TORNADO

flight-test

report

The TECHNICA L EDITOR reports from Panavia headquarters in Munich and the West German flight-test centre at Manching.

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HILE prototype testing of Europe's multi-role Tornado fighter/bomber continues in full spate,
the main landmarks in 1978 will be the start of
initial service assessment trials and the flnalisation of pro-duction arrangements for the 800-plus aeroplanes on order for the air forces of Britain, Germany and Italy. Explora-tion of the performance envelope continues to expand. The clean aircraft has achieved over Mach 1 - 9 at altitude, and Mach 1-plus at low level. It has reached 30,000ft in two minutes from a standing start. A fortnight ago a weight-lifting record was established when a prototype took off at just over 58,0001b, about the weight of a fully laden Phantom. Pilots continue to praise the Tornado's handling and ride qualities.
This week the first of the six pre-series Tornados was being delivered to Boscombe Down for the three-nation evaluation programme to qualify the aircraft for initial operational capability (IOC) in 1980. In Germany the shift of emphasis from prototype and pre-series aircraft to pro-duction is marked by the setting up of final-assembly tools and jigs in the MBB plant at Manching. There the centre fuselage of what will be the first production Tornado is in position and awaiting components from Italy and England. It will be complete by the end of the year and will fly in early 1979. Tri-national engine company Turbo Union is now supplying the first production-standard engine, which will fly later this month. Formal qualification test (FQT) of this engine is scheduled for later this year. Another mile-stone is the submission of the Tornado for the first time in a foreign procurement competition, Canada's New Fighter Aircraft programme (Flight, January 28, page 227). Mean-while, the 12-aircraft flight-development programme has accumulated l,500hr of the 4,000hr planned.
On January 31 Prof Gero Madelung stepped down as managing director of Panavia, the British, West German and Italian company which is building Tornado. His place will be taken by Dr Karl Fichtmuller. Madelung, an en-gineer, has been with Panavia since it was formed, and leaves now to become managing director of MBB's military

aircraft division. This vacancy occurred when Helmuth Langfelder stepped into the MBB chair after the retire-ment of Ludwig Bolkow this year at the age of 65. Made-lung's successor in Panavia was director of finance and economics at MBB's military aircraft division, and so the new Panavia appointment reflects the change of emphasis from engineering and test to production and marketing as the programme itself begins to mature industrially. The full-time Panavia staff, originally 90 people, now numbers about 280 as the size of the task has grown. Little further expansion is foreseen, as the workload has now levelled off.

The development programme, with the nine prototypes and three pre-production Tornados, is generally going smoothly. Handling with and without stores has been fully explored, as has performance out as far as engine limita-tions permit, and high-incidence and spin trials begin this year. Stores-release characteristics have been investigated and weapon trials begin shortly. There are several "clock-work" aeroplanes with a full complement of late-standard navigation and weapons equipment, and the performance and reliability of the avionics has gratified (and perhaps slightly surprised) the German flight-test team. Navigation is based on a Doppler-monitored inertial system, the accuracy of which is in some respects better than specifica-tion. Apart from a fairly major radar redesign, few if any serious avionics problems have been shown up by the comprehensive avionics rigs of the three-nation Central Design and Management Team (CDMT), the two hack Buccaneers at Warton or the navigation-trials Tornados.

A lack of representative engines continues to delay the programme. Although Turbo Union is optimistic that it will clear the the FQT this year without too many diffi-culties, the flight-test centres are still having to make do with engines of low standard. Engines have to be selected to ensure that the later powerplants are kept only for those prototypes whose tasks really call for near-standard performance.
At Manching, 75km north of the MBB plant at Ottobrunn

The most recent Tornado to join the flight-test programme is P.13,
which flew for the first time at Manching on January 10. Visible in this photograph is the new kinked leading edge to the tailplane. This aero-
plane will be the first of four pre-series Tornados which, after testing,
will be refurbished to production standards and delivered to the services.