



TSA & TSB 2500

IFF INTERROGATOR &
COMBINED INTERROGATOR TRANSPONDER

- > **MKXII/Secure, Mode S Level 2/3**
- > **Growth to Mode 5 and growth for Mode S interrogation**
- > **COMSEC Applique**
- > **Monopulse**
- > **E or M-Scan**
- > **Mil 1553B**
- > **Advanced Technology**
- > **Powerful BIT cuts maintenance**
- > **Qualified on: Rafale, Erieye, NH 90, JAS 39, M2000, SU 30**

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TSB 2510 Combined Interrogator Transponder and E-Scan Antenna Control Unit

DESCRIPTION

The TSB 2500 is a family of advanced Combined Interrogator Transponders which can be provided also as Interrogators (TSA 2500).

The TSB 2510 series are dedicated to E-Scan and TSB 2520 series to M-Scan applications.

The TSB 2510 consists of a lightweight Combined Interrogator Transponder (CIT) unit integrating all interrogator, transponder and COMSEC functions (when applicable).

It operates as if it were separate conventional equipments with an Antenna Control Unit (ACU). That is fitted with four banks of phase shifters, low noise amplifiers and power amplifiers.

The TSB 2520 consists of the same CIT unit as the TSB 2510, fitted with a remotable 2 KW RF Antenna Adaptor applique Unit (AAU) providing Sigma / Delta interface with an M-Scan antenna.

The TSA 2530 for Mirage 2000 is a repackaging of the TSB 2520.

The TSB 2500 integrated design saves over than 60 % weight, 70 % volume and is 40 times more reliable compared with the 6 or 7 boxes of the conventional IFF system.

OPERATION

The interrogator and transponder functions are controlled via a MIL STD 1553B or DIGIBUS Bus interface and operates according to STANAG 4193.

The interrogator provides target designated or sector scanned interrogation and reports. Monopulse processing provides accurate azimuth estimation.

The E-Scan version can manage two antenna arrays - top and bottom - and discriminate targets from top, central and bottom sectors.

The M-Scan version is fitted with a high speed serial input providing an accurate tracking capability of the radar antenna position. Digital pulse processing, defruiting and a statistical reply evaluator ensure optimal signal extraction and ground clutter elimination, even in adverse environments.

The transponder provides diversity operation and includes Mode S up to Level 3 capability as well as enhanced and elementary surveillance services. An optional remote Control and Display Unit can be provided if the transponder is required to be controlled independently from the MIL STD 1553B Bus.

TECHNOLOGY

The TSB 2500 family is highly integrated and modular. A dual frequency power amplifier and a diplexer/switch performs the transmission function for both transponder and interrogator.

Interrogator and transponder functions have their own reception channels providing the system with the same availability as separate Interrogator and transponder equipment.

The extensive use of high density programmable technology permits the combination of the Interrogator, Transponder processing functions and a 16/32 bit Central Processor, on only three P.C. Boards, leading to a high level of reliability. EPROM / RAM provisions and the use of high level software language makes the TSB 2500 highly flexible and versatile regarding either future upgrades or platform integration.

The TSB 2500 has growth potential for Mode 5 functions and for interrogating in Mode S.



TSB 2520 Combined Interrogator Transponder for M-Scan Antennas.



E-Scan Conformal Antenna



E-Scan Blade Antenna Array

TESTABILITY

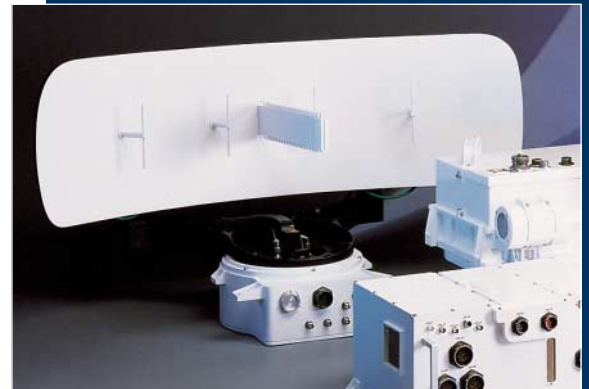
Each SRU is fitted with a powerful BIT ASIC detecting failures down to the chip level and reporting to the Central Processing Unit, according to the latest IEEE 1149.1 BIT techniques.

