

SAFETY IN THE SKIES

How far can airline security go?

BY MALCOLM GLADWELL

On November 24, 1971, a man in a dark suit, white shirt, and sunglasses bought a ticket in the name of Dan Cooper on the 2:50 P.M. Northwest Orient flight from Portland to Seattle. Once aboard the plane, he passed a note to a flight attendant. He was carrying a bomb, he said, and he wanted two hundred thousand dollars, four parachutes, and “no funny stuff.” In Seattle, the passengers and flight attendants were allowed to leave, and the F.B.I. handed over the parachutes and the money in used twenty-dollar bills. Cooper then told the pilot to fly slowly at ten thousand feet in the direction of Nevada, and not long after takeoff, somewhere over southwest Washington, he gathered up the ransom, lowered the plane’s back stairs, and parachuted into the night.

In the aftermath of Cooper’s leap, “para-jacking,” as it was known, became an epidemic in American skies. Of the thirty-one hijackings in the United States the following year, nineteen were attempts at Cooper-style extortion, and in fifteen of those cases the hijackers demanded parachutes so that they, too, could leap to freedom. It was a crime wave unlike any America had seen, and in response Boeing installed a special latch on its 727 model which prevented the tail stairs from being lowered in flight. The latch was known as the Cooper Vane, and it seemed, at the time, to be an effective response to the reign of terror in the skies. Of course, it was not. The Cooper Vane just forced hijackers to come up with ideas other than parachuting out of planes.

This is the great paradox of law enforcement. The better we are at preventing and solving the crimes before us, the more audacious criminals become. Put alarms and improved locks on cars, and criminals turn to the more dangerous sport of carjacking. Put guards and bulletproof screens in banks, and bank robbery gets taken over by high-

tech hackers. In the face of resistance, crime falls in frequency but rises in severity, and few events better illustrate this tradeoff than the hijackings of September 11th. The way in which those four planes were commandeered that Tuesday did not simply reflect a failure of our security measures; it reflected their success. When you get very good at crack-

escaped convict and two awaiting trial for rape—demanded a ransom of ten million dollars and had the pilot circle the Oak Ridge, Tennessee, nuclear facility for five hours, threatening to crash the plane if their demands were not met. Until that point, security at airports had been minimal, but, as the director of the Federal Aviation Administration said at the time, “The Oak Ridge odyssey has cleared the air.” In December of that year, the airlines were given sixty days to post armed security officers at passenger-boarding checkpoints. On January 5, 1973, all passengers and all carry-on luggage were required by law to be screened, and X-ray machines and metal detectors began to be installed in airports.

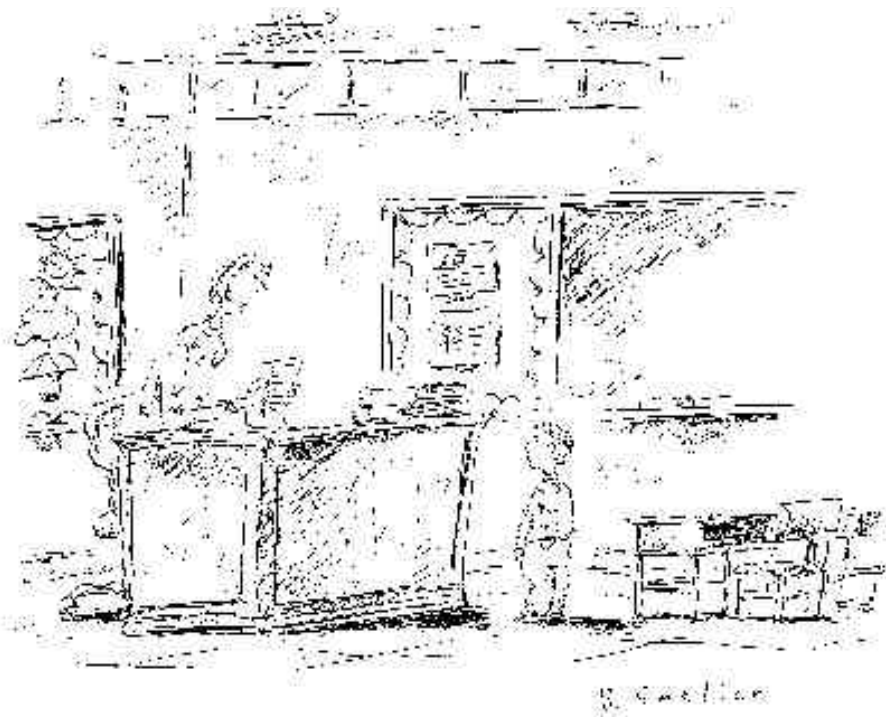


Stricter security reduces the frequency of attacks while increasing their intensity.

ing down on ordinary hijacking—when you lock the stairs at the back of the aircraft with a Cooper Vane—what you are left with is extraordinary hijacking.

