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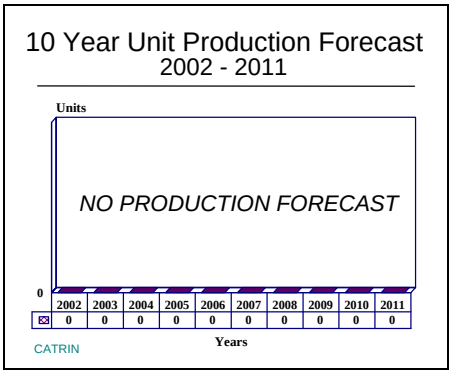
CATRIN - Archived 09/2003

Outlook

- Forecast International expects no additional production of CATRIN at this time
- United Kingdom Ministry of Defence is studying CATRIN and its potential application to the UK's Integrated Ground-Based Air Defence system



Orientation

Description. CATRIN is a command, control, and communications system. CATRIN provides automated battlefield communications.

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Status. One corps unit is in service.

Total Produced. Two corps units have reportedly been produced.

Application. Provides integrated communications and battlefield information up to corps level.

Price Range. Anticipated final cost of the complete CATRIN system is US$1 billion. A CATRIN system for a single corps is estimated at US$396 million.

Technical Data

CATRIN. A CATRIN (Sistema Campale di Trasmissioni e Informazioni) network consists of trunk nodes, connected by 32-channel UHF radio links and linked to corps and division access nodes by 16-channel radio relays. The CATRIN system is deployed at the corps level and is installed in Class 1 and Class 2 UEO shelters, while terminal equipment is normally mounted in armored fighting vehicles. The CRESO radar component is reportedly deployed on helicopters. The transmission rates selected for CATRIN are 16 kbps and 32 kbps, with speech digitally encoded by delta modulation. The CATRIN system is composed of three subsystems: SOTRIN, SORAO, and SOATCC.

SOTRIN. SOTRIN (Sottosistema di Trasmissioni Integrate) is a mobile network that handles voice, data, telegraph, and facsimile communications, linked together by radio relay and tropospheric scatter. SOTRIN has extensive built-in redundancy and is designed to remain operational even when up to 50 percent of the network has been destroyed. SOTRIN is expected to be installed in shelters and vehicles, with the latter used particularly for single-channel radio access. Primary command posts will be established at the division level, with secondary posts at the brigade level.

The SOTRIN single-channel radio is the Hydra-T produced by Telettra (now Alcatel Telettra). The Hydra-T is a derivative of the earlier Hydra-V frequency-hopping direct-sequence radio. The Hydra-T was unveiled in 1987 and operates in the 30 to 88 MHz band. It offers up to eight simultaneous radio links per access point and can carry secure or clear voice data, teleprinter, or facsimile transmissions.

The primary SOTRIN radio is the Marconi Italiana MH-301 1,520-channel VHF radio. The company was also reportedly developing the MH-344 2 Mbits SHF radio relay. Three of these VHF radios are installed in a truck-mounted shelter, together with the MH-306/ MH-313 UHF relays and the MT-241 delta-modulated multiplexer. The shelter-mounted nodal access points are based on the Italtel ATD-2000 digital switch that provides 768 channels in 20 TDM/delta-modulated groups. The basic packet-switching equipment can handle 100 packets per second through the nodal switching equipment, although this can be increased to 800 packets per second by multiplexing.

SORAO. The SORAO (Sottosistema di Sorveglianza del Campo di Battaglia e Acquisizione Obiettivi) portion of CATRIN provides surveillance and target acquisition at the corps level, using a network of sensors and data correlation centers. The former includes Meteor Mirach-100 long-range and CL-89 medium-range reconnaissance drones, Mirach-20 mini-RPVs, artillery locating radar, a battlefield surveillance radar produced by FACE Standard Italiana, passive sound-ranging equipment developed by Elmer, and laser rangefinders.

