

[News Home Page](#)[Nation](#)[National Security](#)[Science](#)[Courts](#)[Columns](#)[Search the States](#)[Special Reports](#)

- [America at War](#)

- [- Archive](#)

- [- Bioterrorism](#)

- [- Business](#)

- [- Editorials](#)

- [- Investigation](#)

- [- New York](#)

- [- Opinions](#)

- [- Washington](#)

- [- The Human Toll](#)

- [- Retaliation](#)

[Photo Galleries](#)[Live Online](#)[Nation Index](#)[World](#)[Metro](#)[Business](#)[Washtech](#)[Sports](#)[Style](#)[Education](#)[Travel](#)[Health](#)[Home & Garden](#)[Opinion](#)[Weather](#)[Weekly Sections](#)[News Digest](#)[Classifieds](#)[Print Edition](#)[Archives](#)[Site Index](#)[Help](#)

Pentagon Crash Highlights a Radar Gap

Limited System in One Area Made Flight 77 Invisible to Controllers for Half-Hour

By Don Phillips

Washington Post Staff Writer

Saturday, November 3, 2001; Page A06

The airliner that slammed into the Pentagon on Sept. 11 disappeared from controllers' radar screens for at least 30 minutes -- in part because it was hijacked in an area of limited radar coverage. That gap cost military and aviation officials valuable warning time, according to officials and other sources.

Investigators are still piecing together the facts in the hijacking of American Airlines Flight 77. But the sector of limited radar coverage at an Indianapolis "en route center" helps explain one of its mysteries: Why did the Boeing 757 simply disappear from radar screens for a half-hour or more, turn around over southern Ohio and get back into Washington airspace before anyone noticed it or knew that it had been hijacked?

It's an especially intriguing question because controllers in New York, Boston and Cleveland suspected or knew quickly that three other airliners had been hijacked. They tracked two of them on a backup radar system as one slammed into the World Trade Center and another crashed in Pennsylvania.

They searched, without success, for the third, which also plowed into the World Trade Center.

AMERICA AT WAR SPECIAL REPORT

[Post Coverage](#) | [Discussions](#) | [Video](#)
[Photos](#) | [Graphics](#) | [List of Victims](#)
[Subscribe to Daily Newsletter](#)

— Top Stories —

- [U.S. Chopper Crashes in Afghanistan](#) (The Washington Post, Nov 3, 2001)
- [N.J. Case Could Be Linked to Spores in Mail](#) (The Washington Post, Nov 3, 2001)
- [FBI Pleads for Help on Attacks](#) (The Washington Post, Nov 3, 2001)
- [Full Coverage](#)

— Online Extras —

Photo Galleries

- [Gallery: America At War](#)
- [Gallery: WarZone Eyewitness](#)
- [Gallery: After the Fall](#)
- [Gallery: Sept. 11, 2001](#)
- [Fall of the Twin Towers](#)
- [Satellite Images: Ground Zero](#)
- [More Photo Galleries](#)

Video/Audio Coverage

Latest news clips and features:

- [Bush: Bombing Won't Stop for Ramadan](#)
- [Mueller on Anthrax](#)
- [Post Roundtable](#)
- [More Video and Audio Features](#)

News Graphics

Latest graphics:

- [Other Deadly Agents](#)
- [U.S. Weapons: Tools of Attack](#)
- [Anthrax Detected in Washington Area](#)
- [More Graphics](#)

Live Online Discussions

Latest chats and transcripts:

- [11/05: How Congress Has Changed](#)
- [11/05: Understanding Islam](#)
- [Upcoming Discussions](#)
- [America at War Archives](#)

Transcripts

Latest texts and statements:

- [Bush on Economy, Terrorism](#)
- [Ridge on Anthrax](#)
- [Rumsfeld: Overseas Troops](#)
- [More Transcripts](#)

— On This Site —

- [Airports Special Report](#)

In the case of American Flight 77, it is unclear whether additional warning time would have changed anything. Military jets were scrambled after controllers became aware of the hijacked aircraft, but the fighters could not get to the Washington area in time.

Thirty minutes' extra warning would have allowed the jets to arrive in Washington before Flight 77, but it is unclear what action they were prepared to take.

— Related Articles —

- [Southwest Airlines, Happily Shticking to Its Business](#) (The Washington Post, Nov 3, 2001)
- [GOP Under Gun on Airport Security](#) (The Washington Post, Nov 3, 2001)
- [Financing Assured for Swissair Cos.](#) (Associated Press, Nov 2, 2001)
- [More Airlines News](#)

— The Airlines —

- [Air Travel Q&A;](#)
- [Airline Contact Information](#)
- [The Latest Airline News](#)

-  [E-Mail This Article](#)
-  [Printer-Friendly Version](#)
-  [Subscribe to The Post](#)

The aircraft, traveling from Dulles International Airport to Los Angeles, was hijacked sometime between 8:50 a.m. -- when air traffic controllers made their last routine contact with the pilot -- and 8:56, when hijackers turned off the transponder, which reports the plane's identity, altitude and speed to controllers' radar screens.

The airliner crashed into the Pentagon at 9:41 a.m., about 12 minutes after controllers at Dulles sounded an alert that an unidentified aircraft was headed toward Washington at high speed.

The answers to the mystery of the aircraft's disappearance begin with the fact that the hijacking took place in an area served by only one type of radar, FAA officials confirmed.

Although this radar is called a "secondary" system, it is the type used almost exclusively today in air traffic control. It takes an aircraft's identification, destination, speed and altitude from the plane's transponder and displays it on a controller's radar screen.

