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THALES at

the International Paris Air Show - Le Bourget

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THALES

The Thales Group

Thales is a leading international group, addressing Defence, Aerospace and Security markets worldwide. Thales's expertise in its core markets spans the entire value chain, providing all the capabilities its customers require, from equipment and systems to comprehensive support services, and including prime contracting on large-scale programmes.

Thales's leading-edge technology is supported by 22,000 R&D engineers who offer a capability unmatched in Europe to develop and deploy field-proven **mission-critical information systems.** To this end, the group's civil and military businesses develop in parallel and share a common base of technologies to serve a single objective: the security of people, property and nations.

The group builds its growth on its unique multi-domestic strategy based on trusted partnerships with national customers and market players, while leveraging its global expertise to support local technology and industrial development. Thales employs 68,000 people in 50 countries with revenues forecast in 2007 in excess of € 12 billion.

Thales's three strategic pillars

- **Span the entire value chain:** Thales provides all the capabilities its customers require, from equipment and systems to comprehensive support services, and including prime contracting on large-scale programmes. The concept of mission critical systems is a defining feature of what Thales is today and underpins many of the company's solutions for applications in defence, aerospace, land transportation and security in the broadest sense.

- **Optimise synergies between civil and military technologies:** Thales solutions draw on an exceptional platform of technologies with applications across the company's whole range of businesses. Much more than a supplier of electronic equipment and systems to the armed forces, Thales actively cross-pollinates civil and military technology to bring all its customers the benefits of both. With more than 20,000 high-level researchers, Thales offers a capability unmatched in Europe to develop and deploy critical information systems for defence and security markets.

- **Leverage our international dimension and multidomestic operations** to remain as close as possible to our customers. In the defence, security and space markets, national sovereignty is still an extremely important factor. For this reason, Thales has pursued a multidomestic strategy for more than fifteen years and has become a full-fledged local player in each of its target markets. This strategy enables the company to anticipate and meet customer requirements much more effectively — and the approach is working.

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Thales recently concluded a series of operations that strengthened the Group's scope of expertise across the Defence, Aerospace and Security markets:

Reinforced capabilities in transport and security

The acquisition of Alcatel Lucent's transport and security activities, completed on 5th January 2007 reinforced Thales's core competency – critical information systems – and its overall offering to security markets, particularly within the field of land transport infrastructure security. These assets contribute to a better balance between defence and civil security solutions and reinforce the group's international dimension.

A European leader in the space industry

On 5th April 2007, Thales also acquired Alcatel-Lucent's shareholdings in the two space sector joint venture companies Thales Alenia Space (67% Thales – 33% Finmeccanica) and Telespazio (67% Finmeccanica – 33% Thales). Following this acquisition, Thales formed the **New Space Alliance** with Finmeccanica: the complementarities of Thales Alenia Space in satellite systems and Telespazio in satellite services will significantly contribute to strengthening the European Space industry as a whole.

For Thales, this operation is an important strategic move that adds a new space capability dimension (communication, navigation, observation, science). Thales will thus be able to offer end-to-end solutions from satellite, ground segment and equipment's design, development and manufacturing to implementation, operations and services.

Consolidating the European defence industry

Finalized on the 29th of March 2007, the convergence with DCNS created a European leader in naval systems, in which Thales now holds a 25% equity interest. The convergence with DCNS is a coherent, balanced industrial project with the potential to optimize proposals and improve competitive performance in naval programs; develop a single, coherent offering in France and seek out synergies in R&D between the two companies.

Thales at the 2007 Paris Air Show

In 2007 there is a specific emphasis on the "New Thales", with a focus on Thales's enhanced Space and Security activities that complements Thales's expertise in civil and military aviation markets. Following the signing of the new "Space Alliance" between Thales and Finmeccanica, the former Alcatel Alenia Space stand is co-branded Thales/Thales Alenia Space and Finmeccanica /Telespazio. At the Paris Air Show this year, Thales also presents its solutions for integrated transport security, including new aspects of ground transport.

In the civil aerospace domain, Thales exhibits its market-shaping expertise developed thanks to its experience in networked systems for civil aviation. In the military domain, Thales presents its ability to deliver systems, services and comprehensive solutions tailored to the exact requirements of each customer across far ranging civil and defence markets including air transport, space, ballistic missile defence and C4ISR.

Thales Innovation at the 2007 International Paris Air Show

Thales at the 2007 International Paris Air Show demonstrates its expertise in transforming the aerospace sector.

Thales holds a unique position as being the only Group worldwide with capabilities stretching across aircraft systems and equipment, aircraft and ground-based air traffic management systems, as well as training and simulation activities.

Each year Thales invests 18% of its revenues in research and technology, of which 500 million euros are self-funded. Its cutting-edge technologies are developed by 22 000 research engineers worldwide, a unique pool of expertise serving its three core markets of defence, aerospace and security. Thales holds a portfolio of 15 000 patents to which it adds new 250 patents each year. Innovation has been a constant factor in the history of Thales and is a pre-requisite for its development: Thales has thus entered into 30 cooperation agreements with universities and public laboratories in Europe, the United States and Asia.

Thales creates "Airlab" – the world's first civil aviation networking system for the future

"Airlab" is the name of Thales's technical and operational simulation environment for civil air transport. Airlab allows both air and ground functions to be regrouped within the same simulation tool – Thales is the only player worldwide with the in-house expertise in avionics systems, air traffic management and simulation to be able to create such a tool.

"Airlab" is a vital component of Thales's forward-planning strategy and is expected to make a valuable contribution in support of the two major European initiatives in the civil aviation sector: the SESAR programme and the Clean Sky Joint Technology Initiative (JTI).

