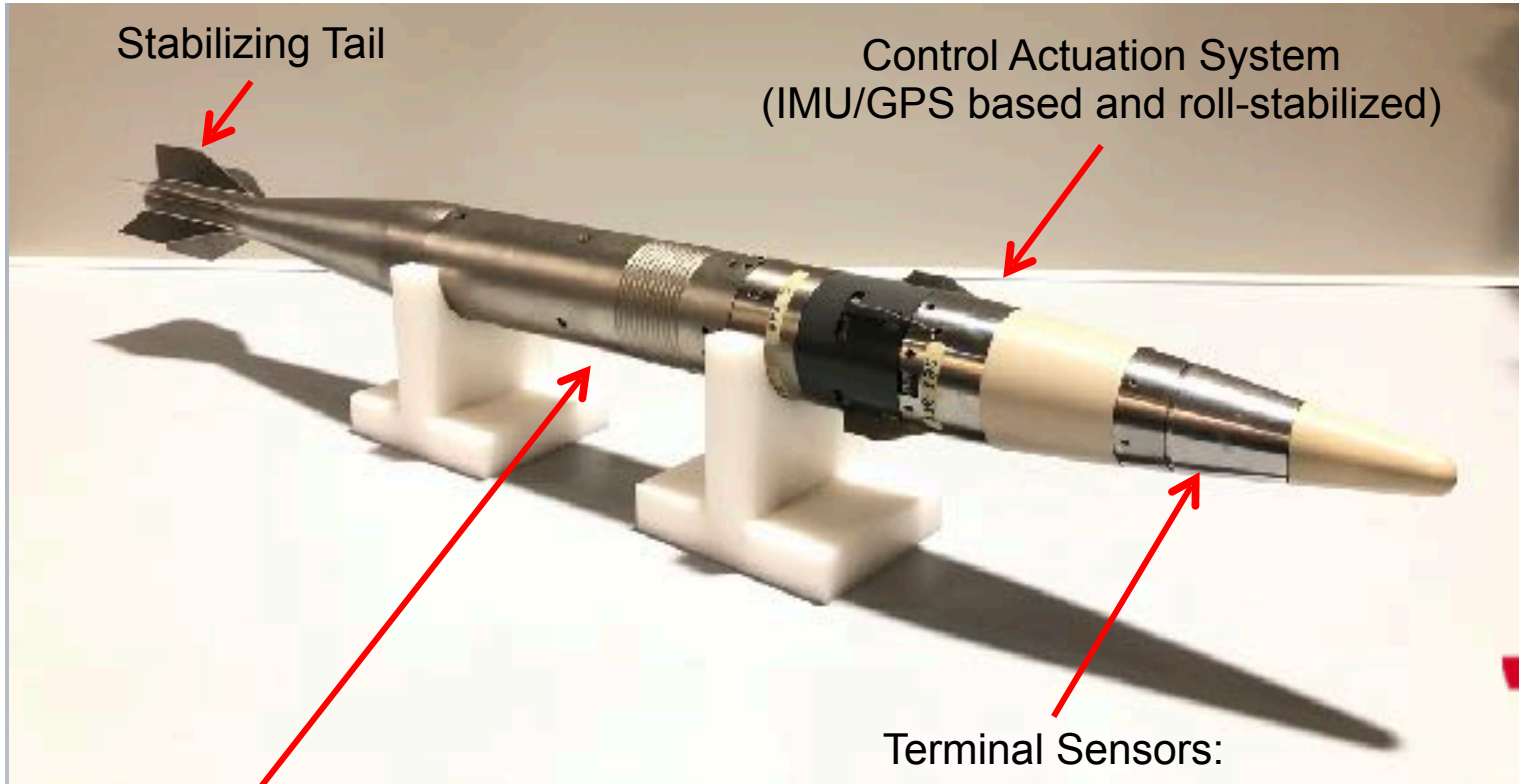
76/62 SR – OVERVIEW



- Best selling medium caliber gun system in service with more than **50 Navies** worldwide
- Suitable for ASuW, NFS, AAW as well as ASyW thanks to the Multi-Feeding Magazine and a wide range of ammunitions.
- Capable of achieving a range in excess of 35 km and metric accuracy by using the **Vulcano** GLR ammunition.
- Capable of neutralizing highly manoeuvring threats, such as anti-ship missiles, by using the DART guided ammunition (Driven Ammunition Reduced Time).



