MULTILAUNCHPAD EGC SPACE TELEMETRY ANTENNA

First Author/Speaker,[1] Nicolas CHAMBE[1],

[1] Stations Architecture Department
Space Transportation Directorate
Ground Segment Development Sub-Directorate
Centre National d'Etudes Spatiales, Toulouse, France

Nicolas.CHAMBE@cnes.fr / www.cnes.fr

Abstract:

In 2011, the first EGC Espace Telemetry antenna has been qualified for the Soyuz Launch Pad active repeater called : "RATTI". It is used for test several hours before liftoff to retransmit Telemetry S-Band Soyuz launcher signals in a directive path to Galliot Telemetry Station. This antenna is located on the top of a light mast very closed from the Soyuz Launcher.

Due to his robustness after many years of exploitation, this model of antenna has been selected in 2018 for Ariane 6 Project in the same configuration : LHCP Polarization, 1m20 diameter parabolic reflector, 25 dBi antenna gain, 5° antenna at 3 dB beamwidth. The antennas are located very closed form the Ariane 6 launcher inside the Mobile Gantry behind a radiofrequency window.

According to "Eco conception" design rules, CNES have developed and qualified in 2020 a "reusable" KASSAV ground radiofrequency system in order to test the KASSAV kit on board the launcher (Ariane 5, Ariane 6, Callisto Vehicule, Micro Launcher …) with French Guyana Space Center (Galliot Telemetry Station) during negative countdown activities. This system is using a second model of the EGC Space Telemetry antenna : both circular RHCP and LHCP Polarization, 0m70 diameter parabolic reflector, 21 dBi antenna gain, 14° at 3 dB beamwidth and 12,5 dB minimum for the cross polarization of each main polarization.

Now, a third model of this antenna is available and used to develop "Low Cost" CNES solutions : near-field Trajectography system Prototype called "MARTA" or future S-Band TM/TCo Callisto ground station. In this "Low Cost" configuration, the EGC SPACE source antenna is necessary for reception and emission without any reflector : both circular RHCP and LHCP polarization are available, G/T ≥ -18 dB/K, +/- 35° at 3 dB antenna beamwitdh (with an axial ratio lower than 1,5 dB), +/- 65° at 10 dB antenna beamwidth.