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EUROPEAN OPTIONS FOR CREW TRANSPORTATION

**Abstract**

With the successful launch of COLUMBUS and ATV, Europe has become a partner in the operations of the International Space Station: payloads, spare parts, consumables for the entire ISS are delivered by ATV, COLUMBUS provides a working space not only for European scientists, but also for the international partners, and the European astronaut corps participates in the operation and utilization of the ISS. By doing so, Europe has demonstrated a political will to participate in the peaceful, cooperative endeavour of human spaceflight, following Russia and the United States on the ISS.

Although Europe has thus acquired a certain competence level in the area of human spaceflight through its own assets, one key asset is still lacking a solution: The launch and return of its astronauts. So far, European astronauts depend upon being launched by the US Shuttle and the Russian Soyuz. At the same time, China is developing its own capability in human space transportation, demonstrating a strong political will to present itself a leading world power not only in low technology consumer goods, but also in the high tech area. Europe sees itself being pushed to fourth rank and even risks of losing more ground to other nations striving for indigenous capabilities in this field.

It is therefore an opportune moment for Europe to investigate if a crew transport should be part of its future human spaceflight activities. Such capabilities could be acquired through cooperation with other space-faring nations or by using its own assets and technology.

To provide technical and programmatic information needed for the political discussion, this paper presents some recent design study results of ASTRIUM SPACE Transportation, providing options on how Europe could acquire within reasonable timeframe a self standing space transportation capability for its astronauts. Trade-off results on various configurations based on different mission requirements are given. Mission targets could range from low Earth orbit (LEO) to low Lunar orbit (LLO) missions, and development times for initial capabilities could range from five to eight years, depending on chosen configuration, mission targets, development philosophy, and organizational setup.