seismo
MULTI-INT EXPLOITATION SYSTEM

seismo Multi-INT

seismo MultiINT gathers data from multiple information sources in different formats and provides the intelligence analyst with the tools required for elaborating useful and appropriate intelligence for all conduction levels in operations, improving the situational awareness in distributed and collaborative environments according to the principles defined by the multinational program MAJIIC.

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INNOVATING SOLUTIONS

JISR

Joint Intelligence, Surveillance and Reconnaissance (JISR) is an activity that synchronizes and integrates the planning and operation of all collection capabilities with exploitation and processing and the dissemination of the resulting information to the right person, at the right time, in the right format, in direct support of current and future operations. JISR encourages the dynamic, agile and coordinated use of platforms, sensors and systems to support a wide range of staff functions.

MAJIIC

MAJIIC stands for Multi-Intelligence All-Source Joint Intelligence Surveillance and Reconnaissance Interoperability Coalition. The MAJIIC program is a multination program, formed by 9 NATO nations aiming to maximize the military use of Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) resources. For that purpose, the MAJIIC program develops the tactics, techniques and procedures (TTPs) and the architecture and technical common data format to achieve that aim.
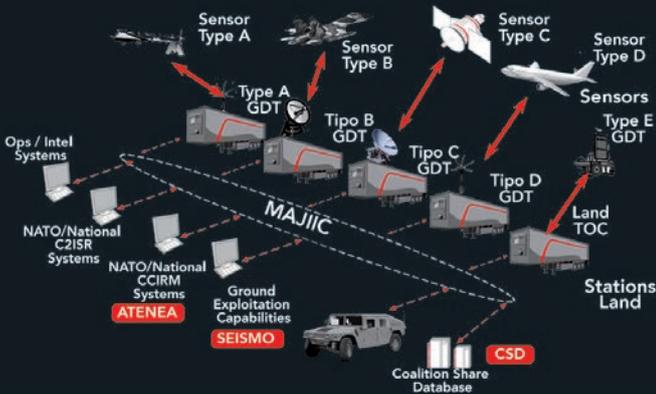
MAJIIC OBJECTIVES

- Improve Commanders Situation Awareness.
- Improve the shared use of coalition sensors (GMTI, SAR, EO/IR, Motion Imagery, Link16 and ESM tracks).
- Sensor data management in Near Real Time.
- Coordinating assignment, planning, monitoring and management of Information requirements (IRM&CM process).
- Develop network based interoperability (NEC).
- Support NATO and national doctrine development.

MAJIIC ISR PRODUCTS

- Imagery SAR, EO, IR (STANAG 4545 NSIF).

- GMTI – Ground Moving Target Indicator (STANAG 4607).

- Video (STANAG 4609).

- LINK 16 (STANAG 5516):
    - PPLIs (msg. J2.2, J2.3, J2.5).
    - Tracks (J3.0, J3.1, J3.2, J3.3, J3.5).
    - Tracks Management (J7.0, J7.1, J7.2, J7.3).
- CESMO:
    - ESM (STANAG 5516) (J3.7, J14.0, J14.2).
    - NEDB/EOB (STANAG 6009).

- HUMINT:
    - HUMINTREP (STANAG 2578 – AintP-5).
    - PENTAGRAM (STANAG 2433 – AintP-3).

- Exploitation Reports (xxEXREP):
    - STANAG 3377.
    - Targets Category (STANAG 3596).
    - Reliability and Credibility of Information Sources (STANAG 2511).
    - Country Codes (STANAG 1059).

- Intelligence Reports (STANAG 2511):
    - INTREP.
    - INTSUM.

- Intelligence Plans (STANAG 3277):
    - Intelligence Collection Plan (ICP).
    - Collection Task/Requirements List (CTL(/CRL)).
    - Collection and Exploitation Plan (CXP).

- Request For Information - RFI (STANAG 2149).

- ISR Request - ISRR (STANAG 2149).

GMV IN MAJIIC

Within the MAJIIC framework, GMV has developed the following products interoperable with any other subsystems develop under this program:

- *seismo* – Exploitation application and scenario simulator.

- *csd* – Coalition shared database.

