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FUTURE SCENARIOS IN ISR NETWORKS

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A contribution to the CESMA Workshop on
FUTURE J-ISR
INCREASING INFORMATIONAL SUPERIORITY IN THE AGE OF INFORMATION
Rome Oct 10th 2013

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World class, integrated ISR/ISTAR solutions

ISR/ISTAR sensors and subsystems

Scalable mission systems, AESA and M-scan multimode radar, electro-optical turrets, navigation aids, lightweight EW/ELINT systems, acoustic sensors, soldier systems

Mini/Micro UAS

Land / Naval Sensors

Night & Day Rifle sights, vision and target location systems

Putting ISR/ISTAR at the warfighter's fingertips

Collection, fusion, exploitation from multiple sources

Network enabled retrieval and dissemination of information

Rapid Sharing of full-motion video

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Operational Advantages -The Needs

IS(TA)R Operational Requirements

- Persistent Surveillance of Border Areas
- New complex Situations/Densely Populated/Urban Areas n
- Either enemy or international airspace
- Permissive or lightly contested or denied airspace
- Individual Nations or in support of NATO Missions
- Urban or Littoral areas

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skyISTAR : Airborne Data Collector System

THE REQUIREMENT

Unmanned Air Systems will need to be able to carry out a broader range of surveillance missions, **demonstrating interoperability with other platforms** and a flexible multi-role capability to fulfil a variety of mission objectives

THE SOLUTION : skyISTAR

- a **state of the art, integrated mission management and sensor system.**
- built on a **scalable and modular architecture** that allows the customer to define **specific sensor configurations** and guarantees adaptability to provide an upgrade path as operational requirements evolve.
- containing advanced **data fusion algorithms** providing a true integrated sensing solution.
- incorporates user-selectable levels of **autonomy** designed to deliver **the right information to the user at the right time**, reducing operator workload.
- designed to support cost-effective system enhancements **to meet evolving and future needs**.

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skyISTAR approach : Innovative and Versatile

AN **INNOVATIVE** ISTAR APPROACH

Moving toward Autonomy & Intelligence on board

It means:

- Ground operator workload shifted from “threats detection” to threats analysis
- Data Link throughput optimized

New concept of transforming the on board “acquired data” into “information” useful to maximize mission effectiveness, throughout proprietary SW algorithms for DATA FUSION

A **VERSATILE** SYSTEM ARCHITECTURE

Moving toward SOA (Services Oriented Architecture)

It means:

- Interoperability → adaptable to different operational scenarios
- Scalability → easy to upgrade
- Reusability → easy to customize

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Radar : GABBIANO

Grifo

More than 450 units sold World Wide

APS-717

More than 200 units sold World Wide

Operational on EH-101

APS-784

HEW-784 ISAR

Operational on EH101

In service for Italian Navy

T-200

T-20N

X-Band Very Compact, Advanced, Lightweight,
High Performance State of Art Surveillance Radar

