

The logo for Eurofighter Typhoon, featuring a stylized red and white circular emblem to the left of the text "Eurofighter Typhoon" in a bold, sans-serif font.

**Eurofighter
Typhoon**

A detailed, semi-transparent rendering of the Eurofighter Typhoon cockpit, showing the pilot's seat, control panels, and various instruments. The cockpit is overlaid with a green wireframe grid, suggesting a technical or digital theme. The background is a bright, blue sky with white clouds.

Technical Guide

Effective Proven Trusted

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1 INTRODUCTION

Eurofighter Typhoon is a highly agile Air Superiority and Air-to-Surface, multi-role/swing-role weapon system.

In full operation with six nations – Germany, Italy, Spain, the United Kingdom, Austria and the Kingdom of Saudi Arabia – Eurofighter Typhoon is the most capable modern combat aircraft available on the global market. Austria became the first export customer in 2003. Deliveries to the Kingdom of Saudi Arabia started in 2009. A new contract with the Sultanate of Oman as the third export customer was signed in December 2012.

The collective military requirements of the four Partner Nations are the foundation of the Eurofighter Typhoon weapon system. This provides a comprehensive and flexible capability that will meet the demands of many nations over the next half century. Each aspect of the Eurofighter Typhoon is designed to provide a balanced contribution to the overall effectiveness of the weapon system:

- Passive sensors, low radar signature, and supercruise capability for low detectability
- Integrated sensors and data fusion, for pilot situation awareness and low cockpit workload
- High supersonic performance for superior Beyond Visual Range (BVR) combat capability
- Carefree agility, Advanced Short-Range Air-to-Air Missile (ASRAAM and IRIS-T) and Helmet Mounted Display (HMD) for excellent Within Visual Range (WVR) combat capability
- Dedicated radar and FLIR modes for air space policing
- Extensive weapons/stores inventory which includes effective long and short-range weapons for successful Air-to-Surface operations
- Automated and mission-tailored defensive aids for high survivability
- Designed for growth
- Low cost of ownership

All of these characteristics contribute to a balanced weapon system for maximum effectiveness in a dense and complex threat scenario. The multi-role/swing-role Eurofighter Typhoon allows a single-tier Air Force structure with substantial reductions in costs and with the opportunity for commonality and interoperability on a worldwide scale.

AGILITY

Due to its foreplane/delta-wing low drag configuration and high thrust-to-weight ratio, Eurofighter Typhoon exhibits exceptional acceleration, instantaneous and sustained turn rate performance both subsonic and supersonic, coupled with excellent airfield performance.

Using the latest control technology with a high degree of aerodynamic instability, and by extensive use of carbon composite, the resulting airframe and engine are some 10-20% smaller and 30% lighter than its predecessors.

High thrust/weight + Low wing loading = Agility
Agility + Integrated avionics = Combat superiority



PILOT FRIENDLY

The cockpit and Human Machine Interface (HMI) have been designed and fully tested to provide low pilot workload even in the most adverse mission and threat scenarios predicted. The cockpit is spacious, and the displays show the pilot:

What is needed, when it is needed!

Other features such as Direct Voice Input/Output (DVI/O) associated with Hands On Throttle And Stick (HOTAS) control functionality have been implemented on the Eurofighter Typhoon to drastically reduce the pilot's workload. Voice + Throttle And Stick (VTAS) enables singlepilot operations even in the most demanding Air-to-Air, Air-to-Surface, and swing-role missions.

DVI/O + HOTAS = VTAS = Low pilot workload

CONTINUOUS GROWTH PROGRAMME

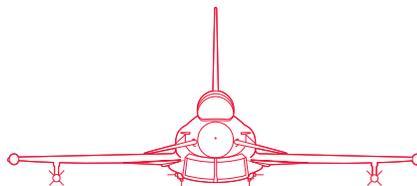
Eurofighter Typhoon which is a next generation fighter, offered already exceptional capabilities at entry into service. Through capability enhancements and a proven technology insertion plan, Eurofighter Typhoon is designed to meet future operational requirements that will maintain its operational dominance well into the 21st century.



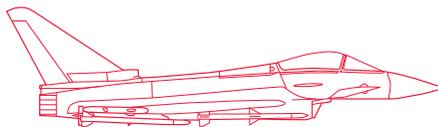
2 GENERAL CHARACTERISTICS

Eurofighter Typhoon has a foreplane/delta wing configuration that is aerodynamically unstable. This gives the aircraft advantages in:

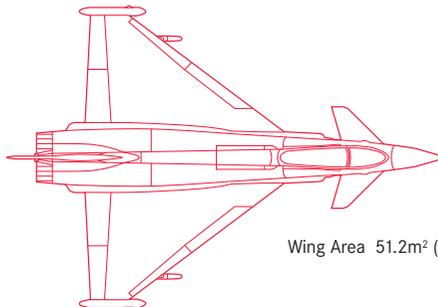
- Agility
- Supersonic performance
- Reduced drag
- Lift and STOL performance



Wingspan 10.95m (35ft 11in) Height 5.28m (17ft 4in)



Length Overall 15.96m (52ft 4in)



Wing Area 51.2m² (551.1ft²)

DIMENSIONS / MASS

Wingspan	10.95 m (35 ft 11 in)
Length overall	15.96 m (52 ft 4 in)
Height	5.28 m (17 ft 4 in)
Wing Area	51.2 m ² (551.1 ft ²)
Basic Mass Empty	11,000 kg (24,250 lb)
Maximum Take-off	> 23,500 kg (51,809 lb)
Maximum external load	> 7,500 kg (16,535 lb)