- *atenea* – Intelligence Requirements Management & Collection Management (IRM&CM).
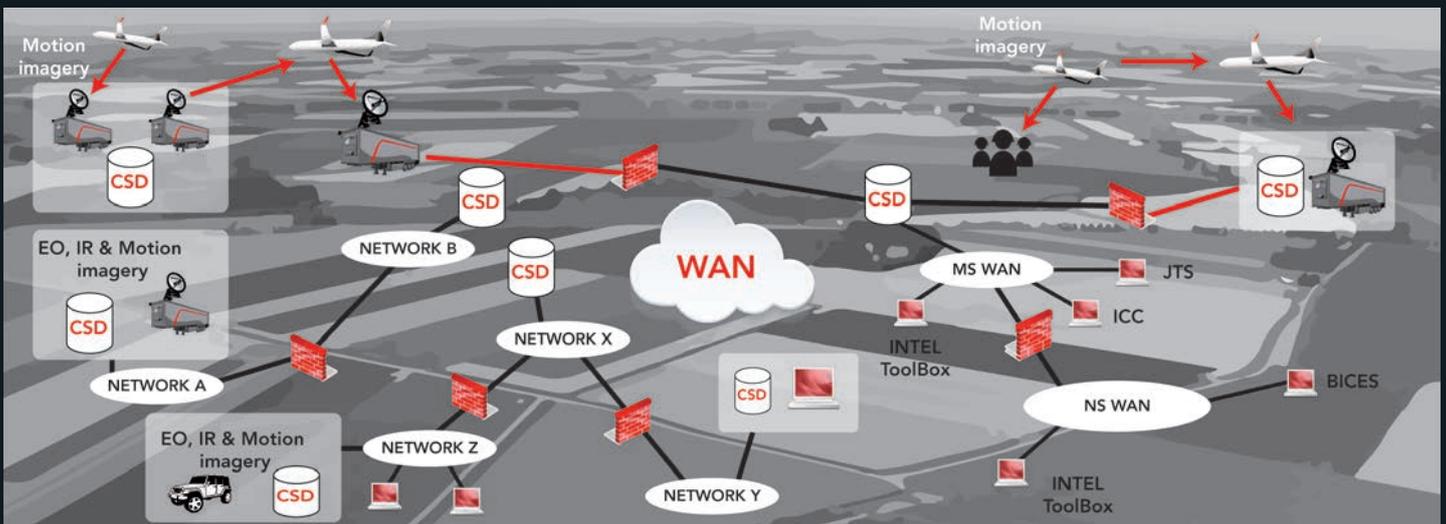
seismo

The **seismo** system objective is the exploitation of ISTAR data originated on the different type of sensors and sources of information. **seismo** purpose is to enhance the knowledge of the situation provided to the different military levels, from tactical to strategic command, through the cooperative and interoperable use of the ISTAR products and their exploitation capabilities.
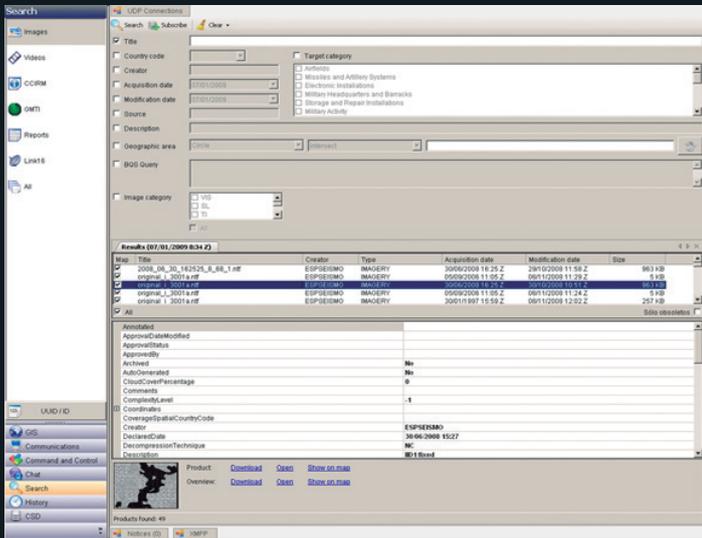

The **seismo** system is composed of two subsystems:

- Exploitation Station: Main system that incorporates the required functionality to exploit the ISTAR data. Contains the main functionalities presented by the **seismo** system to receive, process, display and exploit the information.

