

REVIEW

- Locked on to Success
- Qualifying Tranche 2
- First Line of Defence

General Jesús Pinillos Prieto:

Eurofighter Typhoon – The Answer

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RAF Typhoons Rip Through the Welsh valleys



Cover picture shows a Royal Air Force No. 3 Sqn Eurofighter Typhoon on a low level pass through the "Mac Loop" in Wales, UK

Photography: Tom "TJ" Hill

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Eurofighter Management Conference 2008



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New Eurofighter, new faces



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Aloysius Rauen
CEO Eurofighter GmbH



Dear Friends of Eurofighter Typhoon,

The remarkable achievements across the programme in 2007 were topped off in December with the full agreement of the Salam contract and the delivery of the Tranche 3 proposal to NETMA. We have hit the ground running in 2008, setting the pace for the tasks ahead of us.

All activities this year are firmly focused on securing the long-term future of Eurofighter Typhoon. The first Tranche 2 aircraft has flown and is now integrated into the Test and Evaluation programme where it will be worked hard to achieve Type Acceptance and first deliveries by Summer this year. The Tranche 3 negotiations have commenced and both industry and our NETMA customer nations will strive for contract signature at the end of the year. We expect strong political debate, but we are confident that our partner nations will commit to the third Tranche of the Umbrella Contract that they agreed in 1998.

Our partner Air Forces are flying the jets harder than ever before, with 15,000 flying hours accumulated in 2007, almost half of the 33,000 total in-service flying hours to date. The Italian Air Force, the Royal Air Force and the German Air Force have already placed Quick Reaction Alert responsibilities with Eurofighter Typhoon, with Spain to follow soon. Austria is due to begin Air Surveillance tasks in July. But this is just the beginning. Advanced weapon system capability is the driving force behind our targets of Tranche 2 Type Acceptance and a successful outcome to the Tranche 3 negotiations. Future Enhancements packages will elevate our Air Forces to be the very best in the world in terms of capability. The Royal Air Force are finalising their multi-role deployability while the Spanish Air Base at Morón, in mid-March, played host to a four nation joint exercise assessing aircraft interoperability.

This will, of course, be of tremendous benefit in export. Domestic confidence in the programme will generate intense global interest. Conclusively strengthening the core programme will undoubtedly ensure a capable, profitable and unbeatable product that will form the backbone of strategic operations worldwide for years to come. 2008 will not just be another year for Eurofighter Typhoon, it will be a decisive year.

Enjoy the issue.

Aloysius Rauen
Chief Executive Officer, Eurofighter GmbH

Aircraft from across the core programme's Air Forces on the flight apron at Morón Air Base, Spain



Four Eurofighter Typhoon Air Forces United in Exercise Strength in Numbers

For the first time, all four Eurofighter Typhoon core Air Forces from Germany, Italy, Spain and the United Kingdom combined their skills for a mutual exercise at Morón Air Force Base, near Sevilla, upon invitation of the Spanish Air Force. Code-named "Typhoon Meet", the deployment commenced on Monday 10 March and officially finished on Friday 14 March.

In total, 20 Eurofighter Typhoon aircraft took part in the exercise: the German Air Force deployed three aircraft from Fighter Wing 73 "Steinhoff" from Rostock-Laage; Italy's Gruppo XII 36 Stormo, based at Gioia del Colle, and Gruppo IX 4° Stormo, at Grosseto, both sent two aircraft; a total of four weapon systems came out of the Royal Air Force's No. 3 and XI Squadrons from RAF Coningsby; with the remaining nine already stationed at Morón as part of the Spanish Air Force's Gruppo 11 Ala 11.

The objective was to demonstrate the interoperability of Eurofighter Typhoon and its air-to-air capabilities while training with, and in mock combat against, other fighter aircraft types. While tactical aspects in realistic scenarios were evaluated, of equal importance was the inter-squadron comparisons with regards to maintenance and logistical support.

Eurofighter Typhoon flew in formations of up to twelve aircraft against fighters brought in from across the Spanish Air Force, including a combined ten F-18s from Ala 12, Torrejon, and Ala 15, Zaragoza, (supplying six and four respectively), as well as four Mirage F-1 jets of Ala 14, Albacete.

In addition, the Spanish hosts had invited the Portuguese Air Force to take part in the exercise, who brought with them four F-16 assets of 310 Escuadrón, Monte Real. The Spanish Navy also played their part with four Harrier AV-8Plus of 9 Escuadrilla, Rota. The Eurofighter Typhoon sortie rate for the "Typhoon Meet" was three per day, with a total of up to 70 different aircraft flying in the training areas over Toledo, Albacete and Huelva (Atlantic Coast) daily, which delivered an impressive operational scenario for the military experts.

Spain took up air surveillance tasks in 2006 and is to follow with QRA duties this year. And Austria will start air surveillance tasks with Eurofighter Typhoon this summer.



From left to right: Test Pilots from the Royal Air Force, BAE Systems and EADS combine for flight test at Warton, UK

International Co-operation in Aircraft Development

Joint Flight Test

Eurofighter Typhoon is truly a product of industry and operator co-operation. Nowhere is this more evident than in the Test & Evaluation teams from across the partners. This joint approach was demonstrated recently when test aircrew from EADS Military Air Systems in Germany and the Royal Air Force supported crucial flying tasks utilising all four of the BAE Systems-operated aircraft stationed at 4 Hangar at their Warton facility, United Kingdom.

Their combined efforts covered a whole range of Main Development tasks. The EADS contribution focused on providing support to the Block 8 Entry into Service programme which included air-to-surface, radar and Defensive Aids (DASS) testing. The BAE Systems and Royal Air Force crews meanwhile dedicated their attention to the now completed laser

designator pod trials using Instrumented Series Production Aircraft One (ISPA1, or BT005 of the RAF).

Mark Bowman, BAE Systems' Typhoon Project Test Pilot commented: "It has been a pleasure to again work so closely and productively with both the customer and our industry colleagues. Not only does this expand the knowledge base of the evolving product across the whole programme, but also exposes other Eurofighter Partner Companies to the integrated way the United Kingdom has adopted to the design/development/operational test cycle. In support of this, aircraft availability has been key where, on most days, all four aircraft have been made available to the flying programme"

Indian Air Force Chief visits Spain

Bilateral Force

In support of the ongoing campaign to export Eurofighter Typhoon to India, the Chief of the Indian Air Force, Air Chief Marshal Fali Homi Major, spent two days with the Eurofighter programme in Spain to be briefed on the production and operational aspects of the Spanish Air Force's newest weapon system.

Part one of Air Chief Marshal Major's trip took in the Final Assembly facilities at EADS CASA, Getafe, on 21 January. Hosted by Mariano Barrena, Key Account Leader at EADS Defence & Security in Spain, and Antonio Rodriguez Barberán, Director of Marketing and Sales at Military Air Systems, India's top Air Force official was given unrestricted access to Military Air Systems' production capabilities. Day two saw the Air Chief Marshal flown to Morón Air Force Base on the invitation of Colonel Machés, Base Commander at Morón, for a bilateral meeting between the two Air Forces. Although he didn't participate in any flying, a Eurofighter Typhoon display of aerobatics was organised in his honour where Air Chief Marshal Major was able to admire the aircrafts performance.



The India campaign, for the export of 128 multi-role combat aircraft, is set to hot up over the next twelve months. The flying evaluations will take place at the end of the year, possibly running into 2009, where each competing party is expected to place three aircraft in-country for a period of three months. The results of these evaluations will determine the three aircraft to be short-listed. The Indian authorities will

then assess the respective manufacturers' responses to the initial Request for Proposal (RFP), submitted already in early March this year, before a final decision is given.

Air Chief Marshal Major (3th from left) takes a guided tour of the EADS-CASA final assembly facilities.



Defence Attaché visits Eurofighter HQ

Austrian Guests

Austrian Defence Attaché (5th from left) at consortium headquarters, Germany

On Tuesday 05 February, a delegation from the Austrian Ministry of Defence in Vienna led by the Defence Attaché, Brigadier Magisto Andreas Mempoör, arrived at the Eurofighter consortium headquarters in Hallbergmoos, Germany, to meet with colleagues seconded to the programme.

Accompanied by Amtsdirektor Bruno Demmel, the two VIPs met with the four Aus-

trian representatives who are stationed with Industry and NETMA to assist in the process of aircraft acceptance into service with the Austrian Air Force. The group also received a status briefing from the Austria team headed by Programme Director, Peter Maute.

The procurement contract with the Republic of Austria covers 15 Eurofighter Typhoon weapon systems of Tranche 1 standard. The

first handovers took place in July 2007 following months of renegotiations on the original contract. By the end of 2007, five aircraft had been delivered to the Air Surveillance Wing at their Zeltweg Main Operating Base, with the remainder scheduled for delivery by 2009.

