



Tech Talk

The Unsung Heroes of Aviation Safety©

by John McCarthy

Hi and a very warm welcome to this week's edition of Tech Talk. Flying has become one of the most popular methods of holiday transport, and if you intend flitting to faraway foreign lands you may not have any other choice. According to the experts, it's supposed to be the safest mode of transport – technological advances over the last fifty years have seen to that: computers, radars, ATC, ILS, TCAS and a whole host of other inventions. Of course, as far as flying is concerned, we're relative newcomers. First there was Icarus, but he came to a sticky end, and in fact the first successful flight took place in 1903, whereas birds and their ancestors have been taking wing for over 100 million years. Breaking the chains of gravity nonetheless came with a price for both us and our feathered friends. Inexorably, mid-air collisions had to come, and the first fatal impact occurred in 1912 when Cal Rogers, the first person to fly across America, was killed shortly after this epic feat when he flew into a flock of gulls, causing his plane to crash into the ocean.

Bird strikes alas have become more common – approximately 800 Civil Aviation incidents per year in France alone – and throughout the world the cost to the airlines industry is billions of Euros in damages and repairs. As an ounce of prevention is worth a pound of cure, aviation has for years sought to avoid avian encounters and collisions, as the result of these can be catastrophic. To the vast majority of people, bird strikes were for a long time one of the more unfamiliar facets of aviation, but with the release of "Sully", a Hollywood blockbuster based on the true story of Chesley Sullenberger and his celebrated 'Miracle on the Hudson', they're now very much in the public eye.

Technological advances have made the skies safer, and all major airports are equipped with the latest gadgetry to prevent winged contact or ingestion. For the last fifteen years there have been major developments in bird-tracking radar systems, and today radar is a valuable tool to track birds and enable controllers to warn pilots of impending encounters. Automated infrared detection systems are also under development with the idea of detecting birds on the ground that are invisible to radar. There are many techniques, but none is 100% effective, so several have to be used in combination, selectively and in rotation to avoid habituation. These include audio repellents such as shell crackers, propane cannons and powerful sonic devices; pyrotechnics, as for

instance fireworks, alarm pistols and flare guns; bioacoustics, the broadcasting of different pre-recorded bird distress calls specific to each species, and trained birds of prey such as kites and falcons, used to disperse smaller birds at one point by JFK International Airport. There's even a Dutch-designed robotic falcon, the 'Robird' controlled by a person on the ground. Much technological progress and a far cry from the early days of arm-waving, scarecrows and flying on a wing and a prayer ...

At CDG and Orly, fixed runway speakers are used to frighten birds away. Starlings, rooks, crows, pee-wits, geese, pigeons, etc. are all kept at bay by the unsung heroes of aviation security – that's airport agents stationed at each runway, equipped with flares and sundry noisemakers which enable them to play the sounds of birds in distress, thereby scaring other birds. As a result of these preventive measures, Air France has managed to reduce its number of collisions considerably in the past ten years.

But best of all, in South Korea, a robotics lab in conjunction with a weapons manufacturer have developed the world's first bird strike defence robot. It's a six-wheeled UGV – to the uninitiated that's unmanned ground vehicle – which uses a combination of the previously mentioned directional acoustics (speakers that can relay a batch of bird-scattering sounds, including the screams of birds of prey, at up to 100 decibels and laser patterns to scare the living daylight out of any flying creature in hearing range. It's also semi-autonomous, which means a human operator is in charge of a control station. It can circumvent obstacles and return to pre-programmed specific locations as an added safety precaution. It carries all the latest goodies: directional acoustic transmission and detection, green lasers, collects information about bird movements, concentrations and behaviour, is equipped with diurnal and nocturnal colour cameras, thermal imaging, laser scanners and can perform 24/7 even in adverse meteorological conditions. It wouldn't be out of place as a Batmobile.

That's all we have time for, I'm afraid. For those of you who have access to the Tech Talk script, I'm leaving a few URLs of bird strikes so that you can see for yourselves what carnage they wreak. Until next time, bye for now.

<https://www.youtube.com/watch?v=-XhLJMzRB4>

<https://www.youtube.com/watch?v=wVq3dfDDFKY>

<https://www.youtube.com/watch?v=tOWtNCalO1U>

<https://www.youtube.com/watch?v=LQPzh46f-Ds>

