Three pieces of evidence point to jet's takeover

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There are three pieces of evidence that aviation safety experts say make it clear the missing Malaysia Airlines jet was taken over by someone who was knowledgeable about how the plane worked.

TRANSPONDER

One clue is that the plane's transponder—a signal system that identifies the plane to radar—was shut off about an hour into the flight.

In order to do that, someone in the cockpit would have to turn a knob with multiple selections to the off position while pressing down at the same time, said John Goglia, a former member of the National Transportation Safety Board. That's something a pilot would know how to do, but it could also be learned by someone who researched the plane on the Internet, he said.

ACARS

Another clue is that part of the Boeing 777's Aircraft Communications Addressing and Reporting System (ACARS) was shut off.

The system, which has two parts, is used to send short messages via a satellite or VHF radio to the airline's home base. The information part of the system was shut down, but not the transmission part. In most planes, the information part of the system can be shut down by hitting cockpit switches in sequence in order to get to a computer screen where an

option must be selected using a keypad, said Goglia, an expert on aircraft maintenance.

That's also something a pilot would know how to do, but that could also be discovered through research, he said.

But to turn off the other part of the ACARS, it would be necessary to go to an electronics bay beneath the cockpit. That's something a pilot wouldn't normally know how to do, Goglia said, and it wasn't done in the case of the Malaysia plane. Thus, the ACARS transmitter continued to send out blips that were recorded by the Inmarsat satellite once an hour for four to five hours after the transponder was turned off. The blips don't contain any messages or data, but the satellite can tell in a very broad way what region the blips are coming from and adjusts the angle of its antenna to be ready to receive message in case the ACARS sends them. Investigators are now trying to use data from the satellite to identify the region where the plane was when its last blip was sent.

GUIDED FLIGHT

The third indication is that that after the transponder was turned off and civilian radar lost track of the plane, Malaysian military radar was able to continue to track the plane as it turned west.

The plane was then tracked along a known flight route across the peninsula until it was several hundred miles (kilometers) offshore and beyond the range of military radar. Airliners normally fly from waypoint to waypoint where they can be seen by air traffic controllers who space them out so they don't collide. These lanes in the sky aren't straight lines. In order to follow that course, someone had to be guiding the plane, Goglia said.

Goglia said he is very skeptical of reports the plane was flying erratically

while it was being tracked by military radar, including steep ascents to very high altitudes and then sudden, rapid descents. Without a transponder signal, the ability to track planes isn't reliable at very high altitudes or with sudden shifts in altitude, he said.