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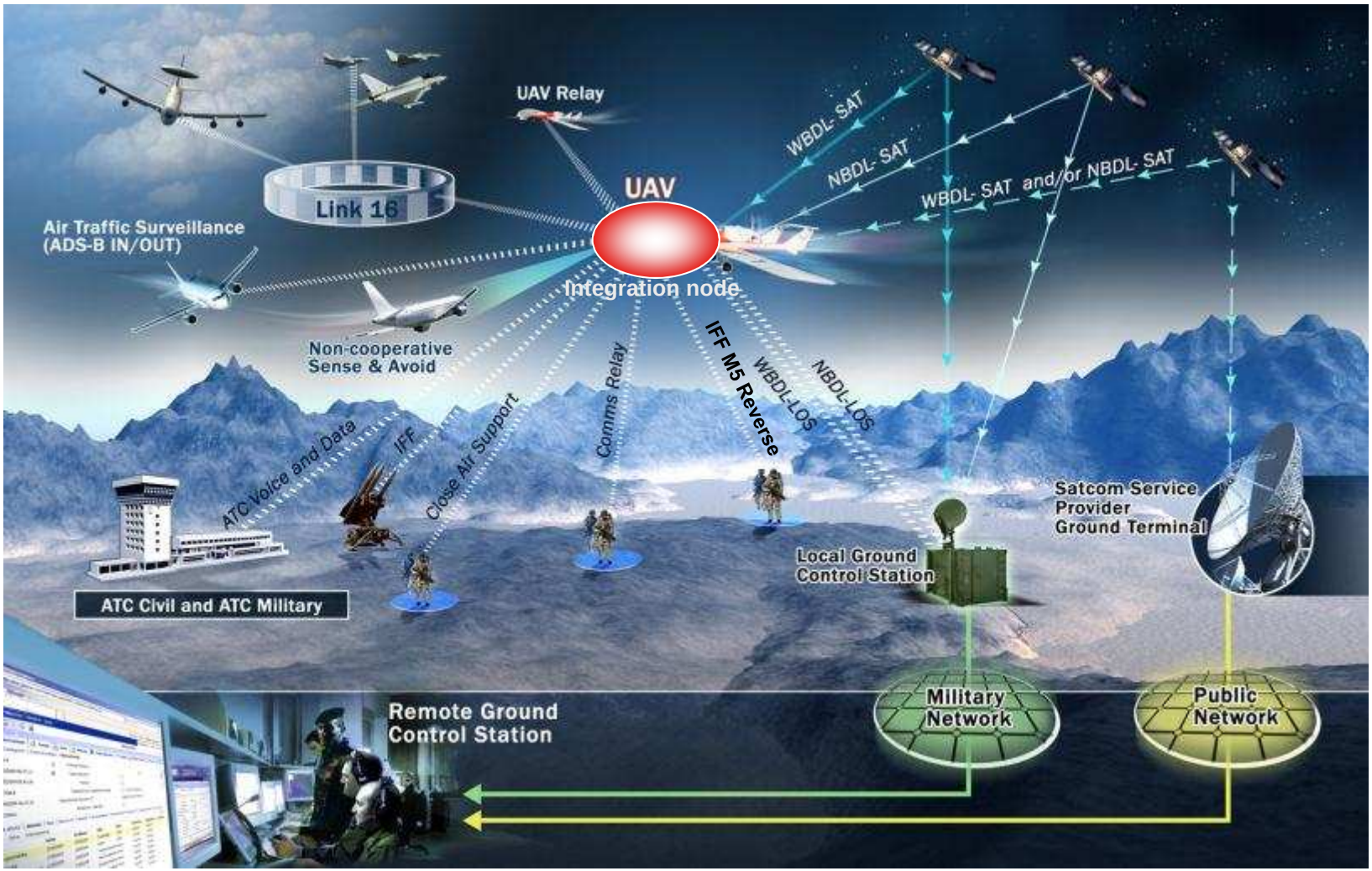
Comms/Identification system integration in UAS



