



The need for an Unmanned Traffic Management System (UTM) for drones

The disruptive actions of several rogue drone operators have gained international prominence in recent times, but the fact is airports see UAS as an opportunity, not a threat. Unmanned freight aircraft are in development¹; once they are big enough to need fixed runways existing airports will likely be part of the supporting infrastructure. In the last year the capacity of heavy-lift drones available to the market has gone from a 50kg to 200kg payload². From construction tasks to delivering aircraft spares the potential utility of drones to the aviation industry is massive.

AIRSPACE MANAGEMENT FOR DRONES

Airports need to find ways to safely integrate drones into their operations using an Unmanned aircraft system Traffic Management system – or UTM. Such systems must support flight planning through to dynamic change requests together with an ability to react safely and logically in the face of unplanned interventions. Airports are early adopters of drone technology for example for hangar roof surveys, aircraft checks,³ bird scaring⁴, checking for FOD⁵ and numerous other applications increasing daily. They will, therefore, need to be early adopters of UTM and drone detection. Airports already have unrivalled experience of integrated air operations so UTM is a logical next step for them.

¹ <https://www.aircargonews.net/airlines/freighter-operator/large-unmanned-cargo-aircraft-set-to-take-off-despite-regulatory-challenges/>

² <https://newatlas.com/drones/volocopter-volodrone-drone-powerful/>

³ <https://www.aerosociety.com/news/inspector-gadget/>

⁴ <https://www.bbc.co.uk/news/av/uk-england-hampshire-43705789/drone-bird-of-prey-trialled-at-southampton-airport>

⁵ <https://www.marketplace.org/2017/05/31/how-atlanta-airport-using-drones-help-with-runway-maintenance/>

Many companies are working on UTM systems, often alongside national airspace agencies. It remains to be seen if one system will triumph or if a number of different systems will co-exist. What is common to the majority of them is the 'carrot and stick' approach used in manned aviation airspace - the more control you are prepared to cede and the more information you are prepared to share, the more airspace will be opened up to you.



ACCESS V LOSS OF CONTROL

In manned aviation, an aircraft with the necessary equipment (landing aids, conspicuity systems, collision avoidance and more) and a crew with appropriate training, can access the most closely controlled airspace (in return for accepting a high level of air traffic control). For UAS a similar approach is likely – to operate in highly regulated congested airspace, the UAS will need to demonstrate high levels of reliability and assurance, have appropriate technology on board and be operated by trained personnel.

For a UTM system to be effective and safe it must incorporate drone detection capability. As well as having sensors that receive information sent out by the drone, the system will also need non-cooperative sensors (radar, RF, EO/IR etc) so that situational awareness is maintained at all times. This meets the requirement of the need to detect rogue drones – the UTM system will quickly unravel if unknown drones appear and exhibit unpredictable behaviours.

THE NEED TO OPERATE BEYOND LINE OF VISUAL SIGHT (BLOVS)

A driving factor that will accelerate the need for combined UTM and drone detection is Beyond Visual Line of Sight (BVLOS) operations. Current legislation requires a drone to be in sight and under your control at all times ⁶(albeit with some exemptions). As drones fly further and more autonomously, their utility and range of applications increases further, driving a need for UTM systems to have greater coverage and functionality.

⁶ <https://www.caa.co.uk/Commercial-industry/Aircraft/Unmanned-aircraft/Small-drones/Regulations-relating-to-the-commercial-use-of-small-drones/>

A GAME-CHANGER FOR DELIVERING AIRPLANE SPARES

The airline industry is a leader in 'just in time' spares supply. British Airways' 24/7 spares distribution facility near Heathrow provides parts to their own fleets and other airlines. Whilst the facility has easy access to the M3, M4 and M25, that can often mean easy access to congestion! To put the part on a drone and send it to an 'AOG' would be a logistical dream



– truly joined-up UTM could facilitate this and the drone can bring another part back by return flight (or be tasked on another mission, it does not necessarily need to return to point A immediately).

Far from keeping drones out, airports need to find ways to bring them in – safely. For that UTM is needed and that requires an effective drone detection system for cooperative and non-cooperative drones. This is a rapidly developing area and a number of systems are emerging. Ideally, they will all be sufficiently open protocol (without compromising security) that they can co-exist and, indeed, interlink. That way we will likely see UTM and detection 'bubbles' starting to appear around airports and, in due course, those 'bubbles' being linked up to give wider area UTM.

AN EXCITING FUTURE FOR THE INTEGRATION OF DRONE OPERATIONS

Coupled with the push to BVLOS operations there is a genuine opportunity to bring together these technologies to the significant benefit of the airline industry, airport operators and the multitude of other industries that rely on those transport links to do their business.

Sources

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