

Intercomparison of Aircraft-Derived Wind and Turbulence Profiles with Measurements from Radiosondes and a VHF Wind Profiler.

Jorg M. Hacker

Airborne Research Australia / Flinders University, Adelaide, Australia

E-mail: Jorg.Hacker@flinders.edu.au

The National Aerospace Laboratory of Japan (NAL) is developing a supersonic transport aircraft of the next generation under the acronym NEXST (see <http://www.nal.go.jp/eng/research/sst/index.html>). To test the aerodynamic configuration of the SST, an 11m-long unpowered model of the aircraft will be launched by a rocket to approximately 20km altitude and then glide back to the ground performing various manoeuvres. The tests were to take place within the Woomera Test Range in South Australia in July and August 2002.

It is important to know exactly the state of the atmosphere through which the model aircraft flies. For this purpose, a VHF wind profiler was installed near the launch site. The wind profiler can measure wind speed and direction to altitudes of about 20km. It also is able to detect layers of turbulence, the existence and strength of which is also very important for the flight trials.

To verify the profiler measurements, flights were carried out with ARA's Grob G520T Egrett high altitude research aircraft which is equipped with high resolution wind and turbulence sensors and can reach altitudes up to 15km. In June 2002, three research flights of approximately 5 hours duration each, plus one 1-hour instrumentation test flight were carried out over the Woomera area for this purpose.

As the Bureau of Meteorology launches regular GPS-radiosondes from Woomera, these flight offered a unique opportunity to compare the wind and turbulence profile from the three sources.

The results from the intercomparison will be presented at the Conference.