

## **Thales at Aero India 2005**

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## **THALES IN INDIA**

**More than 50 years of successful partnership**

**Thales is a proud partner of Indian Armed Forces and other Aerospace entities in India for more than 50 years. The Group's objective and strategy in India consists of reinforcing partnerships with Indian industries through transfers of technology and joint ventures.**

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## **NEWS**

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# THALES

In the Defence sector, Thales, present on all types of air, sea and ground military platforms, is one of the few companies to have recorded several successive years of revenue growth in the challenging new defence context.

Thales has been present in India since 1953 and has become a significant supplier to the three Indian Armed Forces.

A large array of Thales' business activities are represented in India:

## Aerospace

The Thales **avionics** business serves the markets for flight electronics, in-flight entertainment systems (IFE) and onboard power generation. In India, Thales is a major avionics supplier to Air India and Indian Airlines for their Airbus fleets. Pawan Hans, the Indian largest operator of Dauphin helicopters, is also a major customer for Thales. In addition, Thales is the selected supplier for the In-Flight-Entertainment (IFE) system for the newly created Kingfisher Airline.

Thales has worked for many years in close cooperation with the **Indian Air Force**, Thales has supplied numerous avionics packages for the MIG 21, MIG 27 and Jaguar upgrade programs. Thales is also the supplier of radar, avionics, optronics, communications, electronic warfare and simulators for the IAF Mirage 2000 as well as SU 30 and HJT 36 aircraft.

Thales is also a significant supplier of **microwave components** to the defence, space and radiology markets, an activity which belongs to the Aerospace division. Thales has been awarded a major contract from Ministry of Telecommunications for a nation wide **frequency monitoring and management system**.

## Air Systems

Thales has the largest installed base of **Air Traffic Management** (ATM) equipment in the world. In India, Thales has also sold ATM solutions to the Airports Authority of India, , **Indian Navy & Coast Guard and the Indian Air Force**. Key contracts have been signed in the fields of navigation and landing aids (VHF Omnidirectional Range, Distance Measuring Equipment, Instrument Landing Systems).

Thales has worked for many years in close cooperation with the **Indian Air Force**, Thales has supplied numerous ground based air defense radar

## Naval Systems

Thales' naval business has delivered a large number of air defense radar through a transfer technology programme to the Indian company Bharat Electronics.

## Land & Joint Systems

Thales has supplied cutting-edge key optronic systems to the **Indian Army**. These contracts include Catherine thermal cameras for the T90 tank program, as well as Sophie cameras for the infantry. A large COMINT system has also been delivered.

## Broadcast

In the field of broadcast technology, Thales offers a wide and unique product line such as **radio**, **TV** and wireless systems, **broadcast** antennas systems and MPEG-2 digital video processing and multimedia distribution systems.

Thales has deployed its systems in 170 countries, including India. Thales is the main supplier in India of broadcasting high power Radio and TV transmitters to all India Radio and Doordarshan.

## Services

Thales is a world leader in the **simulation** business and is the only player to cover military and civil aircraft, military vehicles and land systems, trucks and nuclear power stations. Thales has supplied an Airbus A300 simulator to flag carrier domestic Indian Airlines. Together with the Macmet company, Thales has been awarded contracts related to Jaguar and Cheetak simulators.

## Security

Thales' businesses in the **civil security** area focus on commercial high technology markets in industry, administration and services. In India, Thales references include major contracts in the field of ticketing for **ground transport systems**. Since 2001, Thales has been awarded contracts for the supply of the ticketing and passenger control systems for lines 1, 2 and 3 by the New Delhi Metro Corporation. The system allows both for use of contactless smart cards and recyclable travel tokens (also based on contactless technology). The token-collecting device, developed and patented by Thales, eliminates the need for magnetic stripe technology. The global solution could evolve into future applications for the metro as well as buses, car parks or electronic purse. Thales has also supplied ticketing systems to the Calcutta Metro Authority.

## THALES INTERNATIONAL INDIA

-Customer-dedicated product support-

In 2003, to strengthen its presence in India and to reinforce its support to its Customer. Thales has created Thales International India, dedicated to Customer and product support. Since, Thales has established comprehensive maintenance services to support its equipment inducted in the Indian Armed Forces.

These services are sustained by an electronic workshop open in the high-tech park of Gurgaon. The benefits for the Customer are: fast reaction time for repairs and a lower maintenance cost. In addition, taking the opportunity of the opening of the defence production to private sector, Thales has established close relations with many Indian companies to undertake joint development of systems.

Thales is also supporting Thales Units and becomes the preferred channel for outsourcing and subcontracting in India. Local sourcing, installation of vehicles and shelters, software production are the areas where Thales is bringing knowledge of Indian competencies and capabilities to Thales Units to increase bridging between the Indian high tech resources and Thales needs.