- Scenario Generator (Emulator). This system performs two high level functions, generate data to test the Exploitation system and facilitate the training of system operators, emulating an external environment that generates data.

seismo FUNCTIONALITIES - ACQUISITION

- Acquisition, Presentation and Exploitation of multi-sources ISR data. GMTI, Imagery, Video, Link16, ESM, EOB.
- Processing of tactical information (Link16, NFFI, KML).
- Data acquisition:
    - Network – Streaming (Near Real Time, UDP).
    - Coalition Share Database (CSD).
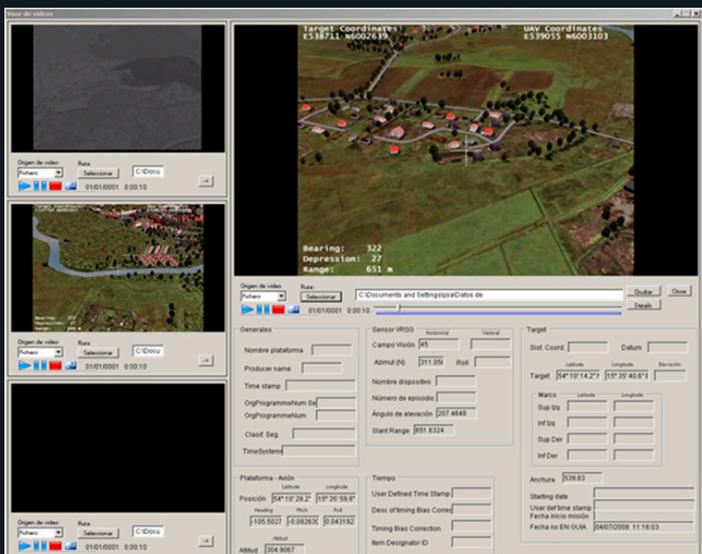

seismo FUNCTIONALITIES - ANALYSIS

- Integration with IRM&CM process:
    - ISR requests.
    - Tasking.
    - System Status Update.

- Imagery exploitation tools:
    - Exchange of Imagery through CSD, with previews and chipping capabilities.
    - Imagery processing according STANAG 4545 NSIF.
    - Provides metadata information of the images.
    - Representation of the images over the GIS.
    - Automatic geo-referencing using Control Ground Points (CGP).
    - Projection of slanted images.
    - Annotation of images using CGM (Computer Graphics Metafile).
    - Enables creation of mosaic for overlapping images.
    - Enables export of geo-located images to NSIF format.
    - Control of Brightness, Contrast and Transparency.

- Video exploitation:
    - Exchange of videos through the CSD.
    - Video processing according to STANAG 4609.
    - Processing of video clips and streaming Full. Motion Video.
    - Provides metadata information of the video (KLV): footprint, platform and sensor data, target data.
    - Representation of the video data over the GIS in real time with contextual information.
    - Processing data coming from multiple sources at the same time (up to 5 videos).
    - Player control to pause, resume, displacement on the control bar (even for streaming videos).
    - Player with speed control, jump to specific positions.
    - Management of bookmarks.
    - Application of different video filters (including control of brightness and contrast).
    - Generation of video clips from streaming video of from other video clips.
    - Generation of NSIF images from snapshots.
    - Generation of annotations over the video clips.
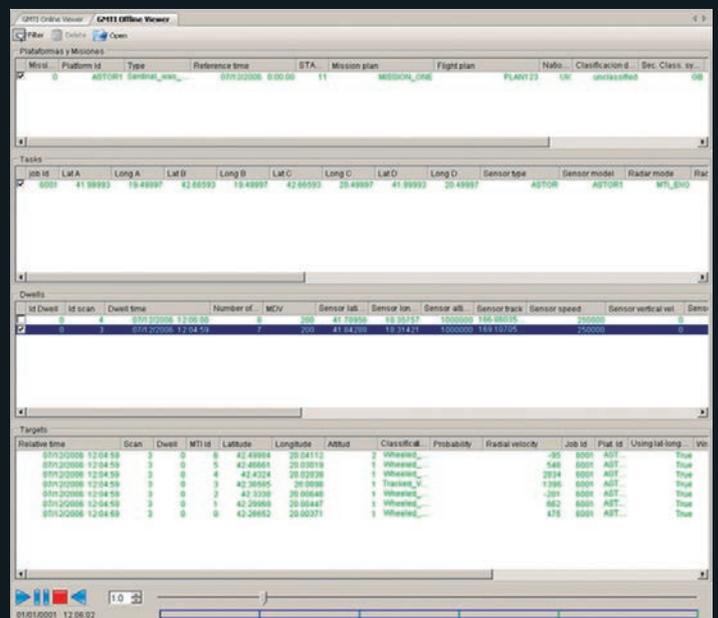
- GMTI exploitation tools:
    - GMTI processing according to STANAG 4607.
    - Processing data coming from multiple sources at the same time.
    - Provides metadata information of the GMTI: platform, mission, jobs, dwells, targets.
    - Representation of the GMTI data over the GIS in real time with contextual information.
    - Provides a player of recorded GMTI data for offline analysis.
- Tracking and data fusion tools:
    - IMM-MHT (Interacting Multiple Model – Multiple Hypothesis Tracking) tracking algorithm.
    - Mono and multi nodes tracking algorithms.
    - Processing data coming from multiple sources at the same time.
    - Multiple tracking modes: automatic, semiautomatic, assisted, manual.
    - Generation and dissemination of Link 16 tracks (J3.x messages) as output of the tracking process.
    - Representation of the GMTI tracks data over the GIS in real time with contextual information.
    - Fusion tools between GMTI tracks and incoming Link16 data.
    - Correlation tools between GMTI tracks and vector GIS information.
    - Counting tools for GMTI and Link 16 tracks: Determining number of tracks inside/outside an area.
   - Estimation of times of arrival and times of crossing between tracks.
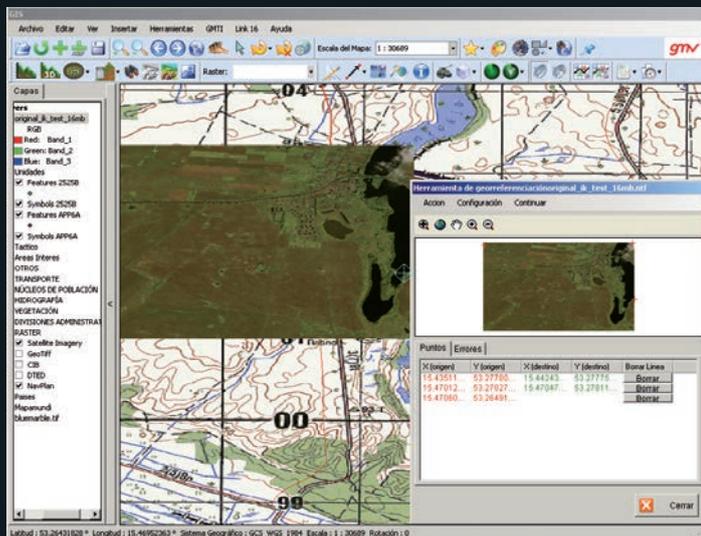
- ESM exploitation tools.
- Integrated collaborative tools.
- Integrated CSD client. (Access to the *csd* repository and services).
- Integrated GIS (ESRI).
- Supervision and monitoring tools.
- Capable of off-line operation.
- Ready to handle information up to NATO secret level.
- Multiple languages MMI.