DA2 Relocates to the RAF Museum

Star Attraction

Just short of 14 years after its first flight from BAE Systems Warton, and a little over one year after its final landing at RAF Coningsby, Eurofighter Typhoon Development Aircraft Two (DA2) is now permanently residing at the Royal Air Force Museum at Hendon, United Kingdom.

The British-built prototype aircraft, a workhorse of the flight test fleet, is now proudly hanging at the front of the viewing gallery as part of the Museum's "Milestones of Flight" Exhibition.

DA2 arrived by road on Tuesday 22 January. Engineers from RAF Coningsby and RAF St. Athens assembled the aircraft, initially putting it on display on the ground in the exhibition hall where it was to



DA2 in its final position at the RAF Museum, Hendon



The lifting process begins



DA2 was temporarily displayed on the exhibition floor prior to suspension

remain over the following eight weeks while the engineers planned the rigging and hoisting process. Finally, on 19 March, the team put their plans into operation and slowly lifted Eurofighter Typhoon DA2 into its final dramatic position in the Milestones of Flight gallery.

As the "black" Typhoon (the aircraft was painted black in order to hide the 490 pressure transducers), DA2 was at the forefront of developing the carefree handling aspects of the Flight

Control System. Its edge-of-envelope work meant that it was the only Eurofighter Typhoon to be fitted with the anti-spin gantry.

The full scale replica model that DA2 has replaced is scheduled to be erected on poles outside the museum as a "gate guardian".

Eurofighter Management Conference 2008

LOCKED ON TO SUCCESS

All eyes were on Munich on 13 March as the key decision-makers from across the Eurofighter consortium converged in Southern Germany to discuss the programme status and the way ahead. Almost 90 managers from Alenia Aeronautica, BAE Systems, EADS Deutschland, EADS CASA and Eurofighter GmbH took part in the Locked On To Success management conference together with the members of the Supervisory Board. The special guest was Werner Sabarz, Deputy General Manager of NETMA.



"After a successful 2007, major steps lie ahead in the programme, so the time to meet is right," said Aloisius Rauen, CEO Eurofighter GmbH, in his opening remarks.

"It's all about people, as we need a common understanding, what we have to do, who does it and who is responsible for it. We have innovative technology and a competitive product. We need a joint and efficient approach to satisfy the customer."

Werner Sabarz made it very clear in his presentation that efficiency is the main concern, demanding more cost reduction and improvement of processes. The area of Integrated Logistic Support has received a tremendous amount of industrial attention as part of the reduction process. Consequently, the customer is happy with the development of the Aircrew Synthetic Training Aids (ASTA) programme and the so called Neuburg approach which have already yielded improvements, and therefore cost reductions, in areas such as Defensive Aids and radar maintenance. Mr Sabarz also called for a more transparent contract structure in the area of Logistic Support as a joint initiative between NETMA and the industry.

In his presentation, Maurizio De Mitri, Chief Operating Officer Capabilities, focused largely on the transition of Integrated Logistic Support. Two major objectives determine the industrial ILS strategy: more reduction in respect to cost of ownership; and provision of higher operational availability. These goals are to be achieved through four workstreams:

1) Management of Changes and In Service embodiment, representing aircraft modifications and retrofits as well as modifications in other areas like ground equipment or training aids. Main responsible player in this is the National Partner Company, supported by Eurofighter GmbH.

Eurofighter CEO calls for a "joint and efficient approach"



2) Improvements in the equipment supply chain leading to common logistic support based on National Performance-related requirements and specifications with more management authority of Eurofighter GmbH.

3) Streamlining of processes and contracts is a central task of Eurofighter GmbH leading to a new contracts suite in the support area reducing existing complexity of contracts and increasing efficiency.

4) Improvements in the Air Forces' operations by strengthening engineering services leading to common technical support in all nations through the National Support Centres.

Eurofighter's Chief Financial and Commercial Officer, Victor De La Vela, underlined that the business opportunities in the programme are immense. Brian Phillipson, Chief Operating Officer Programmes, highlighted recently achieved milestones including the agreement of Main Development Contract closure and the completion of all Tranche 1 weapons testing including the integration of a Laser Designator Pod for the Royal Air Force.

Questions and Answer periods were intensively used for discussions amongst the participating managers demonstrating the overall success of the initiative.

Wolfdietrich Hoeveler



Top: Aloisius Rauen presents to the Programme Managers

Middle: Werner Sabarz, Deputy General Manager of NETMA, speaks at the conference

Bottom: The Board of Management listens intently to the conference presentations

Flight Test Fleet Powering Ahead

Qualifying Tranche 2

As Instrumented Production Aircraft Seven (IPA7) touched down at EADS Military Air Systems' Manching site following its first flight on 16 January, the target of Tranche 2 Type Acceptance was fixed firmly in the sights of the Eurofighter Test & Evaluation teams. IPA7, as the first Tranche 2 Eurofighter Typhoon, and IPA6, essentially a Tranche 1 aircraft but one which is loaded with the computer suite and avionics of the second Tranche standard, will be leading the charge to attain the certifications required for delivering the next batch of 251 weapon systems into operational service.

Although IPA7 was put into a Pause phase throughout February as it underwent upgrades to its avionics, IPA6 has been building up the air miles most notably in ASRAAM integration tests, flying in co-operation with IPA1. In further firing evaluations,

AMRAAM and IRIS-T for air-to-air combat, and Paveway II, Enhanced Paveway II, GBU-10 and GBU-16 for air-to-ground tasks. Lending their presence to Tranche

2 testing further, several IPAs have, in recent weeks, been heavily and successfully involved in Equipment qualification. The Computer Symbol Generator (CSG) and the Identification Friend/Foe (IFF) transponder have been put through a rigorous evaluation procedure to ensure the correct tagging of other airborne platforms. Additionally, the Interface Processor Unit (IPU), the system that deals with all Bus traffic between aircraft systems, has undergone a series of tests assessing correct maintenance recording and failure tracking.



The gap between stores through which the AMRAAM C5 must safely pass

IPA2, the Alenia-operated aircraft, has been carrying out important AMRAAM C5 separation tests. The objective was to check on the safe jettison of the missile in relation to other stores ensuring that, on launch, a safe distance is achieved between the weapon itself and the Paveway II store still loaded on the inboard pylon of the aircraft. Both the jet and the missile performed flawlessly. The successful test flight, conducted by Alenia Aeronautica at Decimomannu Air Base, Sardinia, means that all required weapons for operation with Tranche 1 are now cleared, including AIM-9L, ASRAAM,

As the workload for Tranche 2 increases, the number of tasks remaining in order to complete the Main Development Contract (MDC) is shortening. By the end of 2007, Service Release Package 4.1 (SRP 4.1), the last evaluation segment of the MDC, was nearing finalisation with just a handful of customer re-fly requests outstanding. IPA1 completed both the Autopilot assessment as well as the Official Assessment of the air-to-air Handling Qualities. At the end of February, IPA3 took to the skies at Manching for work on the Limited Change Capability 4.1 (LCC 4.1) of the Flight Control System (FCS).



IPA2 airborne during AMRAAM C5 separation tests

This is a NETMA-approved initiative where, under controlled flying parameters, only certain sections of the FCS are tested within the entire system. This technique is proving to be much more efficient than standard bench-testing of upgraded software, where the entire software package is examined, and ensures that the Flight Test programme retains all its assets.

Elsewhere across the programme, ISPA1 (the Series Production Aircraft BT005 of the Royal Air Force) has been involved in the assessment of the Head Equipment Assembly (HEA). Utilising Air Force pilots from the partner nations, the Night Vision Enhancement goggles have been put through their paces on the HEA MK II+. ISPA1 is also deployed with the Combined Test Team (CTT) for joint industry/Air Force tasks, especially where the integration of air-to-ground munitions is concerned. As well as avionics integration for the Enhanced Paveway II bomb, the CTT has, at the end of February, conducted a live laser firing of the Laser Designator Pod (LDP). Although the Enhanced Paveway II is scheduled for future integration, the LDP work is considered highest priority under the banner of Change Proposal 4.2 (CP 4.2), otherwise known as the "Austere capability", along with the full integration of the Paveway II laser-guided weapon.

Making up the rest of the team, IPA4 has just returned to operations following its 400 flight hours inspection and will now progress on to Multi-function Information Distribution System (MIDS) testing. IPA5's notable contributions have come on the Defensive Aids programme, assessing the threat prioritisation of the DASS system.

Phillip Lee

Acquisition, Negotiation, Delivery

New Eurofighter, New Faces

2007 saw the major overhaul of the internal structure at Eurofighter GmbH. The resulting streamlined organisation, reducing from nine directorates to just three, also took influence from the new philosophy at the heart of all contract work – Acquisition, Negotiation, Delivery. Playing their significant parts in the re-structured programme are Maurizio De Mitri, Chief Operating Officer Capabilities, and Victor de la Vela, Chief Financial and Commercial Officer. Both took the time to speak to EF REVIEW to discuss their achievements during their first year at the helm and where they hope to steer the programme through its next phase.