Within the framework of major European programmes (SESAR and Clean Sky Joint Technology Initiative (JTI), Airlab illustrates the interfaces and communication of the future between ground (Air Traffic Management services) and air (pilots) and how that will assist in optimizing the growing levels of air traffic and minimizing the negative impact of air traffic (fuel consumption, CO_2 and NOx emissions, noise, eco-design, etc.).

Airlab provides a collaborative environment in which the key players in the air transport sector can interact — i.e. the air segment and the avionics functions made available to crew members so they can complete their mission from departure gate to arrival gate (flight management, airport navigation, environment monitoring, etc.) and the ground segment and its three components (air traffic control, control tower and ground operations, control of airline operations). Airlab makes provision for all the exchanges needed to ensure effective cooperation between the ground and air segments.

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Thales in civil aerospace

Thales is a long-standing partner to major aircraft manufacturers: its innovative solutions using advanced graphic functions developed in cooperation with Diehl Aerospace, give flight crews all the on-board intelligence they need. Thales's expertise includes simulation and air traffic management, providing the broad vision required to develop optimum solutions for the aircraft of the future.

<u>On-board avionics:</u>
<u>From equipment to systems and services - moving up the value chain</u>

Thales on-board the A380
The A380 is the first Airbus airliner fitted with the Integrated Modular Avionics (IMA) suite, developed with Diehl Aerospace. The IMA is a leap-ahead technological innovation, with all onboard computing modules networked and able to support different applications. The result is a substantial improvement in computing power, reliability, maintainability, volume, weight and scalability.

Thales systems and equipment are fitted to all Airbus jetliners: A300, A310, A318, A319, A320, A321, A330, A340 and A380.

Thales on-board the Boeing 787
Thales supplies the electrical power conversion system, In Flight Entertainment systems, and Integrated Standby Flight Displays (ISFD) for the Boeing 787. Thales has developed its latest TopSeries IFE system within the framework of the B787 program, hand in hand with Boeing's engineering and research teams. Today, Thales has won over 70% of the bids to equip IFE systems on the new B787, for companies such as Northwest, Air China, China Eastern and the Japanese airline, JAL.

Today, Thales has a strong presence in Seattle where it has recently invested significantly in a new service and support center, close to Boeing's headquarters. In this center Thales also uses its advanced engineering capabilities to work on sophisticated cockpit and cabin conception and design for future Boeing projects.

Thales on-board the Sukhoi Superjet100 (SSJ100)
Thales was selected as a key partner by Sukhoi at the 2005 Paris Air Show to be the full integrator and avionics supplier of the flight deck aboard the SSJ100. Thales' extensive experience as full avionics integrator will be an asset in the design, the development and the flight-testing to the certification of this new program. Thales already has strong experience through the full integration of the avionics for Regional Aircraft (DASH8, CRJ, GEX). Equipped with the latest and most advanced architecture, the SSJ100 program will offer pilots a much-simplified working environment.

Thales systems and equipment are also fitted to regional and business aircraft manufactured by BAE Systems, Bombardier, Cessna, Dassault Falcon jet, Embraer, Fokker, Gulfstream, Saab and Grob.

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Thales on-board helicopters

Thales systems and equipment are fitted to helicopters manufactured by AgustaWestland, Bell Helicopter, Boeing, Denel, Eurocopter, HAL, NH Industries and Sikorsky.
Thales develops and produces systems and equipment for both civil and military helicopters, spanning all types of applications.

As the leading supplier of avionics to Eurocopter, Thales was involved in the European NH90 and Tiger military helicopter programmes from the outset.

Thales is a supplier to AgustaWestland for the A109 LUH and is providing the TopDeck integrated avionics suite for Sikorsky's new S-76D helicopter—a choice that strengthens Thales's position to pursue growth in the U.S. civil and military helicopter markets.
In the United Kingdom, Thales is involved in several helicopter modernisation programmes such as the Future Lynx with AgustaWestland.

Cockpit avionics

TopDeck: A Multi-platform solution

TopDeck is an open-architecture solution that is confirmed by both the large number and various types of aircraft on which it is flying today: Fixed wing SAR, Maritime Patrol, Tactical Air Mobility, civil & military helicopters, and regional jets, for both line fit and retrofit programs. All of these platforms have completely different electrical requirements, interface constraints, and operational needs.

At the 2007 Paris Air Show, Thales exhibits the latest generation of its TopDeck avionics suite for civil and military helicopters, derived from state-of-the-art modular avionics originally developed for the A380. Offering a common cockpit solution for all types of helicopters, it is based upon advanced, open, versatile and scalable glass cockpit architecture. TopDeck flight decks are already in service on a wide range of rotary wing platforms across the world, and were selected recently by Sikorsky for the S76-D.

The TopDeck glass cockpit can be supplied with four or five displays (6x8 or 8x10 inch useful area) for primary flight, navigation, engine and system information, tactical mission data (radar, intervisibility, electronic warfare,etc.) and imagery coupling (Forward Looking Infra Red), etc.

Cabin Solutions

In designing its on-board cabin solutions, Thales strives to further enhance passenger comfort and well-being. Thales's TopSeries family of in-flight entertainment systems (IFE) brings innovation right to the passenger's seat, through integrated entertainment and communications solutions and connectivity with personal electronic devices.

Thanks to their widely proven performance and reliability, Thales IFE systems are now a feature in the cabins of commercial airliners worldwide, the most recent being the Airbus A380 and Boeing 787 aircraft. Their light weight make them suited to single-aisle and regional aircraft.

