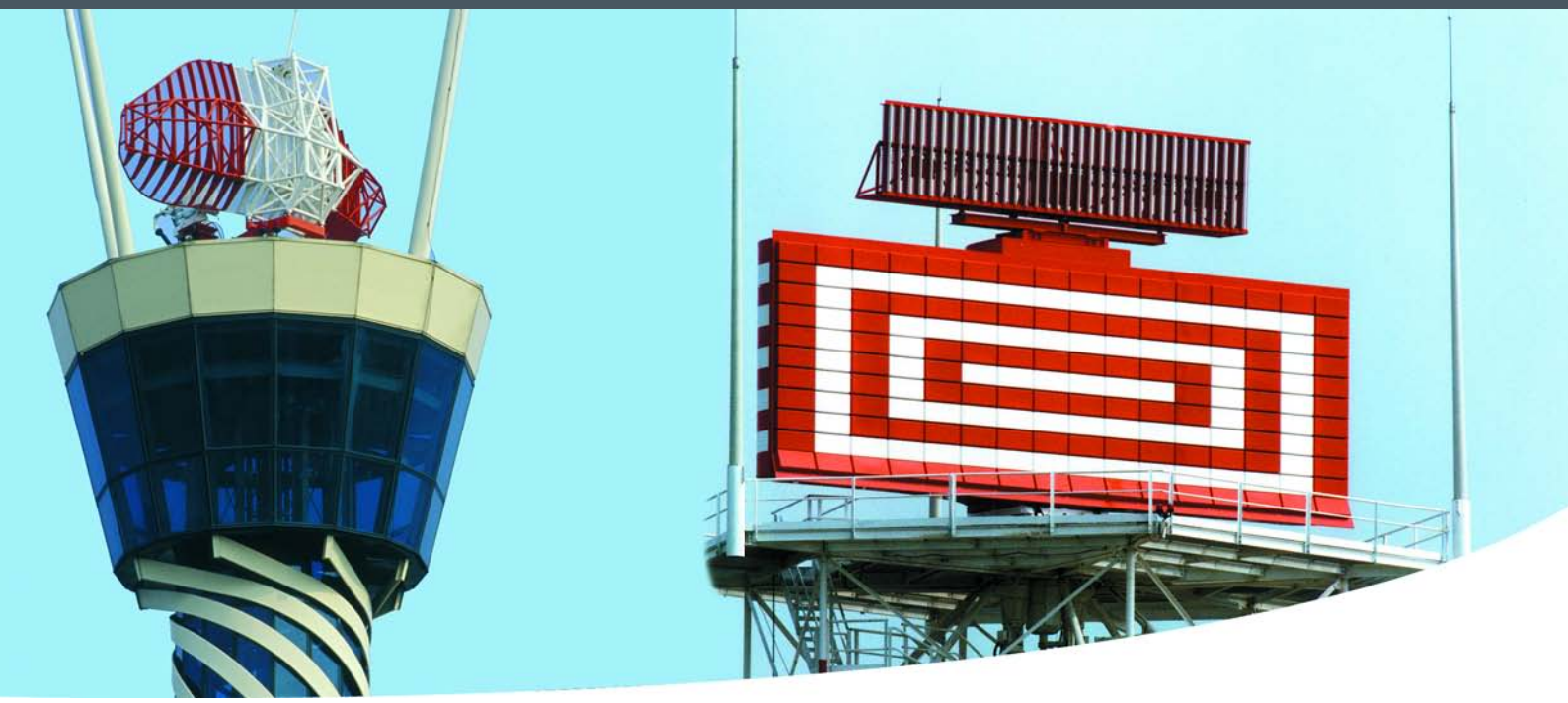
SELEX
Sistemi Integrati
A Finmeccanica Company

Predictable results
for unpredictable threats



PRIMARY SURVEILLANCE RADAR SENSORS

The ATCR-33S is the SELEX Sistemi Integrati solution for En-route and Terminal Management Area services. It is an S-band Air Traffic Control Radar.
The ATCR-44S is the SELEX Sistemi Integrati solution for En-route and extended Terminal Management Area services. It is an L-band Air Traffic Control Radar.
The ATCR-33S and ATCR-44S are designed to cope with the international standards for PSR sensors. Functional and performance characteristics meet the requirements issued by ICAO and EUROCONTROL.
Equipment is fully redundant. Fully solid-state transmitter is comprises parallel operating modules in order to guarantee continuity of operation a fail soft degradation.
ATCR-33S and ATCR-44S are fully designed with replaceable plug-in modules and printed circuit boards. Modules and PCBs meet the international RoHS (Restriction of Hazardous Substances Directive) 2002/95/CE rules.
Equipment layout has been designed to reduce repair time; to guarantee access to all modules, PCB, assemblies, test points, terminals and wiring.
Corrective maintenance only consists of removal and replacement (plug-out, plug-in) of complete LRUs with few and simple adjustments.
Full control of radar parameters is performed via a Local Panel allowing simple and effective on-site radar setting.
A wide range of processing techniques is automatically employed by ATCR-33S and ATCR-44S to ensure maximum operational performance under any environmental condition. The selection of the most appropriate available techniques is controlled by an extensive geographical mapping system managed by the extractor/controller integrated into the radar.
An integrated weather channel is included in the ATCR¬33S and ATCR-44S in order to provide six level of weather contours according to six standard reflectivity levels (as for U.S. National Weather Service recommendations).

