ble. There will be increased support from Airbus and its main vendors at key airports in the airline's network. In-service data will be tracked and analysed to anticipate potential issues and dedicated teams will be in place at Airbus facilities to ensure minimum reaction time to any problems.

The first A340-500 flew on 11 February and this aircraft is completing the bulk of the 350h flight-test programme. The high level of commonality between the two models means much of the data from the -600's trials are applicable to the -500. Towards the end of the -500's test programme, the first customer aircraft (for Air Canada) will be used for a small amount of testing of the passenger cabin's systems, such as air conditioning distribution and the new lower-deck crew-rest area.

## Predicted performance

By the beginning of this month, the A340-500 prototype had flown over 240h and more than 74 flights. Take-off, cruise and climb performance evaluation, flutter and stall tests, and minimum control speed take-off trials had all been completed. The full flight envelope – 41,000ft ceiling and 330kt (610km/h)/M0.86 maximum operating speed/Mach number – has been explored.

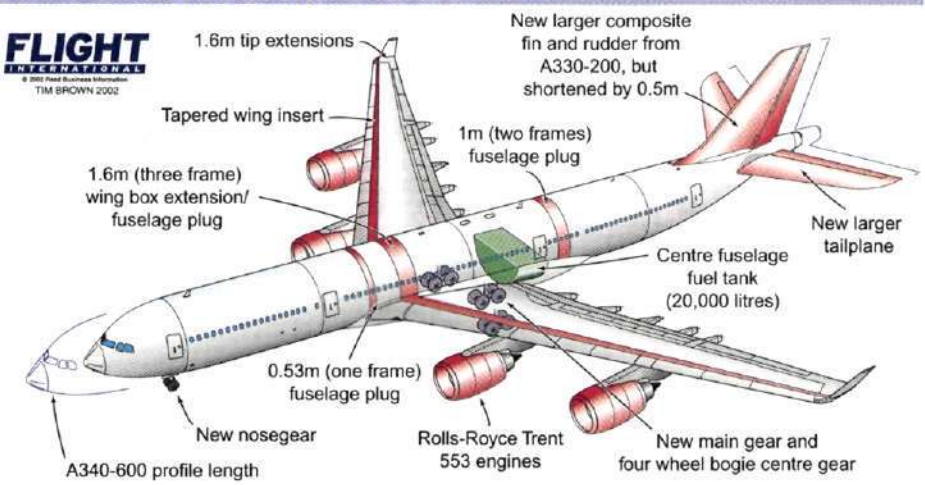
The aircraft is now being used to fine-tune handling qualities and control laws for the fly-by-wire system, and to test autopilot, fuel and air systems. Airbus says results show take-off, climb and cruise performance to be as predicted or better.

During performance testing of the larger A340-600, it emerged that climb to initial cruise altitude performance at MTOW was "significantly better" than the target of 33,000ft, says McConnell. The -500 is exhibiting similar performance gains, he adds. "The -600 can reach 35,000ft in under 30min," says McConnell. This was against a target time of around 38min. He adds that the buffet boundary has also turned out better than predicted at all Mach numbers.

**"With the Trent 500 certificated at 60,000lb, there is plenty of thrust in hand for any future developments"**

GORDON McCONNELL, CHIEF ENGINEER LONG-RANGE PROGRAMME

AIRBUS A340-500 CHANGES OVER A340-300




| A340-500 SPECIFICATIONS | | |
|---|---|---|
| **Dimensions (m)** | | |
| Length 67.9 | Span 63.5 | Height 17.1 |
| **Weights (kg)** | | |
| Maximum take-off | 368,000* | Maximum landing 240,000 |
| Operating empty | 175,000 | Maximum zero fuel 225,000 |
| Maximum payload | 56,500 | Fuel capacity (litres) 214,800 |
| **Performance** | | |
| Normal cruise speed (Mach) 0.83 | Maximum cruise speed (kt/M) 330/0.86 | |
| Maximum altitude (ft/m) | 41,000/12,500 | |
| Powerplant | 4 x Rolls-Royce Trent 553 each rated at 53,000lb-thrust | |
| **Accommodation** | | |
| Three-class 313 | Two-class 359 | One-class 440 |
| Design range (km/pax) | 16,000/313 | |

Notes* – 365,000kg also available, offering 15,750km range with 313 passengers

"The new wing has much better lifting capability than predicted," says Pardoe. "The whole performance during the take-off to top-of-climb regime is better – it can lift 6t more payload than we expected."

The wing's tapered insert provides slightly greater wing sweep, up from 30° to 31.5°, and greater chord, without any significant increase in depth, yielding a small boost in cruise speed. Airbus says the aircraft will cruise "close to M0.83" compared to the earlier wing's M0.82 design cruise speed.

Airbus has rerun its rejected take-off certification tests for the -600, after many of the wheels suffered structural failure during the original test in February, when tyre pressure rose dramatically because of brake heat. The wheels and tyres have been redesigned and a second test was completed successfully in May. The A340-500 is due to receive FAA and JAA type certification at the end of October, with deliveries beginning the following month to Air Canada, which is expected to put the new aircraft into service by the end of the year on Toronto-Hong Kong services.

Airbus expects to deliver 11 A340-500/600s this year and 27 in each of the following two years. When it has finished its testing work in November, the prototype -500 will be refurbished for delivery to Emirates in 2003.

Despite the outstanding payload/range performance of the new family, Airbus is already feeling the pressure for more-capable variants. Emirates wants to supplement its A340-500 fleet with a heavier extended-range version of the -600 to enable it to fly year-round from Dubai to the USA. The airline holds a letter of intent for eight aircraft, pending a decision by Airbus to go ahead with the airliner. Boeing is threatening to push the -500 with its planned 777-200LR which, in theory at least, has the greater range capability.

## Spare thrust

Airbus is reluctant to divulge details of weight-growth plans it has for the new family. "When the certification programme is wrapped up, our process is to consolidate all the data to see if there is structural capability to exploit," says McConnell. "With the Trent 500 certificated at 60,000lb thrust [4,000lb above the -500/600's current requirements], there is plenty of thrust in hand for any future developments." ■