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COMPATIBLE AND RECONFIGURABLE TEST LAUNCH CONTROL SYSTEM OF THE EXPEDITION SERIES UPPER STAGE

Abstract

On March 30, 2015, Expedition-1 completed its first flight and successfully launched a Beidou navigation satellite into orbit after being lifted by a Long March 3C carrier rocket. By around 2020, when the Beidou Navigation Satellite System(BDS) goes global, it will have more than 30 satellites. The BDS will join the U.S. Air Force's Global Positioning System(GPS), Russia's Glonass satellite network, and Europe's Galileo fleet- which is still being deployed- as the world's four navigation services with global reach. The Expedition-1A is an upgraded version of the original hypergolic Expedition-1 and used with the new Long March-7. The Expedition-2 is China's largest liquid-fuel upper stage aircraft with the strongest capability for orbit transfer, which integrate with Long March-5 carrier rocket. Traditionally, different upper stage has its own ground test launch control system, resulting in a substantial increase in research and development costs as well as technical complexity. In the face of high density launch of carrier rocket in recent years, this paper presents a ground test launch control system that can match a variety models of upper stage, which saves a great number of R&D costs. For the technical characteristics of upper stage, A reconfigurable test launch control system has been established to solve the test requirement of upper stage's long-term in-orbit flight, which greatly improved the reliability of launch vehicle.