Introducing:
Maurizio De Mitri,
COO Capabilities

From a starry-eyed student dreaming of one day joining the aeronautical world, Maurizio De Mitri

began his professional aerospace career as a Commercial Executive on the Tornado programme at Aeritalia, now Alenia Aeronautica. Moving up through the Commercial ranks, Mr De Mitri soon established himself as Commercial Director for Military Aircraft becoming a major force in Alenia's Military Programmes of Tornado, Eurofighter Typhoon, the C-27J transport aircraft, the ATR 42 Maritime Patrol aircraft and the Harrier. From 1995 to 1998, he operated in the role of Programme Director for Eurofighter Typhoon at Alenia, and then on to Head of the Combat Aircraft Business Unit. In 2004, and for the subsequent three years, Maurizio De Mitri was Managing Director at Panavia Aircraft GmbH before finally landing the role of Chief Operating Officer for Capabilities within the Eurofighter consortium. Ten months later, he sat down with EF REVIEW to discuss all things Capabilities.

The re-organisation of Eurofighter GmbH has seen the company streamlined into three programme areas. What was the rationale behind this?

Reducing the organisation into three pure areas, Programme, Finance & Commercial and Capabilities, demonstrates the change into an organisation that is more efficient and more effective. In other words, an integrated organisation, because three directorates interact much more effectively than nine separate teams. This is the idea. We have more of a focus on programme objectives with clear and integrated targets to be achieved. Of course, running simultaneously is the drive to reduce overall programme costs, and this goes hand-in-hand with lowering the number of people in management positions.

Integration is the key then?

Exactly. Better integration is the mission of the new organisation. Something that is particular to the aerospace and defence business is that we share expectations not only in contract delivery, but also product delivery, and by this I mean to deliver capability to the customer to operate the Eurofighter Typhoon as a complete Weapon System. This is the essence of my function.

How would you define capability?

My interpretation of the role of Capabilities is to align product capability with customer expectations. We are managing the development, production and in-service support, and the relevant contracts, of the Eurofighter Typhoon weapon system. Our goal is purely and simply to deliver the contracted capabilities to the customer i.e. a weapon system which is not only able to fly, but one that is capable to perform missions and be supported through a comprehensive in-service support system. The integration of in-service support is as critical as any other factor in the overall programme in delivering capability. From an industry point of view, we have been good in delivering development contracts, production contracts and in performing within the Initial Logistics Support contracts. This places the aircraft in the hands of the Air Forces. What we are now striving to do is to deliver the operational capabilities and a sustained in-service support in order for the Air Forces to fulfil their mission responsibilities.

We're almost 12 months into the life of 'New Eurofighter'. What have been the major achievements in that time?

We have recorded significant achievements in 2007 and are continuing in that vein in 2008. I believe 2007 has been a very important year for the programme, in that we have issued the operational performance for Service Release Package 4.1 (SRP4.1) which, in real terms, means basic development is broadly completed. With the immense growth potential of our product, there will be future upgrades, future enhancements to use the buzz word. There are some remaining activities which are still to be completed in the next phase of the programme, but the basic development of the aircraft is there.

Are you referring to the Main Development Contract (MDC)?

Yes. Basically, the obligations under the Main Development Contract have been fulfilled. We have delivered the requested evidences and documentation and have provided the customer with an Overall Weapon System Assessment in relation to the performance capabilities which have been achieved. This is very important because, although it brings the curtain down on a tremendous amount of work, crucially it has laid the foundation for future enhancement activities. There are new upgrades, new developments in the pipeline. What we have accomplished is to have developed an outstanding and capable platform, and one which has the growth potential to receive further upgrades in order to reflect the state-of-the-art in terms of technology and weapons.

Additionally, we are about to complete the core programme's Tranche 1 delivery, another very important achievement in 2007. Although we still have a few Tranche 1 standard jets to be delivered, in essence, we have completed the basic production of the aircraft.

Looking ahead, we have put in place all the activities in order to be able to start the delivery of the Tranche 2 aircraft this year. We have been able to sign the Salam contract for deliveries to the Kingdom of Saudi Arabia which, after the Austria contract, gives the programme's international prospects a further enormous boost. In achieving this contract, we have supported

the negotiation team by bringing to the table all the technical capability aspects. We had to, for example, support them in terms of defining the technical specifications, aircraft delivery plan and in-service support for the Salam product. This is something generated by us in Capabilities.

You described your involvement in the Salam negotiations but, in terms of the core programme, how much interlinking is there with the Commercial and Programmes directorates within the new structure?

This is one of the key points in creating the new organisation. We need to work in an integrated environment because, for example, any decision taken in the technical area has an impact in the other areas and vice versa. If you look at the business process from programme acquisition to programme delivery, you will see that there is always a need for each Directorate throughout. In the contract acquisition phase, Capabilities' input is critical in defining what kind of product we, as a whole, can deliver. It is also important to note that in the case of there being no specific requirement from the customers, our role is also to generate such a requirement by examining the overall scenario and defining a proposal which could attract their interest. In case operational requirements are defined by the customer, it is Capabilities which is outlining the best solution.

As Commercial build a price proposal, our contribution is delivering the technical documentation in the form of annexes to be discussed with the customer during the negotiation. Once the proposal is received by the customer, we move into contract negotiation. Here, we support the Commercial team in conjunction with Programmes in trying to negotiate the best balance between technical, programme and commercial issues. After the contract signature, while discharging our obligations, our responsibility in Capabilities is to really manage the Partner Companies and the Supplier work in order to deliver the contracted product/ services thus ensuring that the Programmes team can deliver them to the customer. Careful management of this phase is of utmost importance. All programmes go through difficult periods but strong management can turn all positions positively.

Should we, as an organisation, fail to meet all criteria of a contract, the Capabilities and Programmes organisations enter into the joint Risk Management process, where alternative options to mitigate the problem will be identified. Then, in co-operation with Programmes, we decide which is the most suitable solution that can be implemented in order to ultimately achieve product/service acceptance from the customer.

In the phase of contract acquisition, you describe how your teams respond to customer requirements. Putting this into an export context, for example, should a nation request a capability not currently under contract in the core programme, can you still deliver?

Export is a very specific area demanding special attention. In the core programme, we have one customer, a clear customer, which is NETMA representing the core nations. In export, the customer is the potential market. We, as Capabilities, working with the export analysts, identify the possible requirements emanating from the market and our contribution is to then identify a product which can be offered to the market. In the instances where there is a clear demand, we contribute in developing the proposal and discussing what kind of product and what kind of services we are in a position to deliver.

In this respect, I would like to highlight one very important accomplishment from December last year. We have, in cooperation with Export Support, produced the "Product Export Strategy", which is the first of its kind in the programme, and which represents what we are able to offer into the market, recognising also the inter-linkage with the core programme. It highlights the potential customers and their respective requirements and, based on those scenarios, what we as Capabilities are in a position to offer.

Does the document also account for future capabilities?

Absolutely. Not only do we take into consideration what is the state-of-the-art today, but also what we are already developing for the core programme in the future. This includes the Phase One and Phase Two Enhancements (P1E, P2E) and, in addition, the predicted requirements identified in the wider market. Our "Product Export Strategy" also handles the economic and technological market requirements, namely Offsets and Industrial Participation. The national industries in the potential Customers can be assured that they will benefit from technology transfer as well as potential involvement in future capabilities development.

How can we further improve on delivering capability to the customer?

Our first priority is to ensure aircraft availability. We need to maintain close relationships with the operators to understand how they are using the aircraft and any difficulties they are encountering in-service. We must then work together through the International Weapon System Support System (IWSSS) to recover in-service issues in order to ensure that we are delivering a high-availability weapon system. This is

very important. We are generating an "Availability Report" which covers these issues, highlighting that our attention is not only focused on contract delivery but also on responding to customer needs. I believe that our In Service Support function must play a key role in this, while we must also utilise this channel for discussions on future upgrade programmes. There is already a close co-operation with the core customer in identifying the areas for future capabilities in Tranche 2 and Tranche 3, and it's with this industry/operators integration that we could improve our performance in delivering capabilities.

Do you envisage the change at the top of NETMA affecting the transition in the Support System?

No, not at all. On the contrary I believe that the new Management in NETMA could positively contribute to this process. One of the big achievements in 2007, and which is ongoing in 2008, is the transformation of the Integrated Logistics Support. We are developing the future In-Service Support (ISS) strategy detailing how we manage the support in the future through recognition of the expectations from each individual nation. If we talk about affordability, we need to look for efficiencies together with effectiveness i.e. reducing the total cost but improving aircraft availability. In this ILS strategy, there is a trade-off between national support policies and national expectations. The cost-saving measures are also achievable through economies of scale in an international framework, working towards a shared investment, and, consequentially, working in an integrated overall ILS environment.

When do you hope to roll the strategy out?

