

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

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LIBRA, THE AIRBORNE LAUNCH PAD

Abstract

The idea behind Libra is to suggest a concept of an airborne launch pad for a small rocket carrying 15 to 45 kg to LEO.

The launch pad will have the shape of a triangle and be lifted by three helium balloons, one at each corner of the triangle. The rocket will be launched from the middle and will be gyro-stabilized over two axes to ensure a perfect verticality of the launcher at lift off.

The launch pad, fully automated and radio controlled, will be reusable.

The platform will lift the launcher to an altitude of approximately 30 km (100,000 ft) where it will launch the rocket. The rocket is composed of two stages:

- a first stage using a solid propellant
- a second stage using 2 to 4 bi-liquid engines powered with UDMH and NTO.

These motors/engines were chosen so that the rocket will be easily operated with no cryogenic propellants. The rocket will weigh between 2.5 tons to 4 tons for a payload composed of many nano-satellites weighing from 15kg to 45kg for a LEO altitude (about 300 km).

The goal of this architecture is to propose an easy and cheap way to reach space using a reusable platform that behaves as a first stage.