

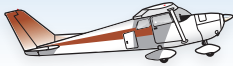
CALLBACK

From NASA's Aviation Safety Reporting System



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ATC Low Altitude Alerts

Controller issued Low Altitude alerts are created by either the Minimum Safe Altitude Warning (MSAW) or the Low Altitude Alert System (LAAS). The systems are similar as far as pilots are concerned, although MSAW has some predictive capabilities. The alerts are intended for IFR aircraft but may be requested by VFR aircraft, and are designed “as a controller aid in detecting potentially unsafe aircraft proximity to terrain or obstructions.” The alerts generally result in the controller issuing a “Check your altitude” call and often include an altimeter setting and altitude reference (MDA, MVA, etc.). Nuisance false alarms can be generated as the computer cannot predict a pilot’s intentions and delays in Mode C updating can delay a timely warning.

Even though there are excellent Terrain Awareness and Warning Systems (TAWS) and Ground Proximity Warning Systems (GPWS) in many aircraft, the ATC alert systems provide a useful backup for pilots.

The following ASRS reports show the benefit of having the controllers keeping an eye on a pilot’s altitude.

Flying Straight Toward Trouble

Before they could resolve an ambiguous clearance, two C172 Pilots were “alerted” about their proximity to terrain. Misunderstandings between Pilots and Controllers are problematic. In the approach or departure environment they can be critical.

■ *We were climbing via a published departure. At around 3,000 feet we contacted Departure Control who gave us a new altimeter setting and then proceeded with the following clearance: “Fly straight out; climb and maintain 9,000 feet.” Our altitude was approximately 3,800 feet and we were still heading westerly toward terrain, not yet established on the outbound radial. The student noted that it was strange for ATC to vector us close to terrain while we were this low. A moment later, ATC gave us a Low Altitude alert and suggested a right turn to 090. Then ATC mentioned a possible deviation and gave us a number to call.*

There was confusion about what the ATC clearance actually meant. The clearance “Fly straight out” was filled with ambiguity (we were still flying westerly and not heading northwest on the published procedure radial). The clearance was perceived as a vector for the climb. Before we had a chance to request clarification, the Low Altitude alert was issued.

Help on a Hazy Day

One CRJ Pilot and two Controllers share three perspectives on an approach to the wrong airport. A timely ATC Low Altitude alert cleared up the confusion on a hazy day.

ATC Front Line Manager Report:

■ *Aircraft X was handed off to Approach at 12,000 feet. The Controller issued the landing information and told the aircraft to expect the Visual Approach to RWY 17 at [their destination airport]. The Controller then informed the aircraft that the airport was at 12 o’clock, 18 miles. The pilot stated that it was hazy, then reported the airport in sight. The Controller cleared him for a Visual Approach Runway 17 and to contact the Tower.*

A little while later the Low Altitude alert went off and the Controller noticed Aircraft X turning final to [the wrong airport] and was observed at 3,400 feet MSL with a field elevation of 3,062 feet. The Tower issued a 300 heading and a climb to 6,000 feet.

I asked the Controller if he had advised that [the nearby airport] was at 1 o’clock and 10 miles and [the destination airport] was at 12 o’clock and 18 miles and he said he had not. We have two airports that are located ten miles from each other.

Approach Controller Report:

■ *I was the Approach Controller and cleared Aircraft X for a visual approach to Runway 17 and switched them to the Tower frequency. Aircraft X began to maneuver and appeared to be attempting to land at [a nearby airport], which lies 12 miles southeast of [the intended destination]. I called the Tower and the Tower had Aircraft X on frequency. The Tower issued a heading to Aircraft X to land at the correct airport.*

Pilot Report:

■ *I was the Pilot Flying. Normal In-Range checklist was completed, including a briefing of the intended runway and type of approach (visual backed-up by the ILS Runway 17). ATC cleared us from cruise altitude down to 13,000 feet and subsequently down to 10,000 feet. We both agreed we had the airport in sight at approximately 12 o’clock and approximately 8 miles (based on my recollection of visually identifying the airport and confirming it with the Multi-Function Display). ATC then cleared us to land.*

I began maneuvering the aircraft for a downwind leg, while continuing to configure the aircraft for landing. After turning from base to final, the Pilot Monitoring notified me that the LOC had not captured and called for a go-around. As I called for TOGA and Flaps 8, my scan moved to the top of the PFD and I noticed that the Flight Mode Annunciator did not change to LOC. I caught a glimpse of the number on the runway and noticed it was "18." Around this time, ATC queried us as to our intentions and status. It quickly became evident that we had mistaken a nearby airport for our destination airport.