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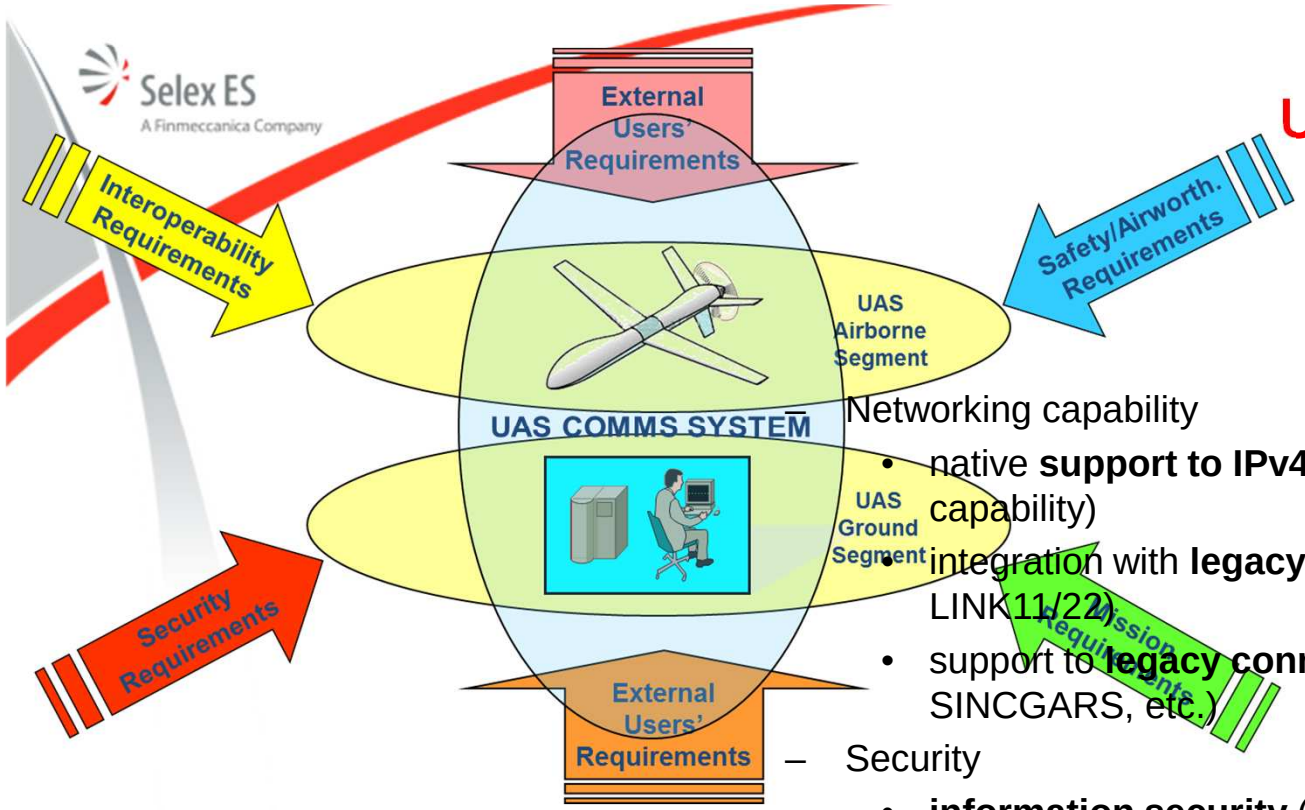
UAS Communication Systems evolution Key paradigms



– Networking capability
  - native **support to IPv4/IPv6 data traffic** (wideband core capability)
  - integration with **legacy tactical networks** (e.g. LINK16, LINK11/22)
  - support to **legacy connections** (e.g. analog voice, SINCGARS, etc.)
– Security
  - **information security** (IP encryption) → information confidentiality protection
  - **core network protection** (low-level bulk encryption, firewalling, etc.)
– Safety/Integrity
  - support to **redundant configurations**
  - capability to guarantee **differentiated quality of service on a common set of connectivity resources**
– Interoperability
  - compliance to **military standardisation** (e.g. NATO STANAG)
  - compliance to **civilian regulations** required for UAS insertion in General Air Traffic