The Industrial Strategy is finalised. We have started promoting this strategy to the customer. I believe that it is in line with the nations' strategy and in line with the international programme needs. We are not simply developing, we are not simply producing and we are not supplying simply in-service support to the aircraft but we are thinking strategically. And strategic integration. That is our mission. We have a revolutionary weapon system and now we are developing capabilities in an integrated environment and this is the way forward.



Introducing:
Victor De La Vela,
Chief Financial &
Commercial Officer
(CFCO)

In terms of programme of work, Victor De La Vela's professional career

has gone full circle having started at CASA in Spain on the Eurofighter project. He switched to civil programmes after two years, where he operated for twelve months before emigrating to the United States for an engineering role supporting CASA's contracts with the McDonnell Douglas company. During his six years in America, Victor De La Vela made the transition to a more business-oriented role, becoming responsible for a wider range of aspects in the aerospace programmes. Mr De La Vela's area of work gradually enlarged to the Boeing Company and had the privilege of witnessing the Boeing-McDonnell Douglas merger. It was around this time that Franco, German and Spanish aerospace interests combined to form EADS, convincing Victor De La Vela to return to Europe where he became Vice-President of Mergers & Acquisitions at EADS' Paris Headquarters. From EADS, he led the UK Future Strategic Tanker Programme (FSTA) and headed a Private Finance Initiative (PFI) to the banking competition stage (just before the contract signature), progressively adding Corporate Business Development to his repertoire, before accepting the opportunity to head all monetary and contractual matters of the Eurofighter programme. EF REVIEW listens as Victor De La Vela talks Finance & Commercial.

As of 01 May last year, the restructured organisation saw the departments of Finance and Commercial merged into one powerful directorate. What was the driving force behind this decision?

I think there was a dynamic here where the Contracts department was trying to deliver what they thought was a good contract, but without proper consultation with the Financial side of the company. For example, I don't think there was a clear assessment of the financial risk when we were signing a contract. Now, all the teams from the Contracts, Legal, Finance, Controlling and Pricing departments work under the same umbrella which encourages everybody to talk. Today, when I authorise the signature of a contract, I do it on behalf of all of them, meaning that the document has received departmental approval from all corners of the directorate.

It's a big challenge culturally in the company but it is working much better each day.

Your new process encourages more interaction?

Exactly, and now it's mandatory. There is no excuse for overlooking the people from any department, because, when we sign a contract, we do so safe in the knowledge that all aspects are satisfactory for the Company, the Terms and Conditions, the payment plan, the associated risks, etc. In the past, it wasn't structured like that and that's a big improvement.

What are the major objectives over the next, lets say, two or three years for your department?

There are a number of challenges that I would like to mention. The first one, very clearly, is the Tranche 3. The teams in my directorate are heading the Tranche 3 negotiations on behalf of the Eurofighter consortium, so we are, in effect, responsible for the successful completion of the contract. This is the biggest target right now.

Another objective is the Main Development Contract (MDC) closure. We are on the threshold of wrapping up the MDC and are working hard to ensure the contracts for further development after the MDC are correctly structured.

We have another target in creating a proper new contractual framework for the Support Contracts. At the moment, we have too large a number of very different contracts, which require a lot of resources and effort to manage. We believe a uniformed contract structure is much easier to manage and is the sensible way forward.

The MDC closure is also a top priority in Maurizio De Mitri's Capabilities directorate. In what way are you both working together to conclude that contract?

The new organisation is set up in such a way that, with every area of work, one of the three directorates will have a leading role backed up with the support of the remaining two. One can not move without the others being aligned. For decision-making on critical items, the first interlinkage is to be found in the Eurofighter Board of Management. The initial discussions begin there, from which our respective teams work together on the direction we decide to take. Just as an example, this morning I chaired the Contract Review Meeting where we discussed the MDC closure again and, as usual, among the attendees we had the Programmes and Capabilities Chief Operating Officers ensuring the full co-ordinated support among the directorates. The new organisation represents properly co-ordinated

decision-making, but also gives accountability and clarity on how we, as a company, need to progress.

Where does Finance & Commercial fit into the three point strategy of Acquisition, Negotiation and Delivery?

Let me tackle this in reverse order and begin with contract delivery. In this end phase, the basic premise is we must deliver on an agreed contract, and here the Programmes directorate has to take the lead. However, we will be supporting Programmes because, during the life of a contract, there will be amendments and changes that require Commercial participation. Going back further in the process, we have the contract negotiations phase. This is the area where my directorate will take charge, covering the time between identification of a potential contract till the moment we sign the contract. If I go right to the beginning, contract acquisition is the phase where we evaluate what can be offered to the customer. This means the Capabilities team. They identify what is feasible and look to create a real opportunity of where we can deliver. In summary, we clearly lead the negotiation point of the strategy.

Ten months have passed since the organisational restructuring. What have been the major achievements in this period?

Delivering the Tranche 3 proposal in December and the clarifications in February, both on time, has been the big achievement. Everybody, including the colleagues in the Eurofighter Partner Companies (EPCs), has been working very closely to meet the timescales. Other achievements in these ten months include the signing of the contractual documentation regarding Project Salam. That was a big challenge because it was a multi-layered agreement not only with NETMA, but later with the Prime Contractor which, in this case, is BAE Systems, and then flowing out the contract through us to the EPCs. Overall, it was a big challenge.

Financially, we have just closed the accounts for 2007 and I am happy to report that this was a very good year financially speaking. In summary, the directorate has demonstrated a very solid performance, which is the result of the deliveries of a very capable team.

You have already mentioned Project Salam, but how much input and support do you give in terms of export campaigns?

We have an Export Support department here headed by David Richardson. When there's a campaign, the Export team co-ordinate with the EPCs up to the point where a

Request for Quotation (RFQ) is required to be sent, and then the Commercial teams begin the standard Commercial procedure (the bid approval process) engaging with the EPCs and discussing with them the conditions from which the prices will be given. I would like to add that Export is something that I think the Eurofighter community should pursue more aggressively. We have a very good product that, if it is priced correctly to be competitive, can win important campaigns. The message I want to send to all the Eurofighter stakeholders is that we all benefit from any export successes. Job creation, full order books for our suppliers, and the benefits to the programme itself need to be more appreciated.

A lot of emphasis at the moment is placed on Future Capabilities. How is the Finance & Commercial directorate involved in preparing the programme for this?

The capabilities discussion is not driven by the consortium, but is rather driven by the customer because they want to have capable aircraft. Our responsibility is to ensure that we can support commercially those discussions. Once we are clear on what the customer is looking for and what the industry can provide, we enter the negotiations and attempt to sew it together financially. We are talking about further aircraft development which, at the end of the day, presents its own risks, so we need to be very mindful of the contractual obligations and to always consider providing value for the money. Although we do not initially lead these discussions, we become involved in the game very early, because any requirement eventually becomes a Commercial effort and a contractual obligation.

How can we further improve on delivering value to the customer?

As I mentioned before, we have a high number of contracts to support the aircraft which are, in my opinion, way too many especially when you consider that each one has different Terms and Conditions for similar products/services requiring a huge effort to be ready to discuss any issue or to carry out an amendment. The same applies to the customer side, representing resources and money that could be better allocated elsewhere in the programme. This is only one example, but we realise there are many other potential ways to improve the efficiency in the programme. Eurofighter is looking at these issues very seriously and we are aiming to bring to the table a number of initiatives to satisfy the customer's demands for cost reduction in the overall programme.

Interviews by Phillip Lee

New Face of the Customer

NETMA Changes

The Eurofighter programme has entered perhaps its most important phase. Tranche 3 is the hot topic throughout the consortium with all stakeholders firmly focused on securing the contract to be able to deliver the third tranche of Eurofighter Typhoon aircraft to the nations. The customer, the NATO Eurofighter and Tornado Management Agency (NETMA) have, for their part, injected fresh life into the negotiations following a raft of changes at the top of their management structure.

General Manager: **Lt Gen Antonino Altorio**

Before being appointed by NATO's General Secretary to be NETMA's next General Manager, Lt Gen Altorio held the position of Logistics Commander for the Italian Air



Force, from June 2005, at their Headquarters in Rome. Earlier, beginning in October 2002, he represented the Italian Military to NATO and EU Military Committees in Brussels, this coming after his stint as a member of the NEFMO Board which gave Lt Gen Altorio his first experience of the Eurofighter programme. He has accumulated around 3,000 flying hours on several types of aircraft and helicopters, and recently had the pleasure of flying Eurofighter Typhoon.



Deputy General Manager:
EDiBWB Werner Sabarz
Supporting the NETMA leader is Werner Sabarz, the former Head of the Project Division Air in the German

Federal Office of Defence Technology and Procurement (BWB). In his former role, he was responsible for the procurement of all aerial and space vehicles of the German

Armed Forces, including the Eurofighter Typhoon weapon system. Prior to that, Herr Sabarz directly participated in the Eurofighter programme as Head of the German Delegation in the NEFMO Board between 2003 and 2005.



