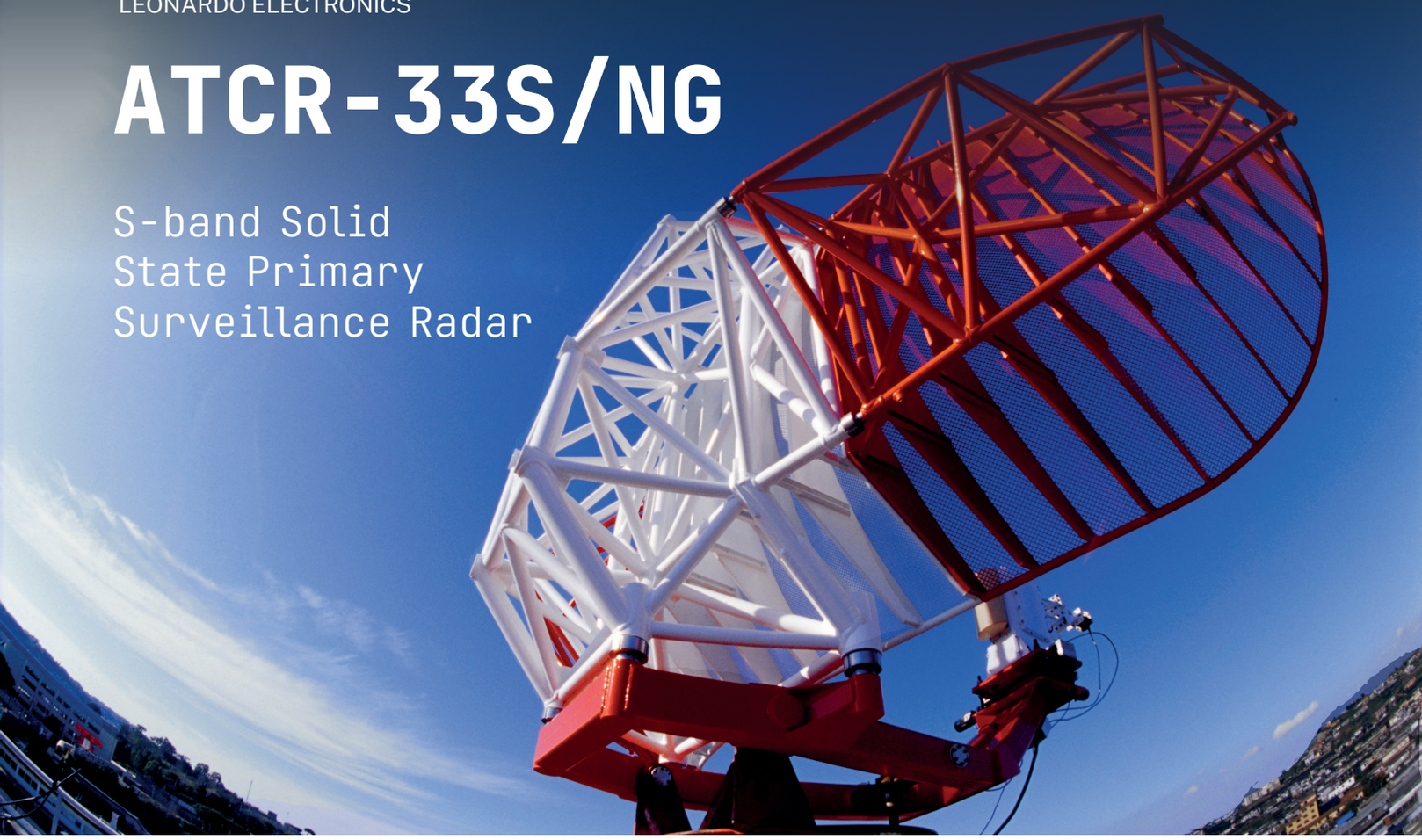
LEONARDO ELECTRONICS

ATCR-33S/NG

S-band Solid State Primary Surveillance Radar



S-BAND SOLID STATE PRIMARY SURVEIL-LANCE RADAR

Leonardo ATCR-33S/NG is the New Generation of Leonardo S-Band Primary Surveillance radars. ATCR-33S/NG meets the most demanding requirements issued by ICAO and EUROCONTROL. ATCR-33S/NG system employs a wide range of processing techniques, allowing specific parameters to be adapted to any site configuration such to optimise operational performances.
Radar processing is controlled on a cell-by-cell basis by a very sophisticated geographical mapping system managed by data processors. An integrated weather channel provides six levels of weather according to U.S. National Weather Service recommendations.

Full control of system status and parameters is performed via local or remote positions, with a user-friendly operator interface adopting standard communication protocols (SNMP based). ATCR-33S/NG is fully solid-state, including Receiver Protectors, based on a “state of the art” technology which ensures high reliability and availability.

ATCR-33S/NG system interfaces the S-Band Antenna Group which includes the G-33 S-Band Antenna and the S-Band Antenna Base with azimuth encoders, duplicated motors, automatic electronic clutch.

ATCR-33S/NG is operated for Air Traffic Surveillance in departure/arrival and extended Terminal Manoeuvring Area (TMA) applications.

PROCESSING FEATURES

- Digital pulse compression with enhanced peak-to-side lobe ratio
- Operation in diversity or fixed frequency
- Automatic antenna beam switching (Low and High beams) for ground clutter suppression
- Fully coherent Adaptive Moving Target Detection (A-MTD) System with four sets of Doppler filters (6-12 per set), adaptively selected according to ground clutter conditions
- Extensive mapping techniques for adaptively maintain Constant False Alarm Rate (CFAR) in presence of clutter with different time and spatial characteristics
- High resolution maps, updated separately for each MTD filter, to provide extra-clutter visibility and tangential target detection
- Built-In Test Equipment (BITE) for enhanced failure identification and isolation

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- Emission control function to reduce or disable RF radiation at given azimuth sectors
- Selectable Linear/circular polarization for optimum target detection in all weather conditions
- Anomalous propagation rejection
- Asynchronous Interference Blanking (AIB)
- Target height estimation by concurrent beam processing
- Wind farm interference mitigation
- Optional kit for 4G/5G interference mitigation

ARCHITECTURE

- Compact Design, ease of maintenance
- Modular Fault Tolerant solid-state transmitter, based on last-gen RF power modules using GaN-on-SiC technology
- Independent power supplies for TX HPAs
- Expandable Architecture
- Redundant receivers in a single cabinet, providing target and weather signals
- Duplicated digital A-MTD signals
- Duplicated Radar processor
- Configurable with embedded or external combiner/tracker

TECHNICAL FEATURES

Frequency band	From 2700 to 2900 MHz
Maximum range	60/80/100 NM
Antenna rotation rate	15/12/10 RPM
Transmitter architecture	Modular (fail soft capability) 8 modules (single TX cabinet) / 16 outputs 16 modules (dual TX cabinet) / 32 outputs
Peak power	> 21 kW (single cabinet) > 32 kW (dual cabinet)
Transmitted waveforms	Short/Long pulse 1 µs / 90 µs 10 µs / 100 µs
Frequency management	Burst to burst frequency diversity with capability of 100 frequency selection within the S-Band
Cooling	Air Cooling
Conversion type	A/D Conversion at IF level
Signal Processor	Adapting moving Target Detector (A-MTD) including up to 12 FIR filters
Processing Platform	COTS architecture with standard interfaces Adaptive algorithm on LINUX OS Extended plot processing capability
RMA	MTBFC > 48,000 hurs MTTR < 20 minutes Availability better than 99.999 %

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