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Thales's TopSeries Digital Video Audio On Demand system is presented in a two-seat configuration at the 2007 Paris Air Show. The system's innovative, flexible design has allowed Thales to realize industry first achievements. For example, the TopSeries system was first to provide an integrated approach to audio/video on demand, power and connectivity, and was the first to line-fit install throughout the cabins of single aisle aircraft and regional jets.

On twin aisle aircraft, passengers are enjoying big picture entertainment using Thales 23 inch displays. And, through the successful integration of the Rockwell Collins' Tailwind 560 satellite TV system passengers in India are able to view 16 channels of domestic TV.

IFE systems are set to play a pivotal role in the current evolution of technologies driving the exchange of data inside aircraft, especially between the cockpit and cabin.

Satcom

Thales's high-tech IFE systems have paved the way for in-flight services now on offer from airlines. In the very near future, passengers will be able to communicate with the outside world during their flight, from the comfort of their seat.

Thales has launched TopFlight Satcom to meet the market needs for the introduction of the new Inmarsat Swift Broadband service. This service will allow a change in the level of connectivity that is available to passengers with the potential to support the use of their own mobile phone, and providing Wi-Fi access for voice-over-IP or data applications including Internet access during a flight.

TopFlight Satcom is the first ARINC 781 satcom system, offering significantly increased capability in a smaller, lighter package than previous generations of SATCOM equipment: it is compatible with the new generation of smaller ARINC-781 antennas, as well as the legacy ARINC-741 antennas.

Connectivity applications include:
- Providing a greatly enhanced working environment for the executive in their business jet, including broadband access to terrestrial networks, and extended communication using mobile and fixed telephones including tele-and video-conferencing.
- Providing revenue generation for airlines by allowing passengers to utilise their own personal devices on-board an aircraft for voice calls, messaging or data applications
- Extending the capability of the on-board In-Flight Entertainment system to provide extended shopping, downloading and communication purposes

Supporting improved airline efficiency by improving the connectivity between the aircraft systems and the ground infrastructure.

Cabin lighting: Diehl Aerospace

In the cabin domain, Thales works closely together with Diehl Aerospace, a joint venture of Diehl and Thales. Diehl Aerospace is the market leader in its sector and a tier one supplier of

cabin lighting for new large aircraft and regional transport aircraft. Cabin lighting is one of its domains of excellence, along with flight and engine controls, avionics and cabin systems.

Dedicated service packages supporting customized solutions in aerospace

Thales has an efficient global support network that provides aerospace support services to customers worldwide. Aerospace Services Worldwide is made up of 1,300 professionals worldwide delivering services and support for avionics and in flight entertainment systems. It is focused on civil services globally for air transport, regional aircraft, bizjet and helicopter market segments.

Recent successes demonstrate the company's ongoing commitment to deliver the highest levels of customer service and support. Ahead of the A380's entry into commercial service, Thales has formed a joint venture called OEM Services with Diehl Aerospace, Liebherr and Zodiac to provide airlines with a single interface for their logistic services.

For military aircraft, Thales offers a comprehensive approach to services and support through Military Customer Services, made up of 1,000 professionals. In 2006, Thales UK, along with its partners Smiths Aerospace and Selex Sensors & Airborne Systems, created the Total Support Services (TSS) alliance, an innovative approach to the future provision of military support contracting and through life support. This approach reshapes the avionics defence industrial base to provide a better service for less cost.

In France, Thales also provides through-life support for equipment and airborne systems on approximately 1800 French armed forces platforms. Contractor logistics support is also provided for the French Rafale allowing entry into service of the F2 standard. The support organization is also currently focused on Entry Into Service of Tiger and NH-90 helicopters. New generation Mirage 2000 fleets are entering into service in United Arab Emirates and in Greece.

Thales delivers equipment availability to more than 60 nations. In this perspective, Thales is currently reinforcing local support premises in countries such as Greece, India and Japan.

Air traffic management:
Thales contributes to airspace security and efficiency

Thales is the world leader in air traffic management and offers the most comprehensive and technically advanced range of solutions on the market. This includes air traffic control centres, conventional and satellite navigation systems, navigation aids and landing systems, communication, navigation and surveillance systems and airport security solutions.

Thales is one of the few companies in the world with the capability to provide completely integrated systems and turnkey solutions for air traffic controllers. EUROCAT air traffic management system is a prime example. With more than 260 centres in operation throughout the world, equivalent to 4,000 controller positions, the EUROCAT air traffic management system is recognised as the industry standard.

In the promising ADS-B (Automatic Dependent Surveillance Broadcast) market, Thales has won major contracts and supplied the first wide-continent ADS-B system. In line with

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Thales's commitment to enhance safety through the accelerated introduction of new system functionality, ADS-B enables monitoring and surveillance of extended airspace with either inadequate or insufficient radar coverage.

In the airport area, Thales has developed essential tools for enhancing airport efficiency and safety. Thales meets the customer challenge by continually improving and opening up its system architectures allowing systems to be interoperable. Thales is able to offer airport authorities the combination of its STREAMS (Surface Traffic Enhancement & Automation Support) and TECOS (Terminal CO-ordination System) products.

STREAMS is a modular and scalable system, supporting the safe, orderly and efficient movement of aircraft and vehicles on an airport surface. Thales STREAMS can be implemented as a stand alone system and can be integrated as a part of an overall aerodrome air traffic control (ATC) system.

TECOS is a flight data processing system specifically designed for use in tower and apron control. The central objective of the system is to reduce the communication and co-ordination effort between different ATC positions by providing an integrated planning and management tool for the terminal area and the airport's surface.

