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Feature Article

Aviation Enthusiasts Ponder:How Good Are PC Simulators?

by Sandra I. Erwin

It has been by now widely reported that the hijackers who committed the deadliest terrorist act in U.S. history acquired some of their aviation skills in flight simulators.

To what degree the hijackers were able to only rely on simulators to learn how to steer multi-engine jets and how to operate the transponders still remains uncertain. But the fact that flight simulators became useful tools for terrorists has stirred debate within the industry as to how much flying can really be learned in computer-based trainers.

Major airlines own and operate sophisticated flight simulators, which cost millions of dollars. Professional flight schools also have simulators. At least two of the hijackers trained on a Boeing 727 simulator facility, in South Florida.

But PC-based simulators are so advanced today, experts contend, that it would not be unreasonable to expect that someone could learn how to operate the instrumentation of a large jet by using off-the-shelf technology, such as Microsoft Flight Simulator.

Microsoft Corp. announced in mid-September that it would delay the release of the 2002 version of its popular Flight Simulator, because it needed to remove the World Trade Center from the virtual New York landscape that was built into the program.

A veritable cottage industry has thrived around Microsoft Flight Simulator. Hundreds of utilities are available, which are used to customize the simulator so it replicates the instrumentation of whatever type of airplane one wants to fly—from a Cessna 172S single-engine trainer to the Boeing 747-400 jumbo

jet.

The Microsoft Flight Simulator provides the “background material,” said David Silbergeld, who frequently writes reviews of computer-based simulations. “Whatever utility you add on is used for the instrumentation.”

Magazines such as PC Pilot and Computer Pilot have hundreds of product reviews and advertisements of simulators and utilities for the Microsoft program. For the most part, the largest markets for these products are in the United Kingdom, Germany and Japan. Software packages range from about $40 to $100.

The flight simulators for the Boeing 767 and 757 happen to be “very precise,” said Silbergeld. “Pilots love them,” he said. “They can familiarize themselves with the controls ... take a look and play around. The simulator is very accurate.” More importantly, he added, “You can’t crash your airplane when you make a mistake.”

The PC simulators, however, are not good enough to teach someone how to fly the aircraft. They are good enough to learn the instruments, Silbergeld said. “A [large Boeing jet] aircraft weighs a half a million pounds. You are not going to get that kind of feel, unless you were in the high-end simulators.”

The more complex part is to take off and get it up in the air, he said, “but staying in the air is not that difficult, if you know where all the instruments are, and which ones you are going to pay attention to.”

Offering a similar assessment was Jerry Weltsch, a senior aerospace analyst at Frost & Sullivan Aerospace and Defense Research Group.

“The Microsoft program is only for desktop use. It doesn’t give you the feel of the aircraft,” he said. “It’s a familiarization tool.”

It relies on a mouse or joystick to fly the airplane, he explained, “so you don’t have a hands-on experience with the controls.”

However, said Weltsch, “you get a familiarity with behavioral responses to certain controls in the cockpit and a familiarity with how the instruments on the cockpit panel look. So you know what to look for in terms of altitude, air speed, ground speed, direction relative to switches on the panel and how the airplane responds to certain inputs.”

Flight Simulator 2002 comes with a new artificial intelligence system that generates air traffic around and between airports. It also has enhanced virtual cockpits with working instruments. Maps and graphs show the operators how well they maintain course and altitude. A so-called “graphical flight planner,” is used to plot the route from departure to destination on an interactive map.

The hijackers, Weltsch said, trained in flight simulators under the supervision of flight instructors. “They got the experience of flying in the simulator.”

of flight instructors. "They got the experience of flying in the simulator." Additionally, Weltsch said, they may have used Microsoft Flight Simulator 2000 to see what it would look like—from the cockpit of the type of airplane they were going to use, with the panel in front of them—to fly into the World Trade Center.

"They got to see the lay of the land on approach to the building," he said. "They could see altitude, speed relative to their approach to the building from a certain distance away. One of the things that threw people off was that they changed the flight pattern" within seconds. Flight Simulator, in other words, can help someone become familiar with a particular flight route, but it's not adequate to learn how to fly. "The Microsoft program wouldn't be enough," said Weltsch.

Since the September 11 attack, the FBI has conducted investigations at dozens of flight schools in the United States. According to press reports, the 19 suspected terrorists received flight training from at least 10 U.S. flight schools.

Typically, U.S. flight schools do not perform background checks of foreign students. But that may change, said Weltsch. Even stricter standards will be enforced at military flight-training schools, he said. "When bringing foreign nationals, they will need to go through a security clearance before they are allowed to train on U.S. military simulators and training centers."

The United States will have to make sure that U.S. agencies do their own security clearance checks, rather than expect other countries to do that for them, said Weltsch. "Commercial flight training schools may want to do background checks on students. It's an expensive business, but they could add it to the price of training."