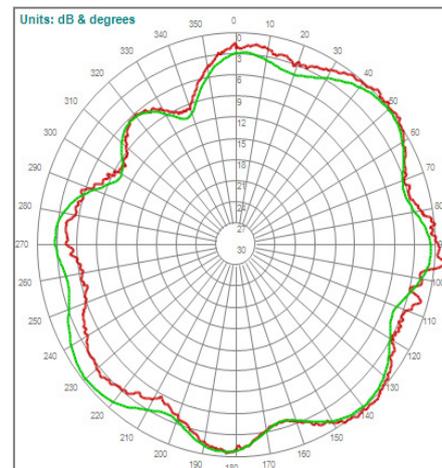


Technical Analysis



Advantages and Add-On's of RPA airborne measurement compared to ground or field testing of broadcast terrestrial networks



Coverage analysis for terrestrial broadcast networks can be performed in different ways, from relatively simple ground measurements at selected locations around the transmission site to mobile drive tests requesting extensive equipment. If such kind of measurement campaign can deliver interesting single results on the coverage and the transmission signals, it is insufficient to qualify properly the performances of the antennas used and thus of the overall effective coverage. For this specific purpose, airborne measurements have to be performed.

Airborne verification of antenna patterns of broadcasting stations using conventional helicopters being an expensive operation and having its own technical limitations, new solutions have been investigated. Airborne measurement via remotely piloted aircrafts (RPA) with specific, dedicated measurement equipment can cope with the limitations of both the systems based on conventional helicopter and of ground or field testing.

The advantages of RPA airborne measurement compared to ground measurement are summarized below:

- No or limited effect of ground reflection, which represents a major source of error of ground measurement / field testing. In general morphology on the ground is a big issue and affects the results.
- Topology and access to suitable measuring points is a challenge for ground measurement. Depending on the regulation in place, RPA can fly even in congested areas and can cope with difficult topography.
- Airborne measurement enables a fine recording of the horizontal and vertical antenna patterns, whereas ground measurements require many iterations and volumetric measurements (at different geographical points).
- Specific antenna data like tilt or null fills are impossible to obtain with ground measurements. Airborne measurement provides directly these results.
- The extensive engineering of the Colibrex RPA solution has conducted to a system with a very low “typical measurement uncertainty“, as described in ITU-R SM.2056. The uncertainty factor and calibration errors of ground measurement can conversely be problematical
- Results of RPA airborne measurement can be directly integrated as complete antenna pattern data into planning and coverage tool like ChirPlus_BC, thus enabling new simulation or network correction.