European initiatives in air traffic management

As a major player, Thales actively participates in the modernisation and the implementation of tomorrow's efficient ATM tools and process. When creating the Air Traffic Alliance in 2002, Thales, Airbus and EADS had the objective of modernising ATM and driving the implementation of both a pragmatic and innovative ATM approach to support air transport future growth.

To keep up with these challenges, the Air traffic Alliance is committed to the ambitious SESAR project, the operational complement to the Single European Sky legislation. It is viewed as the necessary momentum to gather resources and investments as well as harmonise the actions of ATM community's stakeholders.

DEFENCE

As a leading systems integrator and supplier of equipment and subsystems, Thales offers flexible, cost-effective solutions to meet customers' increasingly complex mission requirements.

Thales's expertise spans the full range of requirements, from onboard equipment and systems for combat aircraft and military transport planes, to complete systems and subsystems for Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) solutions.

In aircraft equipment, Thales has successfully applied a dual technology strategy to developing onboard equipment and systems for the A380 and A400M. Capitalising on the new concepts developed for the A380, Thales contributes to the many innovative solutions on the new European military transport aircraft, the A400M, including its latest-generation avionics.

At the Paris Air Show 2007, Thales will demonstrate its C4 ISTAR functions, all of which are supported by comprehensive communications solutions for seamless voice and data services. Also on display is Thales's Battle Transformation Centre (BTC) that allows the creation of comprehensive ISTAR solutions. It is based on this experience of BTC in the military field that Thales developed AirLab, an example of the dual-use technology approach adopted by Thales for the benefit of its customers in both civil and miliitary markets.

Battlespace Transformation Centre (BTC)
Thales, a reference in ISTAR solutions

Thales established its Battlespace Transformation Centre in 2004. This collaborative centre of expertise operates across all Thales entities and is established locally in all of its multi-domestic countries to identify and evaluate transformation options that provide a smooth and affordable transition from legacy to network-enabled capabilities.

By combining operational analysis, system engineering and architectures with extensive Battlelabing facilities, all parties to transformation are working together in a common CD&E environment analysing and evaluating the impact of technology insertion on the Tactics, Techniques and Procedures.

Thales's BTC is a central asset to create and integrate comprehensive ISTAR solutions that also rely on mastering the Information Chain and Complex Systems of Systems Architectures. Through the CD&E process, the Thales BTC places the human dimension at the heart of ISTAR in order to provide users and commander with the right information at the right time in the right location.

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The scenario presented at the Paris Air Show 2007 shows how the information, provided by the ISTAR System of Systems in a Joint context, turns out to be vital for a small Army unit that will eventually be able to avoid a dangerous and critical hidden ambush.

  o **Integrated ISTAR** demonstration featuring part of the platform deployed to experiment the new capability presented in the video. In a simulated environment SIGINT aircraft's information are shared with Air Command Centre for improved situation awareness on the overall area.

  o **Extended Air Defence/Anti Theatre Ballistic Missile** simulation evaluating increased situation awareness and early warning when integrating space and sea based platforms in an ATBM surveillance and defence system.

  o **Homeland Airspace Security** demonstrating merits of networking civil (ATM) and military (Air defence) systems, adding of new sensors (passive radar) for stealth targets and low altitude coverage. Introducing then a 3rd Dimension Airspace security bubble approach.

Thales : Mastering the C4 ISTAR chain

Thales is a leading provider of C4 ISTAR – Commmand, Control, Communications and Computer, Intelligence, Surveillance, Target Acquisition and Reconnaissance - capabilities. The company offer ranges from integrated systems through to the provision of specific technologies, products and sub-systems.

C4 ISTAR is a process that links several battlespace functions together to assist a combat force in employing its sensors and managing the information they gather.

C4 ISTAR solutions aim at shortening the OODA (Observation, Orientation, Decision, Action) cycle and multiply the lethality and reactivity of the military systems by synchronising action and effects. The goal is to provide actionable intelligence to the right user at the right time, to achieve a verified effect.

Thales supports the Air & Joint Forces in this process by providing ISTAR tools for all types of platforms – aircraft, helicopters, UAVs - to detect, observe, identify, communicate, navigate, target and enhance survivability. Thales also provides C4ISR solutions contributing to operational superiority in joint theatres of operations through enhanced ISTAR services, effective air defence and network-enabled capability.

As a communication and information systems architect, Thales offers the prime contracting capabilities needed for a "system of systems" approach to communications for Network Enabled Capabilities. Network-ready systems architectures link sensors, commanders and forces in the field, while ensuring that commander is kept in the loop.

A recent example of this is the NATO Consultation, Command and Control Agency (NC3A) has chosen to outsource its intra-theatre communication capability to Thales in 2006. Under the contract, Thales will supply secure voice and data communication services for the International Security Assistance Force (ISAF) as it expands operations in Afghanistan. Thales is responsible for the provision, operation and maintenance of a complete network that will be progressively deployed to more than 64 points of presence.

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Thales will remain the owner of all deployed equipment and will operate and maintain the network and security for a minimum period of three years. A 24/7 help desk in Kabul backed by on-site user support will guarantee service availability of more than 98% at all times.

Observation & Reconnaissance

Thales solutions bring long range, day and night information and intelligence gathering capability. Real time exploitation of imagery is achieved through the use of interoperable data links and networked communications systems. These solutions deliver time sensitive targeting, weapons effect assessment and dynamic mission retasking:

- **The AREOS – RECO NG pod** is an airborne reconnaissance electro optical system for tactical and strategic missions. It has been designed to meet the full field of operational requirement worldwide through a very large range of scenarios and weather conditions by the integration of state of the art digital technology both in the sensor/detector solutions and the real time/differed time transmission capability.

