DEFENSE AND SECURITY

MK-XII/A IFF TRANSPOndERS

Defense and security in five continents

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MK-XII/A IFF TRANSPONDERS

A new family of transponders has been developed to satisfy the latest requirements in IFF systems and ATC

MK-XIIA IFF transponders

These transponders include all military and civil modes: modes 1, 2, 3/A, C, 4, S and the advanced Mode 5.

This family is mainly integrated by the TXP-2000, the TXP-2000N and the TXP-25S5. These equipments have the same package, but different functionality. The dimensions are ARINC 600 - 4 MCU.

Mode 5
Mode 5 is the latest and most advanced combat identification mode currently available.

Mode 5 presents significant operational, security and performance improvements with respect to the alternatives modes: better use of available bandwidth, new cryptographic algorithms, increased probability of identification and improved performance in presence of interferences.

NATO has announced that in the near future, all allied platform operating in a conflict area must fit IFF Mode 5 functionality.

The TXP-25S5 supports Mode 5, up to Level 2 and squitter.

Mode 5 benefits
Robust to interferences and intelligent jamming
Significantly enhanced security to avoid exploitation
Highly confident ID, reducing casualties and fratricide
New cryptographic algorithms and security features with Time of Day (TOD) authentication
Enhances the battlefield's situational awareness
Maximum military effectiveness
Compatible with Air Traffic Control systems

Mode S
Mode S is the civil mode intended to provide aircraft surveillance and communications, necessary to support air traffic control.

The family of transponders includes Mode S up to level 3, that implements all necessary functionality for Basic and Enhanced Surveillance (EHS). It provides unique aircraft identification, enhanced Mode C height resolution and flight details through the transmission of Downlink Aircraft Parameters (DAPs).
Modular architecture

The family of transponders is based on a modular architecture, in order to facilitate the adaptation to new platforms and the inclusion of new operational requirements.

The extensive use of standards interfaces and off-the-shelf components has allowed reducing the development time and including spares for future features.

The transponders can be fitted with a Mode 4, Mode 5, or Secure Mode crypto appliqué. The interfaces supported are Ethernet, dual MIL-STD-1553B, RS-485, ARINC 429, RS-232 and others.

Technology

The modular solid-state design including extensive use of state of the art Microprocessors, Digital Signal Processors (DSP’s), Field-Programmable Gate Array (FPGA) technology and integrated Built-in-Test (BIT) provides maximum reliability, maximum flexibility and easy maintenance.

Main features

Modes 1, 2, 3/A, C, 4
Mode S Level 1, 2 and 3 and extended squitter
Growth to Mode 5 Level 1, 2 and squitter
Appliqué crypto for Mode 4 and Mode 5 operation
Hardware-provisioned to include an embedded ADLP (Airborne Data Link Processor)
TCAS II compatible
Hijack according to ARINC 718A
Two antenna interfaces for diversity operation

Built-in test

The integral BIT functionality eliminates the need of scheduled preventive maintenance activities. It detects equipment failures and tests external interfaces (antennas, communications, altimeter and cryptographic unit).

The BIT results are available on the data bus and some failures are also available at the remote control box.

RCB-25SS / RCB-25A / RCB-25N remote control box

The transponders can be operated via either dedicated control unit or via any standard communications bus (MIL-STD-1553, ARINC429, RS485 or RS232).

The operation with the RCB-25SS allows selecting the modes and codes of operation to be transmitted and also provides all the controls and indications necessary for the transponder operation. The operation through the RCB-25A or RCB-25N provide backup control of the transponder.
**Maintainability and reliability**

The transponders have been designed for exhibit high MTBF and low MTTR. The shop-replaceable units are easily accessible and interchangeable.

**Qualification**

The transponders have been tested under the most stringent environmental conditions: temperature, humidity, altitude, shock, vibration, acceleration, fungus, salt and fog, explosive atmosphere, lightning, acoustic noise and EMC, according to MIL-STD-810 and MIL-STD-461, MIL-STD-462.

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### Technical characteristics

#### TECHNICAL CHARACTERISTICS

| Modes supported | Mode 1, 2, 3/A, C, 4  
|                 | Mode 5 level 1, 2, and 3  
|                 | Mode 5 level 1 and level 2  
| Interfaces | Bus 1553, ARINC 429,  
|            | RS485, RS232, ethernet  
| Special functions | Mode S and mode 5 squitters  
|                  | ISLS  
|                  | TCAS II  
| BIT / BITE | Included  
| PHYSICAL CHARACTERISTICS | ARINC 600 – 4MCU  
|              | 193.5 x 123.95 x 318/338 mm  
| Weight (without crypto) | < 6.9 Kg  
| RECEIVER CHARACTERISTICS | Sensitivity (MDL)  
|                         | According to STANAG 4193  
| Carrier frequency | 1030 ±0.5 MHz  
| Dynamic range | MDL to -22 dBm  
| Diversity | Dual channel  
| TRANSMITTER CHARACTERISTICS | Carrier frequency  
|                          | 1090 ±0.1 MHz  
| Peak power | 27 dBm ±2 dB  
| Duty cycle (long-term) | According to STANAG 4193  
| POWER SUPPLY | Power consumption  
|               | 129 W max.  
| Input voltage | ±28 V DC  
| According to | MIL-STD-704A  
| RELIABILITY / MAINTAINABILITY | MTBF  
|                       | ≥3500 hr  
| According to | MIL-HDBK-217, RTCA DO160  
| ENVIRONMENTAL CHARACTERISTICS | Operating temperature  
|                           | -40°C to +71°C  
| Maximum altitude | 50,000 ft  
| According to | MIL-STD-810E, MIL-STD-461/462  

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