

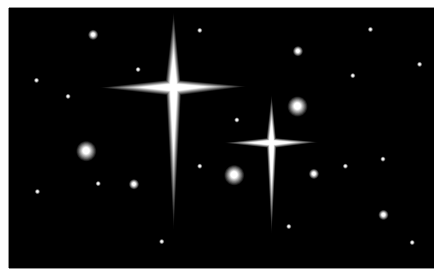
CALLBACK



From NASA's Aviation Safety Reporting System

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The Parallax Effect

The "parallax effect" describes a type of visual illusion in which the position of an object in 3-dimensional space appears to change, due to a shift in the position of the observer. The parallax effect can make distant fixed objects, such as a planet or star, appear to be close and in motion. The twinkling planet Venus is a well-known example in aviation. Tower controllers have often cleared Venus to land, while pilots have mistaken the planet for nearby aircraft position lights.

The parallax effect is especially apt to occur during night operations when there may be few, or no, visible references to the horizon as an aircraft moves through space. Several ASRS reports illustrate, beginning with a First Officer's account of a nighttime evasive maneuver that startled crew and passengers:

■ *I observed what I believed to be an imminent traffic conflict. I manually overrode the autopilot and started an immediate left turn. The perceived conflict was a result of slight parallax of green and red wingtip lights of another aircraft. A bright white star also appeared as one of the running lights on the perceived conflict. The maneuver was a gut reaction on my part, as I perceived the aircraft to be within a few thousand feet from us. Passengers and flight attendants who were not seated with their belts fastened were upended in the cabin. One passenger received an abrasion to a knee and one complained of a neck injury... After landing...[no passengers] required medical attention... The aircraft was inspected for overstress and no discrepancies were found.*

A conservative approach, followed by the First Officer in this instance, is to avoid the perceived hazard first, and verify the nature of the hazard afterwards. Although this report didn't mention crew fatigue as a factor, fatigue is known to be associated with susceptibility to the parallax illusion. U.S. Air Force research has shown that a few minutes of breathing 100% oxygen will help to refocus pilots' thinking—and eyesight.

When To Their Wondering Eyes Should Appear...

The parallax effect also can be experienced by several observers at the same time, as reported by a general aviation pilot who described a night flight with companions:

■ *There were 3 of us in the cockpit, including 1 non-pilot. We were heading northbound over the peninsula... All 3 of us looked off to the 9 o'clock position and saw 2 landing lights which appeared to be a single large aircraft approaching at a very rapid rate... We banked to the right and pulled the throttle to idle in an attempt to avoid what appeared to be an imminent collision course. We then returned to level flight to see that the perceived aircraft was still approaching from the*

same direction and was now much closer. After another

brief moment, we realized that what we were looking at was the landing lights of two separate aircraft approaching from the west and that we were experiencing a visual illusion. It was not until the aircraft finally got close enough to see the position lights that we were able to distinguish one aircraft from the other...

The reporter noted that contributors to the event were a very dark night with no moonlight, and the aircraft's proximity to the ocean with its lack of surface lights and features. Awareness of the flight conditions conducive to the parallax effect can help keep pilots from falling victim to this illusion. ▲

Ground Crew Safety Reprise

The August 1999 *CALLBACK* contained an article about a baggage handler who went to sleep in an airliner cargo hold and awoke at FL200. His banging in the cargo hold was heard by the cabin crew, and the aircraft made an emergency landing. But what happens when the cries for help of a cargo hold occupant can't be heard? As this First Officer's report concludes, the occupant may be lucky to survive:

■ *I was the First Officer on a cargo/mail flight from XXA to XXC, with a 16-minute stop in XXB. The first leg was flown at FL310 and the second leg at FL270. During post-flight duties at XXC, our company mechanic came to the cockpit and advised there was a foreign national in our aircraft cargo compartment, cold but alive, stating that he was a company employee that had been closed in the aircraft belly compartment in XXA. Maintenance also advised the airport security and an ambulance were enroute..*

The man appeared cold but otherwise OK. He said he was waiting in the aft belly for cargo to be loaded. No cargo arrived. The door was closed. Due to the ramp noise, hearing protection, and the APU I can only assume no one could hear his cries and knocking for attention. It is the responsibility of the loading crew to look inside the compartment before closing the door... It is my understanding that my company and the FAA are looking into ways to prevent this from happening again... If this had been a much longer flight, I am sure it could have been fatal. As it was, the man was closed in the compartment for a total of 2-1/2 hours; 1/2 of that [time] was in flight.

Clip-on badges or flags of a distinctive color, attached to the cargo conveyer belt, would be an effective way of signaling that the cargo hold was occupied. Removal of the badges/flags could be a ground crew check item. ▲

ASRS Recently Issued Alerts On...

