A customised low-cost ultralight aircraft for survey, filming and animal tracking in wild environments.

Sprawozdania

Informacje na temat projektu

AIRSCAN

Identyfikator umowy o grant: 812904

DOI
10.3030/812904

Projekt został zamknięty

Data podpisania przez KE
18 Czerwca 2018

Data rozpoczęcia
1 Września 2018

Data zakończenia
29 Lutego 2020

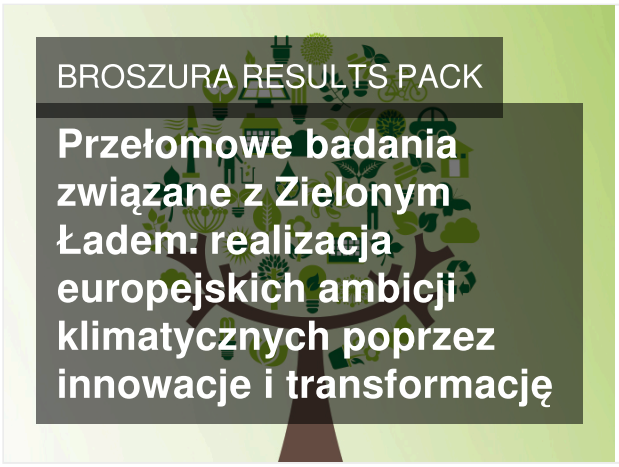
Finansowanie w ramach
EXCELLENT SCIENCE - European Research Council (ERC)

Koszt całkowity
€ 149 526,00

Wkład UE
€ 149 526,00

Koordynowany przez
THE ROYAL VETERINARY COLLEGE
United Kingdom

Ten projekt został przedstawiony w...



20 Listopada 2020

Periodic Reporting for period 1 - AIRSCAN (A customised low-cost ultralight aircraft for survey, filming and animal tracking in wild environments.)

Okres sprawozdawczy: 2018-09-01 do 2020-02-29

Podsumowanie kontekstu i ogólnych celów projektu

The primary purpose of the AIRSCAN project was to document the technical and engineering specifications for production of a Trail ADAP aerial data collection aircraft. Additionally, we evaluated a range of options for data collection technologies across the price and quality range and explored the aerial survey market to determine the extent of the commercial opportunity for this specialised aircraft.

The Trail ADAP is a modified version of a Groppo Trail, small light aircraft available in kit and ready to fly form and perfectly suited to operation in a low-infrastructure environment. It was used successfully in a scientific research capacity for conducting aerial data collection for research into hunting and evasion by large African carnivores and their prey in a remote area of northern Botswana.

The technical manual produced contains an explanation of all modifications applied to the Groppo Trail base aircraft to create the Trail ADAP. A flowchart guides the user through the modification options based on the data collection requirements. The technical manual is designed for use by an engineering specialist. It is an electronic document and includes engineering drawings, electrical circuit diagrams, and, where relevant, links to downloadable cutting files.

The equipment specification of the original Trail ADAP was at the top end of the scale in terms of performance and thus cost. This level of performance was essential for the research work the aircraft was equipped to undertake, but may not be a requirement for all applications. We evaluated lower cost and lower performance options for photogrammetry and aerial survey and produced a cost/benefit analysis, providing an indication of the accuracy and quality of the 3D images and survey data. Options for professional grade FX format (SLR) camera based aerial survey/photogrammetry packages were also evaluated and were found to deliver good performance at a much lower price point. This is a rapidly developing field and further improvements are likely.

The LiDAR system for survey and terrain mapping (LiDAR) used for our research is at the higher end of the quality and price range; the more basic models were found to be limited in terms of range and suitability for aerial survey work. Hire and lease options for this equipment were explored, revealing that such an approach is feasible but that cost is very much market-dependent and subject to individual negotiation.

Cost for an aircraft GPS and attitude system depends on accuracy requirements (a few metres down to a few cm). The GPS accuracy is intrinsically linked to the accuracy of the photogrammetry outputs. It would be feasible to use the integrated electronic flight information system (EFIS) to provide GPS and attitude data, obviating the need to buy a second system. However, difficulties in accurately time stamping such data and the falling cost of mid-range commercial componentry mean that a bespoke system based on emerging dual frequency lower cost chipsets is likely to be more appropriate for a commercial application.

The selection of onboard data collection technologies from the range available that are compatible with the aircraft mounting and control systems will depend on the user's budget and requirement for accuracy and resolution.

The potential worldwide market for the Trail ADAP was explored. The main limitation found was the Permit to Fly status of the aircraft as opposed to a full Certificate of Airworthiness. Whilst operating on a Permit to Fly results in much lower operating costs, it does limit the aircraft to non-commercial use in most jurisdictions. This means that the aircraft can be owner-operated, but cannot be hired out with a professional pilot. This was found to be a major hurdle for some potentially viable market sectors, including infrastructure survey (eg rail companies, energy companies) as their preferred mode of operation is often to use a specialist service provider rather than in-house ownership and operation of an aircraft. A further limitation was on the classification of the Trail ADAP as an experimental aircraft, which made it subject to further limitations in some jurisdictions. For example, in the USA, it would have to be at least 51% built from a kit in the USA rather than supplied as a ready-to-fly aircraft from the manufacturer in Italy. This issue could be overcome by having the kit assembled in the USA by an aircraft builder on behalf of the end user.

The worldwide light aircraft market is not currently strong, indicated by a decline in sales of kit and light aircraft, low demand for avgas fuel and other factors. However, the base aircraft manufacturer in Italy, Groppo Ing, have reported strong recent performance and will market the Trail ADAP as a new model in their range. The launch was to have been in April 2020, but the coronavirus outbreak has led to the postponement of the key European and American airshows and suspension of normal business operation and movement in northern Italy. The launch will therefore be made via their website and social media as soon as possible after normal business resumes, subject to the market conditions returning to their pre-coronavirus buoyancy. Marketing will be supported by the AIRSCAN project team, who have the specialist knowledge of the onboard technologies and data collection methods.

As it is still anticipated that the project will result in the Trail ADAP being transformed from a research

tool to a commercially-available product, the project can be considered to have been successfully completed.

Ostatnia aktualizacja: 6 Maja 2024

Permalink: https://cordis.europa.eu/project/id/812904/reporting/pl