From design towards manufacturing of winglets with integrated VHF antenna

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ABSTRACT

One possibility for reducing aerodynamic drag of an aircraft is to reduce the number of protuding parts as antennas, by integrating them in the existing aircraft structure without influencing the best possible aerodynamic shape. When integrating functions, care must be taken to ensure that the individual components are coordinated with each other.

An example of such a function integration is to relocate the VHF antenna in a winglet. The size and shape of the antenna must be optimized for efficient radiation, and must take place in combination with the aerodynamic design of the winglet structure. The shape and size of the antenna are constrained by the boundary conditions of construction volume, strength and aerodynamic conditions. Within the H2020 EU project ACASIAS, a specially shaped VHF notch-antenna is integrated into the winglet of the regional turboprop aircraft Evektor EV55. The design challenges are pointed out and the proposed solutions are presented in this paper.

The design progress of the test panels and the resulting solutions are explained. In addition, the current design status of the construction model is presented.

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