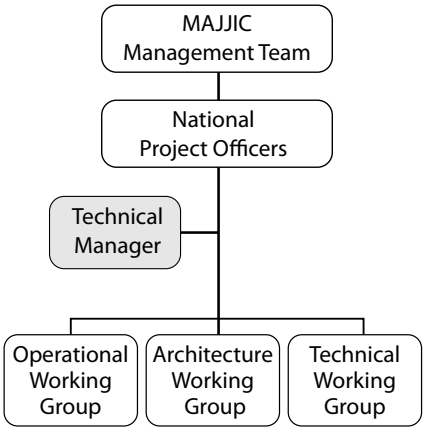
The Multi-Sensor Aerospace-Ground Joint Intelligence, Surveillance and Reconnaissance (ISR) Interoperability Coalition (MAJIIC) Project

What is NC3A?

The mission of the NATO Consultation, Command and Control Agency (NC3A) is enable NATO's success through the unbiased provision of comprehensive Consultation, Command, Control, Communications, Intelligence, Surveillance and Reconnaissance (C4ISR) capabilities.

What is MAJIIC?

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.



MAJIIC Project Organisation

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.

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.

Project Aim:

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.

To achieve this, MAJIIC addresses interoperability from three primary perspectives:

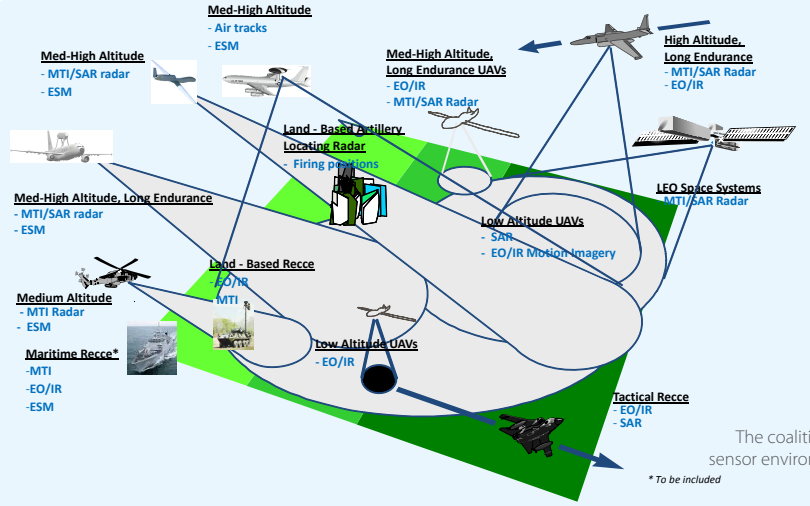
- **Operational**, including development and demonstration of concepts of employment (CONEMP) and tactics, techniques and procedures (TTP) for collaborative employment and use of coalition ISR assets in support of military missions. MAJIIC also supports incorporation of these operational documents into NATO and the nations
- **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
- **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.

What is the Scope of the MAJIIC project?

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 are guided by operational doctrine in the form of CONEMP, TTP, and other requirements and guidelines. This doctrine is 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.



The coalition ISR sensor environment

ISR data types addressed by the MAJIIC project

Flexible and Wide-Reaching Approach

MAJIIC addresses 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 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.

What can MAJIIC offer the Nations?

MAJIIC Conference 2009

MAJIIC enables interoperability between NATO and national 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 national system.

Each NATO or national system provides 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 are based on NATO standardisation agreements (STANAGs). For data formats, this includes:

STANAG 3277: Air Reconnaissance Request/Task

STANAG 3377: Air Reconnaissance Intelligence Report

STANAG 4545: EO, IR and SAR still imagery

STANAG 4607: GMTI data

STANAG 4609: EO and IR motion imagery (video)

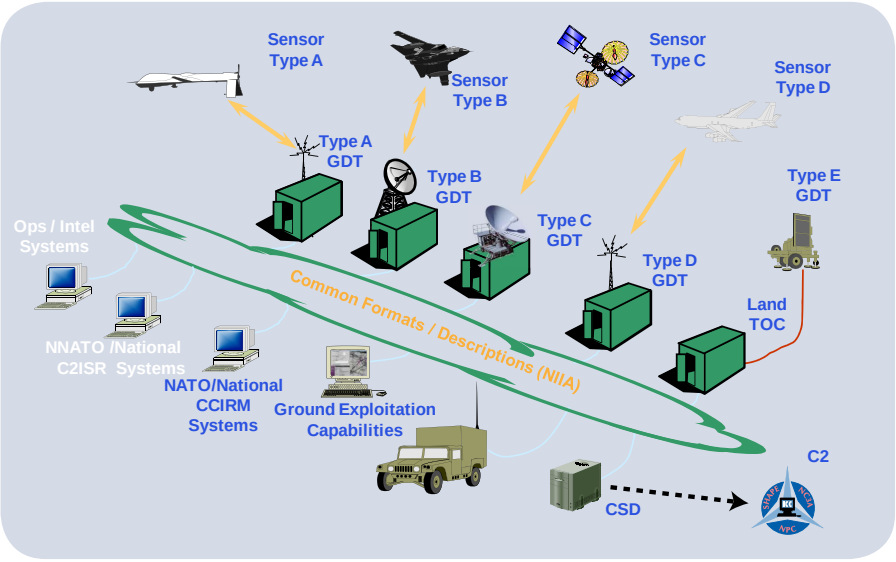
STANAG 5516: Track and track management messages

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

The project will continuously be testing the implemented STANAGs during simulated and live exercises, and will work in close cooperation with nations and 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.