The first serious push for airport security began in late 1972, in the wake of a bizarre hijacking of a DC-9 flight out of Birmingham, Alabama. A group of three men—one an

For a time, the number of hijackings dropped significantly. But it soon became clear that the battle to make flying safer was only beginning. In the 1985 hijacking of TWA Flight 847 out of Athens—which lasted seventeen days—terrorists bypassed the X-ray machines and the metal detectors by using members of the cleaning staff to stash guns and grenades in a washroom of the



"My parents didn't write it—they just tweaked it."

plane. In response, the airlines started to require background checks and accreditation of ground crews. In 1986, El Al security officers at London's Heathrow Airport found ten pounds of high explosives in the luggage of an unwitting and pregnant Irish girl, which had been placed there by her Palestinian boyfriend. Now all passengers are asked if they packed their bags themselves. In a string of bombings in the mid-eighties, terrorists began checking explosives-filled bags onto planes without boarding the planes themselves. Airlines responded by introducing "bag matching" on international flights—stipulating that no luggage can be loaded on a plane unless its owner is on board as well. As an additional safety measure, the airlines started X-raying and searching checked bags for explosives. But in the 1988 bombing of Pan Am Flight 103 over Lockerbie, Scotland, terrorists beat that system by hiding plastic explosives inside a radio. As a result, the airlines have now largely switched to using CT scanners, a variant of the kind used in medical care, which take a three-dimensional picture of the interior of every piece of luggage and screen it

with pattern-recognition software. The days when someone could stroll onto a plane with a bag full of explosives are long gone.

These are the security obstacles that confront terrorists planning an attack on an airline. They can't bomb an international flight with a checked bag, because they know that there is a good chance the bag will be intercepted. They can't check the bag and run, because the bomb will never get on board. And they can't hijack the plane with a gun, because there is no sure way of getting that weapon on board. The contemporary hijacker, in other words, must either be capable of devising a weapon that can get past security or be willing to go down with the plane. Most terrorists have neither the cleverness to meet the first criterion nor the audacity to meet the second, which is why the total number of hijackings has been falling for the past thirty years. During the nineties, in fact, the number of civil aviation "incidents" worldwide—hijackings, bombings, shootings, attacks, and so forth—dropped by more than seventy per cent. But this is where the law-enforcement paradox comes in: Even as

the number of terrorist acts has diminished, the number of people killed in hijackings and bombings has steadily increased. And, despite all the improvements in airport security, the percentage of terrorist hijackings foiled by airport security in the years between 1987 and 1996 was at its lowest point in thirty years. Airport-security measures have simply chased out the amateurs and left the clever and the audacious. "A look at the history of attacks on commercial aviation reveals that new terrorist methods of attack have virtually never been foreseen by security authorities," the Israeli terrorism expert Ariel Merari writes, in the recent book "Aviation Terrorism and Security."

The security system was caught by surprise when an airliner was first hijacked for political extortion; it was unprepared when an airliner was attacked on the tarmac by a terrorist team firing automatic weapons; when terrorists, who arrived as passengers, collected their luggage from the conveyer belt, took out weapons from their suitcases, and strafed the crowd in the arrivals hall; when a parcel bomb sent by mail exploded in an airliner's cargo hold in mid-flight; when a bomb was brought on board by an unwitting passenger. . . . The history of attacks on aviation is the chronicle of a cat-and-mouse game, where the cat is busy blocking old holes and the mouse always succeeds in finding new ones.

And no hole was bigger than the one found on September 11th.

What the attackers understood was the structural weakness of the passenger-gate security checkpoint, particularly when it came to the detection of knives. Hand-luggage checkpoints use X-ray machines, which do a good job of picking out a large, dense, and predictable object like a gun. Now imagine looking at a photograph of a knife. From the side, the shape is unmistakable. But if the blade edge is directly facing the camera what you'll see is just a thin line. "If you stand the knife on its edge, it could be anything," says Harry Martz, who directs the Center for Nondestructive Characterization at Lawrence Livermore Laboratories. "It could be a steel ruler. Then you put in computers, hair dryers, pens, clothes hangers, and it makes it even more difficult to pick up the pattern."

