MAJIIC

Multi-sensor Aerospace-ground Joint ISR Interoperability Coalition

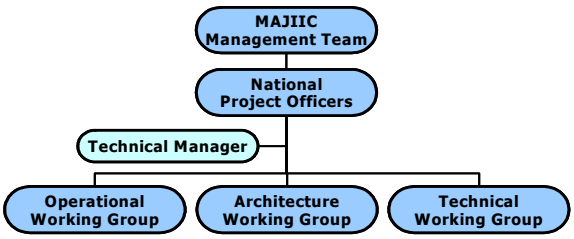
Introduction

The Multi-Sensor Aerospace-Ground Joint Intelligence, Surveillance and Reconnaissance (ISR) interoperability coalition (MAJIIC) project is a multinational effort to maximise the military utility of surveillance and reconnaissance resources through the development and evaluation of operational and technical means for interoperability of a wide range of ISR assets.

In close cooperation with industry, the nations participating in MAJIIC are Canada, France, Germany, Italy, Netherlands, Norway, Spain, United Kingdom and the United States of America. The nations have appointed the NATO Consultation, Command and Control Agency (NC3A) as a facilitator for the project and to provide overall technical management.

Organisation

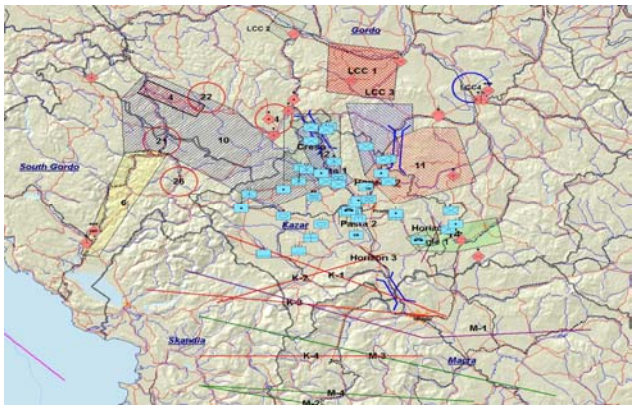
MAJIIC was established as a project under the multinational coalition surveillance and reconnaissance memorandum of understanding (CSR MOU). Overall leadership is performed by a management team consisting of national representatives, while a group of national project officers (NPOs) handles day-to-day project execution. The project is further organised into an operational, an architectural and a technical working group, each of which reports to the NPOs.



MAJIIC Project Organisation

Project Aims

The primary aim of the MAJIIC project is to improve the commanders' situation awareness through collaborative employment and use of interoperable ISR sensor and exploitation capabilities.



Enhanced situation awareness enabled by MAJIIC capabilities.

To achieve this, MAJIIC will address interoperability from three primary perspectives:

1. **Operational**, including development and demonstration of concepts of employment (CONEMP) and tactics, techniques and procedures (TTP) for collaborative employment and use of coalition ISR assets in support of military missions. MAJIIC will also support incorporation of these operational documents into NATO and the nations
2. **Architectural**, including development of procedures and technology for sharing ISR data and information, system architecture design principles, tools and technology for collaboration, and tools for managing coalition ISR assets
3. **Technical**, including definition and development of key data formats and protocols for the various sensor and data types, tools to support common geo-registration, and data exploitation.

Approach to interoperability

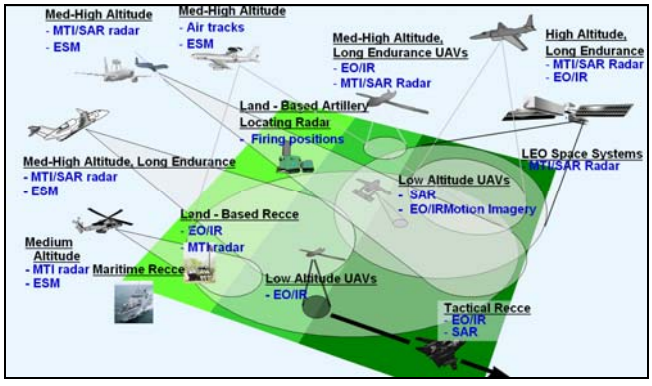
The MAJIIC project addresses the ability to collaboratively employ and exchange data from a wide variety of ISR sensors and sensor types in a network-enabled manner, including close coupling between the ISR assets and the NATO and national command and control (C2) environments.

Operational Foundation

To ensure that the project has the strongest possible operational foundation, the efforts under MAJIIC will be guided by operational doctrine in the form of CONEMP, TTP, and other requirements and guidelines. This doctrine will be developed by operational expertise from the participating nations working in close cooperation with NATO commands and liaising with a wide range of NATO, multinational and national activities and programmes.

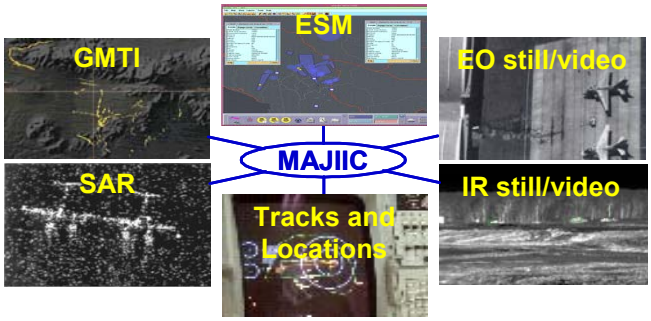
Flexible and Wide-Reaching Approach

MAJIIC will address interoperability in a flexible and wide-reaching manner, ranging from small tactical systems usually assigned to tactical commands and all the way up to highly capable strategic multi-user systems. Although the name of the project indicates an emphasis on aerospace-borne ISR systems, the project aims at addressing any sensor platform category, including space-based, airborne, ground-based or maritime, as well as manned and unmanned subsets of these.