Following the Wrong Bug

Rushing to catch up after a late runway change, this C208 Pilot mistakenly flew a "Vertical Speed" approach until alerted by ATC. Thorough familiarization with the aircraft's instrumentation in a training environment is the best way to ensure interception of the "real glideslope" in actual instrument conditions.

■ *I was being vectored for the ILS 5R and everything was set up for Runway 5R. While turning base, the preceding aircraft had a problem and was delaying on the runway. ATC advised me to descend from 4,000 feet to 3,000 feet and expect the Runway 5L ILS. I started the descent to 3,000 feet and rushed to change and set up the approach to Runway 5L. I was given a late turn to intercept and overshot the localizer. That was followed by a turn to 080 to intercept and maintain 3,000 feet until established, cleared for the approach, and switch to Tower frequency. I corrected back to intercept the localizer, checked in with Tower and was cleared to land. Intercepting the localizer I was now good to descend to 2,500 feet and was still above 3,000 feet descending. I mistook what I later identified as the VSI bug (that was about -450 fpm) as indicating that I was slightly above glideslope and continued the descent. I broke out about the same time that Tower said, "Low altitude alert. Check your altitude." I stopped the descent and could see that I was lower than the glideslope and that the field was much farther ahead. Tower asked me to confirm altitude at 1,780 feet, which I did. I then noticed the green diamond bug had appeared and I realized that I had mistaken the VSI bug for the glideslope indicator. I maintained altitude at 1,780 feet and joined the real glideslope and landed.*

When they gave the late change to Runway 5L, I should have asked for a box around until I had everything set up. My acceptance of this clearance left me rushing to catch up, leading to mistakes.

"We Were Too Low"

A Regional Jet Captain, confident in the abilities of the Co-Captain, was lulled into accepting an improper altitude. A timely alert from ATC awakened the Crew to their altitude vs. position error.

■ *We were flying as Co-Captains. My role was Pilot-in-Command (PIC) and I was the Non Flying Pilot. The weather was marginal VFR. ATC was using the RNAV GPS to the left runway and the ILS to the right runway. We were assigned the RNAV GPS approach to the left.*

Throughout our flight, I was privately admiring the proficiency, professionalism and airmanship of my Co-Captain. As we approached the Initial Fix, the Second-in-Command (SIC) called for the Minimum Descent Altitude (MDA) instead of the Final Approach Fix (FAF) altitude. Since we were in visual conditions, I set the MDA in the altitude preselect without question. I do remember thinking, "He's going to mentally adjust the descent rate for the Final Approach Fix."

I then proceeded to observe the visual conditions outside the airplane, especially noting the surface winds and the whitecaps on the ocean surface, and updated the SIC on my observations.

We received the 1,000 foot callout from the radar altimeter and then the Gear Warning horn. We noted that as being out of the ordinary and lowered the gear. Shortly thereafter, we received a Low Altitude alert from the Tower. I advised the SIC that we were too low, at the MDA [approximately 350 feet AGL], and just approaching the FAF. We continued for an otherwise uneventful landing.

Too Low, Too Soon

In another example of a timely Low Altitude alert, an EMB 500 crew was in a hurry to get home at the end of a long day.

■ *While on an RNAV GPS approach at night, the Captain and I became disoriented and started to descend to the MDA prior to the FAF. We thought we had already passed the FAF but in reality we had only passed the intersection before the FAF. Four miles from the FAF, Tower notified us of a Low Altitude alert and advised us to climb immediately.... The published altitude for that segment of the approach was 2,000 feet and we had descended to 1,400 feet.*

I am most grateful for the safeguards placed within the ATC system. I was safe within legal duty and rest limits, [but] the long duty day... allowed me to slip into a near-lethal combination of get-home-itis and complacency.

ASRS Alerts Issued	
Calendar Year	No. of Alerts
2012	217
2013	173
2014	159
2015*	107
TOTAL	656

*Data through August 2015

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A Monthly Safety
Newsletter from

**The NASA
Aviation Safety
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September 2015 Report Intake	
Air Carrier/Air Taxi Pilots	4,540
General Aviation Pilots	1,216
Flight Attendants	457
Controllers	368
Military/Other	342
Dispatchers	162
Mechanics	139
TOTAL	7,224