CALLBACK

From NASA's Aviation Safety Reporting System

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THE FIXATION FACTOR

The ability to maintain the "big picture" while completing individual, discrete tasks is one of the most critical aspects of working in the aviation environment. Preoccupation with one particular task can degrade the ability to detect other important information.

This month's *CALLBACK* looks at examples of how fixation adversely affects overall task management.

A Repack Comes Back

By fixating on one aspect of a multi-part job, this Maintenance Technician missed a key factor in re-assembling a B767 landing gear.

■ *I was assigned the task of a B767 main landing gear repack…. I removed the lower truck assembly, removed all parts and began assembly…. I assembled the lower gland nut, lower seal carrier, spacer, snubber and upper bearing. The upper bearing can be assembled about five different ways. It is not "Murphy-proof." The Aircraft Maintenance Manual says to check for proper orientation and this is where I made the mistake. I was fixated on the orientation (installed either upside down or right side up) and not the proper placement of the upper bearing. I continued on and finished the repack and I signed the paperwork off.*

Enroute to destination, the crew discovered the right-hand main landing gear would not come out of the wheel well. They declared an emergency and through extreme maneuvers were able to free the gear and land safely.

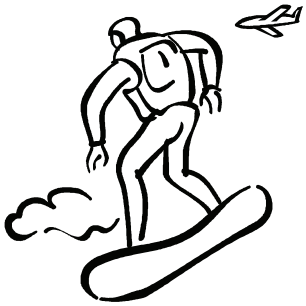
I was called out to fly to the aircraft location to perform another strut repack and found we had assembled the upper bearing incorrectly…. The strut over-extended by 7/8 inch and got caught in the wheel well.

On the Button, Off the Course

Too much attention to an autopilot issue detracted from this General Aviation pilot's navigation duties and resulted in a frightening lesson.

■ *… I meant to set 2,800 feet as my minimum altitude to insure avoiding the…Class D ceiling (2,600 feet). I mistakenly set 1,800 feet. It wouldn't have mattered if I were paying proper attention since I didn't intend to fly that close to the Class D airspace.*

I was head down in the cockpit trying to figure out why a button pushing sequence was not working per the autopilot manual. At some point I realized that I was taking too long over this. When I turned westward I noticed that I was almost over [the] *airport at 1,800 feet.* [There were] *sky divers above and to the north as low as about 2,300 feet and perhaps a half-mile* [distant].



This is the most frightening thing that's ever happened to me in flying. The airspace incursion was the least of it. Had [the direction of] *my turn been different, I could have been among the divers with potentially catastrophic results.*

The cause is obvious – task fixation and a resulting lack of situational awareness that resulted in being where I shouldn't be and not establishing [radio] *contact for any potential warning of the skydiving activity.*

It's not so much that [my] *priorities need reordering, it's actually making my behavior match my mental priorities. Not as easy, but a scare like this is a very effective incentive.*

Tunnel Vision

By fixating on one portion of a traffic conflict, this Air Traffic Controller was late in recognizing that there was more traffic "outside the tunnel."

■ *Aircraft #1 was an arrival that needed to be descended for traffic so I issued a descent to FL210. Aircraft #2 was additional traffic at FL210 that I*

missed. When I realized that Aircraft #2 was a factor, I told Aircraft #1 to amend the altitude to FL220, but they had already gone through FL220. They went to FL217 before climbing back up to FL220.

I got completely fixated on the northern part of the sector I was working. I tunneled so much on the need to descend Aircraft #1 that I failed to even see the other traffic to the right of Aircraft #1.

Distracted Driver

Intent on locating hazardous debris on a runway at night, a Ramp Vehicle Operator inadvertently crossed an active runway.

■ *...On duty as Ramp One, I received a call from Tower* [regarding] *possible debris on Runway 9L due to a tire blowout.... Tower cleared me to inspect Runway 9L and directed me to hold short of intersecting Runway 13....*

I proceeded onto Runway 9L westbound doing a shallow "S" pattern to cover as much area as possible.... [During] *the inspection Tower advised that I had crossed Runway 13....*

Later I spoke to the Tower supervisor to confirm that an unauthorized movement across an active runway had indeed transpired. I fixated on accomplishing my task and tunnel vision caused me to miss the intersecting runway....

Unsafe Lane Change

Defensive driving involves awareness of all potential traffic conflicts, not just those in front of one's vehicle. This crew of an air carrier jet fixated on traffic ahead and got a surprise from the side.

■ *We were going to* [the gate] *and... our traffic was a 757 southbound in the left lane moving* [toward] *us with his taxi light on.... Additionally, there was a westbound baggage cart stopping on the mid-crossroad.... I was focused, more like fixated, on the 757 coming at us and making sure that the westbound baggage cart stopped before crossing in front of us. The First Officer, I believe, was fixated on the westbound baggage cart. I turned the aircraft to make the transition from the left lane to the right lane... when Ramp Control said, "*[Air Carrier XXX]*, Stop!" I stopped the aircraft immediately and then leaned forward and saw* [an aircraft] *pushing off a gate into the right lane. I did not see the MD-80 because of my fixation on the 757 and the baggage cart.... Needless to say, I was pretty upset about not seeing the other aircraft and the collision potential!*

Technically Advanced Violation

Advanced navigation equipment can provide a wealth of readily available information, but as this Cirrus SR20 pilot learned, sometimes too much information can be a distraction.

■ *I was receiving transition training and* [we were]*... in cruise with Flight Following services from ATC. We requested permission to transition the Class D airspace at our cruising altitude of 2,500 feet MSL. We then went back to looking at information about our next destination, some 15 miles away, on the MFD (Multi-Function Display) screen. Since we were on the airport detail page, we were not monitoring our position on the map page. Switching back to the map page we realized that we were...in the airspace around* [the airport]*. Shortly, ATC responded to our request with a denial of clearance into the Class D airspace.*

I can now add my name to the list of those who advise against getting fixated on the capabilities and "interesting things to look at" on TAA (Technically Advanced Aircraft) displays... While they are a fantastic benefit for situational awareness, the information they provide must still be monitored wisely by the pilot....

The U.S. Coast Guard's Team Coordination Training Guide defines Situational Awareness as "the ability to identify, process, and comprehend critical elements of information about what is happening.... Simply put, it is knowing what is going on around you...."

In addition to fixation, there are a number of other human factors that can adversely affect our ability to know and efficiently process "what is going on around" us. In upcoming issues of *CALLBACK*, reporters to ASRS will share their insights on such factors as complacency, overload, confusion, fatigue and distraction.

ASRS Alerts Issued in March 2011

Subject of Alert	No. of Alerts
Aircraft or aircraft equipment	17
ATC equipment or procedures	4
Airport facility or procedure	8
Maintenance procedure	1
TOTAL	**30**

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March 2011 Report Intake

Air Carrier/Air Taxi Pilots	3678
General Aviation Pilots	1039
Controllers	777
Cabin	372
Mechanics	205
Dispatcher	59
Military/Other	18
TOTAL	**6148**