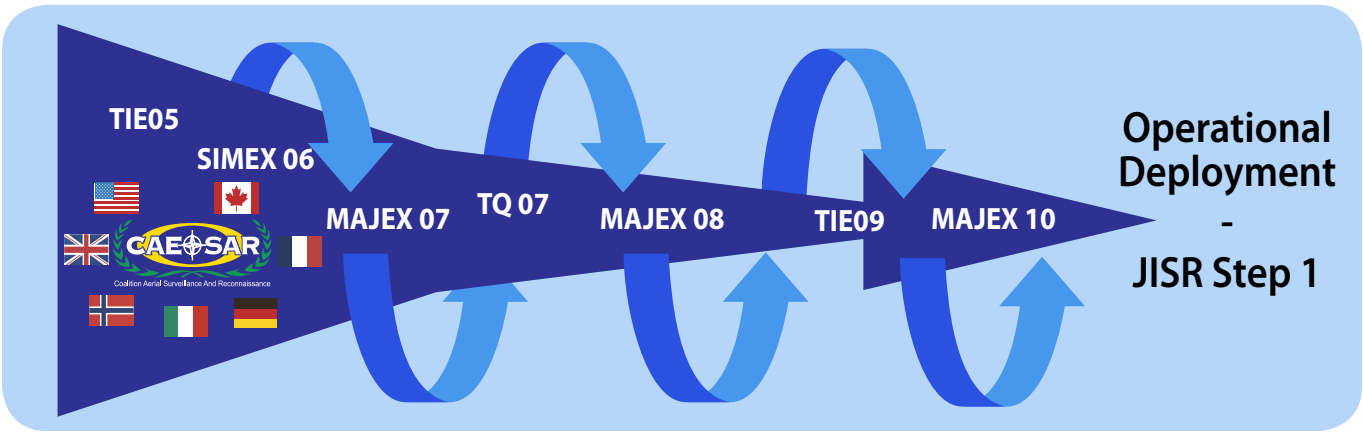
MAJIIC interoperability architecture in principle

Networking and flexibility

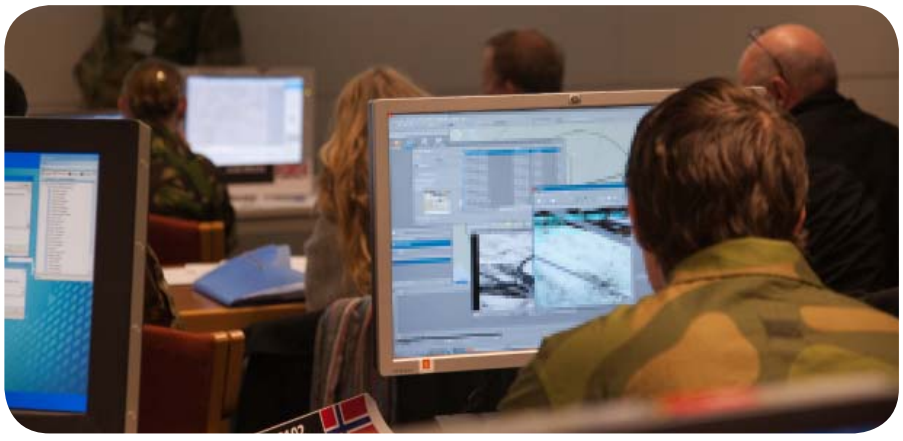
In order to be adaptable to real-world deployed operations, where the availability of terrestrial and satellite bandwidth might be scarce, MAJIIC supports national and NATO interoperability using any network type or bandwidth, as well as any combination of networks and interconnections. This approach includes 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.

What is the MAJIIC schedule?

The MAJIIC project started on 01 April 2005 and was extended through September 2010. To date, the project has participated in at least one operationally-focussed exercise each year in order to test, verify, and refine the developed capabilities. This has included simulated as well as live exercises involving real ISR and C2 assets, with a goal of deployment to ISAF in beginning in early 2010.



MAJIIC Capability (spiral) Development Process



Location Brussels
Boulevard Léopold III, B-1110 Brussels, Belgium
Telephone +32 (0)2 707 4111
Location The Hague
P.O. Box 174, 2501 CD The Hague, The Netherlands
Telephone +31 (0)70 374 3000
www.nc3a.nato.int

NATO C3 Agency
Sponsor Account NATO and Nations (DSA N&N)
Telephone +32 (0)2 707 8547
Fax +32 (0)2 707 8771
Email: DSANN@nc3a.nato.int
www.nc3a.nato.int/Pages/nations.aspx