AIR TRAFFIC MANAGEMENT

Monopulse Secondary Surveillance Mode S Radar

Supplying ATM systems around the world for more than 30 years

Indra reserves the right to modify these specifications without prior notice.

MSSR Mode S Radar Station

Screen from the side local central and monitory position showing Mode S Asterix data and raw video in 3D view.

Avda. de Bruselas, 35
28108 Alcobendas
Madrid (Spain)
T +34 91 480 60 04
F +34 91 480 60 41
info.atm@indra.es
indracompany.com
MONOPULSE SECONDARY SURVEILLANCE MODE S RADAR

Introduction

The current MSSR radar is the fourth significant generation of MSSR radar in Indra’s portfolio. This significant generation has been certified by the International Civil Aviation Organization (ICAO) and meets the performance demanded by EUROCONTROL, in the surveillance and navigation modes in S systems.

This mode S system means a low cost and high performance mode S solution.

The global system architecture takes part of the experience gained to make systems configurable according to the client’s needs.

The MSSR includes full international capabilities as enhanced surveillance performances.

Features

- High technology
- A reusable generation radar with a high technology
- A high performance secondary surveillance mode S radar network for clients worldwide. This is a high performance mode S radar that includes the required answer to any existing surveillance needs.
- High technology
- A reusable generation radar with a high technology
- A high performance secondary surveillance mode S radar network for clients worldwide. This is a high performance mode S radar that includes the required answer to any existing surveillance needs.

Reliability and low lifecycle costs

- High WPSI and LIFR values
- Simple maintenance and adjustment tasks
- Lower annual cost in servicing the life span which greatly reduces the life cycle cost
- Integrated test and supervision unit
- Modular design and software that continuously maintains the correct operation of each and every module for radio-frequency and digital processing

Community

- Designed with the same concepts that have provided optimum results for the railway station and railway management
- The mode S radar station also shares significant components with the WPSI and LIFR modules
- A common set of components with the same power supply and protection modules, control and supervision works, digital processing components, and operational components
- A common set of components with the same power supply and protection modules, control and supervision works, digital processing components, and operational components

Main technical features

- Code: DW4X
- Probability of false alarm: 3 x 10^-5 (Mode A), 0.1% (Mode C)
- Probability of detection (Mode C): 99% (Mode C)
- Mode C: 9% (Mode C)
- Probability of detection: 99% (Mode C)
MONOPULSE SECONDARY SURVEILLANCE MODE S RADAR

Introduction

The current MSSR radar is the fourth significant generation of MSSR radars in the surveillance and navigation mode S systems. The MSSR radar has been developed and manufactured by Indra to meet the needs of the different radar network customers worldwide. This radar is the latest design in a series of MSSR radars supplied by Indra. Those earlier radars were developed in the 1980s and 1990s to meet the surveillance and navigation mode S requirements and the needs of the different sites such as the communications architecture and maintenance network.

Characteristics

• Low cost and high performance mode S radar

Features

• Introduction of targets with enhanced surveillance using selective interrogations
• Video processing
• Image processing
• Image
• Crosshair
• Cross hair
• Side line
• Aircraft coordination
• Double management of SIF and EDO
• Rotary
• Automatic reporting of safe altitude
determination
• Transponder capability report
• Elevation reporting to 25 ft intervals
• Flight status
• Flight capability
• Faulty
• Monopulse
• Fault tolerant
• Presence of heading
• Aircraft with speed
• Aircraft with altitude
• Aircraft with vertical guidance
• Aircraft with control
• Aircraft with performance supervision
• Aircraft with memory
• Aircraft adjustable to adapt to customers needs

System features and mode parameters

• Double channel for the transmission reception in parallel with automatic reconfiguration in the event of fault
• Use of advanced security features
• Use of new-generation signal and data processing for surveillance and tracking the signals
• Complies with international standards on COMAT/CARTS and EDO
• Low-antenna and control and supervision system with maximum efficiency, main- module, auxiliary interface, audio and video displays, exercised in the worktest
• Independent SPS, dual on-board equipment, with diagnostic test and control and performance supervision
• Aircraft adjustable to adapt to customers needs