DESIGN CHARACTERISTICS

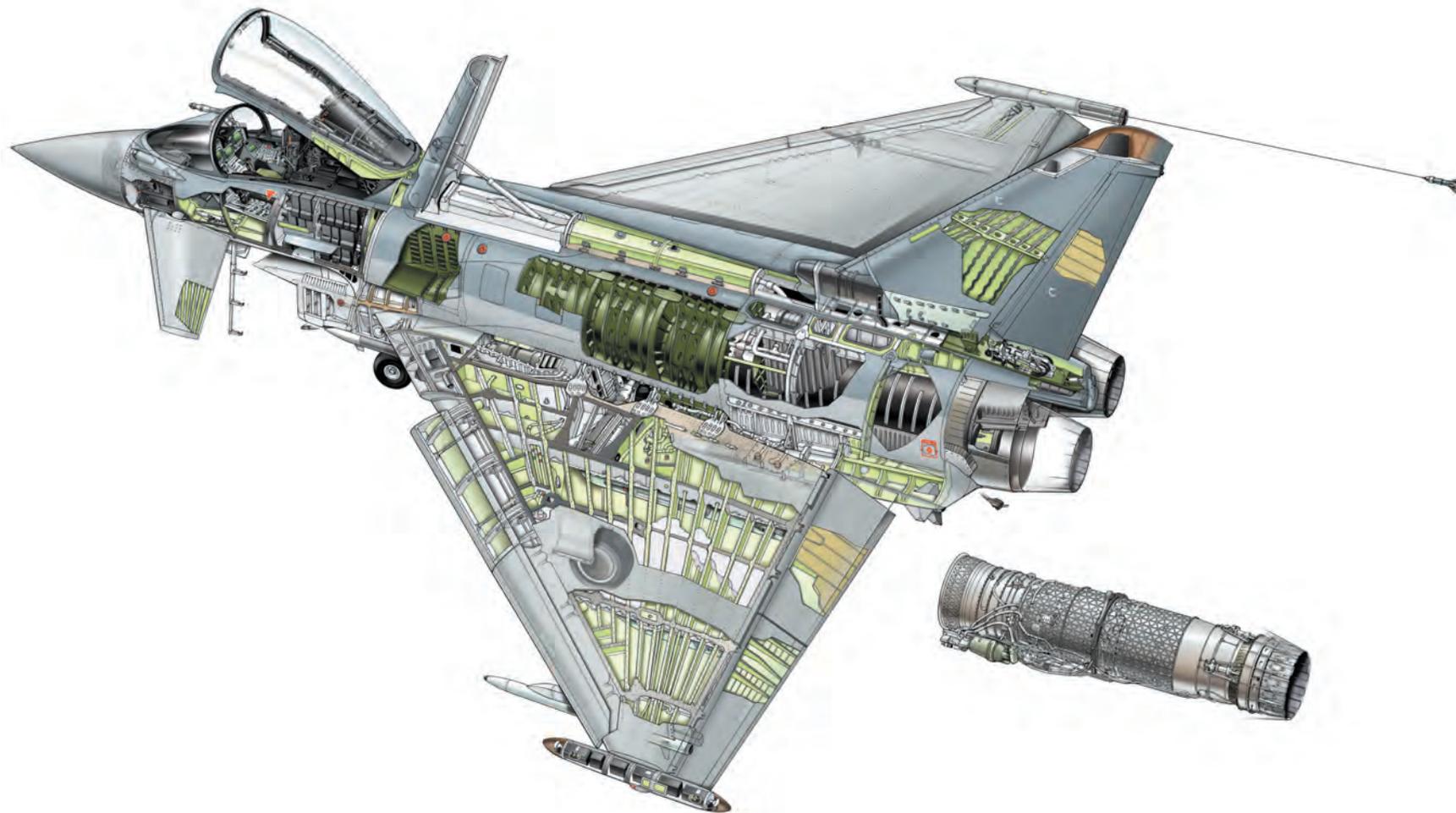
Single seat twin-engine, with a two-seat variant	
Weapon Carriage	13 Hardpoints
G' limits	+9/-3 'g'
Engines - Two Eurojet EJ200 reheated turbofans	
max dry thrust class	60 kN (13,500 lb)
max reheat thrust class	90 kN (20,000 lb)

GENERAL PERFORMANCE CHARACTERISTICS

with a full Air-to-Air Missile Fit

Ceiling	> 55,000 ft
Brakes off to 35,000 ft / M1.5	< 2.5 minutes
Brakes off to lift off	< 8 seconds
At low level, 200 Kts to Mach 1.0	in 30 seconds
Maximum Speed	Mach 2.0
Operational Runway Length	< 700 m (2,297 ft)

Eurofighter Typhoon is both light and strong based on adoption of modern construction and manufacturing technology combined with the use of advanced materials and assembly techniques.

AIRFRAME

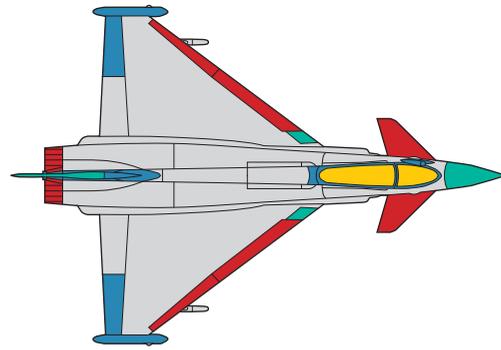
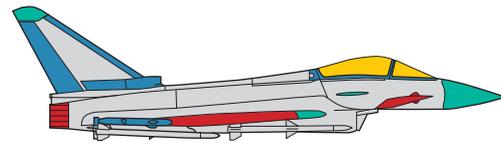


PULL-OUT AIRFRAME

2 GENERAL CHARACTERISTICS

MATERIALS

CFC	70%
GRP	12%
Metal	15%
Other	3%



- Carbon Fibre Composites (CFC) ●
- Glass Reinforced Plastic (GRP) ●
- Aluminium Alloy ●
- Titanium Alloy ●
- Acrylic (Röhm 249) ●

THE PERFORMANCE TO GET THE JOB DONE

Propulsion System

- Twin-engine for safety and system redundancies
- Excellent thrust-to-weight ratio
- Supercruise capability
- Low fuel consumption

Cockpit / HMI

- Excellent all-round vision
- Full glass cockpit
- Helmet display and VTAS
- High level of integration and automation

Flight Control System

- Carefree handling
- Artificial stabilisation
- Quadruplex digital Fly-By-Wire system

Utilities System

- Integrated digital system featuring seven distributed processors and a dual-redundant databus
- High fleet availability
- Reduced pilot workload

Radar

- Multi-role, multi-mode CAPTOR radar
- Very high power and very high detection range
- Extensive search and track volume
- Highest performing type of its class

Swing-Role

- Rapid transition between Air-to-Air and Air-to-Surface moding
- Can always carry at least six Air-to-Air missiles

Designed for Growth

- Robust air-vehicle design
- Highly adaptable platform
- Planned technology insertion

Data Link

- High-capacity secure digital information distribution system

Sensor Fusion

- Presents the pilot with a unified picture of the outside world
- Pilot concentrates on the fight not on the flight
- Reduced pilot workload

Avionics System

- Highly integrated system
- Modular technology
- Rapid access to the overall tactical situation

IRST / FLIR

- Passive Air-to-Air target detection and tracking for covert operation
- Target acquisition and identification
- Low level night navigation and landing aid

Defensive Aids

- Internally housed
- All round prioritised assessment
- Fully automatic response to single or multiple threats
- Featuring a unique towed decoy

Weapons Carriage

- Maximum operational flexibility and combat persistence
- 13 well-spaced hardpoints
- Internally mounted 27mm Mauser gun
- Low drag and radar cross-sections
- Semi-conformal BVRAAM missile carriage

Air Intake

- Chin location
- High performance at high angles of attack/sideslip

Low Observability

- Airframe shaping absorbent materials and coatings
- Hidden engine compressor faces
- Supercruise capability
- Semi-conformal carriage of BVRAAM missiles
- Passive electro-optic sensors
- Secure communications



3 OPERATIONAL CAPABILITIES

MULTI-ROLE AND SWING-ROLE

Eurofighter Typhoon can undertake all the following missions and roles:

- Air Superiority and airspace policing
- Air-to-Surface (including Air Interdiction, Close Air Support, Maritime Attack, Suppression and Destruction of Enemy Air Defences)
- Reconnaissance

Due to the flexibility of the design, future missions and roles can be readily accommodated. This flexibility is based on advanced avionics, sensors and weapon integration techniques that are unique to this aircraft. Eurofighter Typhoon is a genuine swing-role aircraft, with the ability to carry out several roles during a mission, shifting between Air-to-Surface and Air-to-Air roles. One aircraft for all missions reducing costs, increasing effectiveness and enhancing interoperability with allied Air Forces.

