

**SPANISH MINISAT PROGRAM. DETAIL DESIGN,  
MANUFACTURING, LAUNCHING AND OPERATIONAL PHASES.**

**by:**

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**Abstract.** The Spanish MINISAT program has been structured in three main stages plus several associated developments, achieving a modular family of low cost platforms in the small satellite segment, designed to use mainly in low earth orbit (LEO) applications.

The first stage of the MINISAT program conclude with the complete development and orbit qualification of the platform MINISAT 0 together with the operational experiences will be achieved to perform the scientific mission 01. This platform is already left commercially available to perform a lot of scientific missions.

The second stage of the MINISAT program consist of the modular upgrading of the platform 0 up to reach the maximum performances or platforms MINISAT 1 to do earth observation missions. The first mission with the platform 1 started the phase A of feasibility study in 1995.

The third stage of the MINISAT program will consist of the development of the platform MINISAT 2 that will be an adaptation of the platform MINISAT 1 to be able to do communication missions even in the geostationary orbit.

This paper describes the mission objectives, the satellite and ground segment architecture, as well as the launch operation and the operational phase of the system, taking into account the low cost philosophy applied in the program. The satellite is comprised of a low cost multipurpose bus slightly adapted to this mission and a payload module with three different experiments plus a technological demonstrator. The ground segment is comprised of Mission Control System (MCS) and the Scientific Operation Center (COC). The launch operation is supported by three major elements, the air launched vehicle Pegasus with the satellite inside that is dropped from an aircraft L-1011, the NASA Wallops Mobile Test Range and the Launch Operations Control Center (LOCC). The operational work is clearly split of the real time operations and the off-line operations, being performed in separate locations.