Director of Operations and Engineering:
MGen Juan Antonio Dorronsoro

His re-appointment at NETMA marks a return to a former office for MGen

Dorronsoro having already been in the employ of the customer between 1993 and 1996. Since then, he has been responsible for the Personnel, Logistics, CIS, Financial, Engineering and Support Group for all Headquarter activities of the JFC in Brunssum, The Netherlands. Following this, and before his return to NETMA, he held the position of Advisor to the Chief of Air Staff, responsible for Logistics and Eurofighter Typhoon matters.



Director Commercial:
Mr Grant Morris

Mr Morris is a senior manager who has developed a combination of specialist skills balanced with a wide experience gained from a number of policy appoint-

ments. Between 2006 and 2007, he was the professional head of all Commercial staff in the United Kingdom Defence Logistics Organisation. In the year prior to his appointment as Commercial Director at NETMA, he held the position of Director General Commercial (Projects) in the United Kingdom Ministry of Defence.

Phillip Lee

By General Jesús Pinillos Prieto

Eurofighter Typhoon - The Answer!

"The defence policy of a nation is based on two pillars, dissuasion and diplomacy. When both fail, it is necessary to look for the answer in the will and the resources to achieve the victory".

The former Chief of the EF2000 Programme, and now General Sub-Director for Planning and Programmes at the Armament Procurement Directorate of the Spanish Ministry of Defence, heralds the arrival of Eurofighter Typhoon into the ranks of the Spanish Air Force.

Eurofighter Typhoon, in simple terms, could be described as a complex and lengthy project, a controversial modernisation programme plagued of technical, political and economic possibilities, and a very expensive initiative that has, over 20 years development, revolutionised defence but one that, as a result, has produced a splendid combat aircraft. But the real dimension of the programme is much more ambitious. Throughout this article, I will try to show that the Eurofighter programme is something more than just the design, development and production of one of the most advanced weapon systems in the world. Eurofighter Typhoon is, first of all, central to the strategic transformation of Spanish defence policy and, second, is the answer to the

operational demands and modernisation of our Air Force and a key player in the transformation and consolidation of the Spanish defence industry.

A strategic component of the Defence Policy

The Statutory Law of Defence, 5/2005, the National Defence Directive of 2004 and the Strategic Defence Review of 2002, are the foundations of all Spanish defence policies. They establish the minimum requirements and the critical capabilities of the Armed Forces and, as a consequence, those of our Air Power and its equipment for the next decade. The Strategic Review takes into consideration potential future demands that will be placed on the Spanish Air Force, for example responding to asymmetric conflicts, the fight against the terrorism, humanitarian

aid missions as well as the internal challenge to sufficiently modernise the infrastructure to be able to adapt to these potential scenarios. The Air Force will have to be able to undertake peace missions, maintaining the capacity of dissuasion while simultaneously being able to offer rapid worldwide deployment in support of our allies.

The new strategic concept provides a balanced force with the essential and autonomous capacities for the independent defence of our national territories and vital interests, as well as being able to fully integrate into multi-national coalitions. A modern, flexible, dynamic and sustainable force that guarantees:

The superiority in the confrontation

Eurofighter Typhoon constitutes the most competitive and advanced weapon system



Pre flight checks at Morón

existing in the market today (the F-22, its only rival, is not exportable and weighed down with a price rendering it unattainable). The combination of sensors, armament, self-protection and communication systems, aligned with the Flight Control System in the overall sensor fusion, guarantees command & control networking and air

superiority over any threat. The platform not only maintains the edge in aerial confrontations, but its swing-role design provides the capability to destroy ground-based targets and threats, offering the early neutralisation of the enemy's Communication, Command and Control functions critically reducing their capacity in the fight.

Dissuasion

Eurofighter Typhoon is a key element in our dissuasion strategy. The aircraft's effectiveness in air defence aligned to its capability to execute swift and accurate attacks on any targets, with the immediate response provided by velocity and availability, without distance restrictions using the air-refuelling, is primed for spearheading our defence policies. The weapon system, boosted by its abilities in Defensive Aids, precision-guided strikes plus a soon-to-be-added stand-off capability, means that in our dissuasion strat-

egy, we have the adaptable platform at our disposal should the option to display force by exercised.

The technological superiority

A clear bid for the quality over quantity. The Eurofighter Typhoon next generation combat aircraft offers an avionics concept that will allow the easy integration of new emergent technologies. The growth potential has been an important part of its design and it is the next phase of enhancements that are under discussion for the aircraft configuration in Tranche 3. These include the possibility of incorporating an electronically-scanning radar, the capacity to operate in a network-enabled environment, and the possibility of integrating the new generation of radio communications tools, namely the JTRS (Joint Tactical Radio System) and the SAT-COM (Satellite Communications), which will allow the operators to exceed the present restrictions of the UHF system. Technological barriers do not exist in this weapon system, only those imposed by budgetary measures.

The co-operation

The military co-operation in armament programmes holds the advantage of standardisation across multi-national fleets, ensuring a higher degree of interoperability in the concepts of defence and security. The fact that three nations in close proximity to Spain are equipped with the same weapon system facilitates the co-operation and the convergence of efforts in combined operations.

Eurofighter Typhoon activities are ramping up in the Spanish Air Force

IPA4 conducts many test flights out of Morón Air Base



The answer to the operational requirements of the Spanish Air Force

From the point of view of operations, the Air Force have confidently selected Eurofighter Typhoon as the weapon of choice in a single type force structure for its capabilities in overcoming current and emerging threats. This aircraft is the force multiplier that, with just 87 assets, will replace the air power of the 150 airplanes, Mirage F1s and F/A-18s, currently in our inventory. The answer to the operational demands of the Air Force has to be a weapon system able to face any enemy, conventional or asymmetric, in any place of the world and be interoperable with the Air Forces of our allies. In order to achieve this, certain qualities must be in abundance:

Superiority

Eurofighter Typhoon is an aircraft designed to maintain the superiority in the air. The capacity of detection, identification and pursuit of a remote target, utilising the advanced Captor radar, FLIR and MIDS systems, multiplies by a significant factor the capabilities of one F/A-18. In addition, the weapon system's agility at supersonic speeds, coupled with its advanced missiles, AMRAAM and soon Meteor, enables it to neutralise multiple targets at distances where the aircraft itself is not vulnerable. In close-in combat, its manoeuvrability and power, displaying high instantaneous turn rates combined with an excellent Human-Machine Interface and advanced short-range missiles, ensures that this airplane is simply superior to the rest.

Precision

Asymmetric conflicts do not always offer easy to hit targets such as military installations and other such massive infrastructures. However, thanks to its laser-guided armaments and GPS, Eurofighter Typhoon can, under any meteorological conditions, achieve enormous precision and maximise the damage while, at the same time, avoid collateral effects such as own fleet losses and loss of innocent civilian lives.

Deployability

The Spanish Air Force must have the capacity to detach from the Main Operating Bases to hastily prepared outposts on a worldwide scale while maintaining the same standards of combat effectiveness. This deployability is an essential requirement for us in the future. The Eurofighter Typhoon is designed to operate from short runways (air-air configuration, 800 ft takeoff and 2,500 ft landing) and, backed up by the modular and easily transportable design of the support equipment, facilitates the requirement for expeditionary missions. Currently, although not at the same level of design maturity and accumulated flight hours of the F/A-18, Eurofighter Typhoon detachments leave a leaner logistical footprint than that of its predecessor.

Sustainability

For deployed operations, the Air Force must have a sustained maintainability. In the context of the evolving nature of modern con-



Royal Air Force has anticipated a Typhoon deployment to Afghanistan in 2008 and has been able to consolidate the logistical challenges in their rehearsals. In flight, the on-board sensors constantly relay information to the cockpit establishing a link between aircraft and pilot, informing him of sub-system performance and advising on any necessary corrective actions. Furthermore the design of the aircraft includes the NBC protection, intended as a combination of personal flight equipment, cockpit and conditioning sub-systems that increase survivability rates simplifying infrastructures and traditional equipment.

Playing a key role in the transformation and consolidation of the industrial sector

The recently approved Strategic Plan for the aeronautical sector recently identified innovation as an essential factor of Spanish industrial policy. The Eurofighter programme constitutes the single most important initiative in the history of Spain's aeronautics

always have a tendency towards satisfying domestic aerospace industries but economic reality is that the industrialist concentration of knowledge and assets around programmes of technological development inevitably is the best option. Co-operation is the only alternative to ambitious defence projects that will always have to overcome increasing costs combined with the incontestable trend of ever-decreasing budgets.

In the two last decades, co-operative partnerships have been created throughout the industry to answer the needs in aerospace, including Tornado and Eurofighter, Airbus in the sector of commercial aviation, Ariespace in for shuttles and satellites, and Eurocopter for helicopters. As a result of these initiatives, in which Spain has been able to participate, we experienced the consolidation of EADS (European Aeronautic Defence and Space Company) uniting the aerospace industries of Germany, France and Spain.

