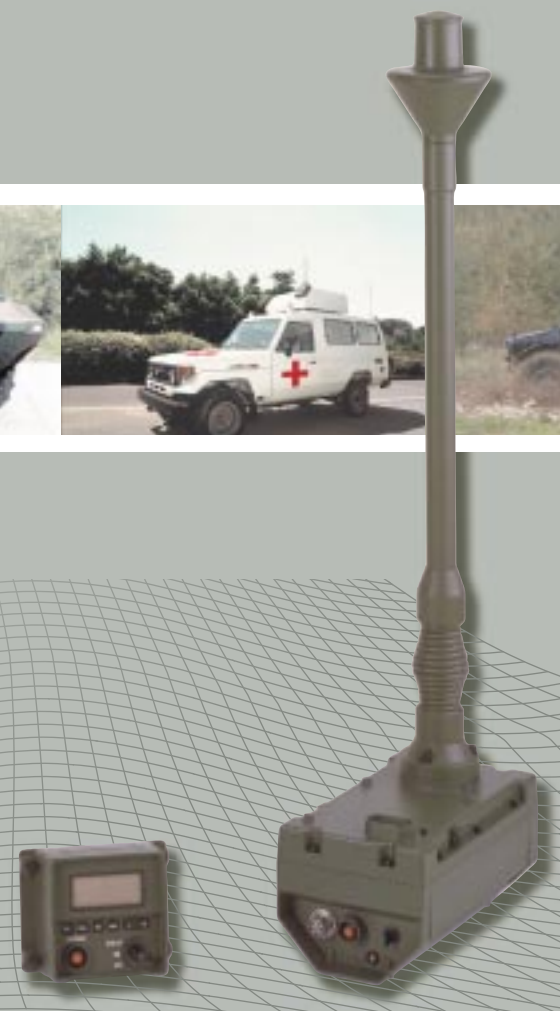


Battlefield Combat Identification

TSF 6010

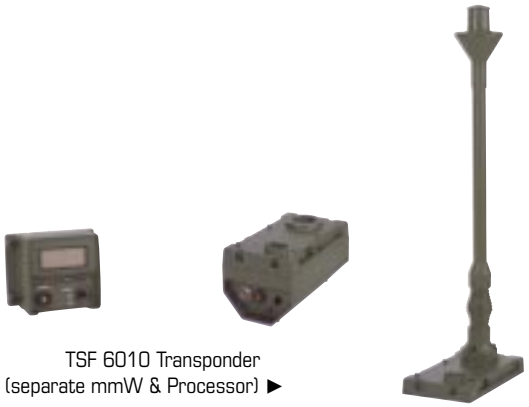
TRANSPONDER

- > 38 GHz Millimetric wave IFF
- > Operates through Dust, Smoke, Rain, Foliage
- > Protects Friendly Forces
- > Contributes to Situational Awareness
- > Reduces Engagement Time
- > STANAG 4579
- > Covert, Secure: TRANSEC, COMSEC
- > Rugged Modular design for simple integration
- > Strap - On version for light vehicles
- > Production contract in progress

THALES

TSF 6010

Transponder



TSF 6010 Transponder
(separate mmW & Processor) ►

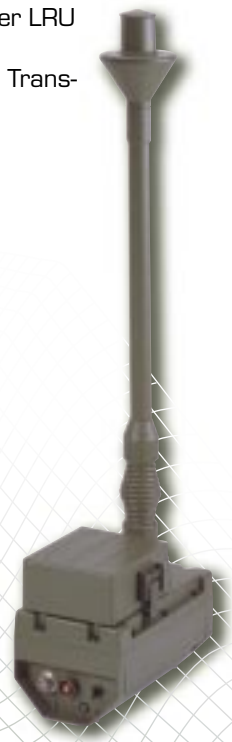
GENERAL

BIFF, Thales Battlefield Identification Friend or Foe solution, **is a millimeter wave based (38 GHz band) cooperative identification system** (Question & Answer) designed **to equip all friendly platforms** operated on the battlefield. BIFF is a trade mark from Thales Communications.
BIFF Ground-to-Ground identification range is better than 6 Km (> 8Km Air-to Ground) and the Probability of Identification is greater than 99 %.
Combined Interrogator / Transponders (CIT) are required for attacking platforms such as Main Battle Tanks, Armoured Vehicles with gun or machine-gun, Recce vehicles, fixed, mobile or portable Anti-tank Missile Launchers and Attack Helicopters.
Transponders are required for non attacking platforms such as Armoured Personnel Carriers (APCs), transport and sanitary vehicles and Utility Helicopters.
In average, the quantity of Transponders required is approximately double that of CITs.

DESCRIPTION

The TSF 6010 is a small size, light weight, rugged, modular BIFF Transponder system.
The TSF 6010 consists of the following units:

- Transponder mmW Antenna / Transceiver LRU
- Processor LRU (including crypto)
- Remote Control Unit (RCU) - for fixed Transponder only.



TSF 6010 Strap-On
Transponder ►

The TSF 6010 modular design allows various implementation solutions such as:

- Transponder mmW Antenna / Transceiver and Processor bolted together as a single LRU for temporary strap-on mounting
- Transponder mmW Antenna / Transceiver and Processor bolted together as a single LRU for permanent external hard mount installations
- Transponder mmW Antenna / Transceiver LRU for permanent external installation and Processor LRU installed internally to the vehicle.