The complement of SORAO sensors is also designed to include Agusta AB.412 helicopters carrying the new CRESO frequency-agile battlefield surveillance radar. CRESO has an under-fuselage slotted planar-array antenna augmented by electronic support measures (ESM) equipment and a GPS/inertial navigation unit. Using advanced scouting techniques, the mission of the helicopter will be to pop up above the local horizon for approximately 30 seconds, then descend and relay the acquired data via a spread-spectrum datalink to a ground station for initial analysis. From there, the information will be relayed to a correlation center.

The SORAO data correlation centers consist of shelters that contain 16-bit and 32-bit computers, video terminals, tactical displays, and peripherals. Much of this equipment is common with the complementary SOATCC system. The computers include 10 Westinghouse Norden-built MILVAX-II (militarized Vax) systems initially delivered for operational evaluation in February 1991.

SOATCC. SOATCC (Sottosistema di Avvisamento Tattico Contraerei, Comando e Controllo) was developed by a team comprising Selenia Defense Systems, Contraves Italiana, SMA, and Litton Italiana. SOATCC aids in the defense and control of army aviation resources by providing a recognized air picture, cueing self-defense anti-aircraft units, and alerting control centers. The SOATCC control centers are installed in standard UEO-2 shelters transported by ACM-80 wheeled vehicles or, in the case of the 3D surveillance radar, by the larger ACP-10 vehicles.

SOATCC sensors include airborne radar, new ground-based surveillance radar, and a position-location reporting system. SOATCC receives inputs from the TSQ-73 command and control system used in conjunction with the Italian Army's improved HAWK SAM batteries. The surveillance radar is composed of the 3D LRAT-31S (an improved and more mobile version of the Selenia RAT-31S) and the Selenia 2D RAT-30C. Eight RAT-30C radar are required to cover a corps area 120 x 80 kilometers.

The G/H band radar is being developed in association with SMA and Contraves, and will be optimized for use against helicopters. Each minor unit within the SOATCC system will have a Litton Italia air raid-alerting receiver interfaced with a combat radio to show alphanumeric and graphics messages.

Variants/Upgrades

Project definition work is under way on the SIACCON, a high-level C^{3}I system reportedly intended to complement CATRIN.

SIACCON. SIACCON (Sistema Informativo Automazione per Comando e Controllo) is said to consist of a dedicated network of centers used for decision-making, data fusion, and information selection and analysis. Italian industry formed two consortia to bid for SIACCON. One of these, the Italcontrol group, is made up of members Alenia, Agusta, Honeywell, Bull, Italtel, SEPA, and Telettra, while the other includes Marconi Italiana, Aeritalia, and Olivetti.

CRESO. Much of the activity around CATRIN in the last few years has concentrated on the airborne surveillance radar element CRESO (Complesso Radar Eliportato di Sorveglianza), which is one sensor within the SORAO target-acquisition subsystem. CRESO was demonstrated to senior military personnel in September 1996, using an Agusta AB.412 helicopter for its platform. The system consists of FIAR radar feeding Elettronica EW equipment, a Marconi Italiana datalink, and a ground station. It uses hardware and software mainly from Alenia Difesa for acquisition, monitoring, and analysis of the data. A conventional PPI display is the user interface. It also includes an Officine Galileo Galiflir Astro forward-looking infrared (FLIR) sensor, as well as navigation systems.

Different elements of CRESO have been under test since 1991. Full system test and acceptance trials were completed during 1997. Any decision on further Italian Army procurement is pending a decision regarding a NATO alliance ground surveillance (AGS) system.

Program Review

Background. Plans to develop the CATRIN system were first announced in 1984. Prior to 1984, a number of feasibility studies and presentations had had been conducted to define system parameters and ensure compatibility with other emerging NATO C^{3}I systems. Development work was started by the consortium companies in 1986, and full-scale development was authorized in 1987. Trials of individual components, including radios and switching systems, were initiated in 1988.

When full-scale development was authorized in 1987, a six-year trial period was envisioned, with pre-prototype testing scheduled to take place three years from the start of development. The computers for the data-correlation sections of the system were delivered for evaluation trials in February 1991.

