

# CALLBACK



From NASA's Aviation Safety Reporting System

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## LASER Illumination Hazards

Laser illumination of aircraft cockpits may cause a number of hazardous effects, including pilot distraction, glare, after-image flash blindness, and in extreme circumstances, persistent visual impairment and inability to perform flight duties.

According to the Air Line Pilots Association (ALPA) Operations Bulletin 2007-04, lasers continue to be a threat to aviation. During the first five months of 2007, over 200 "lasing" incidents were reported despite law enforcement efforts to deter and apprehend those who intentionally illuminate cockpits with lasers.

The rise in laser incidents in recent years is believed to be due to the proliferation and increasing sophistication of laser devices available to the general public. On January 11, 2005, the FAA issued Advisory Circular (AC) No. 70-2, Reporting of Laser Illumination of Aircraft, in response to numerous documented incidents of unauthorized illumination of aircraft by lasers. This AC provides guidance to air crews on the reporting of laser incidents, and recommends mitigation actions to be taken to ensure continued safe and orderly flight operations.

A review of laser incidents submitted to ASRS during the past year-and-a-half provides compelling evidence of the effects of sudden laser illumination in the cockpit. For one First Officer (the Pilot Flying), a laser flash produced a lingering after-image.

■ *Turning base to final, Runway 9R, I saw a very brief, bright green flash about 5 miles NNE of our position, in my right eye. Although not painful, I could feel an unusual sensation in my eye. The light was distracting and caused an 'after- image' to remain in my visual field for about 20 minutes after exposure. I was Pilot Flying, and was able to continue and land normally. After landing, I telephoned my airline's Operations Center to inform them of the event, and they forwarded my report to TRACON...*

A Flight Instructor and student were temporarily blinded by a laser aimed at their aircraft.

■ *My student and I were in cruise and we both noticed a glare on our left passenger window. Both of us turned to look at what was causing it and saw a ground-based laser which was striking our aircraft. It was turned off and then on a total of 3 times before it stopped. The fact that it was turned on and off more than once and that it struck us each time caused us to believe it was intentional. We reported it to Approach...It was blinding but not debilitating.*

In an especially graphic laser event reported to ASRS, a Captain suffered blistering and temporary vision loss as

the result of a laser incident at FL360. More from the First Officer's report:

■ *As I turned my gaze from [the] right side cockpit window, I observed a reflected flash from the left side of the cockpit. The Captain was looking out of the left cockpit side window at the same moment and asked me if I saw 'that flash.' I informed him that I only saw the reflection... The Captain then asked rhetorically if that might have been one of those unauthorized lasers. This made it clear to me that he had observed something far more intense than I had perceived. Based upon the...sensations the Captain was feeling in his eyes and with his suggestion, I made an 'unauthorized laser' report [to] the Center...After several more minutes, the Captain complained of less than clear vision, but nothing 'too serious.' We landed...approximately 50 minutes later...Once on the gate with the opportunity to directly observe the Captain's eyes in good conditions, it was obvious his eyes were extremely bloodshot with what appeared to have been blistering and possible bleeding at the inside corner of his right eye. He was then complaining of increased discomfort in both eyes and blurred vision in the right eye...I accompanied the Captain to the hospital near the airport so that a physician could examine his eyes...The Captain's retina was not damaged, but his normal 20-15 vision was temporarily 20-60...The FBI has contacted the Captain and interviewed him about this event...*

Advisory Circular 70-2 details the reporting procedures to be used by air crews who experience a laser illumination incident, and suggests practical actions pilots may consider taking before, during, and after encountering laser activity.

- Immediately report the laser incident to ATC, including the event position (e.g., latitude/longitude and/or fixed radial distance), altitude, direction and position of the laser source, beam color, and length of exposure (flash or intentional tracking).
- Pilots flying in uncontrolled airspace are requested to immediately broadcast a general laser illumination caution on the appropriate UNICOM frequency. This general caution should include the following elements:
  - Phrase "Unauthorized Laser Illumination Event"
  - Event time (UTC) and general positional information (e.g., location and altitude)
  - General description of event (e.g., color, intensity, and direction of beam)
- Pilots should avoid flight within areas of reported ongoing unauthorized laser activity to the extent possible.
- If laser activity is encountered while pilots are in contact with ATC, pilots should obtain authorization prior to deviating from their last assigned clearance.
- Pilots should avoid direct eye contact with lasers and should shield their eyes to the maximum extent possible during a laser incident.

We hope this information on laser illumination hazards has been useful, and we would appreciate any additional reports to ASRS on laser incidents.

ASRS Alerts Issued in June 2007	
Subject of Alert	No. of Alerts
Aircraft or aircraft equipment	11
Airport facility or procedure	10
ATC procedure or equipment	6
Chart, Publication, or Nav Database	1
Company policy	1
<b>Total</b>	<b>29</b>

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June 2007 Report Intake	
Air Carrier/Air Taxi Pilots	2382
General Aviation Pilots	900
Controllers	135
Cabin/Mechanics/Military/Other	208
<b>TOTAL</b>	<b>3625</b>

## Altimeter Setting Reminder



A legacy of this past winter was a rash of reporting to ASRS on altimeter setting errors. These reports arrived in batches, as numerous flight crews experienced the same problem, on the same day, in areas of the country that were encountering low barometric pressure.