  Thanks to its very sophisticated operational automatic imagery collection modes, the AREOS RECO NG pod is particularly adapted to the integration on a single seat aircraft as it is today on the French Rafale. AREOS/ RECO NG serial production has been contracted by the French MoD in 2005 for both Air Force and Navy.

  The system (pod and ground segment) is qualified on Mirage 2000. RECO NG will be in service phase at the beginning of 2009 with the Rafale F3.

- **Imagery On Demand (IOD) technology** is a single solution for battlespace image dissemination with fully adjustable digital datarate transmission, configured to suit local operation needs and applicable for use on land, sea and airborne platforms. The system is optimised for realtime reconnaissance and targeting applications, linking EO/IR and SAR sensors to weapons effectors.

Joint Exploitation & Dissemination : supporting national and allied intelligence systems

The key challenges today are to qualify vital intelligence early and make relevant information easy to access and exploit. Leveraging advanced data fusion technologies, Thales offers solutions, which crosscue and analyse raw data from multiple sources (IMINT, MTI, SAR, SIGINT, etc.) to generate and share a Common Operational Picture.
Thales also provides image analysts with the resources they need for image acquisition, interpretation and multi-sensor data fusion (EO, IR, MTI). All these solutions are fully projectable, interoperable with national and allied intelligence systems, and flexible with respect to sensor deployment and configuration.

Thales has developed MINDS (Multi-sensor Image Interpretation and Dissemination System), a ground exploitation system of airborne and space-borne imagery and surveillance.

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Jointness and interoperability of IMINT and surveillance (MTI radars or UAV optronic payload) are achieved by the MINDS multi-sensor image intelligence exploitation and dissemination stations. This highly versatile workstation transforms sensor information into standardised image intelligence and surveillance products.

Today, MINDS is in service in sea, air, land and government branches of the French forces, and is being evaluated for a command ground exploitation segment for NATO and the European Union.

Target Acquisition

Through Electro Optical/nfra Red air-to-surface targeting pods, and air-to-air infra red search and track systems, Thales offers high precision attack capabilities across the entire battlespace day/night and in adverse meteorological conditions. Using an open architecture, our equipment matches all operational requirements in all types of aircraft.

DAMOCLES is the latest generation of electro-optic systems using a high accuracy gyrostabilised platform together with a highly sensitive 3-5 μm infrared sensor which results in a unique long range capability and a high resolution image. DAMOCLES can identify any target well beyond the effective range of the precision-guided weapons, for maximum platform survivability.

The processing is digital from end-to-end, implementing state of the art technology and providing the growth potential to cover the expected requirement for future integration of new functions to the aircraft weapon system. DAMOCLES may be used for day and night missions under all weather conditions. The system is integrated on Super Etendard M, Mirage 2000, Rafale, Su-30 and is compatible with Tornado, F16, F18.

Tactical Data Link

Today, Tactical Data Links (TDL) are a key asset for exchanging information as part of Network Centric Operation. They allow all the players in digitised battlespace to share the same real-time vision of the tactical environment and to conduct operations and missions in the full spectrum of warfare areas. Thales has developed a complete range of TDL solutions for NATO and non-NATO customers. These solutions are based on a number of building blocks such as transmission equipment (HF, V/UHF, MIDS…), Data Link Interface Processors (DLIPs) and TDL network planning & management systems.
The Thales offer also includes a complete set of tools to support TDL definition, testing and integration. These tools are tailored to the specific user requirements, including training and associated logistic support.

With its Data Link Interface Processor (DLIP) product line, Thales offers a range of cost-effective multi-TDL (L11, L16, LX16, L22, etc.) solutions. Associated with all types of radio, modem and terminals, these solutions, suitable for any type of airborne platform including UAVs, simplify the onboard integration and guarantee interoperability.

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Onboard Communication Suite

Aircraft now require so many different types of communication equipment to conduct their missions that a coherent onboard communication system architecture is now needed to guarantee technical compatibility and deliver a seamless operational capability.

The Thales airborne communication suite offers full integration of all internal and external communications with direct secure access to any type of radio equipment (HF, VHF, UHF, MIDS, Satcom, etc.). Organised around an IP-based InterCommunication System (ICS), the communication suite provides onboard voice and data services directly to the crew or through the mission system.

NextW@ve, the new Thales multi-purpose terminal, brings to operational users the access not only to traditional radio services (VHF tactical band, Air Traffic Control, maritime band, ECCM UHF, …) but also to new NCW services (tactical data links, image/video, Close Air Support, Imagery On Demand, …) due to its high data rate and its networking capacities. With its Software Defined Radio architecture, NextW@ve can implement new radio waveforms and additional services (embedded communication security…).

Air Mission Systems

The surveillance systems market is expanding, driven by the growing importance attached by governments to national security and the effectiveness of their expeditionary forces. There is rising demand for complete, integrated system architectures that are largely platform-independent. Customers are looking to industry to put forward the operational concepts and architectures they now require.

Thales has wide-scale experience in this area; it is notably prime contractor for Turkey's large-scale maritime patrol and surveillance programme, Meltem, comprising 19 aircraft for the Turkish Coast Guard and Navy. Nine systems will be integrated into existing CN235 aircraft operated by Turkish armed forces and a further ten into Alenia ATR72. The Thales solution is based on Amascos (Airborne Maritime Situation and COntrol System), displayed on the stand at the 2007 Paris Air Show.

The Amascos system is designed around a tactical command subsystem with a full range of latest-generation Thales sensors (radar, ESM and acoustic) and communication systems. Its modular architecture makes it possible to incorporate any combination of sensors, including radar, FLIR, ESM/ELINT, COMINT, an acoustic subsystem and datalinks, as selected by the customer. The system is designed for all types of aircraft, from long-range maritime patrol aircraft to surveillance planes, and including naval helicopters.