In addition to its dedicated control and display features, the (RCU) provides hardware and software adaptable interface capabilities allowing easy integration in any type of platform. As a standard feature, the RCU is fitted with RS 232 and CANBus; Digibus or 1553 B are available as an option.

OPERATION

BIFF's primary function is the identification of friendly platforms using a Question / Answer process.
Used either as a stand-alone strap-on equipment or as a permanently installed system, the TSF 6010 operates as follows:

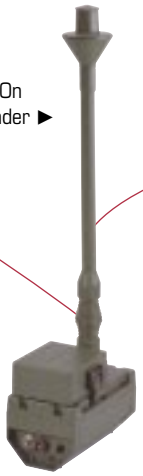
- Having received, authenticated and processed a BIFF interrogation sequence, the TSF 6010 sends back a ciphered reply sequence using its omnidirectional antenna.

Operation is automatic as soon as the TSF 6010 has been switched on.

In addition to the identification function, the BIFF provides a Data Link capability aimed at significantly improving the Situational Awareness, as specified in STANAG 4579.

The TSF 6010 has the capability to answer to Data Exchange Mode (DEM) requests as explained below:
The directional Data Exchange Mode (DEM) is initiated by a BIFF Interrogator to require specific data (Position Report, BMS type, Time Factor of Merit…) from a previously identified platform. DEM operates up to 6 Km and beyond.

TSF 6010 Strap-On
Transponder ▶

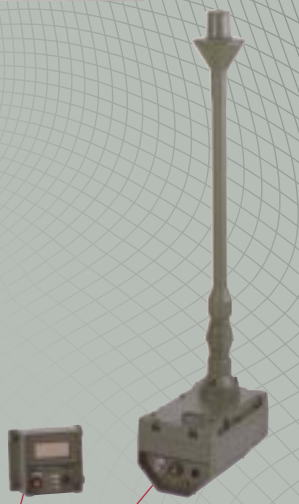


TECHNOLOGY

The TSF 6010 uses a highly integrated design based on state of the art techniques:
In the mmW LRU, the antenna and the Transmitter / Receiver are co-located, eliminating the need for costly and lossy RF wave-guides or cables to interconnect LRUs.
Exchanging intermediate frequency signals allows use of low cost cables, eliminates cable losses at mmW frequencies and allows range performance to be reached with a smaller antenna and a less powerful amplifier.
Signal and data processing are performed by means of ASICs/FPGAs and microprocessors.
TRANSEC and COMSEC functions are embedded.

TESTABILITY

Within the Processor LRU, each SRU is fitted with a set of Built-In-Test (BIT) functions reporting to the main BIT Controller located on the Processing Board.
The RCU and the mmW LRU are fitted with their own BIT Controller reporting to the main BIT Controller.



TSF 6010 Transponder
Permanent mount version
(mmW & processor bolted) ▶

OPERATIONAL ADVANTAGES

BIFF has proven satisfactory identification results, even exceeding requirements, in extreme conditions like heavy rain, dust, smoke and foliage. Field tests have already been performed in Europe and Equatorial areas,
BIFF has proven interoperability with the only other fielded system, the U.S designed BCIS,
BIFF design already includes the capability to perform Coalition type operations,
BIFF has already been satisfactorily tested aboard helicopters, exceeding the 8 Km range requirement.

TSF 6010 Transponder
Permanent mount version
(separate mmW & processor) ▶

TSF 6010

GENERAL CHARACTERISTICS

Transmitter	All MMIC
Frequency	38 GHz Band
Eff. Isotropic Radiated Power	STANAG 4579
Receiver Sensitivity	STANAG 4579
Processing	ASIC/FPGA and µP
BITE	Automatic Operation

SYSTEM PARAMETERS

MTBF	> 5000 Hours
MTTR	< 30 min
Cooling	Natural convection

ENVIRONMENT

Temperature	**Operating**	- 40°C to +70°C
	Storage	- 40°C to +70°C
Shocks, Vibrations		MIL STD 810 E
EMC		MIL STD 461C / 462 C

PHYSICAL

PROCESSOR LRU		
Dimensions	**CIT (W x H x D)**	140 x 92 x 250 mm
Weight		2,8 Kg
Power requirement		28 V DC / 5W
TRANSPONDER MMW LRU		
Dimensions	**(W x H x D)**	140 x 28 x 250 mm
Weight		1.7 kg
Power requirement		DC / 5W (from Processor LRU)
REMOTE CONTROL UNIT		
Dimensions	**(W x H x D)**	100 x 100 x 75 mm
Weight		0,5 kg
Power requirement		28 V DC

OPTIONS & ANCILLARIES

Control & Display Unit	Permanent mount version
Hard Mount	Permanent mount version
Ballistic Armour	Permanent mount version
Strap-On Mount	for Strap-On version
Tactical Container	for Strap-On version
Data Loader	

THALES

THALES Communications
Battlespace Radio
66, rue du Fossé Blanc - BP 156 - 92231 Gennevilliers Cedex - FRANCE
Phone: +33 (0)1 46 13 20 00 - Fax: +33 (0)1 46 13 21 63
www.thales-communications.com