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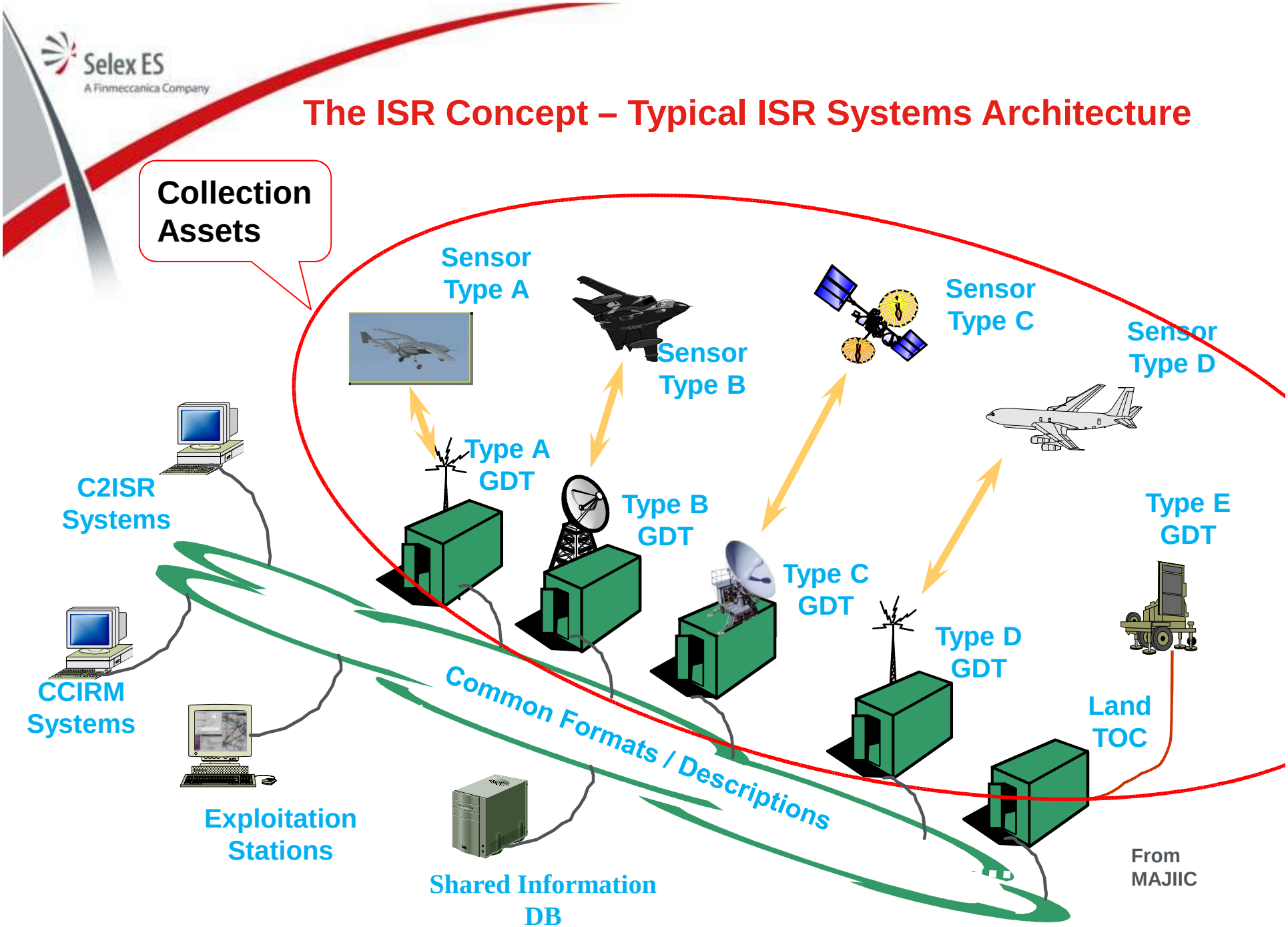
The ISR Concept – Typical ISR Systems Architecture