The coalition ISR sensor environment

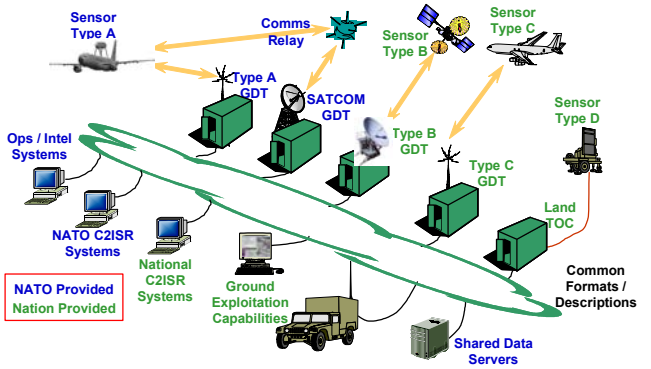
The sensor data types addressed in MAJIIC include ground moving target indicator (GMTI) radar, synthetic aperture radar (SAR), electro-optical (EO) and infra-red (IR) imaging and video sensors, electronic warfare support measures (ESM) sensors, and artillery locating radar.



ISR data types addressed by the MAJIIC project.

Interoperability Principle

MAJIIC aims to enable interoperability between ISR and C2 systems through the use of common interfaces for data formats and exchange mechanisms, leaving the inner workings of each national system outside of the scope of the project and only requiring minor external interface modifications to each system.



MAJIIC interoperability architecture in principle

Each system will provide data to a ground station or another component that is connected to a common network structure, enabling exchange of data and information outside the boundaries of each system.

Interfaces and Mechanisms

The common formats and exchange mechanisms employed in MAJIIC will be based on NATO standardisation agreements (STANAGs). For data formats, this includes:

- STANAG 4545: EO, IR and SAR still imagery
- STANAG 4607: GMTI data
- STANAG 4609: EO and IR motion imagery (video)
- STANAG 5516: Track and track management messages

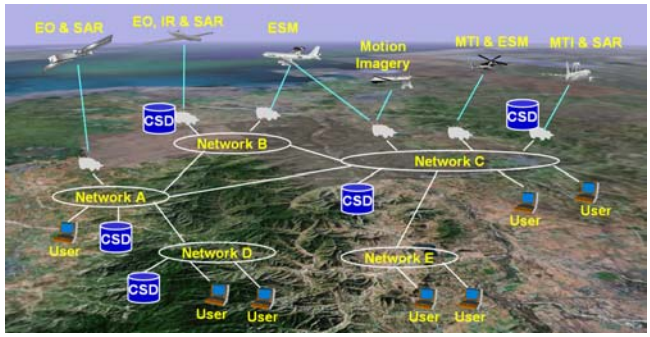
MAJIIC will assess a wide range of network-enabled architecture approaches for enabling exchange of NRT and archived data and information, including techniques such as broadcast, publish-subscribe and request-only. As part of this, MAJIIC has implemented an interface based on STANAG 4559 (NATO Standard ISR Library Interface) for metadata-based access to and retrieval of archived data from any Coalition Shared Database (CSD) throughout the interconnected MAJIIC environment.

The project will continuously be testing the implemented STANAGs during simulated and live exercises, and will work in close cooperation with the STANAG communities to ensure that problems and issues arising can be addressed in future updates to each STANAG. This effort will include development and validation of implementation guidelines to supplement those existing for each STANAG.

In areas where no STANAG is available, such as Instant Messaging tools for distributed operator collaboration, the project will assess widely used commercial standards for potential use in coalition operations, such as the XMPP standard used in the Jabber chat tool.

Networking and flexibility

In order to be adaptable to real-world deployed operations, where the availability of terrestrial and satellite bandwidth might be scarce, MAJIIC will support interoperability using any network type or bandwidth, as well as any combination of networks and interconnections. This approach will include dissemination of near-real-time and archived data, the latter by using CSDs that are synchronised at the metadata level to provide full visibility into all archived data throughout the network independent of where the users are located.

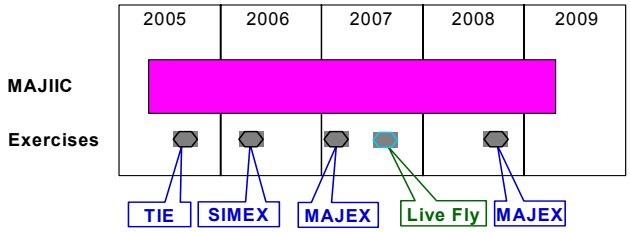


MAJIIC deployed network interoperability

Through this approach, MAJIIC will provide a true network-enabled capability enabling a wide variety of users at different locations and levels of command to access and retrieve data in accordance with own tasks, needs, priorities, and preferences. The MAJIIC architecture is also compliant with the NATO Network-Enabled Capabilities (NNEC) initiative.

Schedule

The MAJIIC project started on 01 April 2005 and will last through March 2009. Throughout this period, the project will participate in or if necessary arrange at least one operationally-focussed exercise each year in order to test, verify, and refine the developed capabilities. This will include simulated as well as live exercises involving real ISR and C2 assets.



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