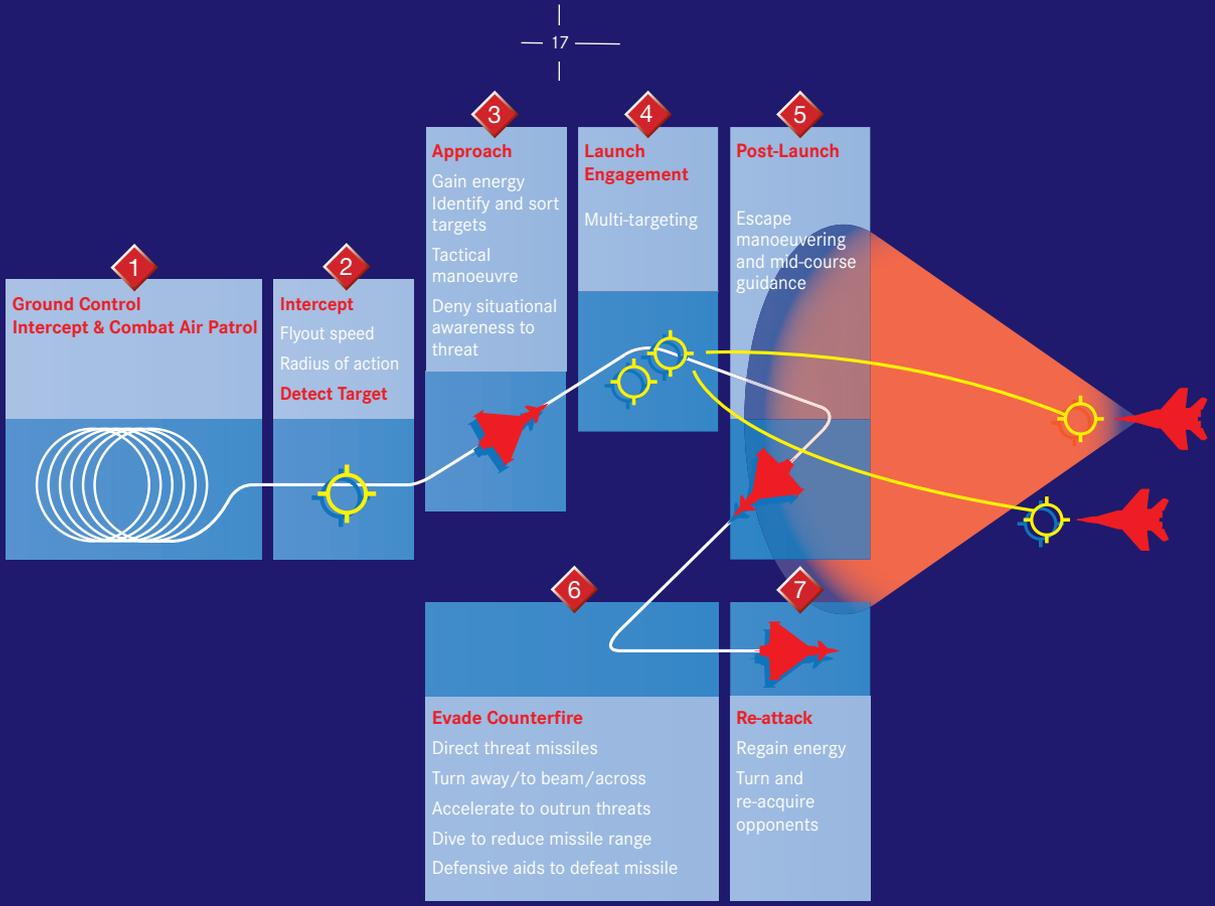
AIR SUPERIORITY

Air Superiority fighters have to be extremely agile in order to meet the increasingly demanding requirements of supersonic Beyond Visual Range (BVR) combat and subsonic Within Visual Range (WVR) combat.

BEYOND VISUAL RANGE (BVR)

The BVR combat philosophy is characterised by the synergy of a number of weapon system characteristics giving Eurofighter Typhoon exceptional combat effectiveness.

3 OPERATIONAL CAPABILITIES



DESIGN DRIVERS FOR BVR COMBAT

- Long range sensors
- High specific excess power and low drag
- Supersonic sustained turn rate and agility
- Low detectability
- Combat persistence
- Defensive aids
- Human machine interface

EUROFIGHTER TYPHOON FEATURES

- CAPTOR Radar, MIDS, IRST, DASS
- EJ200 engines to accelerate to Mach 2.0
- Excellent aerodynamic and engine performance
- Low observability, MIDS, IRST
- Excellent aerodynamic/engine performance and fuel capacity. Weapon load: minimum 4 BVRAAM (Meteor or AMRAAM)
- Fully integrated Defensive Aids Sub System (DASS) including towed decoy
- Highly integrated sensor suite and a sophisticated cockpit for pilot carefree handling

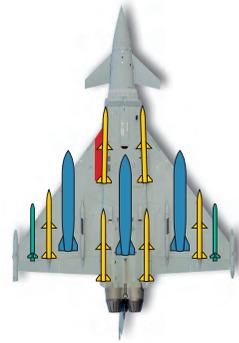
WITHIN VISUAL RANGE (WVR)

Eurofighter Typhoon's airframe and engine agility will be complemented by its systems' agility, with features such as excellent cockpit view, highly capable off-boresight Helmet Mounted Display (HMD) system, advanced VTAS technology, and state-of-the-art short-range missiles. The advanced 'g'-protection system ensures that the pilot can operate comfortably in a relaxed 'g' environment under prolonged agile manoeuvring at 9 'g'.

ONE AIRCRAFT - ANY MISSION

Eurofighter Typhoon provides a diverse range of options for all Air-to-Air and Air-to-Surface operations.

