LEONARDO ELECTRONICS

ATCR-44S-ENH

L-BAND SOLID STATE PRIMARY SURVEILLANCE RADAR

ATCR-44S-ENH has been designed to provide superior surveillance for Long Range and En-route applications, as well as excellent performances at lower ranges (TMA applications).
ATCR-44S ENH is the L-Band solid-state system belonging to the Company family of ATC Primary radars.

OPERATIONAL CONTEXT

ATCR-44S ENH meets the requirements issued by ICAO and EUROCONTROL about functional and performance characteristics.
ATCR-44S ENH provides enhanced processing capabilities granted on cell-by-cell basis by a very sophisticated geographical mapping system. An integrated weather channel provides six levels of weather contours according to the U.S. National Weather Service recommendations.
The equipment is fully solid-state. Full control of radar parameters is performed via Local or Remote Control and Monitoring Positions.

The radar system interfaces with the G-14 L-Band Antenna Group which includes the Antenna Base with duplicated motors and azimuth encoders. Operation under Radome is required to grant full performances under all environmental conditions.

PERFORMANCE OUTLINES

- Modular Fault Tolerant solid-state transmitter
- Redundant receiver channels
- Duplicated Radar Processor with digital A-MTD Signal Processors Extractor/Controller, for Target and Weather detection
- Data Transmission on redundant LAN's
- Operation in En-Route or Extended TMA, using different programmable antenna rotation rates and timing configuration
- Detection mode in fixed frequency or frequency diversity
- On-line selection of the operative frequencies
- Emission control function to disable RF radiation on given azimuth sectors
- Antenna beam switching (between Low and High beams) for ground clutter suppression
- Manual and Automatic polarization selection (Linear/ Circular) for target detection in all weather conditions
- Anomalous propagation rejection
- Asynchronous Interference Detector (AID)
- Fully solid state and fail-soft modular transmitter with separate Power Supply and Driver amplifier for each Power Chain
- Raw Video streaming on LAN
- Graphical user-friendly Control and Monitoring Positions for full control of radar parameters

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KEY FEATURES

- 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 (6 to 12 filters per set).
- Adaptive selection among four MTD filters according to ground clutter.
- Extensive mapping techniques to adaptively preserve the CFAR in presence of clutter with different temporary and spatial Doppler characteristics.
- High resolution clutter maps updated separately for each MTD filter, to provide super-clutter visibility and tangential target detection.
- Built-In Test Equipment (BITE) for enhanced failure identification at single LRU level.
- Operator access to all monitoring functions through its Control and Monitoring Position.

TECHNICAL SPECIFICATIONS

Frequency band	From 1250 to 1350 MHz;
Instrument Range	from 100 NM up to 220NM;
Transmitter architecture	Solid State (with fail soft capability) composed of 16 power chains and radial power combiner
Output power	> 30kW
Transmitted waveforms	Short/Long pulses: 16uS/150us for En Route Application 1.2uS/100us for Ext TMA Application
Compressed Pulse lenght:	1.2 us
Frequency management	Burst to burst frequency diversity with capability of on-line frequency selection over the L-Band;
Cooling	Air Cooling;
Signal Processor	Adapting Moving Target Detector (A-MTD) with four sets, each configurable up to 10 FIR filters according to the radar timing;
Conversion type	A/D Conversion at IF (30 MHz);
Radar Processor Platform	COTS architecture based on DSP processor and standard interfaces; Use of C language algorithms running on LINUX OS; Large extraction processing capability (>1600 plots)
Detection Logic:	Automatic selection of fixed and adaptive thresholds based on high resolution clutter maps separate for each Doppler channel
LAN Connections	3 (per each channel)
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; Avaliability better than 99,999 %;
CE Mark	CE certified and compliant to RED directives. CSA certified.

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