In addition to the Meltem programme, Amascos has been selected by the Indonesian, Japanese, Malaysian and Pakistani armed forces.

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Unmanned Air Vehicles (UAVs)

UAV systems combine air vehicles, sensor suites and ground-based exploitation segments as part of a network-enabled capability. Thales UAV systems are multi-sensor, multi-mission and multi-platform solutions designed to meet a broad range of security needs.
Designed in close cooperation with operational users, Thales's range of UAV systems places great emphasis on interoperability, survivability, persistence, endurance and flight operations in military and civil aerospace.

At the Paris Air Show, Thales exhibits a scale model of its UAV solution adapted for surveillance missions for the export market.

With the expansion of its involvement in the major sector of UAV surveillance and intelligence, Thales has been selected for cutting edge programs such as the Watchkeeper tactical UAV program in 2005. This programme will provide the UK's armed forces with a globally deployable ISTAR capability to deliver Image Intelligence.

System of systems: Thales on board combat aircraft

Thales is at the heart of the mission combat aircraft's electronic mission system. These systems include target and threat detection; offensive and defensive weapon systems and computerised navigation and attack systems.

Thales supplies all of the mission-critical onboard electronics for the multi role Rafale, the leading combat aircraft of its generation. Operational with French naval aviation since 2004, Rafale entered service with the French Air Force in June 2006.

On the stand at the 2007 Paris Air Show, Thales exhibits its Active Electronically Scanned Array (AESA) RBE2 demonstrator model. AESA technology will offer new improved performance radar capabilities providing a high quality combat system designed for integration into the missions systems of combat aircraft. With its expertise in this technology, Thales has been working within its dedicated research and technology centre in France, in cooperation with UMS[1], on the development of optimised gallium arsenide T/R modules, to form the radar's antenna.

The AESA RBE2 gives a strong operational performance, including improved detection of small targets at long range and high-quality Synthetic Aperture Radar (SAR) imaging.
Tactical situations become easier to analyse with the AESA RBE2 radar – its electronic phased array gives the pilot instantaneous detection and pursuit capabilities within the front sector. The AESA RBE 2 provides the full range of radar functions required for any combat aircraft in the 21st century.

Thales expects to move into integration testing on board the Rafale in the second quarter of 2007. Series production start-up is scheduled for late 2010.

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[1] UMS is United Monolithic Semiconductors (UMS), the Franco-German EADS/ Thales owned company.

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In addition to the RBE2, Thales provides Spectra, the electronic warfare suite for the Rafale, which was developed in close cooperation with MBDA. Designed to give the Rafale a decisive advantage in all situations, the Spectra electronic warfare system is fully integrated with the aircraft, employing the very latest active-array antenna and digital analysis technologies to boost the aircraft's survivability against air and ground threats.

Thales systems and equipment are also fitted to the Eurofighter Typhoon, F-16, MiG, Mirage, Sukhoi and Tornado.

Leveraging the systems developed for the latest generation of fighters, Thales offers electronic combat sub-systems and upgrade solutions for aircraft already in service not only as supplier but also as prime contractor depending on customer requirement.

Air Defence Systems

Thales assures the efficient protection of armed forces and sensitive sites by proposing complete solutions for airspace surveillance, command and control operation centres, overall solutions for threat evaluation, threat response and neutralisation of the enemy (ground-to-air weapon systems, very short, short and medium-range, missile electronics and propulsion systems).

The preoccupation of the customer is the protection of manoeuvring forces and fixed installations against attack by current and next-generation tactical ballistic missiles, low and high altitude cruise missiles, remotely piloted vehicles, manoeuvring fixed wing aircraft and rotary wing aircraft. This protection is required in a national theatre context in peace-keeping or conflict situations.

The wide experience of Thales affords customers an opportunity to grow and mature an air defence network that can intelligently link sensors, weapons, and command management in real time, from a tactical level up to a strategic one.

Thales meets the challenge by continually improving and opening up its systems architectures allowing systems to be interconnected more easily through a "plug and fight" concept.

The Crotale Mk3 is a prime example of this. Thales has developed the Crotale Mk3 system to defend civil and military installations against airborne threats and protect deployed forces. The VT1 hypervelocity missile that equips the Crotale Mk3 is available with an extended range of more than 15 kilometres, further reinforcing its operational capabilities and making it the highest-performance system on the market.

The Crotale's multi-engagement capabilities have been continually field proven and over 330 systems have been sold worldwide. In constant evolution, the Crotale range has been in service with the armed forces for over 30 years and, in addition to France, has been exported to some 15 different countries including Finland, Greece, Oman and Korea.

However, threats to civilians and military forces are changing and the diversity of these threats can only be defeated by flexible and rapidly deployed defence and security systems.

The Multi Mission System (MMS) is a unique lightweight, vehicle based system capable of delivering a rapid reaction response to threats from the air of the ground. Equipped with the Starstreak missile system or other missiles systems such as anti-armour systems or rocket systems, MMS has the ability to take on a wide spectrum of targets such as Armoured Personnel Carriers (APCs), static installations and terrorist platforms, as well as air threats such as Unmanned Aerial Vehicles (UAVs) and pop-up helicopters.

In addition to weapon systems, Thales also provides man-portable missile systems. The Lightweight Multiple Launcher (LML) system is a tripod-based system providing a multi-engagement capability against low-level air targets. Providing three missiles all ready to fire allows the system to deal with saturation attacks from the air or the ground.