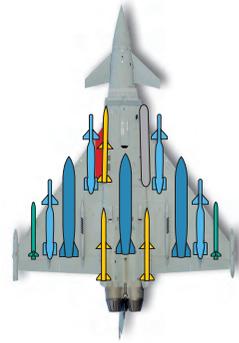




UNMATCHED CAPABILITY

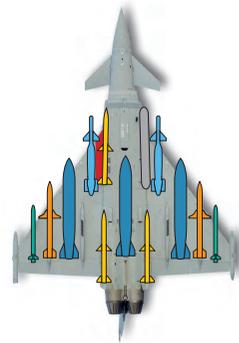
Air Superiority

- 6 BVRAAM
- 2 SRAAM
- 27mm Mauser
- 3x1000L Fuel Tanks



Interdiction/Strike

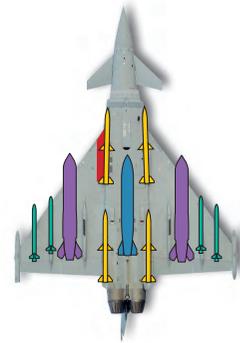
- 4 Laser/GPS Guided Bombs
- 3 BVRAAM
- 2 SRAAM
- 27mm Mauser
- 1 LDP
- 3x1000L Fuel Tanks



Suppression and Destruction of Enemy Air Defences

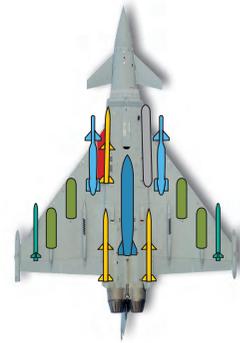
- 2 Laser/GPS Guided Bombs
- 2 ARM
- 3 BVRAAM
- 2 SRAAM
- 27mm Mauser
- 1 LDP
- 3x1000L Fuel Tanks

MULTI-ROLE/SWING-ROLE



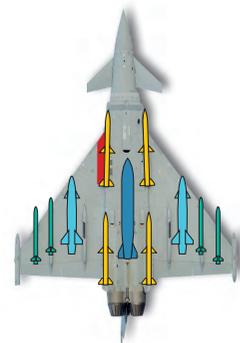
Strategic Attack

- 2 Stand-Off Missiles
- 4 BVRAAM
- 4 SRAAM
- 27mm Mauser
- 1x1000L Fuel Tank



Close Air Support

- 4 Air-to-Ground Rocket Launcher
- 2 Laser/GPS Guided Bombs
- 3 BVRAAM
- 2 SRAAM
- 27mm Mauser
- 1 LDP
- 1x1000L Fuel Tank



Maritime Attack

- 2 Anti-Ship Missiles
- 4 BVRAAM
- 4 SRAAM
- 27mm Mauser
- 1000L Fuel Tank

CONTINUOUS ENHANCEMENTS FOR FUTURE DEMANDS

Eurofighter Typhoon is designed to maintain operational dominance well into the 21st century. At present, the enhancement and technology insertion is focused on the following capabilities:

System of Systems:

Interoperability

- Communications
- Wide Band Data Links (link 16 and IDM)
- Reconnaissance
- Exploitation of Intelligence Surveillance Target Acquisition and Reconnaissance (ISTAR) assets

Reach

- Conformal fuel tanks
- Larger external tanks
- Improved engine efficiency

Precision Attack

- Increased weapon inventory
- Enhanced Nav/Attack sensors
- Improved target detection/identification
- Air Superiority
- Thrust vectoring and thrust increase up to 30%



Survivability

- Advanced DASS including towed decoy
- Stand-off capability
- Signature reduction (engine, airframe and radio frequency)
- Improved co-ordination and safety with friendly forces

Deployability

- Minimised logistic footprint
- Improved availability

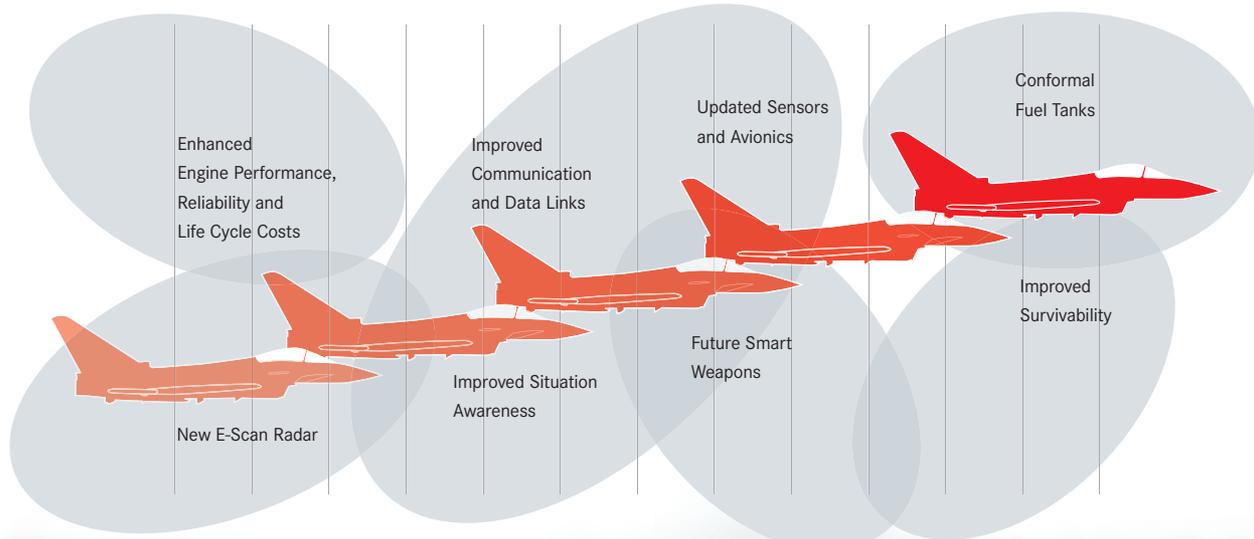
Affordability

- Increased robustness
- Enhanced maintenance and field support
- Open architecture to facilitate technology insertion
- Increased engine life

Human Machine Interface

- Improved helmet display leading to HUD removal
- 3D Audio for immediate spatial perception of threats
- Increased DVI control envelope and vocabulary

T E C H N O L O G Y I N S E R T I O N



I M P R O V E D A F F O R D A B I L I T Y





4 AVIONICS & SENSORS

The Avionics System has been designed to ensure that the pilot is presented with all the information needed in the cockpit, at all stages of flight. The solution – a highly distributed computing capability linked by high-speed conventional (MIL-STD-1553, MIL-STD-1760) and fibre-optic data-buses (STANAG 3910) which will further evolve to make maximum use of the rapid developments in computing power.

SENSOR FUSION

The heart of the system is the Sensor Fusion that processes information received by the main aircraft sensors. This information is correlated and presented clearly to the pilot to allow safe and efficient single pilot operation in the swing-role environment. The high level of integration and sharing of information between the sub-systems gives the pilot an autonomous ability to assess rapidly the overall tactical situation and respond efficiently to threats.



INDIVIDUAL SENSORS

The CAPTOR Radar

The CAPTOR Mechanical Scan Radar is the best performing type of its class. The Radar provides Air-to-Air and Air-to-Surface features. It has excellent ECCM protection features in a jamming scenario for sidelobe nulling, interference blanking and jammer classification.