The challenge of detecting something like a knife blade is made harder

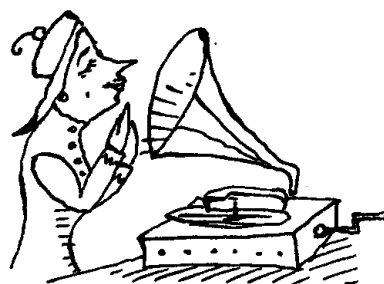
still by the psychological demands on X-ray operators. What they are looking for—weapons—is called the “signal,” and a well-documented principle of human-factors research is that as the “signal rate” declines, detection accuracy declines as well. If there was a gun in every second bag, for instance, you could expect the signals to be detected with almost perfect accuracy: the X-ray operator would be on his toes. But guns are almost never found in bags, which means that the vigilance of the operator inevitably falters. This is a significant problem in many fields, from nuclear-plant inspection to quality-control in manufacturing plants—where the job of catching defects on, say, a car becomes harder and harder as cars become better made. “I’ve studied this in people who look for cracks in the rotor disks of airplane engines,” says Colin Drury, a human-factors specialist at the University of Buffalo. “Remember the DC-10 crash at Sioux City? That was a rotor disk. Well, the probability of that kind of crack happening is incredibly small. Most inspectors won’t see one in their lifetime, so it’s very difficult to remain alert to that.” The F.A.A. periodically plants weapons in baggage to see whether they are detected. But it’s not clear what effect that kind of test has on vigilance. In the wake of the September attacks, some commentators called for increased training for X-ray security operators. Yet the problem is not just a lack of expertise; it is the paucity of signals. “Better training is only going to get you so far,” explains Douglas Harris, chairman of Anacapa Sciences, a California-based human-factors firm. “If it now takes a day to teach people the techniques they need, adding another day isn’t going to make much difference.”

A sophisticated terrorist wanting to smuggle knives on board, in other words, has a good shot at “gaming” the X-ray machine by packing his bags cleverly and exploiting the limitations of the operator. If he chooses, he can also beat the metal detector by concealing on his person knives made of ceramic or plastic, which wouldn’t trip the alarm. The knife strategy has its drawbacks, of course. It’s an open question how long a group of terrorists armed only with knives can hold off a cabin full of pas-

sengers. But if all they need is to make a short flight from Boston to downtown Manhattan knives would suffice.

Can we close the loopholes that led to the September 11th attack? Logistically, an all-encompassing security system is probably impossible. A new safety protocol that adds thirty seconds to the check-in time of every passenger would add more than three hours to the preparation time for a 747, assuming that there are no additional checkpoints. Reforms that further encumber the country’s already overstressed air-traffic system are hardly reforms; they are self-inflicted wounds. People have suggested that we station armed federal marshals on more flights. This could be an obstacle for some terrorists but an opportunity for others, who could overcome a marshal to gain possession of a firearm.

What we ought to do is beef up security for a small percentage of passengers deemed to be high-risk. The airlines already have in place a screening technology of this sort, known as CAPPs—Computer-Assisted Passenger Prescreening System. When a ticket is purchased on a domestic flight in the United States, the passenger is rated according to approximately forty pieces of data. Though the parameters are classified, they appear to include the traveller’s address, credit history, and destination; whether he or she is travelling alone; whether the ticket was paid for in cash; how long before the departure it was bought; and whether it is one way. (A recent review by the Department of Justice affirmed that the criteria are not discriminatory on the basis of ethnicity.) A sixty-eight-year-old male who lives on Park Avenue, has a fifty-thousand-dollar limit on his credit card, and has flown on the Washington-New York shuttle twice a week for the past eight years, for instance, is never going to get flagged by the CAPPs system. Probably no more than a handful of people



per domestic flight ever are, but those few have their checked luggage treated with the kind of scrutiny that, until this month, was reserved for international flights. Their bags are screened for explosives and held until the passengers are actually on board. It would be an easy step to use the CAPPs ratings at the gate as well. Those dubbed high-risk could have their hand luggage scrutinized by the slower but much more comprehensive CT scanner, which would make hiding knives or other weapons in hand luggage all but impossible.

At the same time, high-risk passengers could be asked to undergo an electronic strip search known as a body scan. In a conventional X-ray, the rays pass through the body, leaving an imprint on a detector on the other side. In a body scanner, the X rays are much weaker, penetrating clothes but not the body, so they bounce back and leave an imprint of whatever lies on the surface of the skin. A body scanner would have picked up a ceramic knife in an instant. Focussing on a smaller group of high-risk people would have the additional benefit of improving the detection accuracy of the security staff: it would raise the signal rate.

We may never know, of course, whether an expanded CAPPs system would have flagged the September 11th terrorists, but certainly those who planned the attack would have had to take that possibility seriously. The chief distinction between American and Israeli airport defense, at the moment, is that the American system focusses on technological examination of the baggage while the Israeli system focusses on personal interrogation and assessment of the passenger—which has resulted in El Al’s having an almost unblemished record against bombings and hijackings over the past twenty years. Wider use of CAPPs profiling would correct that shortcoming, and narrow still further the options available for any would-be terrorist. But we shouldn’t delude ourselves that these steps will end hijackings, any more than the Cooper Vane did thirty years ago. Better law enforcement doesn’t eliminate crime. It forces the criminals who remain to come up with something else. And, as we have just been reminded, that something else, all too frequently, is something worse. ♦