LR-25 dive attributed to autopilot malfunction
DME outage in a Central American circling approach
B-737 uncommanded roll during ILS coupled approach
Password protection for Terminal Doppler radar systems
B-727 loss of engine power after fuel crossfeed termination

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October 1999 Report Intake

Air Carrier / Air Taxi Pilots	1912
General Aviation Pilots	675
Controllers	69
Cabin/Mechanics/Military/Other	100
TOTAL	2756

More on Battery Fire Hazard

An article in the October 1999 *CALLBACK* on battery fire hazard has created a ripple of interest, and several letters to the Editor. We'd like to share excerpts from this correspondence with readers who may carry spare batteries in their flight gear or personal belongings. We begin with a pilot's tale of a battery **EXPLOSION** in flight:

✍️ *Just wanted to reinforce the problem with carrying batteries with unprotected terminals as described by the C-172 pilot in the Oct. 1999 CALLBACK.*

I was climbing out on takeoff years ago in a C-182 when I heard a sharp explosion. Turned around and saw a cloud of light smoke in the baggage compartment.

I thought the aircraft battery had exploded but alternator output, etc. were normal. Immediately returned to airport, landed, and removed everything from baggage compartment.

After checking aircraft battery, began to empty luggage, etc. Finally found the remains of the culprit in my flight case. I was using a portable intercom at the time and had changed batteries (9V alkaline) just before engine start and had thrown the "discharged" battery into my flight case for disposal at home. It had shorted out on a metallic piece of the flight case and had exploded, apparently due to the ignition of a gaseous by-product of the shorted condition which accumulated in the flight case...

If this explosion had occurred in a pocket, it could have caused serious injury. My wife is a Registered Nurse, and was in the habit of carrying spare batteries for pacemakers, etc. around the hospital in a pocket with coins, keys, etc. Needless to say, she immediately stopped that habit.

When we carry 9V alkalines now, they not only have a terminal protector in place, it is also held on with rubber bands.

Hope this word of caution helps keep the skies (and our bodies) safer.

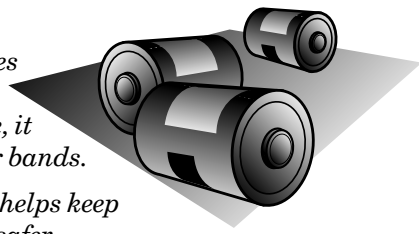
Another reader adds a domestic note on battery-related "hot pockets" that has implications for many light-airplane pilots—and their passengers:

✍️ *Recently, I was changing the batteries in my home smoke alarms, and upon removal of an old battery, I put it in my pocket... In short order I realized that I had a "hot pocket"... I reached into my pocket to remove the hot material and discovered the old battery, which was very warm. I then realized that it had shorted out upon contact with either the foil of my life savers or the steel in my pocket knife...*

Being a pilot, your article alerted me to the fact that I must now treat batteries with special respect while having extras aboard...

A summary of these battery care "life savers":

- ✓ Use terminal protectors on all batteries carried onboard an aircraft, or leave new batteries enclosed in their original protective wrapping.
- ✓ Secure terminal protectors with rubber bands or other devices that won't themselves cause a fire hazard.
- ✓ Don't place unprotected spare or used batteries in pockets, flight cases, or other enclosed spaces that contain metallic objects. ▲



Where Not To Do A Run-Up

A general aviation pilot recently supplied ASRS with a compelling tale of "wrong way" ground navigation:

■ *I had flown into [airport] for the first time two days prior [to incident]... The Ground controller gave me excellent progressive taxi instructions to the general aviation tiedown area.*

[On day of incident] I was cleared to taxi to Runway 03 via Bravo taxiway. Ground instructed me to follow the taxiway out of GA parking, and turn right at Bravo, which I did. I was unable to see a separate run-up area, so upon reaching Runway 03, I stopped behind the runway boundary, switched to Tower frequency, and began my run-up. Tower called...and said that I was blocking the taxiway...and told me I should move to the run-up area. I turned the aircraft around, pointing it now at the side of the taxiway away from the runway and asked if the direction I was now pointing was the direction of the run-up area (it was a wide taxiway, and I thought the far side might be the run-up area). Tower told me "No, just go to the end of Runway 03." I thought it was an unusual place for a run-up, but I visually confirmed that there were no aircraft on final for Runway 03, and the Tower

frequency was congested, so I simply responded "End of Runway 03."

As soon as I was on the runway, Tower called and asked if I had entered the runway—evidently surprised that I had. I responded that I thought that's what he had told me to do. He responded that he hadn't... In discussion afterwards...[my passenger and I] concluded that the controller had meant that we should have gone to the extreme southern edge of the taxiway adjacent to the end of Runway 03.

The situation could have been avoided if: 1) I had asked Ground about the specific location of the run-up area; 2) Tower had indicated "the taxiway adjacent to the end of Runway 03" instead of "the end of Runway 03"; 3) I had called for confirmation on what I thought was an unusual instruction.

Tower controllers, as well as pilots of large jet aircraft, have a better overall view of runways and taxiways than do light airplane pilots. ATC should keep this in mind when giving taxi instructions. Pilots of light airplanes should ask for progressive taxi instructions when uncertain of directions. ▲