Main Air-to-Air features

- Search Modes – Range While Search (RWS), Velocity Search (VS) and multiple target Track While Scan (TWS)
- Lock-Follow Modes, which are tailored for long range tracking and short range tracking for use in visual identification or gun attacks
- Air Combat Acquisition Modes allowing a choice of boresight, vertical scan HUD field of view or slaved acquisition

Main Air-to-Surface features

- Search Modes – Ground Map, High Resolution Map, Ground Moving Target Identification and Sea Surface Search and Track While Scan
- Track Modes – Fixed Target Track and Moving Target Track
- Air-to-Surface Ranging

The Captor-E AESA Radar

E-Scan Operational Benefits

- **Extended Detection and Tracking Range**
Flexible mode management with optimum time on target
- **High Operational Availability**
Reliability, Maintainability, Graceful Degradation
- **Multifunctional Performance**
Simultaneous modes, Air/ Air and Air/Ground
- **Non-Radar Functions**
Data Link Capabilities, Electronic Attack, ESM



Captor AESA radar: Proven and operationally discriminating performance

- Enhanced situational awareness, with reduced pilot work load
- Fully integrated with total weapon system
- Improved weapon system combat effectiveness

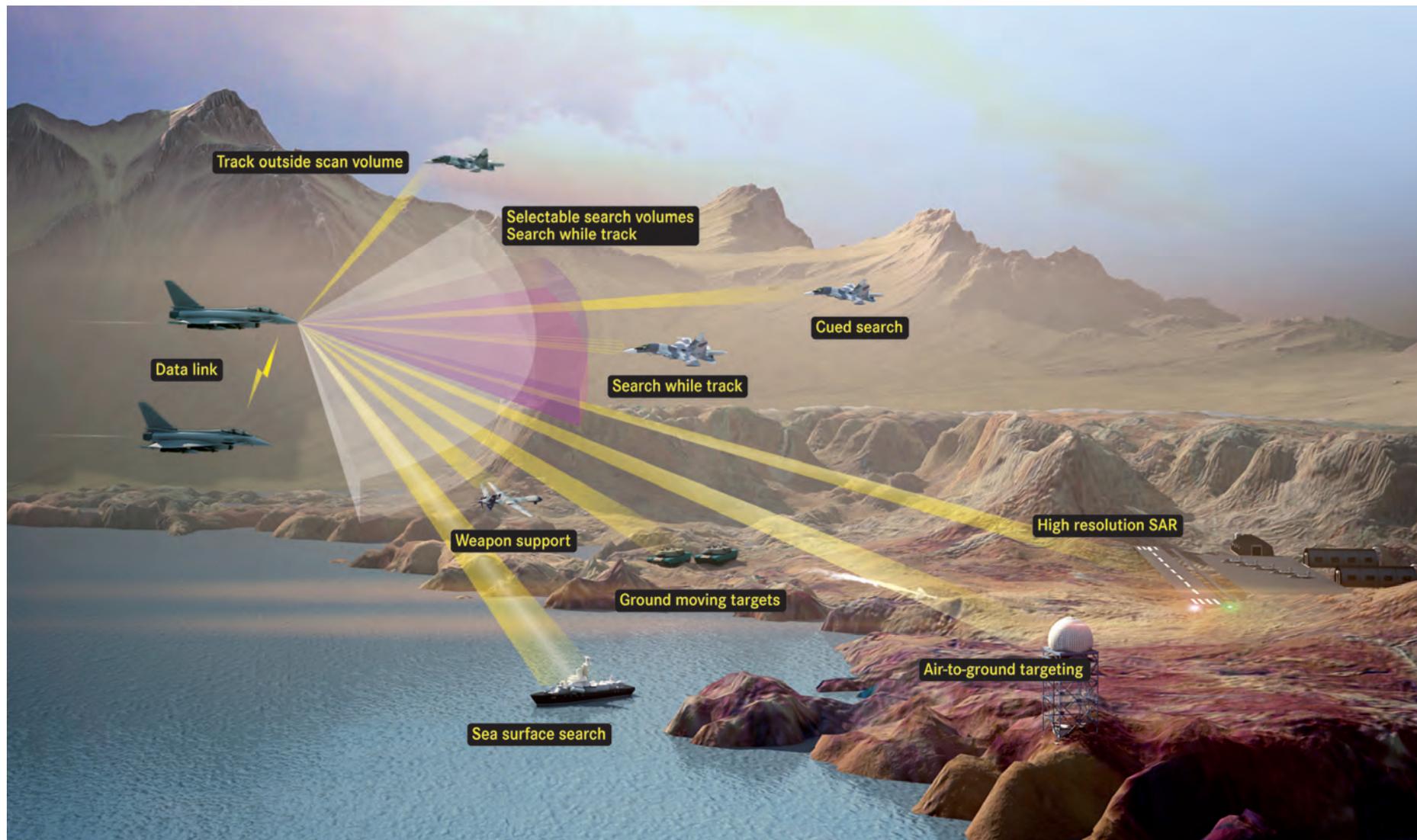
Captor-E: A Wide Field of Regard AESA capability

- Mechanical re-positioner significantly extends Field of Regard and mitigates performance limitations of fixed array AESA Radars
- Increases detection and tracking ranges
- Greatly improves track robustness, stability and accuracy
- Enables AESA capability to be fully exploited, while retaining all other Captor features

Although the current Typhoon's Mechanically Scanned (M-Scan) radar is considered to be best in class, AESA technology will see the Typhoon's radar capabilities developed even further. The AESA radar will offer a variety of benefits over M-Scan, including increased detection and tracking ranges, advanced air-to-surface capability and enhanced electronic protection measures.

The new radar will retain the key features of the existing Captor radar architecture in order to exploit the maturity of the current system. The radar will rely heavily on the "back-end" processor and receiver architecture from the existing best-in-class Captor mechanically scanned radar.

Performance of the Typhoon AESA radar will be unmatched. The very large aircraft nose allows for an optimised array (>1000 Transmit Receive Modules) and with the addition of an innovative re-positioner, the field of regard is +/-100° which is some 50% wider than traditional fixed plate systems.





PULL-OUT RADAR

The wide field of view has significant benefits in both air to air and air to ground engagements allowing Typhoon to turn away from, but still engage, target aircraft and carry out high resolution SAR whilst maintaining safe distance from enemy forces.

The new radar can also be retrofitted to existing aircraft.

The radar will have significant growth potential and both existing and new customers will be able to participate in tailoring the radar to meet their individual operational requirements.

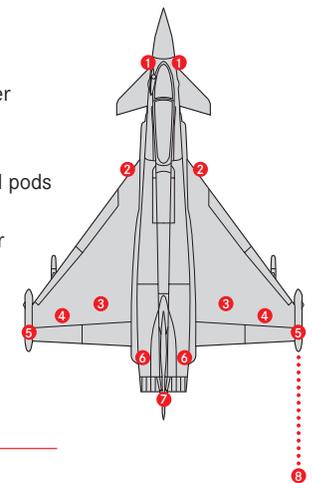
IRST – Infra-Red Search and Track

The PIRATE IR sensor provides the Avionics System with more information but in a frequency band complementary to that of the Radar. Passive Air-to-Air target detection and tracking performance in the IRST mode provides totally covert-tracking capabilities. PIRATE also fully supports Air-to-Surface operations in the Forward Looking Infra-Red (FLIR) mode, with ground and target imagery as required during missions where passive operations are also needed. A special VID mode aids identification in the airspace policing role.