OPERATIONAL ADVANTAGES

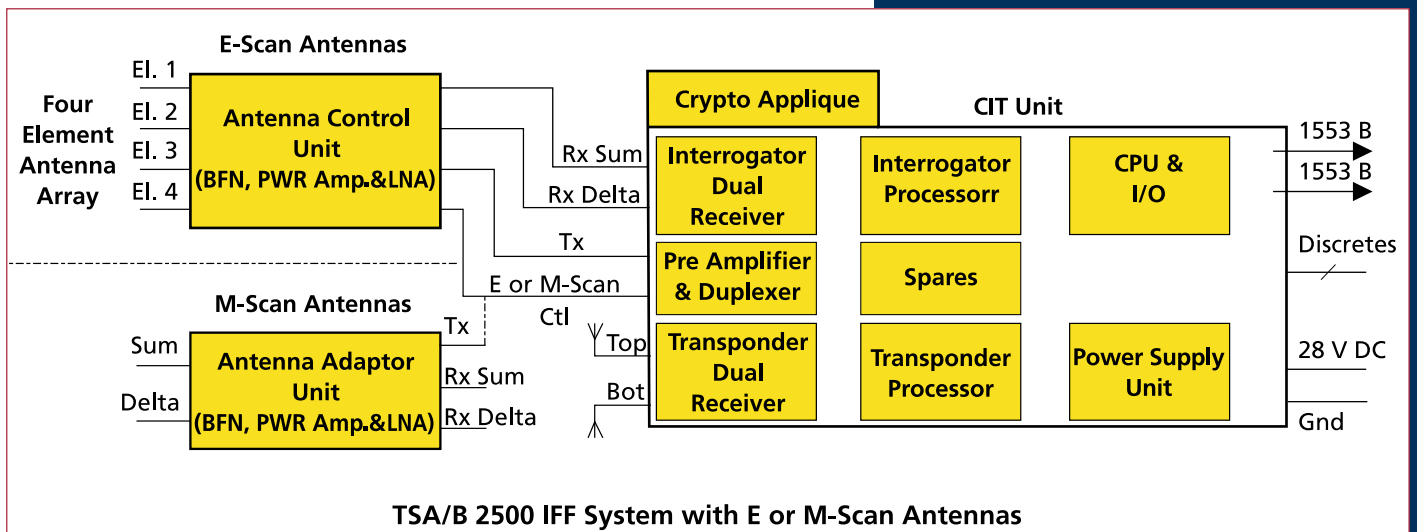
The TSB 2500 family is suitable for advanced fighters, surveillance aircraft, helicopters, as well as for ground or naval applications.

The remote active Antenna Control or Adaptor Units provide a superior performance margin compared to other systems, offering an outstanding capability to identify friendly aircraft beyond the radar range.

The modularity of the Interrogator and Transponder functions enable delivery as a Transponder, an Interrogator or a Combined Interrogator Transponder. This allows a procurement of a Transponder only, and subsequent upgrade to add the interrogator.



M-Scan Antenna Array



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GENERAL CHARACTERISTICS

INTERROGATOR	
Transmitter	All Solid State
Frequency	1030 ± 0.2 MHz
Output Power Sum or Delta @ 1 % DC	TSB 2510: ≥ 4 x 700 W TSB 2520: ≥ 1600 W
Receiver	Dual channel superheterodyne
Bandwidth	> 6 MHz @ 3 dB < 50 MHz @ 60 dB
Minimum Decoding Level (MDL)	> -83 dBm
RSLS, STC	According to application
Processing	ASIC and DSP
Processing Range	Up to 475 Km
Modes	SIF 1, 2, 3/A, C and 4/Secure
Operating	Automatic or manual
BITE	Automatic operation
TRANSPONDER	
Transmitter	All Solid State
Frequency	1090 ± 0.5 MHz
Output Power	≥ 500 W @ 1 % DC
Receiver	Dual channel super heterodyne
Bandwidth	> 8 MHz @ 3 dB < 50 MHz @ 60 dB
Minimum Triggering Level (MTL)	> - 77 dBm
Dynamic Range	> 55 dB
Processing	ASIC and DSP
BITE	Automatic Operation

PHYSICAL

TSB 2510		
Dimensions	CIT (W x H x D)	157 x 193 x 332 mm
	ACU (W x H x D)	330 x 120 x 150 mm
Weight	CIT	8.8 Kg
	ACU	5.5 Kg
Power Requirement	28 V DC	
TSB 2520		
Dimensions	CIT (W x H x D)	157 x 193 x 332 mm
	AAU (W x H x D)	33 x 193 x 313 mm
Weight	CIT	8.8 Kg
	AAU	2.7 Kg
Power requirement	28 V DC	

SYSTEM PARAMETERS

MTBF	> 1800 Hours
MTRR	< 10 min
Cooling	Natural convection

ENVIRONMENT

Temperature	Operating	- 40° C to + 75° C
	Storage	- 55° C to + 85° C
Shocks, Vibrations	MIL STD 810E	

THALES

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