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DASSAULT AVIATION'S AEROSPACE TRANSPORTER, AN HISTORICAL PERSPECTIVE

Abstract

At the beginning of spaceflight all the launch vehicles featured similar characteristics, i.e. vertical take-off and rocket propulsion, and were more or less directly derived from military ballistic missiles (e.g. Soyuz, Atlas, Titan ...). New launch vehicles developed exclusively for space missions were keeping the same architectural concept (e.g. Saturn). Nevertheless many teams all over the world were thinking at concepts aiming at overcoming the major drawbacks of classical expendable rockets: high operational cost due to the loss of the entire vehicle at each mission, the need for heavy ground infrastructure or poor operational flexibility compared to aircraft. The use of aircraft features as horizontal take-off, air-breathing propulsion, reusability has been periodically considered for future launchers. But the relatively low traffic from Earth to orbit and the high complexity of such vehicles has not yet allowed their emergence. This quest for RLV started very early in space history and it is interesting to look at some of the concepts elaborated in the sixties. This paper presents the TAS project and explains the main technological and architectural choices. The TAS, French acronym for Transporteur AéroSpatial (Aerospace Transporter) was studied by Générale Aéronautique Marcel Dassault (presently Dassault Aviation) as a contribution to a prospective initiative by Eurospace, an association of over 150 European industrial companies. Several vehicles have been considered, fully or partially reusable, using as a first stage a large supersonic aircraft propelled by a combination of air-breathing and rocket engines. Many features developed for the TAS may be found in more recent studies.