DASS – Defensive Aids Sub-System

The DASS, which constitutes the Electronic Warfare suite, monitors and responds to the outside world. It is installed internally and provides the pilot with an all-round prioritised assessment of Air-to-Air and Surface-to-Air threats, with fully automatic response to multiple threats; manual override is available. Space and computing power expansions will house continuous evolution for future threats, enhance Eurofighter Typhoon's survivability and greatly increase overall mission effectiveness.

- 1 Front laser warner
- 2 Front missile warner
- 3 Flare dispenser
- 4 Chaff dispenser
- 5 Wing tip ESM/ECM pods
- 6 Rear laser warner
- 7 Rear missile warner
- 8 Towed decoy



MIDS – MULTIFUNCTION INFORMATION AND DISTRIBUTION SYSTEM

MIDS is a datalink communication system that allows all elements – where Eurofighter Typhoon is one – of a command and control system to share the same information, and contribute data whenever required. Over huge ranges, and in any direction, the Eurofighter Typhoon pilot is presented with all relevant data on friendly and enemy forces, airfields, command decisions or mission changes. Eurofighter Typhoon will have the capacity to absorb all of this information and then process it through the sensor fusion capability to present a clear and relevant battle space picture to the pilot.

Electro-Optic Targeting System

Autonomous operations for Eurofighter Typhoon will be greatly enhanced by the addition of on-board target detection, recognition and identification, using the latest EO sensor technology. This is complemented by on-board laser tracking supporting target designation for self or third party operations. Future generations of targeting and tracking sensors will be readily integrated into Eurofighter Typhoon through the evolving avionics and weapon system architecture. As with theIRST/FLIR, multi-spectral operations will be key to future operational capability.

Autopilot

The Eurofighter Typhoon autopilot is designed for both cruising and to free the pilot in tactical situations. The autopilot provides basic track, heading, altitude and airspeed modes, and allows the pilot to fly optimum attack profiles automatically. In fact, advanced modes such as auto-climb, auto-attack, and auto-approach are available. The autopilot is an integrated part of the pilot's tactical control.

NAVIGATION FEATURES

Navigation Aids

- Global Positioning System (GPS) for full digital interface with individual satellite tracking channels
- Improved anti-jam capabilities
- Inertial Navigation System (INS) with GPS

Landing Aids

- Instrumented Landing System (ILS)
- Microwave Landing System (MLS)
- Differential Global Navigation Satellite System operation

Communications

- Electronic Counter Measures (ECM) resistant with secure and non-secure UHF and VHF dual redundancy
- A reversionary control facility is provided



COCKPIT

At all stages of the design of the Eurofighter Typhoon cockpit, the needs of the single-seat pilot have been paramount. High workload situations have been analysed to establish priorities and to automate tasks. The priorities of head-in and head-out operations were established, and displays and moding designed so that only necessary information is presented to the pilot.

General Features

Five major display surfaces: three Multi-function Head Down Displays (MHDD), a Head-Up Display (HUD) and a Helmet Mounted Display (HMD), provide the pilot with all the tactical information he needs for all stages of his mission. Night Vision Goggles (NVGs) have been integrated in the fully NVG compatible cockpit. Voice, Throttle And Stick (VTAS) technology gives the pilot optimum intuitive controls and enhances the efficiency of the single seat operation.



Mk.16A Ejection Seat

The Mk.16A is a solid state ejection seat which offers high comfort levels, and is integrated with an On-Board Oxygen Generation System, chemical defence, and communication systems.

Life Support System and Aircrew Equipment Assembly (AEA)

The life support system provides pressure breathing and 'g'-protection for a safe 9 G environment.

Helmet Mounted Symbology System (HMSS)

The HMSS provides flight reference data, an energy cue, and weapon aiming through the pilot's visor this will allow target acquisition and engagement at large off-boresight angles. The helmet also incorporates night vision aids using light intensification and provision for Forward Looking Infra-Red (FLIR) imagery.





5 MAIN AIRCRAFT SYSTEMS

THE ENGINE

Twin Engine Configuration

Eurofighter Typhoon is equipped with 2 EUROJET EJ200 engines to increase safety in peacetime and redundancy in war. The high reliability and subsequent availability ensure low operational costs and high safety.

Design Priorities

The EUROJET consortium achieved the following design targets:

- Supersonic Air-to-Air combat superiority
- High-speed interception capability
- High performance in dry and reheat operation, including supercruise capability
- Carefree handling throughout an extensive flight envelope
- Growth potential
- High reliability and on-condition maintenance

Main Characteristics

The overall design features a compact and lightweight engine with high combustion temperature capability.

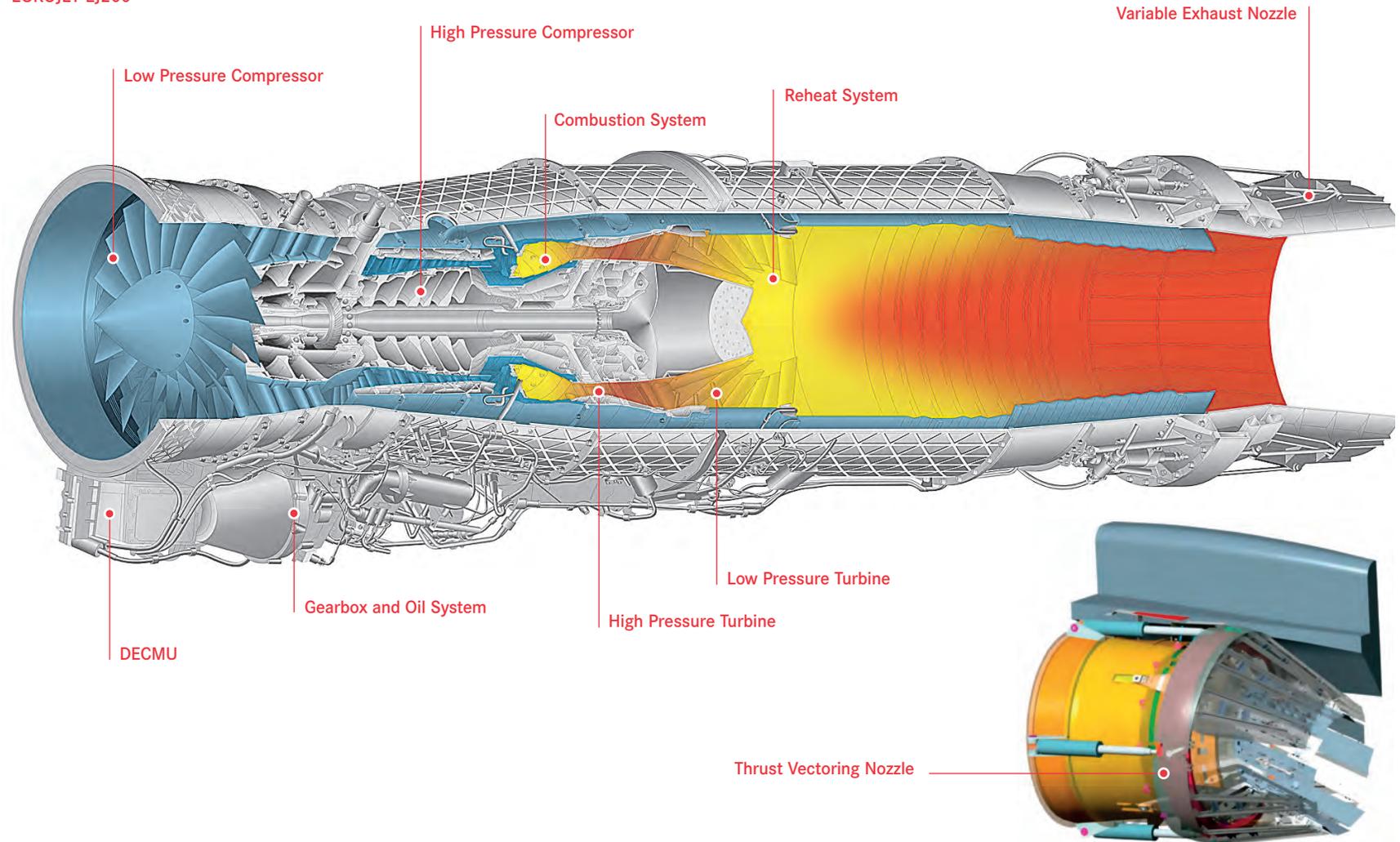
• Thrust / Weight ratio	~ 10:1
• Overall pressure ratio	26:1
• Bypass ratio	0.4
• Overall length	4 m (157 in)
• Inlet diameter	0.74 m (29 in)
• Digital Engine Control and Monitoring Unit (DECMU)	