This strong involvement in India is fully in line with Thales' multidomestic strategy which consists of having centres of excellence in all the countries in which the Thales Group is established, and maintaining a strong local identity in each. This strategy has already been successful in Europe and other parts of the world (Korea, Australia and South Africa).

## Thales at Aero India 2005

### **Air Defence and Battlespace Systems**

Thales provides global solutions offering a complete response to the operational needs of Governments in extended air defence and security. Thales delivers high-tech electronic equipment and systems through Ground Based Air Defence radars, Air Command and Control systems, Missile Defence and Service Solutions, achieving the appropriate level of integration and through-life support. As a world leader in systems integration we are committed to developing and setting up systems and services tailored to our customers' needs.

At AERO INDIA 2005, Thales is presenting its range of extended air defence products and systems, notably the Master radar family, a comprehensive and adaptable range of radars designed for identification of all types of threat, Air Command and Control solutions from recognized air picture establishment to air battle command.

At AERO INDIA 2005, TDA, an equally owned subsidiary of EADS and Thales, and its Belgian subsidiary FZ (Forges de Zeebrugge) are presenting the complete rocket 70 mm system, recognized as the European leader in rocket systems, TDA/FZ masters the whole industrial process, and is the only company world wide able to design, produce and distribute the entirety of an air-to-ground rocket systems in both 68 and 70mm calibers, and to install it onto carriers: fighters, helicopters, boats or land vehicles.

This long lasting expertise has been illustrated by TDA's selection for the Eurocopter French Tiger program, providing the Rocket System in 68mm caliber, and followed by commercial successes in Germany with the UHT Tiger, in Australia with the ARH Tiger, both in 70mm caliber configuration.

## **Air Mission Systems**

**At Aero India 2005, Thales is show casing its capabilities in air mission systems.**

Thales produces all communication, navigation and identification (IFF) equipment and systems required for the Mirage 2000's current and future missions:

- **Communications:** The radio system is based on the **Thomrad** range of V/UHF transceivers, which provide advanced, highly secure voice and data communications.
- **Radionavigation:** The Mirage 2000 is equipped with the **AHV-9** radio altimeter, the **Tacan NC12** transceiver and a **VOR/ILS** receiver.
- **Identification:** The Thales supplies the **SC10** transponder and the **IDEE1** interrogator, which uses location data from the RDY radar.

### **Tri-service identification**

Thales is a world leader in the field of IFF systems and components. Its complete product range includes all kinds of proven, tri-service Mark XII / Mode S IFF transponders, interrogators, Combined Interrogator-Transponders, Mode 4 NSA certified crypto-computers, and also National Secure Mode crypto computers for non-NATO countries.

This product range includes the TSC 2000 transponder family and the TSB 2500 combined interrogator-transponder family which operate in Mk XII, Mode S and are designed for further upgrades.

To date, over 15,000 IFF systems have been delivered and integrated on more than 50 types of platforms in more than 40 countries. In addition to being a major international systems and equipment supplier, Thales has extensive experience as a prime contractor in multi-platform upgrade programs. As the main supplier to the French MOD, the company has successfully completed a Mode 4 upgrade program over a ten-year period from early 1984, for all air, sea

and land platforms. Additionally, both the Polish and Romanian governments have selected Thales to carry out their respective national IFF upgrade programs. These programs included Secure Mode implementation in all air, sea and land platforms, and were carried out through long-term partnerships with local industries.

Thales will also be presenting **Damocles** and NavFLIR at Aero India 2005. **Damocles** is a targeting system used to deliver all types of precision-guided air-launched weapons, either independently or as part of a collaborative engagement. Its very-high-resolution camera and opto-mechanic architecture make it possible to identify any target from well beyond the range of enemy precision-guided weapons, thus ensuring maximum survivability for the aircraft. **Damocles** is suitable for daylight and night missions and is designed to operate in the harshest climatic conditions.

The **NavFLIR** navigation FLIR is housed in the dedicated pylon that attaches the **Damocles** pod to the aircraft. Its high-resolution thermal camera is optimised for hot and humid conditions and provides a perfect image of the area forward of the aircraft. This is projected onto the pilot's head-up display or another cockpit display and enables the pilot to carry out all manoeuvres in an air strike mission in total safety, including takeoff and landing, low-level navigation and flight, and strikes on ground or surface targets.

## Helicopter Systems

**At AeroIndia 2005, Thales is also show casing its complete range of equipment for combat helicopters:**

### Radars:

#### **DAV (Dispositif d'Alerte et de Veille)**

The **DAV** warning and surveillance system for helicopters developed by **Thales** detects threats flying at low and medium altitudes, including hovering helicopters and UAVs. It provides exact coordinates from a stand-off range, classifies the threat as a fixed-wing aircraft or a helicopter, and identifies helicopters by type.