Control and monitoring

• Full reliability
• Monitoring configuration for surveillance control functions
• Geographical data processors manages map by user access
• Video display for the state of the modules
• Error and reconfiguration
• Help in case of unoperational systems
• Configuration set for each channel detected
• Local display
• Presentation of data over maps
• Zooming
• Presentation of data line
• Zooming
• Display monitoring

Main technical features

- Mode S radar
- Probability of detection (Pd)
- Probability of false alarm
- Code selection
- False targets
- Multiple target processing

Features

• High technology
• Unique generation solid state radar, including the transmitter
• Dual T/R’s and extractor architecture
• MSSR SIF radiator assembly corresponds to a standard single and twin, combined with a user-friendly tailored
• Solid state radar
• Display
• Monopulse antenna

Reliability and low lifecycle cost

• High MTBF/MTTR values
• Simple maintenance and adjustment tools
• Lower annual cost in servicing time and space which greatly reduces the life cycle cost
• Integrated test and supervision unit
• Module-based approach that continually controls the correct operation of each and every module for safe-frequency and digital processing

Community

• Complying with the same concepts that have provided optimum results for the radar stations already in the field. The MSSR radar is a radar station that eliminates the three modes S, C, and A to achieve significantly lower operational costs and provides a robust response to the demands of the air traffic management departments.
• Mode S radar
• Probability of detection two 90% targets
• Probability detection two 90% targets

Other

• Test support
• Functional maintenance
• Functional verification
• Diagnostic test and supervision

Specifications

• Traffic management
• Probability of detection two 90% targets
• Probability detection two 90% targets

Air Traffic Management

- Traffic Management
- Probability of detection two 90% targets
- Probability of detection two 90% targets

Air Traffic Management

- Traffic Management
- Probability of detection two 90% targets
- Probability of detection two 90% targets
MONOPULSE SECONDARY SURVEILLANCE MODE S RADAR

Introduction

The current MSSR radar is the fourth generation of MSSR radars in operation in Spain. It was originally conceived and developed by the International Civil Aviation Organization (ICAO) for use in the surveillance and navigation modes S systems.

This mode S system means a low cost and high performance mode S radar system.

The global system architecture means all the technologies designed to make systems in the same class work in the MSSR mode are planned to adapt to the needs of critical configurations. This is a fact in the current MSSR architecture.

High technology

A completely solid state radar, including the transmitter/receiver, provides the input to the MSSR radar assembly corresponding to modern stations and the transmission/reception, with a user-friendly interface and software management. A 1450 MHz, 1550 MHz and 1650 MHz circuits, 10% VPS.

Features

- Monopulse technique
- Antenna pattern enhancements
- Antenna selection technologies
- Simultaneous carrier and data signal processing
- Integrated test and supervision unit
- Modular APSI and CPU, 64-bit architecture is compatible with the contact operation of each and every module, MDM for video-frequency and digital processing

Reliability and low life cycle cost

High visibility (VIS) and RIFR values
Simple maintenance and adjustment tasks
- Spares annual cost in servicing the life time and space which greatly reduces the life cycle cost
- Integrated test and supervision unit
- Module APSI and CPU that continually controls the correct operation of each and every module, MDM for video-frequency and digital processing

Community

Conceived with the same concepts that have provided optimum results for the radar stations already in service. This makes it possible to use the same space and the same structure for the new MSSR systems.

The mode S radar station also shares significant components with the current FAIS and provides modularity and process modules, central and local signal and communications management components.

Main technical features

- Number of primary modules: 4
- System: four base stations and access control
- Number of secondary modules: 4
- Frequency: 1090 MHz
- Number of modular units: 5
- SIM: 1450 MHz
- Number of footprints: 5
- Gain: 40 dB
- Power: 1000 watts
- RF: 300 watts
Screen from the side local control and secondary radar showing mode S raw data and raw video in 3D view.

MONOPULSE SECONDARY SURVEILLANCE MODE S RADAR

Suppling ATM systems around the world for more than 30 years

Indra company.com