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COST EFFECTIVE STRATEGIC CAPACITY BUILDING USING THE GOMSPACE-ALPHA
PLATFORM

Abstract

Developing countries, and others, wishing to build a space technology capacity from scratch generally can choose between attempting a fully independent project or buying a technology transfer mission, which is lower risk, but also means partly loss of independence/control.

This paper argues for a third option using Cubesat derived commercial off the shelf technology to gradually develop an independent capability at a similar or even lower cost than with the aforementioned options, while keeping risk low and the level of independence very high.

The Cubesat concept has considerably lowered the entry barrier for countries or organizations that wish to become space capable. However, despite the small size, building a cubesat is still a complex task that requires the availability of a set of very diverse skills and resources. GomSpace is an entrepreneurial company founded based on expertise back from the first Cubesats launched in 2003. The company has developed a complete low-cost 2 kg satellite platform with an optical payload; the platform is dubbed GomSpace-Alpha.

The platform is open for modifications allowing users to customize mission software (in flight) and replace subsystems. The platform has been developed with developing countries in mind and provides a low-cost option for building an independent capability over 2-4 mission cycles based on the platform.

When building a capability from scratch the first mission should focus on gaining operational experience using a standard GomSpace-Alpha platform with no or little modifications. At a later stage in the mission the user can start experimenting with the on-board software and modify it towards the specific interests of the user. The second mission will again be based on the GomSpace-Alpha bus, but now the satellite is integrated and tested locally, the flight code is tailored locally, and the user can choose to replace one of the subsystems or payloads with an indigenous design. For the following missions the user can continue to gradually introduce more indigenous developed systems eventually becoming fully independent on the commercial platform.

Following the demonstration launch in early 2010 the platform will be offered at a cost of approximately 300k including the satellite bus, launch service and a technology transfer package tailored to the user. We believe this offering will provide an effective low risk option for developing countries, who wish to build an independent capability at a low cost.