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CONSTRAINTS FOR THE SMALL SATELLITE LAUNCH: A STUDY OF SMALL SATELLITE INTERFACE REQUIREMENTS IN THE PERSPECTIVE OF LONG MARCH LAUNCH VEHICLE

Abstract

The Long March launch vehicle has been completed a number of mission tasks of various small satellites launch, by rapid development of space technology, small satellite market becomes one of China's new aerospace business area. Small satellites represent a contender in the aerospace industry - it can be expected that because of the nature of modularization of small satellites, it is cheaper and simpler in comparison with larger spacecraft. The Chinese launch service provider - China Great Wall Industry Corporation (CGWIC), in conjunction with Chinese launch vehicle research institutes, is initiation the anticipation of a set of standard requirements for small satellite missions.

The Long March series of launch vehicles have conducted 188 launches (including 10 international piggyback small satellites launched) up to now and still undergoing continuous development with various capabilities, which enabled China to enter into both domestic and international markets and to accomplish LEO, SSO and GTO satellite missions. In Long March launcher family, most of LEO and SSO missions will be accomplished by Long March 2C, 2D and 4B; for GTO, lunar and deep space exploration missions by using LM-3A series launchers. Beyond that, the new generation launch vehicle with more powerful upper stage is under schedule. For the year 2013, Long March has conducted 14 flights, and this high-density launch activity will continue for year 2014. This brings further opportunities and flexibilities for small satellite (microsats, nanosats, cubesats, picosats, etc.) missions. And a number of piggyback launch opportunities will be available along with Long March missions.

This article gives an outline of the progress of small satellite piggyback launch mission that required for the technical coordination, which encompass the basic design requirement for the separation device, mechanical and electrical interfaces between launch vehicle and the satellite, also flight environment (EMI, EMC, Thermal, etc.), deployment sequence and other relevant requirements needed. As the typical cases, this article describes the Long March's recent piggyback launch missions in 2013 and future CubeSat launch mission for foreign customers in 2014.