Utilising the Starstreak missile with its unique laser beam riding guidance and extremely fast time of flight, this can defeat a variety of threats including aerial targets such as UAVs and helicopters and also surface targets such as APCs, static installations or terrorist platforms. The unique 3-dart concept of Starstreak ensures a high hit probability against all main threats. The combined kinetic energy and warhead ensures that target kill can be achieved from even a single dart hit.

System of Systems: Air Defence Protection

Thales is the only company in Europe capable of providing armed forces with complete air defence solutions from early warning to threat neutralisation. Its capabilities are as follows -

- Integrated air command and control systems
- Detection and identification systems
- Very short, short and medium-range air defence systems
- Missile electronics and propulsion

Dedicated to the protection of airspace and high-value assets, the systems actively contribute to mission planning and tasking, force engagement and threat neutralisation in the event of an attack.

Ground Master 400

The Ground Master 400 is a multi mission air defence radar, dedicated to the protection of key assets, national sovereignty and forces deployed in remote theatres. The Ground Master 400 is the first product to combine three revolutionary concepts "digital radar", "e-radar" and "green radar".

The Ground Master is the first family of HMLA radars (high, medium and low altitude). Unmatched detection performance has been achieved through the intensive use of digital beam forming. This feature makes the Ground Master the first "digital radar" available on the market. In addition, it is one of the only air defence radars that operates in S band, thereby offering the best trade-off between range, location precision and target recognition capabilities. The Ground Master also offers unparalleled ease of use, through the concept of "plug, play & forget". The radar architecture can be monitored and controlled from a remote location by means of web services. This makes the Ground Master one of the first "e-radars" on the market. Upgrades and maintenance can also be carried out via the internet (extranet,

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secure internet), or from a remote location via a specialist line-of-sight link. Human intervention is no longer needed once the radar is in operation and is limited even for maintenance operations. In terms of operational reliability, the Ground Master is in a league of its own, far in advance of the other radars on the market. MTBCF2* is 100% better than that of any other air defence radar proposed by the competition.

The Ground Master is also the first product incorporating the concept of "green radar" in compliance with the most recent EU environmental standards.

<u>Sea-based operations</u>

Thales is one of the world's leading naval defence contractors. The company spans the entire value chain with capabilities ranging from sensors (radars, sonars, optronic equipment), communications and electronic warfare systems to the development and integration of complete combat systems and warship prime contracting. Thales is also present in maritime safety & security and naval services.

For naval aviation, Thales supplies:

➢ Helicopter-borne dipping sonars for anti-submarine warfare missions (Flash, ALFS)

➢ Sonobuoy systems integrated with the mission systems of maritime patrol aircraft (UMS 2000)

Thales is playing a major role on the NH90 NFH programme. The NFH (NATO Frigate Helicopter) is the naval version of the European NH90 helicopter. Designed for combat and support missions, it is equipped with a sonar and a sonobuoy processing system and deploys torpedoes and missiles.

In addition, Thales is actively involved in the major aircraft carrier programmes, most notably the PA2 in France and the two CVF vessels in the United Kingdom. In 2006, the two nations signed a cooperation agreement for a common design.

CVF (STOVL Joint Strike Fighter) and PA2 / CVF-FR (Rafale): with major operations on both sides of the Channel, Thales is co-prime contractor for both programmes. The company has a close involvement in the design of the vessels, which must combine operational power projection requirements with strict cost control. The company is thus playing a key role as programme facilitator to ensure effective cross-Channel cooperation and the successful delivery of these strategic large-scale programmes. The three vessels are scheduled to enter service between 2012 and 2015.

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[2] MTBCF: mean time between critical failures

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SECURITY AND SERVICES SOLUTIONS

Thales contributes to airport security and efficiency

Thales's offering in airspace security begins in the airport parking area: Thales provides airport operators with end-to-end solutions to ensure the security of people and property:

- **Protection of airport areas:** Surveillance, detection and automatic tracking of aircraft and authorised/unauthorised vehicles in airport areas using radar, infrared cameras and vehicle location units. Sonars may also be installed at airports in coastal locations. These systems are designed to monitor and guard against all potential threats to aircraft. Other sensors may also be incorporated with the system to provide more comprehensive surveillance.

- **Airport perimeter security:** Electromagnetic barriers, seismic sensors and infrared cameras provide protection for sensitive sites and generate location data, trigger alarms and track intrusions. They also monitor access roads, trains, buses and parking facilities.
- Protected communications: fixed and portable radio communication systems and IT systems with authentication and encryption functions.

- **Access control and passenger identification:** Contact less badges, ID document control, biometric authentication, passenger and baggage x-ray screening, passenger/baggage matching, facial recognition, video recording.

- **Dangerous object detection:** Integration of nuclear, biological, chemical and radiological sensors for the systematic and/or selective control of objects inside trucks, containers and baggage, and carried by passengers.

Services: Training and Simulation

The requirement for simulation training equipment broadly follows that of the civil airline industry. The sheer amount of air traffic means that skills around air traffic control will need to be further developed. Also the pressure on the industry to go more 'green' will not only see more environmentally friendly products but also the demand for aircrew not only to be able to fly effectively and safely but also to be able to fly to environmental standards.

Thales provides end-to-end solutions from computer-aided training systems to full-flight simulators for both the civil and military markets that take into account the evolutions of the aerospace industry.

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Defence Services

To facilitate defence transformation, Thales has developed a global offer, covering Management Services and Support Services. Defence authorities can enlarge the scope of the services that they obtain from their industrial partners including platform and equipment operation, people training, infrastructure support, ICT services, supply chain services, engineering, etc.

Consulting & Engineering Services: Thales provides expertise and assistance in the management of change, from repair and overhaul processes, to project management support, and innovative acquisition tools, like SEBA (Synthetic Environment Based Acquisition).

