



EIPC SPEeDNEWS

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NEWS FROM GERMANY

If you can drive a car, you can fly a Typhoon!

EIPC Winter Conference delegates see Eurofighter assembly at Airbus Defence and Space

Limited to sixty participants and heavily oversubscribed, the bonus programme of the 2015 EIPC Winter Conference in Munich was a visit to the Manching site of Airbus Defence and Space, a centre for specialist activities relating to manned and unmanned military aerial vehicles. The major attraction was the opportunity to see the final assembly line for Eurofighter Typhoon multi-role combat aircraft destined for the German Air Force,

Our party was greeted by Manching's Head of Protocol, Hilmar Eckert, and after a basic security briefing: "Don't touch anything, don't push any buttons and don't take any photographs", we were led into a long brightly-lit hangar, with a faint aroma of laminating resin and a general atmosphere of quiet industriousness. Various airframe sections were recognisable among the working decks and gantries on either side of the central aisle.

Hilmar Eckert was generous with his comprehensive knowledge, responding to innumerable questions with meaningful and enlightening explanations and descriptions except when a truthful answer might divulge sensitive information, when he would simply smile and say "I don't know...."

He explained that the Eurofighter Typhoon was Europe's largest defence programme, its development and manufacture being based on an

international partnership of governments, industry and air forces in Italy, United Kingdom, Spain and Germany. The work of building wings and fuselage sections was divided among the primary contractors BAE Systems, Alenia Aermacchi and Cassidian, and major sub-assemblies were brought together in Manching for final assembly. An international consortium of Rolls-Royce, MTU Aero Engines, Avio and Industria de Turbo Propulsores was responsible for the development and production of the Typhoon's twin Eurojet EJ200 turbojet engines.

The airframe was constructed mainly from carbon fibre composites, with titanium and aluminium alloys for the control surfaces, and designed to be deliberately unstable for manoeuvrability and supersonic capability. So it relied heavily on highly integrated electronic systems to assist the pilot. The cockpit and "Human Machine Interface" had been developed to provide a low pilot workload in adverse mission and threat situations, so that a single pilot could carry out a swing-role mission where he might be called on to deal with an air-to-surface attack and with an air-to-air threat at the same time. The job of the pilot had changed dramatically as the "one aircraft – any mission" concept of the Typhoon had evolved; his priority was the mission rather than flying the aeroplane. Four computers operated a digital fly-by-wire system designed to enable the pilot to concentrate on the tactical tasks and to fly the aircraft "head-up", with unique features such as "Direct Voice Input/Output" and "Hands On Throttle And Stick" control functionality applied to cockpit design, and displays to show the pilot "what is needed, when it is needed!"

Eckert, clearly a highly-experienced hands-on specialist remarked "I have trained over 150 pilots to fly this aircraft. It's so easy - if you can drive a car, you can fly a Typhoon!"

We didn't talk about weapons systems, but understood that an adequate range of options was available.....

Back to our trip along the production line: There was no great rush to get these aircraft built - annual production was nine units, limited by budget, not by capacity - and Eckert explained that a two-shift system operated, with thirteen technicians per shift backed up about four-to-one by test and inspection engineers. Documentation was ever-present - every operation, however minor, was meticulously recorded.

Apparently, if all of the production and test procedures were printed-out, it would need about three tonnes of paper. And the working language was English - to translate everything into German would cost around eighteen million euros! Every sub-assembly had coils of wire hanging seemingly from every orifice - all of the myriad sensors and systems had to be interconnected, and every piece of cable was printed its whole length with a unique address. Something like seventeen kilometres or nine hundred kilograms of wire per Typhoon if I heard correctly!

As assembly progressed, the aircraft were moved gradually towards the far hangar doors, but even after they had reached the open air the process of testing and calibration continued for another month before they finally left the ground.

Elsewhere on our tour, we were able to see a NATO Airborne Warning and Control System (AWACS) aircraft, a military version of the Boeing 707 "With a cockpit like a clock-shop, and propelled by four fuel-to-noise converters!" undergoing extensive repair and upgrade. Also the Lockheed P-3 Orion maritime patrol and surveillance aircraft and the Transall C-160 military transport aircraft for which Airbus Defence has responsibility for engineering support and maintenance.

Our tour finished with a step back in time - the Messerschmitt Museum, a spectacular collection of historic aircraft, with the Me-109 attracting almost as much attention as the two little KR-200 bubble cars.

All-in-all, a spectacular and memorable experience. Many thanks to EIPC for organising the visit, to Airbus Defence and Space for making us so welcome, and especially to Hilmar Eckert for his patience and good humour in response to our countless queries.

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