BUILT-IN GROWTH POTENTIAL

The EJ200 has been designed with inherent growth potential up to 15%. Enhancements in the compression system and latest innovations in core engine technology could deliver up to 30% increased power. This performance improvement may also be traded for life cycle cost improvements, maintaining current thrust levels. This flexibility is enabled by the advanced digital engine control and monitoring unit (DECMU), fully exploiting the advantages of the enhanced engine in line with operational requirements.



EUROJET EJ200



FLIGHT CONTROL SYSTEM (FCS)

The FCS is a full authority, quadruplex digital Fly-by-Wire System that provides:

- Stability and control augmentation
- Excellent handling characteristics
- High agility
- Carefree handling/manoeuvring

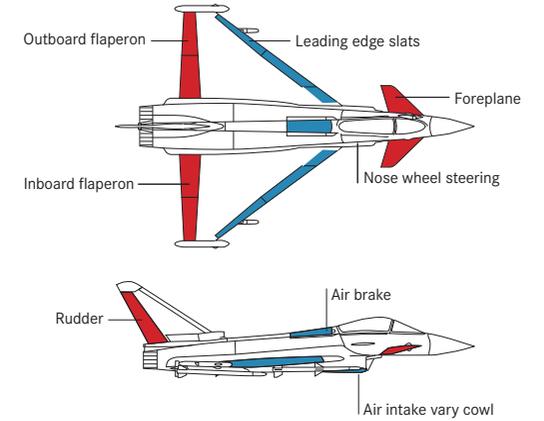
It is designed to enable the pilot to concentrate on the tactical tasks and to fly the aircraft 'head-up' in combination with the HOTAS concept applied to cockpit design. Emergency features have also been embodied in the system design to ensure maximum safety of operation. These include:

- Low speed auto recovery
- 'g' onset limitation
- Disorientation Recovery Facility (DRF)
- Automatic reversion

The system is designed to provide the necessary measurement (Air Data System) computation and surface actuation needed to perform all required manoeuvres ensuring care-free handling and manoeuvring capabilities.

The System is also designed to provide higher mode functionalities including:

- Autopilot
- Auto-throttle
- Flight Director Modes



- ◆ Primary control surfaces
- ◆ Secondary control surfaces

The FCS is controlled by four Flight Control Computers and features primary and secondary actuation to ensure control along all axis (pitch, roll and yaw). The aerodynamic configuration is automatically trimmed to achieve an optimum compromise between performance and manoeuvrability.

Pitch control is provided by symmetric operation of foreplanes and wing flaperons, while roll control is primarily achieved through differential operation of wing flaperons. Yaw control is primarily provided by the fin mounted rudder. Cross feeds among the various actuation systems are also implemented to optimise aircraft performance and handling qualities.

The FCS also features automatic reversion through various back-up modes. It is integrated with other systems through the avionics (STANAG 3910) and utility control (STANAG 3838) databuses.

UTILITIES CONTROL SYSTEM

The Utilities Control System (UCS) is integrated within the overall system architecture. It provides continuous control monitoring and faults detection for Eurofighter Typhoon's general systems reducing pilot workload and increasing fleet availability.

OTHER SYSTEMS

- Secondary Power System (SPS)
- Hydraulic System
- Fuel System
- Electrical Power Generation System
- Environmental Control System (ECS)
- Integrated Monitoring and Recording System (IMRS)
- Landing Gear System
- Fire Protection System
- External Lighting System
- Ice Detection and Protection System





6 INTEGRATED LOGISTICS SUPPORT

To reverse the trend of ever increasing through-life support costs, and to demonstrate absolute commitment to cost of ownership, industry was contracted to give equal priority to Operational Performance and Integrated Logistics Support from the outset of the programme.

This holistic approach to the operation and support of the total weapon system has resulted in an aircraft that demonstrates and surpasses all previous maintenance expectations.

Swing-role capability coupled with unprecedented reliability, low levels of maintenance and a vastly reduced logistics tail, enhances aircraft availability and lethality and permits rapid deployment worldwide.



KEY ASPECTS OF THE EUROFIGHTER TYPHOON TOTAL WEAPON SYSTEM INTEGRATED LOGISTICS SUPPORT

Supportability

The extensive use of prognostic and Built-In Test equipment and high weapon system reliability, together with a low requirement for scheduled maintenance has reduced maintenance man-hours to less than half that required on other combat aircraft in-service.

Availability

High inherent Reliability and Maintainability, coupled with rapid turnaround times, and ease of deployment, result in consistently high levels of operational readiness.

Affordability

Life cycle costs are minimised by flexible cost-effective support solutions tailored to the needs and existing inventory of an individual Air Force.

Weapon System Operational Support

Eurofighter Typhoon operators are given access and involvement in the enhancement of the weapon system through membership of the International Weapon System Support System (IWSSS) and the associated in-country National Support Centre. Membership of the IWSSS offers all Eurofighter Typhoon nations the unique opportunity to have a permanent presence within the central Air Force/Industry management organisation.

Deployment Capability

From the outset, Eurofighter Typhoon was designed for rapid worldwide deployment with minimum dependency on air-transportable ground support equipment. Examples: German Air Force deployed Eurofighter to Alaska and India; Royal Air Force deployed Typhoons to Malaysia, UAE and Southern Atlantic; Italian Air Force deployed aircraft to Kuwait and India.

Ground Operations

The implementation into the aircraft of advanced Built-In Test and diagnostic features has substantially reduced the number of Ground Support Equipment (GSE) compared to previous aircraft. The remaining suite of state-of-the-art GSE was developed according to the same stringent standards as the aircraft, thus ensuring performance and reliability. Depending on the needs of the individual Air Force, off-aircraft equipment maintenance can be supported with a full suite of GSE or through cost-effective industrial support arrangements.

