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High-tech advances could make skies safer

Many of the technological developments of the past decade could be used as anti-hijack devices, for example using fingerprint scanners for pilot identification

By NIALL MCKAY

Last week, I was sitting on a transatlantic flight wondering why, in these times of constant connectivity, we still spend days, weeks and months after a disaster like September 11th looking for an airplane black box? Why not just beam the black box data to the ground constantly? Cheerful thoughts I know, but that's flying today.

I am not the only one who has been asking such questions. GE Aerospace and Boeing are already developing the technology to cope with this.

To date, the problem has been lack of bandwidth - the sort of virtual pipe through which wireless data travels. Then as the jet passed over Nova Scotia, Canada, I realised that there are quite a lot of things we could do with more bandwidth that would ensure the exact events of September 11th would never again be repeated. Of course, that is not to say that we would not have to deal with other threats.

For the past three years I have been slumming it around US research institutions finding what's new and true for a column I have been doing for a business magazine. Needless to say, like most other high-tech work, it was cut following the market meltdown.

But, in the course of my travels, I have learned about quite a few technologies that could make air travel more secure.

Not all solutions are high-tech, of course. Many airlines are, for example, fitting anti-hijack doors and at least talking about arming their pilots. Personally, I am against arming amateurs because, even armed, they don't stand a chance against professional thugs and killers.

Anyway, the first thing we must do is increase the bandwidth between the aircraft and the ground. Boeing Aerospace has developed a technology called Connexion that uses a new aerial to upload and download data from satellites while the plane is in the air.

While Connexion was originally designed to provide access to e-mail, telephone networks and video on demand on the passenger side - and radio ahead data about fuel loads, oil levels and supplies needed on the aircraft side - it is being modified so that it can be combined with systems that would increase aircraft security.

Not least among its possible uses is transmitting video footage from the cockpit and cabin to ground security personnel. That way they could offer support and advice, and be aware of any problems in the air.

Until recently, fitting aircraft with close circuit TV would have cost a fortune - but these days web cameras are very cheap and there are a number of companies providing them, such as California-based PacketVideo.

However, the first thing we must do is ensure that nobody but the pilot and co-pilot can fly an airplane. For this we must look to the banking industry, which in conjunction with high-tech firms are developing biometric technologies for security authentication. Biometric technologies include electronic fingerprint scanners, retina scanners, voiceprint scanners, and facial-recognition technologies.

The most popular of these are the fingerprint scanners, which work by scanning the fingerprint and comparing it to a fingerprint held on the computer's hard disk. A number of years ago, such technology would have cost a fortune, but these days there are a number of low-cost solutions available. Indeed, Compaq is reselling a PCMCIA credit card fingerprint scanner from the California-based Identix for just $200 (€223).

Heart-rate scanners could also be used. Each heart has a unique beat that is as specific as a fingerprint, according to Prof Pradeep Khosla, head of the department of electrical engineering at Carnegie Mellon University. His department is developing scanners that can read heart rates from up to ten feet and that would not only ensure that the pilot and co-pilot are flying the plane, but give an

indication of their general state of health as well.

If an unauthorised person took over the controls of the plane there are two courses of action you could take.

Firstly, you could programme the navigation system to take over the controls, fly the plane on autopilot to a predetermined destination and land the plane on autopilot.

In such cases, the plane uses the onboard navigation system to fly the plane and sensors embedded in the runway to land the plane correctly (this is how planes can take off and land in dense fog).

Secondly, with thick virtual data pipes running between the ground and the skies, another plan is gaining popularity. You could hand over operation of the aircraft to a pilot on the ground who could fly the plane via remote control through a modified aircraft simulation machine.

The American Airline Pilots Association is against such plans, not because such technology could do them out of a job but because then all a terrorist cell would need to do is take control of the ground operations centre to wreak havoc with dozens of aircraft.

Still, right now, some of the US's best and brightest are working on a technological solution to the September 11th disasters. The Bush Administration has appointed a rapid response task force to make a series of recommendations that will beef up security in the skies. The report has not been made public yet but it's likely that it will recommend that airliners (which, after all, have not changed that much since the 1960s) should be overhauled to include a whole list of new technologies that will make a hijacker's job a great deal more difficult.

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