It can be said, without fear of exaggeration, that the Eurofighter programme has been one of the main drivers of Spain's aerospace sector. The Ministry of Defence launched this ambitious Research and Development project in the 1980's, while it was also supporting the production of CASA's military transport aircraft C-212, CN-235 and C-295. The result has been the one of a consolidated aeronautical sector, setting in motion a continuous evolution and an accumulation of intellectual capital, a true investment with the promise of a strong and profitable future.

Without a doubt, the Eurofighter programme has been essential in the integration of the European aeronautics industry. In addition, in the area of Research and Development programmes, it has unquestionable economic importance in its return on investment. The Eurofighter programme has promoted new and innovative companies such as ITP (Industria de Turbo Propulsores, S.A.), CESA (Compañía Española de Sistemas Aeronáuticos, S.A.), the electronics firm Tecnobit, and has also been a regenerating force behind companies like IN-DRA, Espelsa, Gamesa and Spain's own Institute of Technology, INTA, all of whom compete in the most challenging European collaboration projects. More than 15 Spanish companies directly supply to the programme and as many as 300 are operating as indirect participants, with a potential of 22,000 people invested in the programme. Additionally, thanks to the established co-operation agreements, 99.5% of Spanish companies directly supply to the programme and as many as 300 are operating as indirect participants, with a potential of 22,000 people invested in the programme. Additionally, thanks to the established co-operation agreements, 99.5% of Spanish companies directly supply to the programme and as many as 300 are operating as indirect participants, with a potential of 22,000 people invested in the programme. Additionally, thanks to the established co-operation agreements, 99.5% of Spanish companies directly supply to the programme and as many as 300 are operating as indirect participants, with a potential of 22,000 people invested in the programme.

and defence sector and has been a catalyst for a succession of alliances and co-operative projects that have elevated our industrial base over the last few years.

Eurofighter Typhoon is the product of international co-operation, a result of the best method fulfil the need for national defence with sensible economic considerations. Re-allocating national defence requirements will



IP44 lands at Morón

flicts, there is a requirement in addition to the necessary transport to substantially reduce the logistical footprint while simultaneously increasing weapon system availability. In Eurofighter Typhoon, the reliability of its components offer a performance ratio of nine maintenance man-hours per flight hour, half that of the F/A-18, suiting the aircraft for overseas operations. The

Major General Paolo Magro welcomes Brigadier General Norbert Huber

Italian Air Force Strengthens Eurofighter Relationships

Meeting the Partners

As a founding partner of the Eurofighter programme, and the first of the four Air Forces to elevate Eurofighter Typhoon to Quick Reaction Alert (QRA) status, the crews of the Italian Air Force are fully qualified to be able to share experiences and offer operational knowledge. The increasing maturity of the weapon system has seen a marked rise in the frequency of joint training exercises between the partner Air Forces, and 36 Wing's visit to RAF Coningsby in December was one of them.

As part of this trip, four aircraft from XII Interceptor Fighter Group at Gioia del Colle Airbase joined up with the Royal Air Force's XI Squadron at their Lincolnshire Main Operating Base. For the newest Eurofighter Typhoon Wing of the Italian Air Force, having only officially formed in October 2007, the deployment to RAF Coningsby proved to be an excellent demonstration of the Wing's ability to maintain aircraft availability while on foreign soil. In fact, over the course of the trip which, as well as flying sorties with XI Squadron, also took in exercises with Tornado GR4 aircraft at RAF Marham and with USAF F-15s at Lakenheath Airbase, the 36 Wing delivered a 100% operational availability rate, with no mission abandoned on technical grounds.

While co-operation on Eurofighter Typhoon at Air Force level is on the increase, collaboration with industrial partners has long been regarded as the norm. And so it was with the Italian Air Force when, with the participation of Eurofighter Partner Company, Alenia Aeronautica, they undertook a two week "deep assessment" of their newest weapon system at Decimomannu Air Base, Sardinia, in December.

Under the guidance of Pratica di Mare's Experimental Test Unit, around 25 varying operational scenarios across 60 hours of flight were conducted to assess tactical AMRAAM engagements under different operational conditions. Four jets in total, comprised of three out of 4° Stormo from Grosseto and Instrumented Production Aircraft Two (IPA2) from Alenia, were employed for the evaluations which included typical air-to-air combat missions of one-versus-one, one-versus-two, two-versus-two and even one-versus-three.



An Austrian Delegate tests the Cockpit at Grosseto

IPA2 was fitted with Autonomous Air Combat Manoeuvring Instrumentation (AACMI) to record flight data. Results have revealed several new elements which have put the Italian Air Force at the forefront of capability and tactics development on Eurofighter Typhoon. This will be advantageous to the other partner Air Forces and highlights the shared community spirit amongst the customer operators.

In February, a high-ranking strategic summit took place in Vienna with the Chief of Staff of the Austrian Air Force, General Edmund Entacher, hosting his Italian counterpart, Lieutenant General Daniele Tei. The main discussion points were Eurofighter Typhoon air surveillance and defence between the two neighbouring nations and, of equal importance, the need to pool knowledge and put in place common directives on the topics of logistics and support for the weapon system in this role.

Having had over two full years of QRA experience with Eurofighter Typhoon, the Italian Air Force are able to offer a wealth of advice on building up air defence squadrons with the jet. The Austrian Air Force on the other hand only took delivery of their first aircraft in July 2007 and, with five aircraft in their ranks by the end of the same year, are still working towards an operational level. Securing the on-ground infrastructure to support the aircraft is as important as training the pilots for a new squadron. General Entacher and Lieutenant General Tei talked in-depth over these issues, more specifically on the future collaboration in the field of advanced military pilot training. The Chief of Staff from Italy offered full



availability of the Italian Air Force to share experiences and knowledge in the training of military pilots.

This invitation was promptly accepted and, during the week of 10 March, an Austrian Ministry of Defence delegation, headed by Brigadier General Norbert Huber, landed at Pratica di Mare Air Base for a week of information gathering and knowledge sharing.

Guided by Major General Paolo Magro, Chief of the Italian Air Force General Staff, the Austrian visitors continued their tour taking in 4° Stormo at Grosseto, the first operational Eurofighter Typhoon wing of



The Austrian Delegation arrives at Grosseto

the Italian Air Force; the Aircraft Maintenance Unit (RMV) at Cameri Air Base; before rounding the trip off with a presentation from the Air Combat Training squadron (RSSTA) at Decimomannu, Sardinia.

Along the way, summit meetings with the requisite Commanders and Squadron Heads helped to further the discussions that were initiated in Vienna, maintaining a focus on aircrew and ground crew training and logistic support of Eurofighter Typhoon.

The week in Italy concluded this round of bilateral talks between the two Air Forces. Overall, the meetings were conducted in a cordial and collaborative climate.

Phillip Lee



Fighter Wing 74 Cruise to a Flight Milestone

1,000 and Climbing

As operations ramp up with Eurofighter Typhoon at Neuburg/Donau, and with aircraft deliveries to Fighter Wing 74 still on-going, more and more milestones are set to be achieved in the future. On 18 February, the latest benchmark was reached as the Wing clocked its 1,000th flying hour with their newest weapon system in the skies over Southern Germany.

Lieutenant Colonel Jan Gloystein, Wing Commander at Neuburg/Donau, piloted the jet for the milestone flight and, on landing, commented: "To fly Eurofighter is a mental and physical challenge, but one that is a lot of fun! In terms of operational versatility, efficiency and technological growth potential, this next generation combat aircraft is unmatched."

Lieutenant Colonel Gloystein is well qualified to make such comments. Before his conversion-to-type at training at Laage, he had flown almost 2,000 operational hours on the F-4F "Phantom", the jet that

Eurofighter Typhoon is to replace at Neuburg/Donau. Lieutenant Gloystein notes the difference between the two jets as: "In Eurofighter, you are alone but with so much more computing power providing a variety of electronic data."

The 1,000th flight hour celebrations were attended by all Fighter Wing 74 personnel, including pilots and technicians, as well as representation from the media. Commodore Uwe Klein, former Commander of the Wing, was on hand to be the first to congratulate his successor, Lieutenant Colonel Gloystein, as he emerged from the cockpit.

At present, Fighter Wing 74 operates eight Eurofighter Typhoon aircraft, with three more to follow in the coming weeks. The planned total for Neuburg/Donau is 25. Alongside the operational developments, a raft of infrastructural enhancements are nearing completion, including a new crew building and fire station.

The landmark achieving jet preparing for flight at Neuburg



Above: Lt. Col. Gloystein is ready for take off

Below: Commodore Klein congratulates Lt. Col. Gloystein following his milestone flight



Eurofighter Typhoon Begins QRA in Germany

First Line of Defence

National air surveillance received a huge boost in Germany early in 2008 with their Quick Reaction Alert (QRA) crews at Neuburg/Donau joined by Eurofighter Typhoon. On 08 January, two of Fighter Wing 74's newest weapon systems took to the air with two F-4F "Phantoms", the outgoing QRA aircraft, for the start of several weeks training in order to gain practical air surveillance experience with Eurofighter Typhoon.