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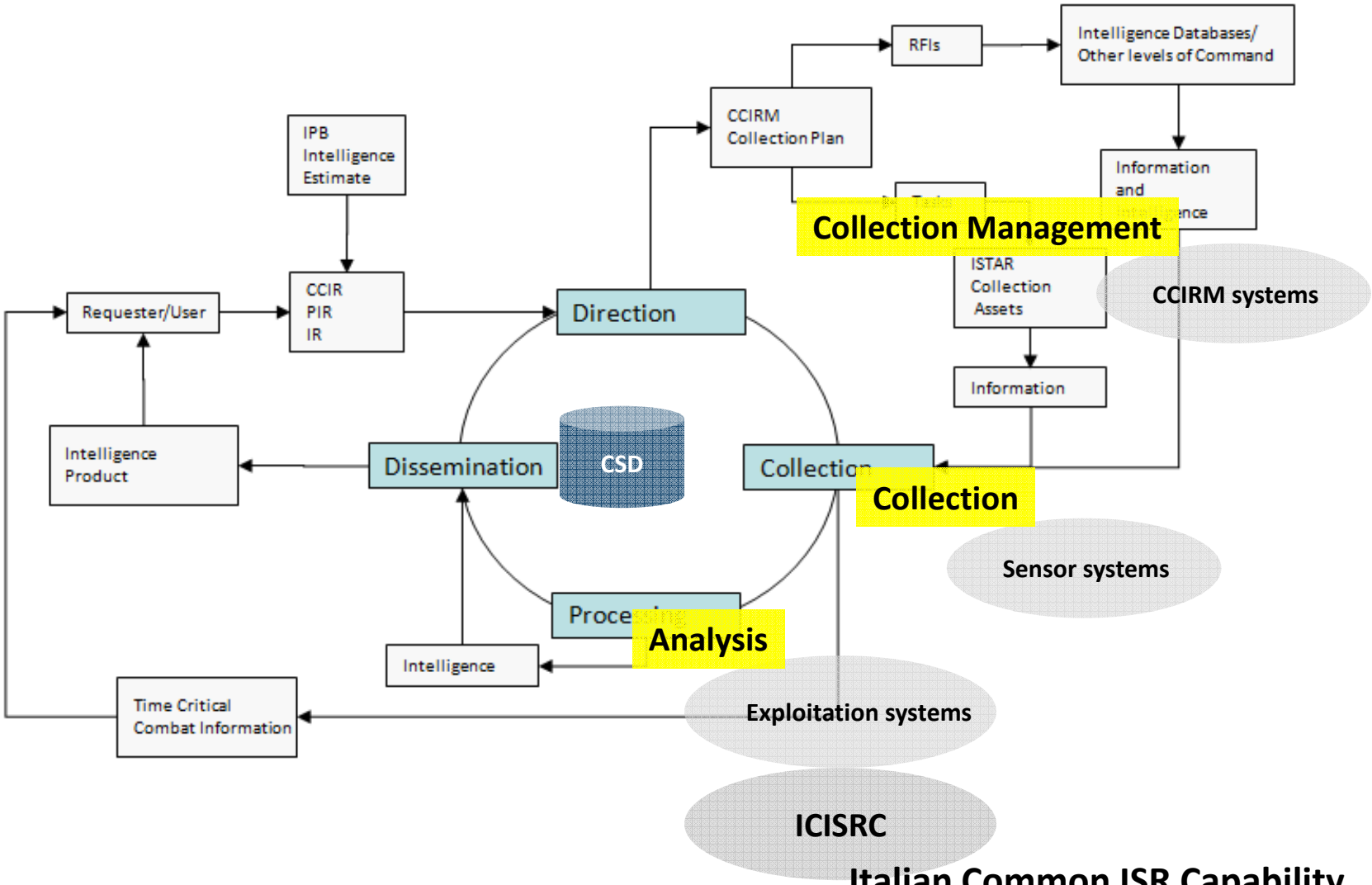
Exploitation MAJIIC

Multi-Intelligence All Source Joint ISR Interoperability Coalition



Italian Common ISR Capability

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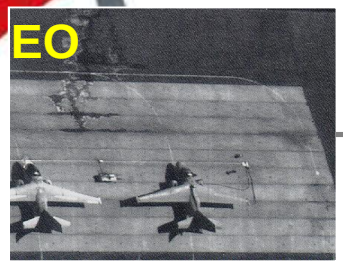
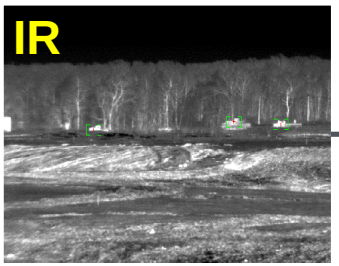
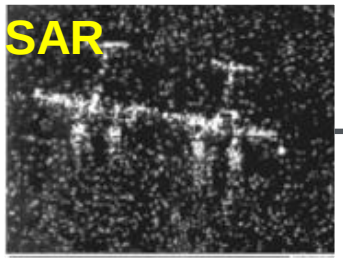
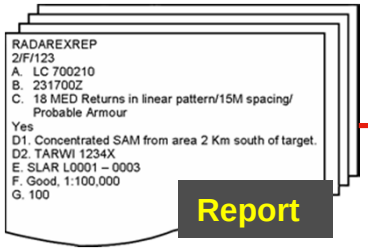
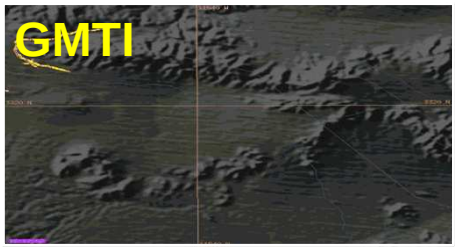
Interoperability through STANAGs