Pre-prototype trials of each of the CATRIN subsystems were undertaken during 1992. The SORAO target acquisition and SOATCC aviation command and control elements were field-tested during the annual artillery command post exercises conducted by the

Italian Army. The pre-prototypes used in these trials included at least one unit of each major equipment item.

The SOATCC prototype included a single shelter of each type together with a single 3D radar and two 2D radar. The SORAO prototype included one shelter of each type, a Mirach 20 drone launcher with eight aircraft, two Alcatel FACE SCAT-20 battlefield surveillance radar, and a single modified TPQ-37 FIREFINDER. Not all of these items had been brought up to full military specification levels to reduce equipment acquisition time and the cost of any modifications required as a result of the test program.

While these trials were under way, elements of the third CATRIN subsystem, SOTRIN, were tested at the Italian Army signals school in Rome. The various components were first tested by the contractors involved (Alcatel, Italtel, and Marconi Italiana) to verify the integration of the systems. The Army then supervised further operational testing using simulators to generate signals from the SOATCC and SORAO networks. The radio, trunk communications, and SCRA (single-channel radio access) components of the system were the first system elements to successfully complete the trials program.

Remaining test efforts were then refocused to concentrate on the supervisory network. A second, experimental SOTRIN system was scheduled to be delivered to the Italian Army 11th Signals Battalion for field exercises once all the components had been fully validated. The remaining components of the CATRIN system were delivered by the end of 1993 and were used to convert the existing pre-prototypes into a full system prototype configuration.

Recent Developments. CATRIN completed field tests with the Italian Army in June 2000. In July 2000, CATRIN was officially handed over to the Italian Army.

Currently, the United Kingdom Integrated Ground-Based Air Defence (IGBAD) project team is studying CATRIN. The goal of the IGBAD program is to upgrade the ground-based air-defense systems in service with the British Army and Royal Air Force, and to integrate them with an overarching air-defense command, control, communications, and intelligence structure. CATRIN's SOATCC subsystem is the main interest of the IGBAD project team. The Integrated Ground-Based Air Defence system is projected to enter service in 2010.

Funding

The Italian Ministry of Defense financed the development of CATRIN.

Recent Contracts

No recent contracts have been identified.

Timetable

Year	Major Development
1970	Original feasibility study begun
1975	Feasibility study concluded
1978	EUROCOM-standard presentations made
1984	CATRIN development announced
1986	Initial development work commenced
1987	Full-scale development announced
1989	Initial equipment trials undertaken; first Mirach RPVs delivered
1990	Service trials commenced
1992	Initial pre-prototype (field) trials
1994	Full prototypes delivered
1995	Full prototype trials
1996	Initial deployment, led by full-system tests and acceptance flights
1999	Representatives from the UK Ministry of Defence visited the Italian Army to familiarize themselves with CATRIN and its potential application to the UK's IGBAD system
2000	In June, CATRIN completed field tests with the Italian Army and is given formal approval for handover; in July, CATRIN officially handed over to the Italian Army

Year	Major Development
2001	CATRIN studied by the United Kingdom Integrated Ground-Based Air Defence (IGBAD) project team

Worldwide Distribution

The **Italian Army**.

Forecast Rationale

CATRIN (Sistema Campale di Trasmissioni e Informazioni) is a command, control, and communications system. CATRIN provides automated battlefield communications and integrates corps area communications with ground and air battlefield surveillance systems.

At the present time, Forecast International expects no additional production of CATRIN.

The United Kingdom Ministry of Defence Integrated Ground-Based Air Defence (IGBAD) project team is deciding whether to use CATRIN as part of the IGBAD system. The IGBAD system will upgrade the current ground-based air-defense systems of the British Army and Royal Air Force, and integrate them with an overarching air-defense command, control, communications, and intelligence structure.

If the IGBAD project team members like what they see in the CATRIN system, CATRIN will be incorporated into the IGBAD system. Forecast International expects the Integrated Ground-Based Air Defence system to enter service in 2010.

Ten-Year Outlook

Currently, no production is forecast.

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