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## Europe Hopes to Thwart Terrorists With a High-Tech Aircraft That Snoops

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Washington Post Foreign Service  
Tuesday, January 16, 2007; A16

PARIS -- Imagine stepping aboard Europe's anti-terrorist plane of the future.

At the door, a hand-held electronic nose reputedly 30 times more sensitive than a dog's snout sniffs passengers for dangerous chemicals and vapors.

After takeoff, computers monitoring cabin conversations pick up suspicious words in Seat 9B, fingernail-size video cameras detect nervous facial tics on the passenger in 21F, and a hidden microphone records questionable noises from the passenger in the rear toilet. Buzzers or flashing lights on a computer screen warn the crew and pilot of potential trouble in each spot.

If a hijacker manages to bypass the fingerprint-activated locks on the cockpit door and grabs the controls, an internal computer takes over and diverts the plane from high-rise buildings, a nuclear plant or any other pre-programmed no-fly zone.

The SAFEE project -- Security of Aircraft in the Future European Environment -- is the first coordinated international effort to create an airplane system capable of thwarting hijackings and terrorist attacks. It is under development in classified laboratories in 11 European countries and Israel. Much of the technology is in advanced stages of development, though systems for accurately analyzing facial expressions remain problematic.

The director of the \$50 million program, Daniel Gaultier, works in a modernist, mirrored building overlooking the Seine River, where entry to his office is controlled by the same kind of fingerprint lock that the plane's cockpit would have. He describes the system -- being developed largely in secret by the European Commission (the European Union's executive arm) and 31 aircraft, avionics, computer and security companies and university research centers -- as "a last defense against attack" in a post-9/11 world.

The project faces serious opposition. Human rights officials are concerned about passenger privacy, pilot groups are fearful of computers usurping their authority, and airline marketers wonder about the eventual price tag.

"The eavesdropping is incredible," Sophia in't Veld, a Dutch member of the European Parliament, said in a telephone interview from Washington, where she was meeting with members of Congress on anti-terrorism and privacy issues. "We have to sacrifice some privacy and some freedom, but people have to have the proper means of redress to defend themselves against unnecessary invasion of

privacy or abuses of data by public authorities."

"The trade-off between technology and human rights is a tricky and tough area," Gaultier agreed. "When there's a crisis, everyone will accept it. Six months after the crisis, everyone will forget. You always have to be careful how you deal with passenger rights."

The use of potentially intrusive monitoring systems -- such as those that would record passenger movements and facial expressions and eavesdrop on private conversations and toilet visits -- is a particularly sensitive issue in Europe. Watchdog commissions here have engaged in transatlantic battles over U.S. rules requiring airlines to report personal data about incoming passengers to U.S. authorities.

Testing of most of the technologies in simulators is to begin this fall and continue through early next year, Gaultier said.

The package of systems found to work is unlikely to be available on commercial aircraft for as long as a decade because most would need to be incorporated into the airframes of planes under construction. The cost of retrofitting existing aircraft would be prohibitively high, according to Gaultier.

None of the systems is more controversial than the onboard video and audio sensors designed to detect erratic or suspicious behavior. Some critics argue that the systems could be prone to false alarms or prove unrealistic for commercial use.

Researchers at Britain's BAE Systems are attempting to compile a database of algorithms to allow computers to differentiate between the "micro-expressions" and facial tics of a person nervous about flying and a person nervous because he's about to detonate a bomb.

Researchers at the University of Reading in England, meanwhile, are working on the system that would quickly analyze such data and deliver it to the crew and the pilot. "Airlines are afraid of this product," Gaultier said. "They have to face marketing it to passengers."

As to whether this technology can be perfected to operate as envisioned, Gaultier said: "We're just getting started. It needs a lot more research."

Gaultier said crew members would not monitor actual videos but would respond to computer-generated signals warning of a potential problem in a specific seat or other location. He said the video images could be destroyed at the end of each flight.

As for other intrusions, "No video in the toilet," he said, "though they would have microphones in the toilet." The monitoring devices could also be used for detecting drunken or other unruly passengers, he said.

Gaultier's company, Sagem Defense Securite, is developing technology to improve security in communications between pilots and control towers and to prevent cyber hacking into airplane systems, especially when commercial aircraft begin introducing onboard Internet services.

Another French company, Thales Avionics, is testing a new collision-avoidance system that would build on existing short-range systems that warn a pilot when a plane is in imminent danger of crashing. The new system could be programmed to avoid not only dangerous terrain such as mountains, but tall buildings or cities hosting vulnerable events such as the Olympics or political summits.

Gaultier refers to the system as "never again the twin towers." He added, however, that "pilots will think that's an intrusion" because the system would take control out of their hands in the event of a hijacking or other emergency and allow the aircraft's computer system to guide the plane.

Other pieces of the SAFEE system would detect gases from a bomb being assembled on a plane and use laser beams to detect potentially dangerous chemicals that had evaded airport security checks.

But even with the new protections, Gaultier acknowledged, the system cannot guarantee an end to terrorist attacks. "Security level zero never exists," he said. "It's crazy to say, 'I have a system that provides 100 percent security.' "

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