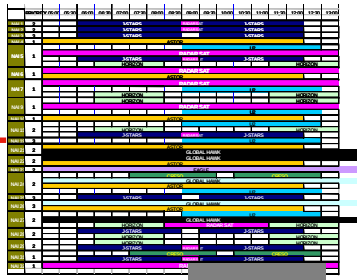












STANAG 4559

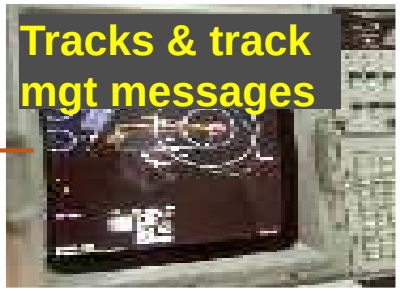
XML

STANAG 4607

STANAG 4609

STANAG 4545

STANAG 5516



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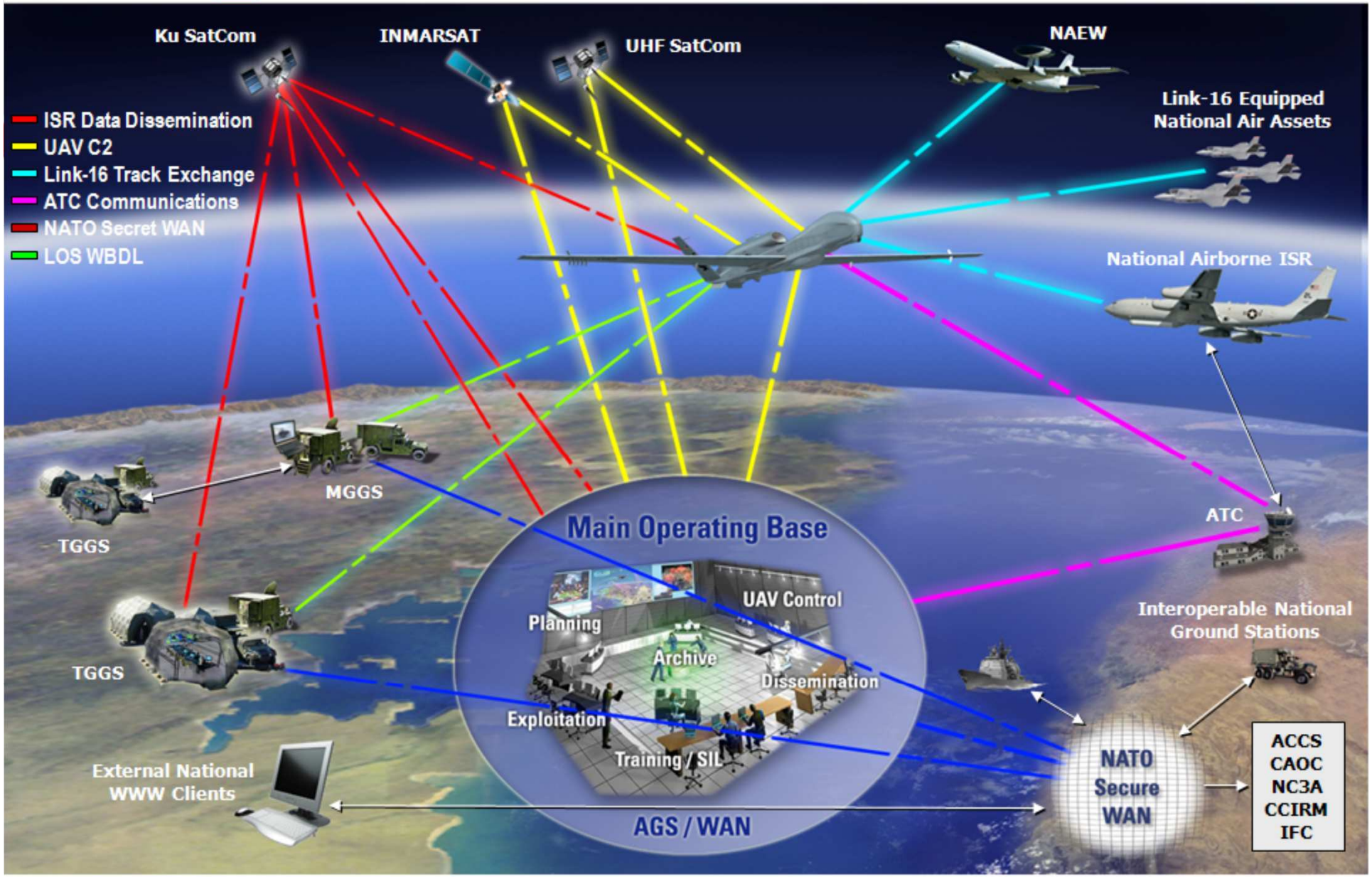
NATO AGS – Operational View