The German Air Force's most advanced fighter will ramp up its QRA responsibilities at Neuburg alongside its predecessor until mid-2008. At this point, the ageing F-4F "Phantoms" will fly-out from the Bavarian base leaving Eurofighter Typhoon with the full responsibility for air surveillance over Southern Germany.

QRA in the Luftwaffe

Two separate QRA crews are maintained by the German Air Force: Neuburg, covering the south, are complemented by a team at Wittmund, in the north. 24 hours a day, 365 days a year, a state of readiness is maintained across Germany to counter any emergency. Fighters are scrambled on the occasions where radio contact is lost with an aircraft for an extended period of time or if it has deviated from its scheduled flight plan, nuances mainly due to pilot error or technical problems onboard the approaching aircraft. In these instances, the QRA jets will disengage and instead offer assistance to the pilot and, if necessary, escort them to the nearest airfield.



The Alarm Chain of Command

In the Control and Reporting Centre (CRC), German airspace is monitored across four Mission Command Areas. In the event of an unidentified object penetrating the airspace or the unscheduled change of the flight plan, either the Combined Air Operations Centre (CAOC) in Kalkar, or the Command Centre for National Air Defence (FüZNatLv) will be informed. With an international offence i.e. when the encroachment originates from foreign airspace, the CAOC is notified whereas all domestic situations are handled by National Air Defence authorities. In the case of the latter, the German Federal Armed Forces, Federal police and Air Traffic Control are pulled in to co-operate on the situation. As soon as the threat level is identified, an officer from the Control and Reporting Centre will put the call into either the Neuburg or Wittmund QRA crews to intercept the threat. Should the situation not be resolved following contact with the offending aircraft, or if the seriousness of the situation increases to a hostile or terrorist level, the Minister of Defence and the Chief of the Air Force are informed. Only they have the authority to command in these extreme events.

Prepared for an Emergency

The QRA crews are called into action by use of a distinct siren. Under normal conditions, the pilots have 15 minutes to get airborne, however, this time requirement can be shortened. Depending on the classification level of the threat, the pilots can already be on the runway within five minutes. Practice scrambles, so-called "Tango scrambles", are held regularly with the scenario for a one-on-one simulation, whereas "Alpha scrambles" are the calls for the real emergencies. In both instances, the pilots are not the only ones who must be in a state of readiness. The full team always consists of five QRA technicians and a multitude of supporting officers including, amongst others, the Squadron Commanders, the airbase fire brigade, medical personnel and the Tower and radar crews. In total, approximately 50 people are on round-the-clock readiness for an emergency.

Top: Eurofighter Typhoon will form the Air Defence for Southern Germany

Below: The new and the old will work in tandem until June 2008 when the F-4Fs will fly out of Neuburg for good



Optimum Power for Eurofighter Typhoon

High Performance

EJ200 installation on Eurofighter Typhoon

What is it that gives the EJ200 engine such great performance and pleases all pilots who fly the Eurofighter Typhoon? The secret lies in a combination of cutting edge technology and optimised design to meet the needs of a next generation fighter aircraft.

In the early stages of development, close collaboration between EUROJET Turbo GmbH and the Eurofighter consortium enabled the most critical flight performance points to be identified, which for Eurofighter Typhoon are at the high speed/high altitude condition.

Such close collaboration to fully integrate the requirements of the engine and aircraft has delivered unprecedented levels of synergy and performance. Emphasis has been placed on both air-to-air and air-to-ground operations.



Careful design and matching of the compressor, combustor, turbine and nozzle modules ensure that the engine can utilise the maximum power available at these most demanding flight conditions.

Whilst other engines offer equally impressive performance figures for take-off, at the high speed/high altitude conditions, where the air temperature at inlet is increased by over 80°C, mechanical, thermal or aerodynamic limits are reached, resulting in lower engine power.

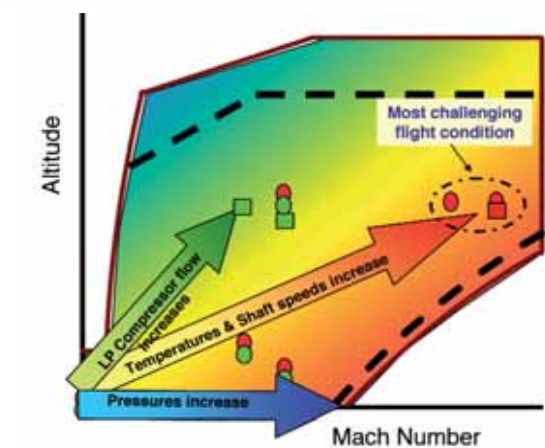
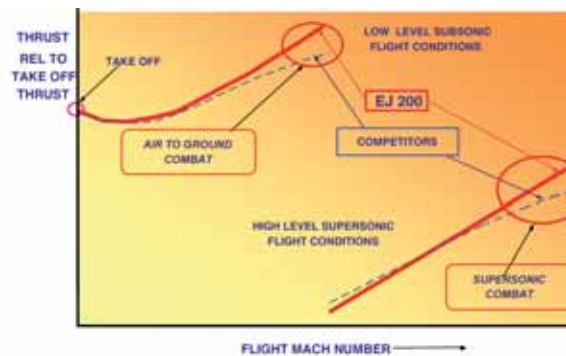
In such cases, a larger, heavier engine is required, forcing significant compromises in the overall aircraft size, design and performance.

With the engine design optimised for the most challenging flight conditions, performance at other flight conditions are easily met, FADEC control allows the engine to be effectively de-rated at such conditions in order to preserve engine life and, in turn, through-life cost.

This approach also ensures flexibility to offer increased performance and growth potential in the future.

The result is an engine that perfectly complements the broad role requirements of the aircraft - offering unsurpassed performance at all flight conditions.

Jessica Schuller
Eurojet Turbo GmbH



EJ200 Guarantee Performance Flight Conditions

Geoffrey Lee's Latest Eurofighter Typhoon Book

Above the Rest



As an ever-present during the development, production and in-service phases of Eurofighter Typhoon, no one is more qualified to showcase the photographic history of the world's most advanced swing-role aircraft than Eurofighter's official photographer, Geoffrey Lee.

Geoffrey has been photographing aircraft for 28 years and his work has appeared in books and all the leading aviation magazines and journals worldwide. Assuming the role of photographer for Eurofighter Typhoon in 2000, he became the first photographer to fly in the jet, going on to make four flights in total and accumulating just under four flying hours. Geoff has also made countless flights in other chase aircraft, including Royal Air Force Hawks and Tornados as well as military transport planes.



Geoffrey Lee presents his new book to the Station Commander, Group Captain Stuart Atha at RAF Coningsby

Above the Rest is a pictorial account of Eurofighter Typhoon. Introductory chapters cover the history of the programme, from projected Air Force requirements to full series production, and, for the first time, project test pilots from across the Partner Companies detail their experiences in developing this best-selling aircraft.

Featuring over 350 full-colour photographs, a mixture of Geoffrey's signature shots complemented by some never-before-seen imagery, Above the Rest - Eurofighter Typhoon, a Pictorial History is the definitive Eurofighter Typhoon photographic collection.

Copies can be ordered from the Publishers at:
www.adhocpublications.com

or signed copies can be requested from Geoffrey himself at:
www.planefocus.com

Phillip Lee



Meteor: Redefining Combat Capability

Beyond Visual Range

Ask ten fighter pilots from different countries what they understand by combat capability and you are likely to get almost as many different responses. Part of the problem is that combat capability is something difficult both to explain and define. It seldom means the same thing to everyone and has therefore resulted in differing concepts of operation being developed. Defining air-to-air combat capability in an age of next generation aircraft is not a simple task. It is more than just a missile operating from a fighter, as the technology is more complex than that. Clearly it would be impossible for a fighter to shoot down an enemy aircraft without air-to-air missiles, but it would be equally impossible for a missile system to destroy an enemy aircraft without the inherent capability of the launch platform.

When considering the future air-to-air capability in the context of Eurofighter Typhoon, the real challenge was to define the future need. The broad statement "what does the 21st century combat pilot need to survive and win Beyond Visual Range (BVR) combat?" proved to be an important foundation in developing a next generation Beyond Visual Range weapon. The initial response most people will make to the question is

tend to evade. Early generation BVR weapons performed poorly due to a combination of threat aircraft evasion and the ability to decoy these semi-active and active radar guided missiles. Boost-coast motor technology meant that after a few seconds the missile motor had been used up and the missile then coasted towards its target. If and when the target aircraft manoeuvred away from the incoming missile, the missile

An RAF Typhoon equipped with Meteor during the jets first flight with the missile

ways, self-explanatory, referring to a zone in which an aircraft will be unable to escape from a missile that is fired at it. This is the primary capability that a fighter pilot needs to survive and win and is as relevant in short range combat as it is in BVR. A large 'no-escape-zone' is a function of motor performance so it will always equate to a long range against a non manoeuvring target. Missile persistence would be another essential as it would overcome the shortfalls presented by a boost-coast missile motor. The ability for the missile to be unaffected by target manoeuvre, enabling it to maintain powered flight all the way to the target, would clearly be a major advantage.

