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Atmospheric research at the highest levels - HALO at DLR Oberpfaffenhofen

25 April 2006

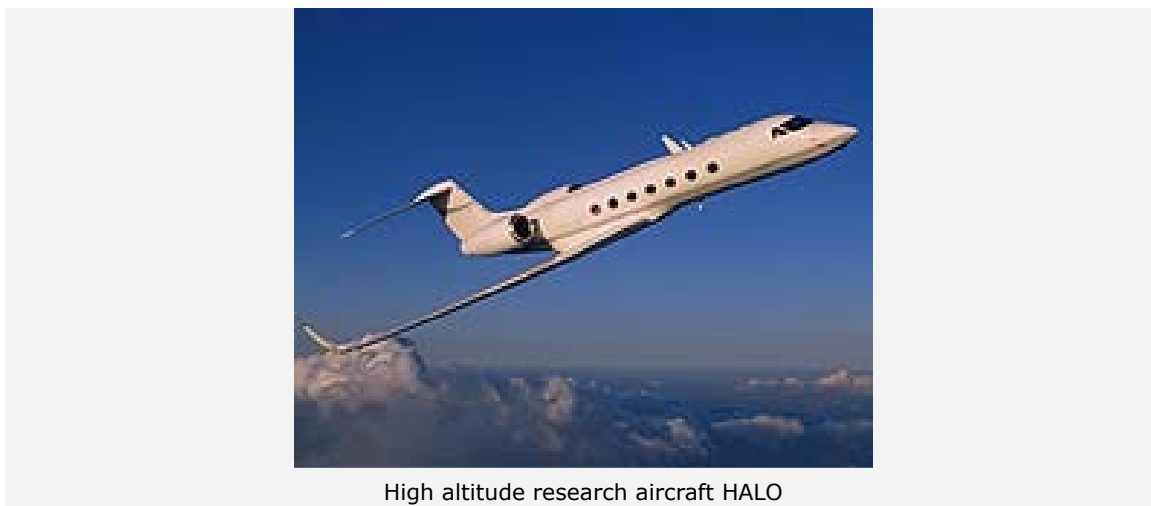


High altitude research aircraft HALO

Oberpfaffenhofen - Germany's atmospheric researchers are moving to a whole new level! HALO, the German Aerospace Center (DLR)'s new High Altitude and Long Range Research Aircraft, touched down at DLR Oberpfaffenhofen on 25 April 2006. The ultramodern aircraft, a Gulfstream G 550 designed as a so-called 'Green Aircraft', rolled to a stop in front of the DLR hanger and was welcomed by an enthusiastic crowd of scientists, academics and invited guests keen to see the sleek new look of future upper atmospheric studies. The modified Gulfstream will join DLR's aircraft fleet and begin research flights worldwide starting in 2009. Once in full service, HALO and DLR - together with the Max Planck Society and other centres within the Helmholtz Association as well as the German Research Foundation - will significantly boost high-level atmospheric research aimed at benefiting everyone. HALO also marks an important generational upgrade to DLR's fleet.

HALO's new ceiling, range and payload capabilities will be crucial advantages in comparison to those of current research aircraft. For example, HALO will more than double the number of scientific devices that can be carried onboard research flights in comparison to the Falcon 20-E, used for nearly 30 years by DLR and quickly reaching the end of its in-service life. With a flight ceiling of over 15 km and a range of 8000 km, HALO will provide for the first time the capability to gather data on a continental scale from the tropics to the poles as well as at heights up to the lower stratosphere.

Improving measurements of climatic effects of ice clouds



High altitude research aircraft HALO

The aircraft will offer a multitude of new capabilities in the area of climate research, particularly in the until-now difficult-to-reach transition zone between the troposphere and stratosphere. This region, up to 16 kilometres high, significantly affects the atmospheric energy balance and the transport of trace gases. The influence of ice clouds (cirrus clouds) lying at high altitudes is of enormous importance: they can directly either strengthen or weaken the climate. Vapour trails and aerosols generated by the constantly growing number of commercial aircraft affect cirrus clouds with, so far, unknown consequences. HALO will operate at these heights and make measurements which are necessary in order to quantify these critical effects.

From business jet to research aircraft

The Swiss-German aerospace company RUAG Aerospace, located at the airport in Oberpfaffenhofen, was tasked with the work of modifying the Gulfstream from a business jet into a research aircraft. The extensive, 18-month modification project will include cutting intake and discharge openings in the body of the plane for gathering air samples, installing special windows adapted for remote sensing devices and adding a special power supply to provide electricity to the onboard scientific instruments. Finally, the aircraft will be painted and finished in the colours of DLR at the Gulfstream facility in Savannah, Georgia, USA. Final test and certification flights are scheduled to take place in 2008.

HALO project a reality due to cooperation of 31 research organisations

The HALO project has been made possible by the combined efforts of 31 research organisations, including the Max Planck Society, members of the Helmholtz Association (HGF), a grouping of German research centres which includes DLR, as well as a number of other scientific institutes working in the field of atmospheric research. Germany's Federal Ministry for Education and Research (BMBF) is providing 47.5 million euro, or about 70 percent in the total cost for HALO. The Helmholtz Association and the Max Planck Society (MPG) will together cover the remaining costs. The German state of Bavaria is also contributing 1.8 million euro.

Europe's largest civil aircraft research fleet

From their locations in Braunschweig and Oberpfaffenhofen, DLR Flight Operations manages Europe's largest fleet of civil research aircraft. In Oberpfaffenhofen, activities are focussed on atmospheric research and Earth observation. The heavily modified aircraft are used by research establishments, universities, authorities and companies worldwide. Missions onboard DLR's flying scientific platforms benefit from the long experience developed by teams of experts from different specialist areas.

HALO aircraft based on the Gulfstream G 550

Length:	29,4 m
Height:	7,9 m
Wingspan:	28,5 m
Cabin length:	15,3 m
Cabin height:	1,88 m
Cabin width:	2,24 m
Cabin volume:	47,3 m ³
Max take-off mass:	41 277 kg

Max payload:	3 000 kg
Engines:	2 Rolls-Royce BR710
Range:	11 112 km (at Mach 0,85)
Ceiling:	15 545 km (51 000 ft)

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