



Country Summary

Rwanda

The Problem

Rwanda is a pioneer in the drone space and is now experiencing an increase in the volume of drone flights, and requests for new operations. There is a need for more information on all drone flights to support better separate air traffic (manned and unmanned) which will ultimately enable approval of more drone flights.

The Rwanda Civil Aviation Authority (RCAA) would like to have real time data on all flights both VLOS and BVLOS. Currently they have tracking data on BVLOS only. The intention is to be able to separate drones from each other and other air traffic to support increased use of drones while maintaining avoidance of incidents and near misses by providing Air Traffic Control (ATC), who are responsible for communicating directly with operators, real time data on which to act.

The CAA also anticipates using the data from an enhanced UTM system including tracking to understand non compliance both the extent of the problem and the reasons for non compliance (e.g. lack of knowledge, errors or illegal activities).

Solution

Rwanda's initial hypothesis, developed in June 2023, was:

If we work together to identify, validate and implement a remote ID solution,

then we will easily be able to track all drone flights,

which means that we can separate drones from each other and other airspace users and enhance operations.



Key Activities and Decisions

Initially, the Rwanda team were exploring multiple approaches to addressing the challenge starting with reducing the risk of mid-air incidents or near misses by introducing new air space parameters (e.g. no-fly zones or for aircraft or one way drone corridors). This might be considered a quick win as it's simpler to define parameters than investigate new technology solutions for tracking and rolling them out. However, in the case of Rwanda, the defining of air space parameters is the purview of the Military and Air Traffic Control and therefore outside of the CAAs control, making it a less straightforward change to make. While relevant authorities in Rwanda continue to pursue this, it was deprioritised as a solution by the CAA.

Identifying an appropriate tracking approach which ultimately would enable the tracking of all approved flights with remote ID (all drones broadcast distinct identification numbers, accurate location data, and comprehensive flight-related information to relevant authorities and stakeholders in real-time) was agreed by the CAA and their stakeholders to be the highest priority need. Related to this is defining a fit for purpose but also cost efficient software UTM framework which can be integrated with existing systems. The CAA has focused specifically on exploring the tracking solution, to roll out in parallel to the UTM system, taking into consideration:

- The availability of cost effective (for operators) compatible with the topography of Rwanda
- The network / how the data would be transmitted and received.
- The data operators / drone users would be required to transmit.
- How the tracking data could be linked to registration data and integrated with the anticipated UTM system.
- The computer processing power needed to manage live data
- The capabilities to oversee and maintain the system
- How the solution would be integrated into the regulations and rolled out to operators (e.g. all flights or staggered and how would costs be managed)

Once the RCAA decided to focus on remote ID and tracking, they set about defining the minimum requirements; the minimum data to be provided by the remote ID. This required significant research to understand the options available on the market today as no other county is fully implementing this, yet. The RCAA team conducted research, including benchmarking new USA standards to define the minimum requirements of the remote ID.

Next, the RCAA explored the telecommunication system options to understand what's feasible now and what might be optimal in the future. The RCAA used a decision tree framework to navigate the possible network options and select the approach best fit solution for the Rwanda context today.



The CAA chose to utilise WiFi and GSM in the short term as it will be compatible with new Antenna that have been procured to support the UTM system. RCAA know there are compromises with this choice but have elected to move forward with what they know to be compatible with the UTM and which doesn't require investment from the RCAA (e.g. LORA) but they will revisit this once the UTM is live and other elements of live tracking have been tested (e.g. roll out to operators, analysis and use of live data).

A significant pivot by the team, in consultation with technical colleagues, was to shift the choice of tracking device from the RCAA to the operator. Rather than the RCAA identifying one specific device and requiring all operators to use it, the RCAA will set minimum data requirements and standards that operators will be required to meet and enable them to select devices that best meet their and the RCAAs' requirements, including compatibility with the UTM receiver. The regulations will be updated in the future as the system is upgraded to be compatible with a wider set of options.

Operators active in Rwanda have been informed about the coming UTM system but there has not yet been engagement on plans for remote ID. Engaging with operators is a core principle in RCAA's approach and they intend to engage operators in the design of the data standards and in the implementation method (e.g. which types of flights and drones to track initially).

Outcome and Next Steps

The team has made progress with both their UTM and remote ID. Initially the focus was on the technology and tracking devices specifically but the team's perspective has broadened to recognise the importance of considering how the technology solution is implemented through regulations, the potential challenges to implementing the technology or the unintended consequences to operators and therefore the drone sector and its potential for positive impact. The CAA are now taking a more holistic approach to driving the drone industry forward.

The CAA are currently working with their UTM supplier to review and finalise the tracking data standards and will then seek operator feedback on the same.

Although the CAA will not mandate in the regulations which tracking device operators should use the do plan to identify possible devices compatible with the mandated requirements to validate the requirements, evaluate the price point and ultimately to provide guidance to operators on how they might comply, and can evaluate the price point. RCAA wants to be sure any requirements included in the regulations are feasible for all current and future operators.