Most of these altimeter setting errors resulted in altitude deviations – a cause for concern since altitude deviations can result in near mid-air collisions and controlled flight towards terrain. Fortunately, most of these deviations were detected and corrected before hazardous incidents occurred.

For a B737 flight crew, expectation of a “normal” altimeter setting and a copying error led to an altitude overshoot.

■ *Enroute to ZZZ, marginal weather being discussed, First Officer obtained ATIS. He wrote down ZZZ altimeter as 29.80, which was set out of FL180. Clearance altitude was 11,000 feet, Captain flying on LNAV, aircraft leveled at 11,000 feet. Center inquired about altitude, said they showed us low. We both checked the altimeters which read 11,000 feet. Handoff to Approach [followed] shortly after where he gave us an altimeter of 28.90 and a descent to 10,000 feet. Confirmed 28.90 and realized the ‘8’ and ‘9’ had been reversed. Reset altimeters and continued to ZZZ... I feel workload combined with an altimeter setting rarely seen caused the numbers to be reversed.*

This incident offers a reminder that obtaining altimeter settings close to the approach segment (particularly the transition level of FL180) complicates the task of preparing for landing, and may lead to altimeter setting errors.

A possible controller error was a factor in another flight crew’s altitude overshoot.

■ *On descent into ZZZ, while passing FL190, Center issued us further descent to 7,000 feet, the altimeter setting and a frequency change. We think the controller may have given us an incorrect altimeter setting, 30.27, instead of 29.27 for landing in ZZZ. Regardless, the Captain and I set 30.27 instead of the correct setting of 29.27. We continued to what we thought was 7,000 feet for the level-off. After reaching level-off, the controller...told us to climb to 7,000 feet. I responded that we were level at 7,000 feet. He told us the altimeter setting and we corrected it, and climbed to the ‘correct’ altitude...The Captain and I talked about it after we arrived at the gate and decided that in the future, it would be better to compare the controller’s altimeter setting to what we received from the airport ATIS on the ACARS printout. If there seems to be a discrepancy, ask the controller for clarification.*

## Sticky Wickets

“Sticky wicket” is a term from the game of cricket referring to a field that is partly dry and partly wet, a playing surface that creates difficult bounces for the batter. More generally, it is any hazardous or uncertain life situation.

Two ASRS reporters describe their sticky wickets – and how they became “stuck.”

■ *Readied aircraft for start-up and departure. Aircraft has no electrical system, so hand-propping is required. Started aircraft with safety person inside holding brakes. Boarded aircraft after start-up, used protective gloves to prop aircraft and didn’t remove gloves from hands. Aircraft is carbureted and was running rough. Applied throttle to clear up rough running engine and glove got wedged between throttle shaft and throttle shaft housing. Tried to remove glove from being stuck, ripped glove. As power control was stuck at a descent RPM, aircraft was rolling while trying to remove glove and close throttle. Managed to remove stuck part of glove and close throttle. Aircraft brakes were applied during this; aircraft stopped rolling. No person or property was in jeopardy. Removed gloves and departed aircraft. Should have removed gloves prior to engine control operations. Contributing factors [were] fast approaching thunderstorms with hail, and hurrying not to get caught in storm.*

■ *After landing, in the transition to taxi, the airplane drifted to the left. The student attempted to correct back to the centerline. The student was unable to correct because his foot was stuck under the pedal. The situation became progressively worse and the instructor attempted to make corrective action as well, but the rudder pedal would not move. The result was that the airplane taxied off the runway and into the ditch, and there was a prop strike. To prevent this from occurring again we [should] make sure that the interior floor is not catching on the pilot’s foot.*

## Meet the Staff

### Thomas “Tom” Tighe



ASRS’s newest addition to the analyst staff, Tom Tighe (rhymes with “sky”), has done it all – flown Air Force jets, commercial jets, gliders, and tow planes. Tom joined the ASRS staff in June 2007, and is bringing his diverse background in aviation to analysis of ASRS reports from air carrier and GA pilots.

Tom’s flying career started with Air Force pilot training and a brief stint flying the F-102. Next he flew the F-106 and, in his words, “fell into the best assignment in the Air Force” – flying F-106’s out of Hamilton Air Force Base in California. His role in the F-106 air defense mission continued with an assignment to the Michigan Air National Guard.

Tom was hired by United Airlines as a pilot and returned to California, flying out of San Francisco International Airport for more than 28 years. During a 2-1/2-year furlough from his airline career, he flew gliders and tow planes in California’s Napa Valley. Back with United, he flew the B727, B737, B747, B757, B767, and B777 as Captain. He retired from United in October 2006.