Outsourcing solutions allow the optimisation and renovation of defence infrastructure and the optimum usage of Information Systems (secured infrastructure outsourcing, application service provision, IT renovation, C4ISR & NEC support infrastructure, etc) and Facility Management (buildings and asset maintenance, service to occupants, safety and security services).

Supply Chain Management: Enhance global support and improve the logistic chain, from storage and handling to transport and delivery, based on long-term commitments on SLA (Service Level Agreements).

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Space: a new dimension to Thales's offering

Thales has been a partner of the international space industry for nearly four decades. Thanks to its long experience in civil (Sarsat, Envisat, Galileo…) and military programmes (Helios, Essaim and Syracuse…), Thales offers a wide range of essential solutions and services in this domain.

Beyond the Group's current activities, Thales has reinforced its presence in the space area by the transfer of Alcatel-Lucent's stake in Alcatel Alenia Space (67%) and Telespazio (33%). Thereby, Thales becomes the European leader in satellite solutions for civil and military applications and a major player in orbital infrastructures.

This operation reinforces the Group's expertise in large systems and dual-use civil and military applications, in telecommunications, navigation, earth observation as well as sciences. As a result, Thales further strengthens its presence in its core markets: Defence, Aerospace and Security.

Thales and Finmeccanica sealed their "Space Alliance" following the European Commission's agreement of April 2007. This strategic partnership is based on the complementarities brought by the European leader in satellite systems, Thales Alenia Space, and by one of the major satellite service providers worldwide, Telespazio. Thales Alenia Space is at the heart of high-performance satellite technologies in both the civil and defence sectors, bringing its expertise in space exploration and observation as well as in military and commercial communications to Thales.

Above all, Thales provides an **end-to-end offer**, combining space and terrestrial technologies, which constitute a major asset in the development of "systems of systems".

The new Space Alliance
European leader in satellite solutions for civil and military applications

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Today, Thales is positioned at the heart of the civil space programs such as the European Earth Observation program GMES, the European navigation system Galileo and its

predecessor EGNOS, including defence programs with the French and Italian telecom systems Syracuse and Sicral as well as the Italian Earth observation program COSMO-SkyMed.

Thanks to strong synergies, complementarities and shared purposes, the Space Alliance can take full advantage of the unrivalled technological expertise and outstanding service record of its partners Thales Alenia Space and Telespazio.

The Space Alliance's mission is based on a common strategic vision of future market needs and investment to develop high quality and leading-edge technologies for innovative solutions.

The expertise of the Space Alliance includes satellite-based systems and services in the fields of telecommunications, radar and optical observation, navigation, science, orbital infrastructure, transportation, launch services and satellite operations.

The customer portfolio of the Space Alliance partners Thales Alenia Space and Telespazio ranges from commercial satellite operators, satellite-based service providers, mobile operators and broadcasters to space agencies, defence authorities and administrations and system integrators.

Thales Alenia Space and Telespazio's leading positions in advanced dual technologies, innovative applications, prime contractorship experience, industrial and operational assets constitute the cornerstone of the European space industry. With R&D support from their parent companies together and their know-how, international presence, customer proximity and long track record of success the Space Alliance is positioned as the cornerstone of the European space industry.

Military Satellite Communications solutions

Thales has long-standing experience in the field of military satellite communications. Satellite based connectivity is a crucial component of defence communication networks and C4ISR systems. By focusing on security requirements, end-to-end communications capabilities, interoperability, mobility and tacticity, Thales provides end-to-end resilient and secured communication infrastructure networks optimising usage of satellite resources capacity and tailored to the military users' needs.

In the field of innovations in the Military Satellite Communications segment Thales has been pioneering cutting-edge technologies, like the active antenna for SatCom-On-The-Move (SOTM). Easy to install on all types of vehicles, SATMOVE Xotm is a standalone terminal that automatically acquires satellites while units are in transit. Based on active phased array technology and operating in the military X band, the new terminal will provide data rates of up to 1 Mbps.

In Military Satellite Communications Thales has expanded its market position as a leading player in the with additional references.

Thales is currently supplying an Electronic Protective Measures Modem System (EMS), to support satellite communications and associated control capabilities under jamming conditions for deployed operations in SHF band at medium data rate (up to 2Mbps) for NATO's Consultation Command & Control Agency (NC3A). Through this program Thales contributes to reinforce the availability, confidentiality and integrity of NATO voice and data information, against the potential jamming, interference and intrusion threats, when transmitted over Satcom links. It will also guarantee interoperable operations with joint multi-national forces, as well as the ability to sustain operations involving land and maritime deployments, under electronic warfare threats. The EMS will contribute to the renovation of the ground segment of the NATO Satcom Post-2000 programme which provides NATO with access to the military space segment of three national satellite communications systems: France's Syracuse III, the UK's Skynet 5, and Italy's SICRAL

Together with major reference as on-going Syracuse III programme prime contractor and key references for systems integration and critical subsystems provision at Nato e.g , Thales is also currently bidding on high profile export projects .

Security of Satellite Systems

Beside Satellite Communication, Thales is currently expanding its market reach in providing Global security solutions to additional segments such as   Satellite Navigation and Satellite Observation Systems.

Selected to specify and design the security policy of the Galileo satellite navigation system, Thales operates on each Galileo segment whether it be space, control, mission or user terminals. Through this critical security architect mission, Thales leverages its dual technologies strategy in providing both defence /governmental high-grade security as well as commercial grade security where appropriate. For this Thales applies the whole range of its expertise in communications security technologies for IP networks, dedicated links, and satellite systems, as well as the full spectrum of techniques in terminal and data security including encryption, authentication and access control.