The next 'must-have' for the modern pilot is arguably situational awareness. This is also where the advanced nature of the aircraft enters the equation. Eurofighter Typhoon's sensor performance and sensor fusion capability now allow the missile designer to use this performance to assist the missile in engaging targets. Ideally, the pilot would also like to know how the launched missile is getting on with its mission post launch. The ability for a missile to have a two-way data link so that target information can be sent to the missile and missile engagement status can be sent back to the aircraft during flight would be an obvious advantage. The pilot would then have the awareness of how the engagement is progressing, be able to change targets if the threat aircraft has manoeuvred away, and even use third party targeting information, passed to him by another aircraft, to prosecute a target.

These design concepts formed the basis of the United Kingdom Ministry of Defence's Staff Requirement 1239. With five other nations also seeking a new BVR weapon, most of them to replace the AMRAAM AIM-120 medium range missile, a common European requirement emerged. The UK was eventually joined by Germany, Italy, Spain, France and Sweden, and the hard fought contract was awarded to MBDA with its Meteor BVR missile solution in July 2000. Meteor will give the Air Forces of

that you need range, and a better range than that of your threat. Range is probably the performance figure that is most often raised as the 'must-have' capability. In reality, however, it is arguably the least relevant figure in terms of judging a missile's true ability in air-to-air combat.

Air-to-air combat is not an organised affair. When threat aircraft are targeted, they

would attempt to follow. This missile manoeuvre would rapidly "scrub-off" speed allowing the target to get away.

The limitations of these missiles were recognised for some time. As new electronics were developed to deal with the issue of jamming and decoys, a new concept in air-to-air missile performance emerged, that of the 'no-escape zone'. The name is, in many



Spanish engineers from EADS CASA oversee aircraft fitting trials with Meteor

closer range targets but will fly a lofted trajectory to achieve the maximum no-escape-zone and high kill probability at longer ranges – exactly what the 21st century combat pilot needs.

Is all this new technology such a change in performance over current weapons? The requirement is to have a missile system with between three and six times better kinematic ability than existing medium range weapons. That equates to a significant change in capability that will also lead to the development of new tactics and new concepts of operation for the European partners.

Meteor is under development for the six partner nations under a contract managed by an International Joint Project Office based at the UK MoD Establishment in Abbeywood, Bristol, and from MBDA's Stevenage UK facility. Meteor development will be completed in 2013.

MBDA leads the programme as prime contractor with Sweden's SAAB Bofors Dynamics and Spanish company INMIZE being its industrial partners. A pan-European defence project has the advantage of being able to bring together the best of European technology. The six partner nations make Meteor a truly collaborative European programme. Meteor is also an essential contributor in maintaining a missile engineering and development base in Europe and therefore has an important role to play in securing industrial and operational futures. For example, this is the first time Spanish industry has participated in a major development with MBDA. Critical components are coming from Spanish

these six countries a step change in combat capability with an unprecedented performance margin.

Meteor can best be described as having a massive 'no-escape-zone'. Its extended kinematic range and persistence are provided by its throttleable ducted rocket motor, commonly referred to as a Ram Jet. This unique solid fuel propulsion system, developed in Germany by Bayern Chemie (now part of the MBDA), provides the missile with a boost motor to allow launch at low speed. Once at Ram Jet speed, the motor transitions into the ducted rocket with a computer controlled throttle.

To meet the situational awareness requirement, Meteor is fitted with a two-way data link enabling the Eurofighter Typhoon's avionics to 'speak' to the missile in flight and for the missile to reply. Add this capability to the aircraft's sensor performance and sensor fusion and the pilot now has unprecedented weapon control and awareness of the battle space. Link Eurofighter Typhoon's inherent sensor capability with Meteor's computer controlled variable thrust missile motor and the pilot now has a weapon that will adjust its speed and performance depending on the target's range and manoeuvre. In operation, this results in a missile that will fly as fast as it can at

industry (Indra, Navantia, Inmize, SBS) and some system tests are being performed by INTA.

Eurofighter Typhoon is a remarkable next generation aircraft that has attracted the attention of the world's Air Forces. MBDA already supports the Eurofighter consortium in the promotion and marketing of the aircraft in the export market with a number of its weapon systems, including Meteor. The combination of Eurofighter Typhoon and Meteor provides an unmatched combat capability. This is well recognised by the Eurofighter partner nations and is beginning to be a significant factor when other countries look at their future combat aircraft's requirements. With one common concept of operation for BVR combat now being realised within the four Eurofighter partner nations, Meteor is emerging as a major differentiator in many export campaigns.

As aircraft and missile manufacturers, industry has the challenge to design products that meet the requirements for the Air Forces of today as well as defeating the threats of tomorrow. The problem is that we have little idea what the precise threat of tomorrow might be. Future proofing means designing from day one an inherent growth potential to meet tomorrow's threat. With Eurofighter Typhoon and Meteor, the partner nations know that they have the best and will stay the best for many years to come. Combat capability is being truly redefined.

*Rob Thornley, Carol Reed
MBDA*



Meteor fitted to the forward eject launch station on Eurofighter Typhoon

RAF Typhoons Rip Through the Welsh Valleys

Low Level Flying



A 17(R) Sqn Eurofighter Typhoon creates a vapour shroud while pulling through the low fly loop

Cameras in position, fingers hovering over the record button, the air still but for the faint sound of traffic from the road snaking through the valley below – and suddenly a Royal Air Force XI Sqn Eurofighter Typhoon tears through the pass, banking sharply before accelerating into the valley

turn and disappearing out of sight. These awesome fly-bys were captured on celluloid as part of the production for a brand new Eurofighter Typhoon promotional film.

At the end of February, a Eurofighter film team journeyed into the heart of Wales to record the Royal Air Force's newest



Tom "TJ" Hill (left) and the Eurofighter film team

weapon system in low-level action. The destination was the Machynlleth Loop, known as "The Loop" or "Mac Loop" to the pilots and aviation enthusiasts alike, but officially referred to as Low Fly Area 7 (LFA7). After assessing four possible locations, the team assembled their equipment at two points across the Cad Pass, under the guidance of Mr Tom Hill, an aviation photographer with a huge amount of local knowledge. They then simply waited for the high speed action to begin...

Over the course of the next eight hours, 21 aircraft tore through the Pass including Hawks, Harriers, Tornado GR4s and Eurofighter Typhoons. The Royal Air Force integrate low flying exercises into their training programmes to prepare their pilots for the potential terrain they will face in combat environments.

Although the weather conditions were far from favourable, the team captured some stunning low-level manoeuvres.

Special thanks goes to Tom for his guidance and advice during the shoot, and to the Royal Air Force for their outstanding flying capabilities.

Low Flying: The Facts

- Is an essential skill that provides aircrew with one of the best chances of survival
- Is a highly demanding skill which can only be maintained through continuous and realistic training
- Is conducted with the safety of people on the ground, aircrew, and other airspace users as the overriding concern
- Is rigorously controlled and continuously monitored
- Since 1988, the total number of sorties has reduced by a third and those by jets by more than half

The "Cad Pass", part of Low Fly Area 7, Wales

Low flying is an essential skill for Royal Air Force pilots

Low Flying in the Royal Air Force

Low flying remains an essential skill for military aircrew. United Kingdom forces have deployed repeatedly to potential trouble spots around the world usually with little or no warning. They have to undertake a variety of roles including reconnaissance, fast-jet or helicopter operations, search and rescue, transporting troops or the delivery of humanitarian aid to remote locations. Whatever missions the Armed Forces are asked to undertake, the aircrew must be able to fulfil the task as effectively as possible, often without time for "work-up" training. Current operations around the world see aircrew of both fixed and rotary wing aircraft undertaking operations at low level. They are only able to do this through specialist training gained through the use of the UK Low Flying System.

This System covers the open airspace of the whole of the United Kingdom and surrounding overseas areas from the surface to 2,000 feet above the ground or mean sea level.

Military fixed wing aircraft are judged to be low flying when they are less than 2,000 feet minimum separation distance from the ground (defined as the distance that must be maintained between any part of an aircraft in flight and the ground, water or any object. It does not apply to separation between aircraft in the same formation). Light propeller driven aircraft and helicopters are judged to be low flying when below 500 feet minimum separation distance from the ground.



Phillip Lee





The Morón “Typhoon Meet” initiative was the first time that all four core programme Air Forces have collaborated in Exercise. Highlighting the scale of the deployment, the image shows all aircrew and ground staff involved throughout the week long operation, hosted by the Spanish Air Force. See Latest News on page 3 for more details.

