



L-BAND SOLID STATE PRIMARY SURVEILLANCE RADAR

ATCR-44S provides superior surveillance on long range and en-route applications in addition to optimum performance at lower ranges, namely extended TMA applications. ATCR-44S is an L-Band system belonging to the company's family of Primary radars.

THE SOLUTION

Designed to comply with the international standards for Primary Surveillance Radar (PSR) systems and to guarantee a high degree of maintainability, ATCR-44S also meets the requirements issued by ICAO and EUROCONTROL in terms of functional and performance characteristics. The ATCR-44S radar provides enhanced processing capabilities and extended performance monitoring in order to support 24 hour operations.

Monitor and control activities can be performed from local or remote stations via the use of a user-friendly operator interface.

High operational flexibility and system availability are also guaranteed through cutting edge technological choices. ATCR-44S employs a wide range of processing techniques to automatically optimize the operational performance under the most severe environmental conditions.

Processing is controlled on the cell by cell basis by a very sophisticated geographical mapping system. It is managed by the extractor/controller integrated into the equipment. A weather channel is included to provide six levels of weather contours according to U.S. National Weather Service recommendations. The solid-state equipment uses "state-of-the-art" technology to ensure high reliability and availability.

A comprehensive Built-In Test Equipment (BITE) is embedded in the equipment, with an ambiguity of less than 2 in most cases. An easy access to all modules, PCB, assemblies, test points, terminals and wiring strongly reduces repair time.

ATCR-44S

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 local or remote control panels, allowing simple and effective on-site radar setting.

The ATCR-44S system interfaces with the L-Band Antenna Group which includes the G-14 L-Band antenna, a well proven reflector antenna system, extensively used in air traffic applications all over the world and the L-Band Antenna Base with duplicated motors and azimuth encoders. Radome is used for ensuring optimum performance under the most severe environmental conditions.

SYSTEM FEATURES

Enhanced Processing Capabilities

- Digital pulse compression with enhanced peak-to-sidelobe ratio for high radar sensitivity and improved range resolution
- Fully coherent adaptive moving target detection (A-MTD) system with four sets of Doppler filters including 6-10 per set
- Adaptive selection among four MTD filters according to ground clutter intensity
- Extensive mapping techniques employed to adaptively maintain CFAR in presence of clutter with different temporary and spatial characteristics
- High resolution clutter maps updated separately for each MTD filter, to provide super-clutter visibility and tangential target detection.

Extended Performance Monitoring

- Designed for unattended 24 hour operation
- Built-In Test Equipment (BITE) for enhanced failure identification and isolation.

High operational Flexibility

- Operation mode in fixed frequency or frequency diversity
- Emission control function to reduce or disable RF radiation on given azimuth sectors
- Automatic antenna beam switching (between Low and High beams) for ground clutter suppression
- Linear/circular polarization, for optimum target detection in all weather conditions
- Anomalous propagation rejection
- Asynchronous Interference Blanking (AIB).

Full redundancy of critical items

- Fully solid-state and fail soft modular transmitter designed for 'on line' replacement for improved system availability and reduced maintenance

- Redundant receivers for target/weather
- Duplicated Signal Processor/Extractor-Controller.

ATCR-44S configuration

- Modular Fault Tolerant solid-state transmitter
- Redundant receivers for target and weather signals
- Duplicated digital A-MTD Signal Processors for target and weather signal processing
- Duplicated digital Extractor/Controller
- Monitor and control position.



TECHNICAL CHARACTERISTICS

Frequency band	From 1250 to 1350MHz
Maximum range	Up to 220NM
Antenna rotation rate	5 up to 10rpm
Transmitter architecture	Solid State (with fail soft capability) composed of 16 ower chains and radial power combiner
Transmitted waveforms	Short/Long pulse (32µs/150µs)
Frequency Management	Burst to burst frequency diversity with capability of frequency selection over the L-Band
Cooling	Air cooling
Signal Processor	Adaptive Moving Target Detector (A-MTD) with four sets including up to 10 FIR Filters
Detection Logic	Automatic selection of fixed and adaptive thresholds based on high resolution clutter maps separate for each Doppler channel
Plot extraction	Extraction logic based on Doppler filter amplitude for improved plot position determination
Weather vector Extraction	Classified in six levels, calibrated according to the U.S. National Weather service
RMA	High reliability with a critical MTBF >40.000 hours MTTR < 20 minutes Availability better than 99,999%