

# CALLBACK

From NASA's Aviation Safety Reporting System



Issue 386

March 2012

## RIGHT NUMBER WRONG RESULT

Much of the guidance given to pilots by Air Traffic Control comes in the form of numbers associated with altitude, airspeed, and heading assignments. But, when feet, degrees or knots get interchanged, pilots end up doing the wrong thing with the right number.

The lessons from this month's reports are: listen carefully; clarify when there is doubt; read back the full clearance, not just the numbers; confirm with another crewmember, if available, before acting.

### Climbing, to a Degree, Is Wrong

By not being fully attentive to a "routine" clearance, this A319 Captain confused the numbers and mistook a heading for an altitude. Wrong numbers can be a nuisance, but in this case a valuable message came through in the form of a "wake up call."

■ *On departure...we were assigned to fly direct to a fix on the Departure. We were climbing through about 9,000 feet MSL and assigned to climb and maintain 10,000 feet. We were advised of an inbound aircraft above us and descending at our two o'clock position. The First Officer advised ATC that we were in IMC. I then thought I heard ATC clear us to FL280, so I allowed the aircraft to continue climbing and I set 28,000 on the altitude alerter. As we approached 10,000 feet, we got a TCAS RA to, "Monitor vertical speed." We entered VMC at that moment and I could see the traffic at about our 11 o'clock and above us. I disengaged the autopilot, stopped the climb manually and leveled the aircraft at 10,000 feet. I remember that we reached 10,300 feet during the maneuver. At the same time, I heard the ATC repeat to us that our climb clearance was 10,000 feet.*

*The actual clearance was to fly heading 280 and maintain 10,000 feet, but I had heard it incorrectly. By the time the First Officer had time to call attention to my mistake, I had stopped the climb and started back to 10,000 MSL. I had not changed our heading, either. We were heading 260 degrees rather than the assigned heading of 280 degrees.*

*I heard the clearance to turn to heading 280 and thought that it was a climb clearance to FL280. I did not clear the*

*new altitude with the First Officer before commanding the aircraft to climb further.*

*I will remember this episode forever. It was a wake up call. As we are supposed to do, I will clear newly assigned altitude assignments with the Non Flying Pilot before initiating or continuing a climb or descent. I will try to listen to clearances more critically even if they seem routine.*

### A Higher Degree of Confusion

Given a number that would have represented a significant heading change and which happened to coincide with their filed altitude, this B747 Flight Crew was predisposed to misinterpret a heading assignment as an altitude.

■ *On climbout, Center cleared us to FL230 and issued a heading of 340. My First Officer and I misinterpreted the clearance as "Climb to FL230" and expect our final altitude to be "340."*

*Since the assigned heading of 340 would have been about 80 degrees off from our on-course heading, and since our original flight plan was filed for FL340, we both mistakenly interpreted the digits 3-4-0 as pertaining to an expected altitude rather than a severe heading change.*

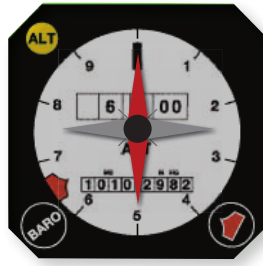
*We ended up maintaining our on-course heading of about 260 degrees and climbed to FL230 until the Controller asked why we had not changed heading and assigned us a different vector.*

*We should have listened more carefully, questioned any clearance or information that was not clearly understood, and confirmed the clearance.*

### Heading for the Wrong Altitude

A Controller and a Learjet 31 Flight Crew describe another incident in which a heading assignment was confused with altitude. By including a reference to a flight level or heading in the readback, rather than just a number, the Flight Crew would have made it easier for the Controller to catch their error.

■ When a Learjet departed a nearby satellite airport, I issued climb and vector instructions keeping the Learjet below crossing departure aircraft. I eventually instructed the Learjet to “Climb and maintain 14,000 feet.” Conflicting arrival traffic was inbound and I also helped coordinate a satellite arrival aircraft that was being worked by the East Arrival Sector. I was issuing vectors to the Learjet to put that aircraft in a position that would help achieve in-trail spacing.... I issued instructions to “Fly heading two zero zero.” The pilot read back, “[Call sign], two zero zero.”



Once the Learjet climbed above the arrival airspace (12,000 feet), I turned the aircraft to a 270-degree heading. I planned to put it between two departures. Shortly thereafter, I noticed him at 15,000 feet. I told the Learjet that his assigned altitude was 14,000 and to maintain 14,000. My airspace limit is 14,000. The pilot said he was given 20,000 feet and read that back. I told him I never assigned him “Flight Level two zero zero.” The pilot had read back my heading and somehow assumed that was his assigned altitude....

The pilot should have said “heading” or “altitude” with the number in the readback. I would not expect a professional pilot to be told, “Fly heading two zero zero” and attempt to climb to that altitude.... Placing more emphasis on correct readback and phraseology to the flying community might help.

[From the Flight Crew report on the same incident]

■ Shortly after takeoff, a heading of 200 degrees was assigned but was mistaken for an altitude assignment. The readback was, “Two zero zero and Call Sign.” Shortly thereafter, ATC questioned our altitude and the mistake was realized.

## Degrees Are Not Knots...

A B737-400 First Officer recounts how a heading assignment got confused with airspeed when the Captain missed a window of opportunity to get it right.

■ Approach Control told us to descend to 3,000 feet and fly heading 210. The Captain (Pilot Flying) started the descent, but dialed 210 into the airspeed window instead of the heading window. Approach asked us if we were flying a 210 heading and we realized our mistake. Approach then cleared us direct to the airport. This event occurred due to complacency, no crosschecking, and a lack of attention to detail.

## And Knots Are Not Feet

ATC apparently missed the readback discrepancies when this CRJ200 crew mistook an airspeed assignment for an altitude.

■ Climbing to FL300...the First Officer was the Pilot Not Flying. I did not hear the transmission, but the First Officer told me that ATC wanted 260 knots. I had the headset off and thought I had the speaker on. It wasn't on, so I selected it on, slowed to 260 knots and continued the climb to FL300. We switched to another Controller and a short time later the Controller told us to maintain FL280. We were passing FL275 at the time. The Controller asked our assigned altitude and the First Officer told him we were given FL300 and an airspeed of 260 by the previous Controller. The Controller responded that the previous Controller wanted us to maintain FL260. The First Officer stated that he had replied, “Airspeed 260 knots” to the previous Controller and that he had checked in with this Controller stating, “Climbing to FL300; airspeed 260 knots.”

Not having my speaker on contributed to this incident.

ASRS Alerts Issued in January 2012	
Subject of Alert	No. of Alerts
Aircraft or aircraft equipment	6
Airport facility or procedure	7
ATC equipment or procedure	6
Maintenance procedure	1
<b>TOTAL</b>	<b>20</b>

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A Monthly Safety Bulletin from

**The NASA  
Aviation Safety  
Reporting System**

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Moffett Field, CA  
94035-0189

<http://asrs.arc.nasa.gov>

January 2012 Report Intake	
Air Carrier/Air Taxi Pilots	2972
General Aviation Pilots	787
Controllers	658
Cabin	271
Mechanics	148
Dispatcher	59
Military/Other	42
<b>TOTAL</b>	<b>4937</b>