Ground Support System

The Ground Support System (GSS) gives all operators a leading edge mission and engineering data management. This provides rapid seamless bi-directional data flow from the operational and maintenance centres to the aircraft and back. The GSS is linked to the National Support Centre and Industry, thus facilitating continuous on-line data and intelligence transfer.

Technical Publications

Technical publications have been developed as structured data modules allowing rapid adaptation to the needs of an individual Air Force and forming the basis of a paperless cockpit and paperless maintenance environment.

Training

Eurofighter Typhoon has an extremely comprehensive suite of aircrew and ground-crew training aids ranging from computer based training classrooms to an integrated network of Full Mission Simulators. This allows Air Forces to achieve more than 50% combatready training in a synthetic environment.



7 FACTS & FIGURES

Eurofighter Typhoon is now in full operational service with six Air Forces worldwide.

The four core nations have signed an umbrella contract for 620 aircraft.

Austria, as the first export customer, has 15 aircraft in service. The second export customer, The Kingdom of Saudi Arabia, ordered 72 aircraft. The third export customer, the Sultanate of Oman, has ordered 12 aircraft in December 2012.

Germany	180	Aircraft
Italy	121	Aircraft
Spain	87	Aircraft
United Kingdom	232	Aircraft
Austria	15	Aircraft
Kingdom of Saudi Arabia	72	Aircraft
Sultanate of Oman	12	Aircraft
Total	719	Aircraft

- 719 Aircraft contracted
- 571 Aircraft ordered
- 6 Air Force Users
- 20 Operating Units
- Unrivalled international co-development
- Inter-nation cooperation with Europe's largest defence consortium
- Unrivalled global partnership

EUROFIGHTER TYPHOON MILESTONES

Date	Activity
April 2013	10th Anniversary of the IWSSC (International Weapon System Support Center)
Dec. 2012	Contract with Oman (third export customer) signed for 12 AC.
Jan. 2011	Air Forces surpass 100,000 flying hours
Nov. 2009	Delivery of 200th series production aircraft
Sept. 2009	Delivery to Austria completed
July 2009	Tranche 3a Contract signed (112 aircraft)
June 2009	Delivery to the Kingdom of Saudi Arabia begun
Dec. 2008	Air Forces surpass 50,000 flight hours
10.10.08	First Tranche 2 aircraft delivered
12.09.08	Type Acceptance Block 8 (Tranche 2)
01.07.08	Eurofighter Typhoon is in full QRA operation in all five operator nations. Royal Air Force declares Eurofighter Typhoon Multi-Role capable.
22.11.07	First in service Paveway II bomb drop
12.11.07	First self designated bomb drop with LDP
12.07.07	Handover of first Austrian aircraft in Zeltweg
08.05.07	First flight of CAESAR e-scan radar
26.02.07	First ASRAAM firing from a frontline RAF Eurofighter Typhoon
15.02.07	Type Acceptance of Block 5 standard aircraft
29.09.06	Delivery of 100th series production aircraft
04.05.06	First air-to-surface weapon release (GBU-16)
15.12.05	First flight with METEOR BVR missile
Summer 2004	IOC – Initial Operational Capability

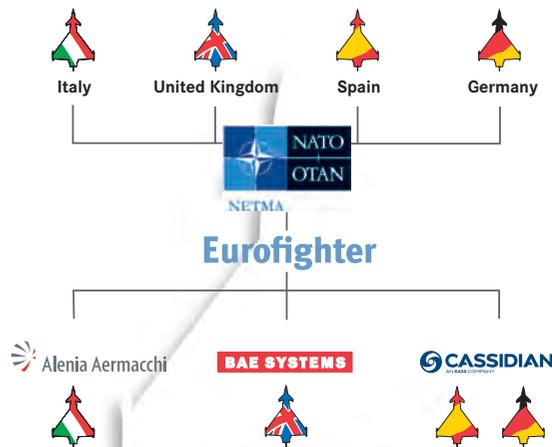
8 ORGANISATION AND STRUCTURE

EUROFIGHTER TYPHOON IS EUROPE'S LARGEST DEFENCE PROGRAMME

The task of developing and manufacturing the Eurofighter Typhoon weapon system is based on an international partnership of Governments, Industry and Air Forces.

The NATO Eurofighter and Tornado Management Agency (NETMA) is the prime customer for the Eurofighter Typhoon weapon system representing the four Governments participating in this quadrilateral programme.

Eurofighter Jagdflugzeug GmbH is the Prime Contractor for the Eurofighter Typhoon weapon system responsible for coordinating the activities of the four European Partner.



EUROJET, comprising Rolls-Royce (RR), MTU Aero Engines, Avio and Industria de Turbo Propulsores (ITP), is the industrial consortium responsible for management of the development, production, maintenance and sales of the EJ200 engine.



9 GLOSSARY

A-A	Air-to-Air
A/C	Aircraft
A-S	Air-to-Surface
AEA	Aircrew Equipment Assembly
AMRAAM	Advanced Medium Range Air-to-Air Missile
ASRAAM	Advanced Short Range Air-to-Air Missile
BVR	Beyond Visual Range
BVRAAM	Beyond Visual Range Air-to-Air Missile
CFC	Carbon Fibre Composites
DASS	Defensive Aids Sub-System
DECMU	Digital Engine Control and Monitoring Unit
DRF	Disorientation Recovery Facility
DVI	Direct Voice Input
ECM	Electronic Counter Measures
ECS	Environmental Control System
ESM	Electronic Support Measures
EO	Electro-Optic
FCS	Flight Control System
FLIR	Forward Looking Infra-Red
GPS	Global Positioning System
GRP	Glass Reinforced Plastic
GSE	Ground Support Equipment
GSS	Ground Support System
HEA	Head Equipment Assembly
HMD	Helmet Mounted Display
HMI	Human Machine Interface
HOTAS	Hand-On-Throttle-And-Stick
HUD	Head-Up Display
IFF	Identification Friend/Foe
ILS	Instrumented Landing System
IMRS	Integrated Monitoring and Recording System
INS	Inertial Navigation System
IPA	Instrumented Production Aircraft
IRST	Infra Red Search and Track

ISTAR	Intelligence Surveillance Target Acquisition and Reconnaissance
IWSSS	International Weapon System Support System
MIDS	Multifunction Information and Distribution System
MLS	Microwave Landing System
MHDD	Multifunction Head Down Display
NVE	Night Vision Enhancement
QRA	Quick Reaction Alert
RWS	Range While Search
S-A	Surface-to-Air
SEAD	Suppression of Enemy Air Defences
SPA	Series Production Aircraft
SPS	Secondary Power System
SRAAM	Short Range Air-to-Air Missile
STOL	Short Take-Off and Landing
TWS	Track While Scan
UCS	Utilities Control System
VTAS	Voice Throttle And Stick
VS	Velocity Search
WVR	Within Visual Range

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