

# 'Planes Don't Blow Up,' Aviation Experts Assert

## *Only a Very Well Placed Bomb Could Do It*

By Fred Bayles  
*The Associated Press*

BOSTON — Airplane design is a craft of precision, computer projections and reassuring statistics. Blowing a plane from the sky is a chaotic act of evil intent, slim opportunity and hellish luck.

This is why, beyond the awful loss of 230 lives, aeronautics and terrorism experts are so disturbed by the explosion of TWA 800.

For them, the mystery of what happened at 13,700 feet stirs special dread: They see either a mechanical failure unlike anything experienced or a terrorist act of accuracy and precision rarely seen.

"If it was an accident, it would scare the hell out of us," said Michael Barr, director of aviation safety programs at the University of Southern California. "These planes just don't blow up. There's too many fire walls, too many checks and balances."

Christopher Ronay is equally troubled. As head of the FBI bomb unit for seven years, he investigated 30 aircraft bombings before retiring in 1994.

"I can't recall anything that has had a catastrophic effect like this case," he said. "You could blow the hell out of a cargo compartment with a luggage bomb, but you have to blow up a fuel cell or an engine to get an explosion like that."

Their perplexed fears are based on witness accounts of a huge orange fireball, a possible marker of exploding jet fuel. The Boeing 747 had taken off just 12 minutes before, its tanks loaded with 48,445 gallons of fuel for the long flight to France.

The specific fuel involved is called Jet A, a derivative of kerosene and a sluggish explosive. To explode, it must mix with air, an indication that one or more of the eight fuel cells in the jumbo jet's wings were breached — either by violent engine or mechanical failure, by a well-placed bomb or possibly by a missile.

There have been cases of sudden mechanical failure that caused fire and the loss of aircraft. An Air Force C-141 transport plane crashed in Europe in the late 1970s when an engine exploded, spraying hot fragments that ignited paint in a cargo hold.

A Boeing 767 ripped to pieces over Thailand

in 1991 when a computer error caused one engine to deploy its reverse thruster, sending the plane into a vicious spin.

But in neither case was there a cataclysmic explosion.

Before TWA 800 went down last week, there had never been an explosion of such ferocity aboard a 747-100, a "wet-wing," or plane that carries all its fuel in wing tanks.

"You have to have instant ignition into a large fuel source," said Mr. Barr, who trains accident investigators. "The way those fuel tanks are sealed, it just doesn't happen."

Few bombings of commercial aircraft have ended in such a fiery conclusion. In many cases, jetliners have survived even severe damage from explosions and landed safely.

In 1986, terrorists planted a sheet of plastic explosive the size of a business letter under one seat on a TWA flight from Rome to Athens. The explosion killed one man, blowing his seat out of the plane. A grandmother, daughter and grandchild were sucked out of the resulting hole. But the plane survived.

In the 1988 crash of Pan Am 103 at Lockerbie, Scotland, there was no fiery explosion — until fuel-laden parts of the plane hit the ground.

In that case, a bomb using 10 to 14 ounces (about 340 grams) of a plastic explosive was hidden in a radio-cassette player. When detonated by a timing device, it blew a hole in the fuselage skin, which rapidly fractured and peeled away. The plane broke into five sections that tumbled to Earth over the Scottish countryside.

"The dumb luck of the tragedy is that the terrorist who places a suitcase in the system doesn't know where it will go on the plane," Mr. Ronay said.

If the suitcase containing the radio-cassette player had been stacked inside a center cargo hold, surrounded by other luggage to absorb the blast, passengers and plane would have survived, he said. Plastic explosives hidden in luggage would not be enough to touch off a 747's fuel tanks, Mr. Ronay said.

"If it was a bomb, I'm inclined to say you'd have something involving an explosive device concealed in the engine cowling or wing assembly," he said. "If the engine explodes, you could break the wing and release the fuel."