This compact, low-cost and lightweight system (< 60 kg) is mounted on the rotor assembly and thus provides 360° unobstructed coverage.

The system was designed for all-weather use and all conditions of engagement. It provides exact information on the bearings, elevation, distance and speed of targets for air-to-air missile delivery and allows for very short reaction times for gunfire.

The **DAV** is equipped with an automatic multi-target tracking system. The low emitted power of this frequency-agile S-band radar offers excellent discretion while maintaining a high detection probability. The **DAV** has successfully completed tactical and operational tests.

### Electronic Warfare

#### **Self-protection systems:**

A European leader in electronic warfare systems, Thales develops, manufactures and integrates self-protection systems for all types of helicopters. These systems help protect helicopters and their crews from all types of attack, particularly by air defence and air-to-air missiles. Thales electronic warfare systems include radar warning receivers, which identify

radar threats and alert pilots in real time, indicating target direction or deploying countermeasures. Self-protection systems also include latest-generation missile approach warning systems, laser warning receivers and chaff & flare dispensers to form seamless defensive aids subsystems specifically for helicopters.

## **Threat Warning Equipment (TWE):**

The **TWE** system illustrates **Thales'** capability as a major player in the development and integration of self-protection systems. **TWE** has been selected for German, French and Italian Tiger or NH90 TTH helicopters. **TWE** is also available for export versions of these helicopters, which have been ordered by a number of countries including Australia and Finland.

**TWE**, developed and integrated by Thales, comprises an instantaneous wideband electromagnetic detection function (radar warning receiver) and a laser warning receiver developed by EADS. **TWE** forms the core of an integrated self-protection system, which also manages other components in the countermeasures system such as missile or projectile approach warning systems, chaff and flare dispensers (Saphir M manufactured by MBDA), jammers and the entire Tiger's EWS (Electronic Warfare System). **TWE** combines advanced technology, high reliability, low volume, easy installation and ease of use to deliver all the advantages of integration within modern avionics architectures and offer a competitive system for future helicopter self-protection programmes.

## **SPS-H**

The **SPS-H** self-protection system developed by Thales is a complete turnkey solution that provides self-protection for a wide range of helicopters engaged in modern theatres of operation.

It comprises the most lightweight and compact equipment on the market, such as the TDS-H radar warning receiver and the MWS-20 missile approach detector, and can be installed easily on many different types of helicopters.

A truly autonomous system, the **SPS-H** handles all the helicopter's self-protection functions and provides the crew with reliable, relevant information as needed.

Each threat is detected and immediately identified under all conditions of operation. Countermeasures are triggered only when necessary. When a threat is detected, multi-sensor data fusion techniques feed information into the electronic warfare system computer for detailed analysis. The most appropriate countermeasures strategy is then selected and implemented to counter the threat. At the same time, a clear tactical picture is presented to the helicopter crew.

**SPS-H** has demonstrated high performance levels in numerous tests. **The French armed forces and defence procurement agency have chosen TDS-H, MWS-20 and ELIPS for ALAT and French Air Force helicopters.**

These systems are currently under production.

## **MWS-20**

The **Missile Warning System (MWS-20)** family of active missile detectors was specially designed by **Thales** for self-protection of helicopters and wide-body aircraft. A maritime version was also derived from the initial product.

**MWS-20** detects any approaching missile and triggers appropriate countermeasures at the best moment for optimum effect. Its primary functions are as follows:

- provide warning of all types of attacking missiles

- perform real-time calculations of the speed, distance and direction of missiles detected and time to impact,
- manage and activate the onboard chaff & flare dispenser at the optimum moment to provide significant reductions in chaff & flare consumption.

The **MWS-20** is unaffected by weather conditions or light from flares or other heat sources, and because of its operating principle has a very low rate of false alarms. The **MWS-20** is highly miniaturised (the entire system is housed in a single unit weighing 10 kg in its airborne version with four conformal antennas) and can be integrated easily into any type of aircraft or helicopter.

The system has demonstrated high performance levels in official in-flight tests with real missile fire. The **MWS-20s** has been ordered for French special forces helicopters, and it is now under series production.

## **Cats**

**Cats**, a compact warning system for helicopters, is the newest arrival in Thales' line of self-protection equipment. **Cats** uses the latest advances in passive threat detection and localisation to provide crews with tactical situation updates in real time. The system detects and identifies threats and displays their exact ground position on a digital map display, so

that the pilot is warned well in advance of any threats on the ground and can avoid flying through high-risk zones. **Cats** functions also include radar warning, radar intelligence gathering (ESM function) and countermeasure system management for automatic activation of the chaff & flare dispenser if required. **Cats** can be integrated easily on board helicopters: it has a modular architecture, a small form factor and weighs less than 15 kg.