ATCR-33S and ATCR-44S configuration is as follows:

- Modular solid state transmitter with fail-soft capability
- Redundant receivers for target and weather signal
- Duplicated digital A-MTD Signal Processors for target and weather signal processing
- Duplicated digital Extractor/Controller
- Monitor and Control Position.

The two sensors are equipped with multi-frequencies STALO capable to operate employing two out of 16 available frequencies.
Frequency selection can be random or automatically done by the Automatic Frequency Selection (AFS) facility.
A transportable configuration of ATCR-33S is available for special operations.

HIGHLIGHTS

- Designed for unattended 24 hour operation, using redundant subsystems with built-in test equipment (BITE) to permit fast and accurate fault diagnosis and monitoring
- High reliability with a critical MTBF higher than 40.000 hours
- MTTR of 20 minutes
- Availability better than 99,999%
- Fully solid state and fail-soft modular transmitter for reduced maintenance
- Transmitter configuration operating in fixed frequency or frequency diversity mode
- Non-linear frequency modulated (NLFM) transmitted waveform for improvement of pulse compression and noise reduction
- Emission Control function to dump or disable RF radiation on given azimuth sectors
- Automatic antenna beam switching (between main and auxiliary) for ground clutter suppression
- Linear/circular polarisation
- High performance receiver employing triple frequency conversion
- STC for enhanced target detection in clutter
- Digital pulse compression with enhanced peak-to¬side lobe ratio for high radar sensitivity
- Fully coherent adaptive moving target detection (A-MTD) system with four sets of Doppler filters; including 6, 7, 8, 9, and 10 filters for each set
- Adaptive selection among four MTD filters according to ground clutter intensity
- Extensive mapping techniques employed to maintain CFAR in presence of high density, non homogeneous clutter
- False Alarm Normaliser (FAN) map for angel suppression
- High resolution Fine Doppler Map (FDM), separate for each MTD filter, to provide super-clutter visibility and tangential target detection
- Anomalous propagation rejection
- Asynchronous Interference Blanking (AIB)
- Censoring Level Map (CLM) to reduce possible false alarms generated in areas where vehicular traffic or very strong clutter are present
- Built-in plot extractor based on the "weighted mean logic" to give best plot accuracy and quality
- Extensive auto-diagnosis circuits (BITE) in all units guaranteeing a high capability of identification and isolation of failures
- Full monitoring and control capability from local or remote positions with user-friendly HMI.

ATCR-33S - CHARACTERISTICS

System capabilities

Frequency band:	from 2700 to 2900 MHz
Maximum range:	from 60 up to 100 NM
Antenna rotation rate:	15 or 12 rpm
Transmitter architecture:	Modular (fail soft capability), 8 modules 16 modules
Transmitted waveforms:	Short / Long pulse
Cooling:	Air cooling
Conversion type:	Conversion @ IF level

ATCR-44S - CHARACTERISTICS

System capabilities

Frequency band:	from 1250 MHz to 1350 MHz
Maximum range:	up to 220 NM
Antenna rotation rate:	5 up to 12 rpm
Transmitter architecture:	Modular (fail soft capability) 16 modules
ransmitted Waveforms:	Short / Long pulse
Cooling:	Air cooling
Phase Detector:	Two Phase detectors for In-phase (I) and Quadrature (Q) components

ATCR 33S AND ATCR 44S EXTRACTOR/CONTROLLER

Plot extraction:	Weighted mean logic using filter amplitude for range/azimuth coordinate extraction, plot quality classification
Functions:	Radar timing control Operator interface System supervision

ATCR 33S AND ATCR 44S DIGITAL SIGNAL PROCESSOR

Type:	Adaptive Moving Target Detector (A-MTD) with four sets of 6, 7, 8, 9, 10 FIR filters
Detection Logic: Fixed thresholding	
Adaptive thresholding	CA-CFAR, (FDM), censoring thresholds
Maps:	Clutter, Beam Selection and combiner, STC, MTD set selection (WSM), Clutter, F alse Alarm Normaliser (FANs)

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Published by
SELEX Sistemi Integrati - External Relations

June 2008