76/62 SR – VULCANO GUIDED LONG RANGE



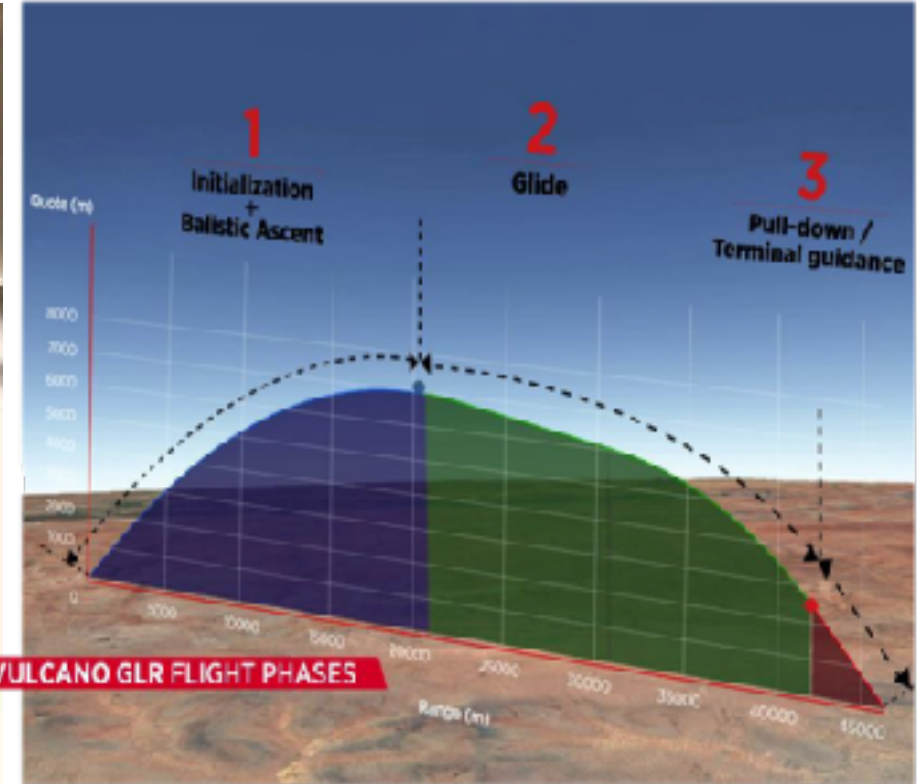
Stabilizing Tail

Control Actuation System
(IMU/GPS based and roll-stabilized)

Terminal Sensors:

Pre-Formed
Fragments Warhead

- RF (Impact, Delayed Impact, Time, HOB)
- SAL (Impact, Delayed Impact)
- IR (Impact, Delayed Impact)











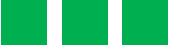



SMALL CALIBER DEFENSE SYSTEMS



SMALL CALIBER DEFENCE SYSTEMS – INTRODUCTION

Leonardo solutions for all domains

 Effectiveness

		Undersea	Sea Surface	Air
Black Scorpion				-
LIONFISH 12.7		-		
LIONFISH 20		-		
LIONFISH 30		-		



BLACK SCORPION

- Mini-torpedo to neutralize threats such as USV, SDV, UUV, midget
- Mini-torpedo to force any underwater threat to commit indiscretions to accelerate its classification process
- To be used in cooperation with more lethal weapons



- **Length** 1100 mm, 5" diameter
- **Weight in air** < 20 kg
- **Operative depth range** NATO shallow water
- **Presetting system** magnetic interface
- **Speed** > 12 knots
- **Acoustics** active/passive
- **Fuze** impact/time delay/flat battery



BLACK SCORPION - LAUNCHABILITY



Submarines



B534 Launching Tube

Surface vessels



B537 canister + B538 tube

Aircrafts/UAV



Size A sonobuoys dispenser



LIONFISH® FAMILY – INTRODUCTION

Ultralight



Inner Reloading



Effective against Go-fast boats, FIAC, helicopters and drones.

Two calibers are available: 12.7 x 99 mm and 20 x 128 mm.

Suitable for small ships and larger ones as secondary armament.

Fully stabilized in elevation and azimuth by powerful servo-systems in closed loop with 2 independent gyros (or with tachometers as back-up).

Top



20



Coaxial Electro-Optical Sensors suite: Daylight camera, IR camera, for overnight operations, and Laser Range Finder.

Lead angles calculation with the estimated target future point.

Possibility to receive target designation or lead angles by CMS/FCS.



INNER RELOADING MODEL



Lighter weight

Cheaper

Suitable also for land applications

Inner ammunitions reloading system



ULTRALIGHT MODEL



Lightest weight

Smallest deck interface

Cheapest

Suitable also for land applications



20 MODEL



Longest operative range

Highest rate of fire

Largest payload delivered to target over time

Stealth

Full communality with Top model



30 MODEL



Group 1



Micro UAS
DJI Phantom4
W<2kg



Mini UAS
DJI Matrice 30
2kg<W<20kg

Group 2



Small UAS
ABABIL II
20kg<W<50kg

Fully stabilized in elevation and azimuth accordingly to OSD

Equipped with ILOS EOD, possible external target designation

Lead angles calculation via its own EOD or direct acquisition from CMS/FCS.

Very low weight (< 1450 Kg) and size

200 rounds/min and 200 Ready-To-Fire rounds

Artificial Intelligence for multiple threats engagements

Sniper and C-UAS/USV functions

ITAR-free





THANK YOU
FOR YOUR ATTENTION

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