"Primary" radar is an older system. It bounces a beam off an aircraft and tells a controller only that a plane is aloft -- but does not display its type or altitude. The two systems are usually mounted on the same tower.

Primary radar is normally used only as a backup, and is usually turned off by controllers handling aircraft at altitudes above 18,000 feet because it clutters their screens. All aircraft flying above 18,000 feet are required to have working transponders.

If a plane simply disappears from radar screens, most controllers can quickly switch on the primary system, which should display a small plus sign at the plane's location, even if the aircraft's transponder is not working.

But the radar installation near Parkersburg, W. Va., was built with only secondary radar -- called "beacon-only" radar. That left the controller monitoring Flight 77 at the Indianapolis center blind when the hijackers apparently switched off the aircraft's transponder, sources said.

The airspace controlled by each of the FAA's 20 "en route" centers is further divided into a number of sectors, with separate controllers

handling each sector. Flight 77 was flying through a sector in the eastern portion of Indianapolis's airspace when it was hijacked.

Sources said the location of the hijacking is likely just a coincidence, although there is a remote possibility that the hijackers knew where to turn off the transponder.

There are a number of locations across the interior of the United States that operate solely with secondary radars. Until Sept. 11, it was the written policy of the FAA to begin turning off some older primary radars as they broke down or came due for expensive maintenance.

The more modern secondary radar was considered sufficient for high-altitude navigation as the FAA began switching to satellite-based navigation systems over the coming decades. FAA officials said no primary radars had been turned off yet, and the events of Sept. 11 have reversed the policy.

Officials acknowledged that several other factors contributed to the lack of information about Flight 77, which killed 189 people when it hit the Pentagon.

- Unlike at least two of the other aircraft, whose pilots apparently held radios open so controllers could hear the hijackers, there was only silence from Flight 77.
- In the case of the two planes that hit the World Trade Center, the Boston en route center handed off the climbing planes to the New York Terminal Radar Approach Control (TRACON) facility, an FAA official said. TRACONs control lower-altitude airspace, and controllers in them routinely monitor both primary and secondary radar.

Also, as soon as it became known that airliners were disappearing from radar screens, controllers in the New York and Boston "en route" sectors turned on their primary radar. That left the Northeast blanketed with both types of radar.

- Alerts and groundings of aircraft on Sept. 11 came minutes too late to help find Flight 77. The aircraft disappeared just nine minutes after the FAA was notified that a plane had hit the World Trade Center, and 12 minutes before the second plane struck, a period of general confusion.

An alert to controllers to watch for planes disappearing from radar or changing to unauthorized courses did not go out until 22 minutes after Flight 77 disappeared, when it was at least halfway back to Washington.

- When they reconstructed Flight 77's path, investigators determined that it was picked up by some distant radars, but none that were available to the Indianapolis controller, FAA officials said.

As the airliner sped east, controllers handling other sectors of high-altitude airspace in the Indianapolis center and the Washington center, at Leesburg, did not notice it, sources said. As usual, they were not monitoring primary radar, either. The two centers cover large areas of the Ohio Valley and Mid-Atlantic areas.

With no signal on their radar screens, controllers did not realize that Flight 77 had reversed direction. At 9:09 a.m., unable to reach the plane by radio, the Indianapolis controller reported a possible crash, sources said.

The first time that anyone became aware an aircraft was headed at high speed toward Washington was when the hijacked flight began descending and entered airspace controlled by the Dulles International Airport TRACON facility, an aviation source said.

The first Dulles controller noticed the fast-moving plane at 9:25 a.m. Moments later, controllers sounded an alert that an aircraft appeared to be headed directly toward the White House. It later turned and hit the Pentagon.

FAA spokeswoman Laura Brown noted that the Indianapolis controller properly followed all procedures in effect before Sept. 11. He or she assumed an electrical power failure and made every possible attempt to contact the plane. In the meantime, the controller cleared other aircraft from the plane's presumed flight path.

Those procedures changed, effectively, 22 minutes after Flight 77 disappeared from radar, when the FAA Command Center -- reacting to the World Trade Center crashes -- told controllers nationwide to be alert for planes dropping from radar or making unauthorized course changes.

Today, controllers would alert supervisors, who likely would call for military aircraft to search for the missing plane.

© 2001 The Washington Post Company

Related Links

[More National News](#)

Loudoun News

[Man Indicted on Perjury Charges](#) (The Washington Post, 11/2/01)

[Mortgage Average Drops To 6.56%](#) (The Washington Post, 11/2/01)

[Local Children's Farm Also Fertile Ground for History](#) (The Washington Post, 11/1/01)

[More Loudoun News](#)

Recent Airport News

[Flying in the Face of Airline Troubles](#) (The Washington Post, 11/3/01)

[Southwest Airlines, Happily Shticking to Its Business](#) (The Washington Post, 11/3/01)

[\\$1.8 Billion Va. Loss Estimated From Sept. 11](#) (The Washington Post, 11/3/01)

[FAA Shuts Down Concourse At JFK](#) (The Washington Post, 11/2/01)

[Man Indicted on Perjury Charges](#) (The Washington Post, 11/2/01)

Latest Business News

[Deep Into 'Recession'](#) (The Washington Post, 11/3/01)

[Circumstance Had Role in U.S.-Microsoft Deal](#) (The Washington Post, 11/3/01)

[States Devising Plan for High-Tech National Identification Cards](#) (The Washington Post, 11/3/01)

[Full Business Section](#)

[Full Washtech Section](#)

SEARCH:
News

GO
[Search Options](#)

