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# MICROSATELLITES GROUND OPERATIONS AND BEST PRACTICES FROM THE EXPERIENCE OF UNISAT-6

**Abstract**

CubeSats and microsatellites are becoming every day more popular. There are many solutions and commercial products already designed to build the different subsystems of these satellites. However, especially when a team designs its first satellite, the ground operations are often left on a second plane. A microsatellite mission usually lasts between few months and few years and a single fault or problem in orbit can give a big headache to the operators, especially when the satellite is below the horizon 95% percent of the time and you are no longer able to communicate with it or to know its status for the next few hours. Emulating ground operations in real time is very time consuming, uplink problems are not always taken into account and emergency procedures are difficult to test or even to imagine. Moreover, when a team launches its first satellite into low Earth Orbit, usually they only have one ground station for uplinking commands and probably it is also far from optimum ground locations that could benefit of longer or more frequent passes.

G.A.U.S.S S.r.l has already operated several microsatellites in orbit and it has given support to other CubeSats teams that were launched by GAUSS. This fact has given GAUSS enough hints to think that teams are not always properly considering or understanding the constrains involved on ground operations with these satellites.

The aim of this abstract is to point out our experience in ground operations for microsatellites, to show some examples and convey guidelines to plan ground operations to new teams willing to launch their own satellites into orbit getting the maximum benefit possible from the short communications sessions between the ground team and their satellites.