

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Private Human Access to Space: Sub-orbital and Orbital missions: Joint session D2 with Commercial  
Spaceflight Safety Commission D6 (9)

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STATUS OF THE ASTRIUM SUBORBITAL SPACEPLANE PROJECT

**Abstract**

For some years, Astrium is preparing the development of a safe and passenger friendly Suborbital Spaceplane for various missions including commercial and non commercial. The vehicle powered with turbfans takes off and lands from a standard runway and then travels to 100 kms altitude using a rocket engine of proven design to get enough energy. This paper will be the occasion to get an extended overview of the program from both a programmatic and design perspective as examples below indicate.

Example of design maturity is how Astrium expects to validate one key transient phase of the mission which features different ones for shifting from one state to the another : • pure aeronautic-like transient phases as take-off and landing ; • pure space-like transient phases as rocket propulsion system cut-off ; • mixed transient phases from aeronautic to space mode and the other way : former one is dubbed Space Ascent Gate and the latter one Space Descent Gate. Currently attention is given to the latter one and from the very inception of the program it was stated that performing a low cost flight test for validating the Space Descent Gate would be a valuable asset. It will especially take direct benefit from Astrium experience in completing such system test for various programs.

Example of programmatic analysis is Astrium investigation of several options for Final Assembly Line (FAL) location in Europe according to a set of criteria : • real estate and existing facilities for locating properly the FAL ; • easy access to a concrete runway including standard airport services ; • air space available including interaction with standard air traffic for conducting flight tests and acceptance tests featuring a non standard flight envelope when compared to a civil airplane : supersonic speed and ultra high altitude ; • set of skills available in the area for developing a vehicle combining aeronautic-like and space-like products.