

“DB Cooper”

New theory for cause of “pressure bump” on flight 305

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September 2016

Theory Statement:

The “pressure bump” was actually a “pressure dip”, a result of the closing of the bulkhead door by “DB Cooper” immediately prior to his intentional action on the aft stairs to cause the aircraft oscillation. Upon walking up the stairs and re-opening the closed bulkhead door, there was an immediate loss of air pressure in the partially pressurized passenger compartment. Contrary to accepted beliefs, Cooper did not exit the aircraft at the time of this noticeable change in cabin pressure. This new theory further supports “DB Cooper’s” use of the KISS principle in creating the diversion over Washington state and remaining on the aircraft.

Overview:

The reported “pressure bump” at 8:13 pm by the flight crew of Northwest Orient Airlines (NWOA) flight 305, is the cornerstone of where the ground search location was determined to be in Washington state. The presumption was made that the “pressure bump” was the result of “DB Cooper” exiting the Boeing 727. The resulting search was focused on the terrain below that portion of the plane’s flightpath.

Concerns:

- 1.) Should the “pressure bump” presumption of “Cooper’s” exit be incorrect, the search area will be off by 2 ½ miles per minute from his actual exit location.
- 2.) A recreation of “Cooper’s” parachute jump was conducted by NWOA. What was unusual, the NWOA employee who originally determined the search area was in charge of the recreation to determine if his search area information was valid. The recreation should have been conducted by an objective third party to avoid any perception of bias.
- 3.) The captain and first officer of NWOA flight 305, the most critical witnesses, were available but did not participate in the recreation, also very unusual. This is contrary to established protocols of crime scene re-enactments where critical witnesses participate. Critical witnesses often remember additional details during re-enactments that were overlooked in their post-event interview(s).
- 4.) The chief concern? The results of the re-enactment may not be completely valid.

Note:

During the seven months following “Cooper’s” hijacking, five more airliners were hijacked successfully. “Successfully” meaning that the hijacker safely parachuted from the aircraft. In each of the five hijackings, the bandits were captured within a very short time of landing. What is noteworthy is that there is no record of the “pressure bump” having occurred in each of the five subsequent hijackings as one would expect. The “pressure bump” appears to be unique only to the “DB Cooper” hijacking, an anomaly never fully explained.

What exactly was the “pressure bump”?

That is the \$64,000 question and there is not an absolute definitive answer. There are multiple, conflicting beliefs regarding the “pressure bump” including: a.) it being a change in cabin pressure in the aircraft; b.) it being oscillation of the aircraft felt by the flight crew; c.) or both being one in the same. To make matters more perplexing, during later interviews some witnesses have changed their stories slightly from supporting one belief to another.

What caused the “pressure bump”?

The accepted belief from the beginning was the “pressure bump” was caused by the aft stairs rebounding to an almost closed position after “DB Cooper” parachuted from them. The recreation did determine that the “free fall” motion of the stairs was hindered by the slipstream (windblast) of the air rushing by them at 160 mph -190 mph. The windblast allowed the stairs to fall only a few inches under their own weight. With the weight of a person walking down the stairs, they extended more but never to a fully locked position. Once the person’s weight was removed from the stairs, the windblast would spring them back up, similar to a diving board but not to a fully closed and locked position.

Is it theoretically possible for the closing stairs to cause a noticeable pressure increase (pressure bump)?

The answer to this would best be determined by a person with a strong math science background and skilled in the science of air pressure. Simply put, is the square footage of the aft stairs, closing at a relatively slow, rebounding speed, enough to compress the atmosphere in the cabin (and cargo) area, resulting in someone feeling the pressure change in their ears?

I was not able to locate the dimensions of the aft stairs surface area for the Boeing 727-100 series (same series as flight 305). From my observation of the aft stairs of a Boeing 727, the surface area that mates with the fuselage skin area when fully closed, appears to be an area approximately 4 feet wide by approximately 12 feet in length (approximately 48 sq. ft.)

I was able to obtain the interior specifications for the Boeing 727-100 series, for both the passenger cabin and cargo areas. These areas need to be combined since they both share the same pressurized environment.

Passenger cabin volume = 3,278 cu. feet

Lower cargo deck volume = 890 cu. feet

Total volume = 4,168 cu. feet

Q.) If the aft stairs have enough square footage that when closed at a moderate speed, the atmosphere in both the passenger and cargo areas significantly compresses to be felt in the ears of the crew, why did this not occur during the subsequent five hijackings?

A.) Not addressed to date.

Q.) If the recreation of the “pressure bump” flight by NWOA duplicated the so called “pressure bump”, why was it not duplicated on each of the five subsequent hijackings?

A.) Not addressed to date.

Alternative theory for cause of “pressure bump”

The simplest answer and key to the cause of the “pressure bump” is the bulkhead door in the rear of the passenger cabin, at the top of the aft stairs and the aircraft’s automated cabin pressurization system. Let’s review what is known:

1.) Timeline of known events

- **7:36 pm**, aircraft takes off from Seattle airport
- **prior to 7:42 pm**, during aircraft climb, aft light comes on
- **7:45 pm**, Cooper uses internal phone to tell flight deck to, “*Slow down a little; I can’t get the stairs down*” Crew drops flaps from 15 degrees to 30 degrees, reducing airspeed from 170 knots to 140 knots
- **8:04 pm**, light indicating aft stairs are lowered, aircraft experiences sustained, slight “pitch” down of nose, pilot trims aircraft elevators back to level flight. A few minutes later, flight deck attempts to call Cooper over phone, after a slight delay, he answers. When asked if he was having trouble with the stairs, he replied, “*Everything is fine now*”
- **8:12 pm**, captain and first officer notice aircraft “pitch” oscillating, aircraft brought to level flight within moments
- **8:13 pm**, flight crew notices change in air pressure in their ears, flight engineer comments that cabin pressurization needles are fluctuating. Comment made on flight deck that their passenger most likely just jumped. It is from this event that the “pressure bump” is born and the search area on the ground is determined