seismo FUNCTIONALITIES - PRODUCTS
- Generation of Intelligence products.
- Generation of exploitation and intelligence reports by mean of easy to use wizards:
    - RECCEXREP.
    - MTIEXREP.
    - MIEXREP.
    - WLEXREP.
    - HUMINTREP.
    - INTREP.
    - INTSUM.

INTEROPERABILITY
seismo has been developed in accordance with the STANAGs contemplated as mandatory by the MAJIIC program being interoperable with any other ISR tool developed under the standards established by the program.
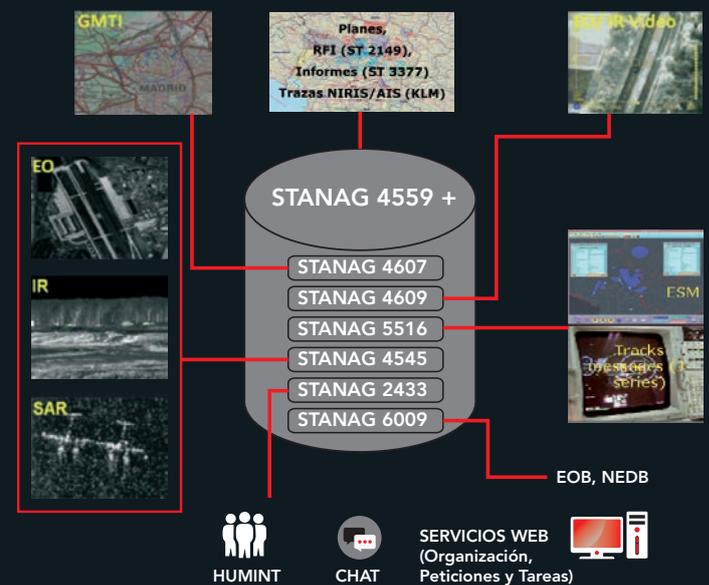
CLIENT REFERENCES
Spanish Ministry of Defense
- DGAM.
- EMACON.
- Ejército de Tierra.
- Armada.
- Ejército del Aire.
- INTA.

Portuguese Ministry of Defense
- Marina Portuguesa.
- Ejército del Aire.
- Instituto Hidrográfico.

International Organizations
- OTAN.
- EDA.
- EC.
- CNES.
- EMSA.