

U-SPACE THE DISRUPTIVE POWER OF DRONES



ROBERT FRAEFEL HEAD OF SWISS U-SPACE

Drones open up new opportunities for professional and leisure purposes and are a major disruptive force to air traffic management. An entire ecosystem of new companies is developing and generating jobs. However, airspace is limited and all its users have to be integrated. For that purpose, skyguide is developing a system called U-Space. Robert Fraefel, a design engineer, is the head of Swiss U-Space since October 2017. Before, he worked for the Sauber Formula 1 Racing Team and, for 11 years, at Solar Impulse and its first successful solar powered flight around the world.

SKYGUIDE **Robert Fraefel, why is skyguide interested in the drone topic?**

ROBERT FRAEFEL Drones are of skyguide interest because of safety questions around airports and because they provide a look into the future of ATM. However, they also represent an attractive business opportunity for skyguide as they will create a huge market with significant volumes. It is to be expected that this new market will be much less regulated and highly competitive. This market will likely attract new powerful “non ATM” global players like Amazon or Google. Skyguide’s strategic intention is to play a leading role in this new market and to incorporate the new

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business very early into the Swiss aviation system. It is to be expected that the new business will be less people-dependent and thus significantly different from the currently known ATM processes and it will require a set of players, such as regulators and high-tech companies, to cooperate.

Why is skyguide well positioned to participate in this new market?

RF In Switzerland there is a unique relationship with the Swiss government, the regulator (FOCA), the national ANSP, the industry as well as spin-offs from the universities, which all recognize the great benefit of this technology and work together on innovative solutions. Due to its complexity and currently restricted capacity, Swiss airspace requires innovative solutions. A pure separation of manned and unmanned vehicles is not possible and there is a need for a common solution. Skyguide has many assets in terms of technology and processes that can be leveraged for this new market.

The airspace is already heavily frequented. Where does U-Space find space for the increasing drone traffic?

RF Actually, the term U-Space suggests somehow that there is a separate space for unmanned aircraft. This of course is wrong; the airspace is already very limited. This means that drones have to be integrated in the existing space. I therefore prefer the term Unmanned Aircraft System Traffic Management (UTM) in contrast to Air Traffic Management (ATM) that deals with manned aircraft. In order to make full use of the potential of

drones and to minimize possible risk, we have to establish the necessary facilities for the cooperation and communication between UTM and ATM. That is the reason why skyguide is introducing U-Space, a system that gives drones easy access to the airspace.

Why does skyguide want to control the traffic of drones?

RF This question wrongly implies that skyguide intends to control the U-space as it controls the airspace. We want to enable the use of drones, not control it. Today, certain technologies are still grounded not for technical reasons, but because they have difficulties to get the necessary approval. This is a killer criterion for many potential users and it is a pity since drones can bring great benefits. Because drones are a disruptive element to the previous way airspace was managed, they require a different and radically new thinking within skyguide.

In which manner do you intend to prevent drones from colliding with each other or with manned aircraft?

RF Many drones are already equipped with a Detect and Avoid System. However, nobody can judge its reliability. Currently, the airspace for drones is still very limited: they may exceed a height of 150 meters above ground only with a special permit. The industry on the other hand reports an increasing demand for autonomous flights, i.e. flights beyond the visual line of sight (BVLOS). That's why we have to aim for an integrated solution. For simple flights, there will be a low-cost and rapid automatic approval process. Manual approval for more complex operations will be more expensive. For specific BVLOS operations such as those conducted by Swiss Post for packet delivery trials in Lugano, Zurich and Berne, a limited prototype of U-Space is already available and is providing real time air traffic data to mitigate collision risks with manned aviation.

To identify the drones and their position and to communicate with them, they have to be registered. Will this affect all drones?

RF The pressure on FOCA to issue appropriate regulations is high. In the commercial sector, many established businesses expect to use drones in the near future to offer new services to their customers while we believe that the number of drones in the leisure sector will not grow that much. There are many new interesting applications: for example, REGA could launch unmanned search flights and

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thus reduce the risk for pilots, especially in bad weather. The Zurich Protection and Rescue Services are considering bringing defibrillators to the scene of accidents by drones. With the current setup, those businesses can hardly implement their new services in an economical way.

When will U-Space be available?

RF We are working hard to provide a first set of services by the end of 2019: registration, a messaging system for traffic awareness (e.g. to inform drone users automatically when a REGA helicopter is operating in their area). If today drone users make mistakes, they usually happen out of ignorance. For example, drones today do not automatically register temporary no-fly zones, such as during the annual meeting of the World Economic Forum in Davos or the Zurich Street Parade. With the first services, the users will be assured to operate their drones according to regulations. It is therefore imperative that we also get the manufacturers on board to equip their aircraft adequately. This process will be accelerated once the regulatory body acts accordingly and stipulates, for example, mandatory registration of drones. This is a fascinating new area for skyguide and we see that responsiveness in strategy, alliances and operating models are key aspects to foster a new culture decisive for the future success.