## **Jamming systems:**

The Thales self-protection offering also includes miniaturised jammers that can be either airframe- or pod-mounted. To deal with the broad diversity of modern threats, all onboard sensors must be perfectly coordinated. Thales optimises each piece of equipment and integrates the different components to form a seamless multi-sensor system and offer the best guarantee of mission security and success.

**A total of more than 1,000 self-protection systems have been ordered from Thales for all types of helicopters, confirming Thales' position as a world leader in electronic warfare systems.**



## Thales on the Mirage 2000 combat aircraft

Thales is a central player in **Europe's most advanced combat aircraft programmes** and a **key partner for Mirage 2000 onboard equipment and mission systems**.

The electronic systems on the Mirage 2000 are constantly evolving in line with customers' operational requirements:

- **RDY radar**

The **RDY multi-function radar** developed and produced by Thales features air-to-air, air-to-ground and air-to-surface capabilities for multi-target detection, tracking and fire control.

For air-to-air missions, the **RDY** is capable of designating multiple targets to Mica missiles with active electromagnetic or passive infrared seekers.

For air-to-ground and air-to-surface missions, it generates the fire control data needed to deliver conventional and precision-guided weapons.

The **RDY** radar equips the latest versions of the Mirage 2000 in service with the Air Forces of France and several other countries.

Mirage 2000s on delivery today are equipped with the **RDY2** radar, the most advanced version in the **RDY** family.

- **The ICMS integrated countermeasures suite**

Mirage 2000s delivered to overseas Air Forces are equipped with the **ICMS countermeasures suite** developed by Thales, which incorporates high-sensitivity detection, electromagnetic jamming and deception functions.

Mirage 2000s currently on delivery are equipped with the **ICMS Mk3**, which is all-digital and uses advanced jamming techniques tailored to today's electromagnetic environments. **ICMS Mk3** also incorporates passive ELINT and high-precision localisation functions.

- **Optronics**

The **Damocles** pod is qualified for Mirage 2000. **Damocles** is a targeting system used to deliver all types of precision-guided air-launched weapons, either independently or as part of a collaborative engagement. Its very-high-resolution camera and opto-mechanic architecture make it possible to identify any target from well beyond the range of enemy precision-guided weapons, thus ensuring maximum survivability for the aircraft. **Damocles** is suitable for daylight and night missions and is designed to operate in the harshest climatic conditions.

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- **Avionics**

Thales supplies LCD displays, navigation systems, autopilots, instrumentation, air-speed indicators and the **Topsight** helmet-mounted sight/display. For the Mirage 2000, the company also supplies the **Totem 3000** laser gyro inertial navigation system.

- **Mission computers**

Mirage 2000s in service are equipped with mission computers developed and produced by Thales.

New Mirage 2000s currently on delivery are equipped with a new, modular mission computer, the Thales-developed **EMTI**, which incorporates mission planning & tasking and symbology functions.

- **Electrical power generation**

Thales produces electrical power generation and static conversion equipment for the Mirage 2000.

- **Crash and fatigue recorders**

Thales develops and produces the **ESPAR NG** crash-protected flight recorder (similar to the "black box" flight recorders used on commercial aircraft) and the **Microspees** fatigue recorders for the Mirage 2000.

- **Mission data recorders**

Thales develops and produces the **DDVR** (Digital Data and Video Recorder) for high-level post-mission analysis.

- **Mission planning and post-mission analysis**

Thales produces the **Aramis** electronic warfare planning tool and post mission analysis system associated with the ICMS Mk3 and integrated with Dassault Aviation's Opera system.

- **Weapons**

Most of the weapons deployed by the Mirage 2000 rely on seekers and proximity fuzes developed and produced by Thales.

## Thales Securing your future

Thales is a global electronics group serving professional markets in three main areas: **defence**, **aerospace** and security. Its activities include prime contracting for large-scale programmes, complex system architecture, and the supply of equipment and systems and related support services. With 2003 revenues of €10.6 billion and 61,500 staff in 50 countries, Thales is recognised as a world leader in high technology. The Group's engineers draw on a **solid foundation of generic and dual civil/military technologies** centred on real-time management and distribution of information.

The other distinctive characteristic of Thales' businesses is their **international dimension** in terms of both the markets they serve and their countries of operation. With industrial operations in nearly 30 countries, Thales is pursuing a unique "multi-domestic" strategy, which is of particular relevance in defence markets. This strategy is designed to provide the Group with the local presence it needs to serve both civil and military customers effectively, anticipate demand and propose the right technical solutions at the right price to meet their requirements.