Most important point: The key point in this alternate “pressure bump” theory is the knowledge that the aircraft’s cabin pressurization system is automated. Therefore, as the aircraft climbs to altitude the automated pressurization system adjusts the cabin pressure without direct input from the flight deck. The flight deck can take the extra step of turning the automated system off, but there is no record of that being done on flight 305. The presumption is the automated pressurization system continuously tried to pressurize the aircraft during its climb to 10,000’ msl, even though the bulkhead door had been opened by “DB Cooper” only minutes into the climb.

Keeping with the “KISS” principle, here is how I believe the “pressure bump” occurred:

2.) “DB Cooper’s” timeline of actions taken: aka, alternate theory

- **7:36 pm**, aircraft took off from Seattle
- **prior to 7:42 pm**, during aircraft climb, Cooper left his seat and opened bulkhead door, that action triggered aft light coming on
- **prior to 7:45 pm**, Cooper tried to lower aft stairs but high airspeed prevented them from dropping down by gravity (free fall)
- **7:45 pm**, Cooper called flight deck, told them to, *“Slow down a little; I can’t get the stairs down.”* Crew dropped flaps from 15 degrees to 30 degrees, airspeed dropped from 170 knots to 140 knots
- **8:04 pm**, Cooper successfully lowered aft stairs enough to trigger sensor for aft stairs light on flight deck. Stairs are also low enough causing drag for aircraft nose to “pitch” slightly down. The pilot trims the aircraft elevators to compensate for this additional drag, aircraft returns to level flight. Cooper was preoccupied when phone rang, he answered after a slight delay. Flight deck asked if he was having trouble with stairs, he replied, *“Everything is fine now”*
- **between 8:07 pm and 8:11 pm**, *[here is the key to what the “pressure bump” actually was]* Cooper either closed the bulkhead door, or it inadvertently closed on it’s own, cabin pressurization system was automatically cycling as he walked down the stairs, the cabin started to pressurize
- **8:12 pm**, Cooper jumped up and down on the stairs in his diversion attempt to mimic parachuting from them. This action resulted in oscillation of aircraft “pitch” felt by both pilots
- **8:13 pm**, Cooper walked back upstairs, opened bulkhead door causing immediate loss of the partial pressurization of cabin. This is a “pressure dip”, not a “pressure bump”. Perhaps not intended as part of his diversion, the flight crew interpreted this change in pressure to Cooper exiting the aircraft. *Note: Flight crew felt the change of air pressure in their ears. For most people it is difficult to determine if air pressure change in their ears is the result of high pressure (bump) or low pressure (dip), both feel essentially the same.*
- **8:14 pm to approximately 10:55 pm**, having remained on the aircraft, Cooper enjoyed the flight to the Reno airport. The bulkhead door remained open for remainder of the flight. He ignored all calls on the phone from the flight deck to simply make it appear he

had parachuted over Washington state. Crew are not certain whether or not he had parachuted from aircraft.

- **10:55 pm**, as the aircraft was nearing Reno airport, pilot was jockeying throttles and doing control surface (elevators, rudder, ailerons) inputs during this phase of approach. Weather was perfect for a night time parachute jump, ground temperature of 30 degrees (fahrenheit), skies were clear, ground winds of 6 mph, moon was 41% illumination. Aircraft was approximately 18 miles from the Reno airport, flying almost a straight line since entering Nevada airspace near Susanville, California. Cooper's walk down the stairs did not alert the captain or first officer who were preoccupied with the landing approach to Reno airport.
- **10:56 pm**, Cooper had an excellent view of the high desert landscape below as the aircraft flew over a small airport, a former WWII US Army airfield known in 1971 as Stead airport. He used this ground reference as his "green light" to jump. He was 15 miles from the Reno airport when he parachuted from flight 305. The parachute descent lasted approximately 4-5 minutes and during his descent he looked for blacktopped roads headed towards Reno. He safely landed in the desert, two states away from his diversion jump over Washington state
- **11:01 pm**, Cooper rigger rolled his parachute, gathered the money bag and simply walked towards a blacktopped road he observed during descent, a road leading to US Highway 395, approximately three miles away
- **11:02 pm**, flight 305 landed at Reno airport, flight crew did not know if Cooper was still on the aircraft or not
- as Cooper approached a blacktopped road, he safely hid the parachute and money in brush, went out to the road wearing his coat, minus the black tie and hitchhiked the 15 miles into Reno
- only hours later, he had a rental car and drove to the location he left the parachute and money. Once he had the items secured in his rental car, he either drove north or south on US 395, or drove a short distance to US Highway 40 (now Interstate 80), and left the "AO" (area of operation) quickly
- Cooper most likely hoped his diversion parachute jump over Washington state would buy him a 24- 48 hour head start; it actually bought him 45 years of a head start

This alternate theory is much simpler than the convoluted theory that the "pressure bump" was caused by the aft stairs bouncing to an almost closed position, or that the "pressure bump" was the aircraft experiencing oscillation, or the "pressure bump" was both events though they occurred one minute apart.