

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Small Launchers: Concepts and Operations (7)

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TRANSPORTATION SPACE SYSTEMS USING A REUSABLE UNMANNED AIRBORNE VEHICLE
AS A FIRST STAGE

Abstract

Owing to booming advance in electronics and innovative technologies over the recent few years, a stable line such as nano- and microsatellite development has been formed in the world practice. As the number of launches of these spacecraft has been intensively increasing, an acute problem concerning the cost of their transportation to space is arisen. Brand new systems are being sought to find an economically sound solution to solve this problem. One of such systems is a system for spacecraft launch onboard a manned carrier platform which is used as a launch pad for a stage. The next step in aerospace launch systems improvement is a transportation space system where an unmanned airborne vehicle is used instead of a manned carrier platform. Using carrier platforms to launch integrated launch vehicles, it is possible to cut the cost required for spacecraft launch. And using an unmanned airborne vehicle, it is possible to cut more costs required for launch, mainly owing to cutting costs required for pilot training and safety assurance. In addition, using an unmanned version of a re-entry airborne vehicle, it is also possible to raise load restrictions imposed for manned versions of an airborne vehicle. The main objective of the projects proposed is thereby to develop a system for launch of nano- and microsatellites. The report presents outline of the transportation system projects where both subsonic and supersonic unmanned airborne vehicles can be used. Technical specifications of the airborne vehicles mentioned above are also described. A number of systems are based on space technologies tested under full-scale conditions, as well as a whole number of innovative technical solutions are also presented.