SKYSURV Primary Surveillance Radar (PSR) is the latest generation for terminal approach control applications. Our engineers have applied their civil and military expertise to create radars that comply with ICAO and Eurocontrol international aviation standards. In addition to meeting ISO 9001: 2008 Quality Management System requirements, the robustly designed and modular PSR provides low lifecycle costs while retaining solid-state capability.

With Intelen’s PSR, you can expect enhanced system stability and superior clutter suppression to minimize false reports while maintaining excellent target detection up to a range of 90NM (with the high powered option). The system also enables superior target accuracy and resolution.

The PSR’s configuration includes a channel for weather processing in the airspace and standby channels with automatic switchover controlled by a system-level watchdog circuit. The data output format uses standardized ASTERIX data; however, other data formats can be implemented as an option. The PSR’s functionality can be extended beyond the terminal approach by adding Intelen’s Monopulse Surveillance Secondary Radar (MSSR). Best of all, a sophisticated remote control and monitoring system allows for unattended operation.

Antenna System
The Antenna System forms a double coverage ‘Cosec’ illumination pattern. It operates with linear or circular polarization and can be adjusted remotely to improve weather clutter rejection quickly.

Configuration of the Antenna system can provide the following benefits:
- Sharp cut-off in the lower part of the elevation pattern
- A small angular difference between the high and low beam with a possibility of site by site optimizing
- Enhanced coverage in high elevations
- Low azimuth side lobes
- Remote selection of polarization (linear/circular)

Transmitter
The Transmitter is modular, air-cooled and solid-state. It is composed of 16 independent modules and operates in the full frequency range with frequency diversity for short-pulse and long-pulse transmission. The design is fault-tolerant with a low voltage power supply that allows for continuous operation during maintenance.

RF Generator
The RF Generator is a digital waveform synthesizer. It provides the optimum number of short and long pulses over the coverage period.

Receiver
The Receiver is a super-heterodyne type with double frequency down conversion. Its dynamic range is achieved through direct IF A/D conversion by 14 bit A/D converters. The Receiver has full digital automatic gain control to improve receiver stability and gain calibration. The BITE receiver measures on-line receiver performance parameters, including the noise figure.
System Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2700-2900 MHz</td>
</tr>
<tr>
<td>Antenna gain</td>
<td>34 dB</td>
</tr>
<tr>
<td>Vertical coverage</td>
<td>45°</td>
</tr>
<tr>
<td>Polarization</td>
<td>linear/circular</td>
</tr>
<tr>
<td>Short/long pulse width</td>
<td>10/100 µs</td>
</tr>
<tr>
<td>Short/long pulse compression ratio</td>
<td>10/100</td>
</tr>
<tr>
<td>Peak power</td>
<td>14 kW</td>
</tr>
<tr>
<td></td>
<td>25 kW (high power)</td>
</tr>
<tr>
<td>Receiver noise figure</td>
<td>1.5 dB</td>
</tr>
<tr>
<td>Signal processor</td>
<td>adaptive MTD</td>
</tr>
<tr>
<td>Clutter improvement factor</td>
<td>55 dB</td>
</tr>
<tr>
<td>Range accuracy resolution</td>
<td>75m/230m</td>
</tr>
<tr>
<td>Azimuth accuracy resolution</td>
<td>0.15/2.3 r.m.s</td>
</tr>
<tr>
<td>Target processing capacity</td>
<td>min. 1000</td>
</tr>
</tbody>
</table>

Signal Processor

The Signal Processor is a 32-bit processor with high computing performance. Real-time application software is designed in “C” language, to provide an efficient application solution for adaptive Moving Target Detector (MTD) processing.

The Signal Processor performs digital pulse compression for short and long pulses. Doppler filtering occurs through a bank of Doppler filters, adaptive Constant False Alarm Rate (CFAR) filtering, target detection and extraction. CFAR filtering includes scan-to-scan filtration criteria for evaluation and weather mapping, while the extraction process uses the filter amplitude for range/azimuth target coordinates evaluation and improving their precision.

Control and Monitoring System (CMS)

Each system unit includes independent BITE for performance monitoring and automatic system reconfiguration at the system level. The CMS has two parts: Local Control and Monitoring System (LCMS) and Remote Control Monitoring System (RCMS). The LCMS is located on the radar site, while the RCMS is typically located in the airport tower’s technical room.

The functional capabilities of the distributed BITE include:
- LCMS and RCMS Control Computers
- Graphic Interface of the LCMS
- Off-line Diagnostics
- Test result Indication

The Control and Diagnostic system allow the monitor to zoom into various diagnostics levels such as:
- Input/output interface of card level
- Card level
- Electronic unit level
- System level

Both systems have the same functional capabilities and communicate with each other using a communication link (i.e., fibre optic cable). The CMS continuously monitors the radar’s status and performance and allows the system technician to adjust the radar parameters locally or remotely. The CMS incorporates a user-friendly graphic interface for data and status presentation.

About Intelcan Technosystems

Intelcan is the leading Canadian communications, navigation, surveillance and air traffic management (CNS/ATM) system and airport infrastructure solution provider. Integrating Intelcan’s own products or utilizing products from a diverse supplier network, Intelcan has delivered complete turnkey solutions both cost-effective and flexible, to fulfill civil and military clients’ requirements in over 60 countries, worldwide.

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