

31st IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Small Earth Observation Missions (4)

Author: Mr. Michal Kubik

Vyzkumny a Zkusebni letecky ustav, a.s. - vzlu, Czech Republic, kubik@vzlu.cz

Mr. Jan Gromes

Aeronautical Research and Testing Institute (VZLU), Czech Republic, gromes@vzlu.cz

Dr. Vladimír Dániel

Aeronautical Research and Testing Institute (VZLU), Czech Republic, daniel@vzlu.cz

Mr. Martin Sabol

Aeronautical Research and Testing Institute (VZLU), Czech Republic, sabol@vzlu.cz

AMBIC (AMBITIOUS CZECH SATELLITES) – CZECH ADVANCED PLATFORM FOR NATIONAL
EARTH OBSERVATION MISSION

Abstract

AMBIC is a response to the call issued by the Ministry of Transport of the Czech Republic to design a complete mission for government users and to increase the capability of the Czech space industry and academia. The mission successfully passed phases 0, A, and B1 and the Ministry of Transport of the Czech Republic together with ESA selected the mission for the implementation phase. The main goal of the mission is to provide high-resolution Earth observation data to government users independent of foreign data sources. An additional goal is to maximize the involvement of the Czech space industry and to increase its capabilities and prestige.

The AMBIC mission is designed with the goal of developing Czech Advanced Platform (CAP), which will provide qualified, modular platform for future smallsat missions within the range 80kg to 200kg, lifetime of 3 to 5 years, aiming to low orbit 500-550km, regardless of mission type (earth observation, scientific ...) with a significant footprint of the Czech space industry and ambitious to become national platform for Czech small spacecrafts.

The spacecraft with its 100kg dry mass can be classified as smallsat, its design lifetime is 3 years, and is planned to be launched to low Earth orbit in 2028. The spacecraft platform architecture is an innovative design, aiming for high modularity and flexibility to allow easier adaptation of the platforms for future missions. This requires a novel approach to key subsystems, such as decentralized Electrical Power Supply (EPS) and On-Board Data Handling (OBDH) systems. The platform takes advantage of the wide availability of Commercial off-the-shelf (COTS) CubeSat components, which are used extensively in the design. This allows teams with pre-existing experience with nanosatellite missions to design and operate spacecraft with higher capabilities than could be reached with even a large CubeSat.

As a payload 2 optical cameras will be used. Primary panchromatic camera with Ground Sample Distance (GSD) under 2 meters and secondary multispectral camera with GSD resolution under 5 meters. These 2 cameras will provide imaging data in emergency situations (wildfires, tornados, ...) as well as planned events (detection of illegal construction or logging, infrastructure corridors).