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NATO AGS Overview

SELEX ES – Entity Level Responsibility

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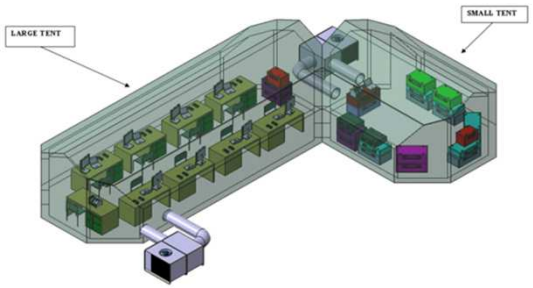
Mission Operation Support (MOS) and Transportable General Ground Station (TGGS)

The MOS, as unique interface for data exchange with the Land Component and Command, is responsible for the management of the data collection plan to be forwarded to the air segment and of the Processing, Exploitation and Dissemination of AGS ISR Product to internal and external interoperable users

The MOS is responsible of the following main operational capabilities:

- Co-ordination of the AGS Core Ground Segment
- Deployment mission planning, including GGS planning, sensor visibility calculation, Comms Planning, High Level Sensor Collection Plan,
- Maintaining situational awareness of the operational status and location of all deployed GGS elements,
- Interface with the long-term AGS Core data archive,
- Interface with external NATO ISR users and National exploitation systems
- Analysis of SAR images, ESM data and other available sensor products,
- Near real time analysis and distribution of MTI data and tracks relevant for the political and strategic level decision making,
- Near real time information feed into existing CIS systems (e.g. ACCS and MCCIS),
- Management of generated and/or exploited data distribution to Nations.



The TGGS implements the same functionalities of the MOS in support of operational level HQ in theatre.

The TGGS entity is able to support commanders at the operational level with timely, accurate and relevant information during the execution phase of operations.

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Multi-platform, world class ISR/ISTAR systems
Scalable mission systems, AESA and M-scan multimode radar, electro-optical turrets, navigation aids, lightweight EW/ELINT systems, CNI.

Complete, independent UAS capability
Mission systems, platforms, ground control stations, battlelabs, training and paid by the hour services.

Combat proven electronics for fixed and rotary wing
Fixed and repositionable AESA and M-scan radar, complete integrated electronic warfare systems, lightweight high performance DIRCM systems, IRST, high power targeting laser.

The only European company **with a complete UAS** capability developed in-house and in operation with export customers

The only company to have **integrated a platform agnostic mission system** on a third party UAS

The only company with **an airborne integrated mission system in operation on 12 different platforms**

The only company outside the US **under contract for a hyperspectral instrument.**

Selex plays a key role in **NATO AGS, the major Alliance ISR Programme** being responsible of **processing exploitation and dissemination of ISR products from main operating base**

We partner with our Customers to deliver world class, tailored and proven airborne integrated systems, sensors and training for military and security ISR/ISTAR manned and unmanned operations through a successful, customer focused business

ATOS

Falco UAV System

Gabbiano Radar

Nato AGS MOS

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