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I'll bet very few of us aerobatic pilots ever think that we will have a mid-air collision, and I'll bet even fewer of us think that we could survive such a situation. We usually think of the typical types of emergencies: engine failures, wake turbulence, loss of control, or accelerated/unrecoverable spins. We then come up with the escape procedures; we rehearse them, and even memorize them. But how many of us ever think of what we are going to do in case of a structural failure or a mid-air collision? My guess is, probably not many of us. If asked, a pilot's most common answer would be, "We fly too low to bail out anyway. If something happens that low, there is nothing that could be done; it's just bad luck, and we have to accept it.

Well, here is my story, and I hope it will be useful to you—no matter how slim you think the chances are that something like this will ever happen to you while flying aerobatics at low altitudes.

I was lucky enough to book several aerobatic camp slots with Sergei Boriak in 2011. I fly a Yak-55 in the Advanced category, and the last couple of camps that I attended were very productive. One of the sessions was scheduled on August 20 and 21, 2011, at the Hammonton Municipal Airport (N81), in Hammonton, New Jersey. This summer wasn't very generous in terms of good weather, and I was pleasantly surprised when I saw bright sun and blue skies on that Saturday morning. So after I had arrived and unloaded the plane, I signed the waiver, got my sequence card ready, rehearsed the flight, and went back to the Yak.

It didn't take me long to climb into the cockpit and get strapped in. In a matter of minutes, the M-14 engine came to life with the familiar cloud of smoke under the belly of the plane. Engine warm-up, taxi, and takeoff were uneventful. A few minutes later I was on the base leg of the aerobatic box diving into the start of my sequence. I was working my way through the maneuvers from the 2011 Advanced Known. Figure 6 is a push to a hammerhead with 4 of 8 on the down line. I have had trouble with the inverted entry before, so I concentrated on making sure that my controls were neutral before the entry and there was no bank or yaw. I established a more or less clean vertical, waited for the right moment to execute the pivot, and kicked the right rudder when the time was right. The nose of the Yak followed the rudder while I was working the ailerons and the elevator to make sure that the pivot was in the same plane and that I had not torqued. With full power on the Yak, I established the vertical down line and started to get ready for the 4 of 8, when I heard a tremendously loud bang.

I associated this sound with a steel cable snapping from too much tension. Instantly the plane departed the down line and started to tumble violently. I saw the ground moving away from my field of view and the sky filling the canopy. Then the *g*-forces started to set in. I immediately verified that my controls were neutral. To do so, I moved the rudder, ailerons, and elevator back and forth around the point that I believed was a neutral position. I immediately noticed that my stick was limp, and I did not feel any feedback from the air going over the control surfaces. At this point I realized that I must be having a massive control failure. In the meantime, the tumble was getting very aggressive and more violent. I tried to reacquire the horizon to get oriented. I forced my head all the way back trying to catch a glimpse of the ground. But at this moment the onset of positive *g*'s whiplashed my head (fortunately I was wearing a helmet), and it was quite unpleasant.

This is when the denial started to set in and time started to slow down. Yes, believe it or not, time does stretch. My adrenaline was probably shooting through the roof, but I obviously was not aware of it. My first thought was, "This is not happening to me...this is exactly what they write about in the articles describing fatal accidents..." Then, more rational thoughts started to hit me.

"I'm tumbling toward the ground with my controls inoperative. I must have been around 3,000 feet when it started. If I don't do something, I am going to die. I need to get out." Interestingly enough, after I said that to myself, I pushed all other thoughts away and started to concentrate on the bailout. At that instant, I was mostly under negative *g*'s and being tossed around the cockpit. I was not thinking about the checklist that I had practiced. I was not thinking about the altitude (although I still felt that I was high enough—above 2,000 feet as far as I could tell). I also did not think to kill the mags to ease the *g*-loading and stop the tumbling. The singular thought that was driving all my actions was I had to get out of the cockpit as soon as possible.

Only three things were standing between me and the clear air: the canopy and the two latches on the Hooker harness that kept me attached to the plane. I tried to work on these in exactly that order. First, with a familiar move I tried to reach the lock on the side of the canopy. Since I relied on my muscle memory to put my hand on the lock, just like I've done hundreds of times on the ground, I missed the lock by a big margin. Because the *g*-forces were so high, my hand didn't get anywhere near the lock. After I realized that my first attempt failed, I locked my eyes on the canopy lock handle and concentrated on guiding my hand to it, no matter how hard the *g*-forces tried to prevent this from happening. On my second attempt, I took hold of the handle and pulled. I tried to slide the canopy back. It moved a little, maybe 10 inches. Something was preventing it from going further, so I grabbed the edge of the canopy with both hands and pulled it back as hard as I could. I was excited to see that the canopy moved further back, and now the opening seemed to be wide enough for me to fit through. The next step was to release the two latches on the lap belt of the Hooker harness. Remembering the lesson I just learned trying to open the canopy, I fixed my eyes on the harness latches. But my first attempt to place a hand onto the latch failed, as I was still being violently bounced around inside the cockpit. On the second attempt I opened the first latch. There was only one more to go. One more attempt and the second latch was opened. As soon as the second latch was released, I was jettisoned from the cockpit.

The engine noise subsided significantly, and I started to hear the whooshing sound of the air. Things felt more natural now. I have around 350 sky-dives under my belt, and the old instincts must have kicked in. I quickly stabilized my body position and established flat, belly-to-the-

ground attitude. My feet were pointing to where the plane must have been. I tried to look back to see how far I was from the plane and tried to determine if it was safe to pull the rip cord. I was able to see several pieces of debris falling down, but I could not recognize my plane. I thought to myself that the Yak must have suffered some sort of a structural failure and actually disintegrated. As I didn't see anything big falling in my vicinity, I figured that I was safe to pull the chute. Based on the way trees looked, I figured I was still at around 1,000–1,500 feet AGL.

I looked at the chute handle, locked my hands on the ring with my thumbs going through the ring, and pulled the rip cord directly away from me. This is what they teach you at the sky-diving schools. There was not much resistance, and as soon as the ring and the cable left the housing, I tossed them away. I wasn't very confident that everything was okay with the parachute as I did not feel any resistance when I pulled the rip cord. In hindsight, I think that was because of my high level of adrenaline, and the force I applied when pulling the rip cord, did not leave me a chance to feel anything. I looked behind my shoulder to make sure that the opening sequence had kicked off. To my pleasant surprise, I saw the pilot chute leaving the container and being pulled away with the airstream. A split second later, the main canopy left the container and opened. It opened *fast*, and the force of the opening jerked me down in the harness and whipped my head backward. I looked up and saw a round canopy over my head made out of white and orange segments. One of the segments on the back of it was made out of mesh material to provide the canopy with some sort of forward motion.

Being satisfied with the fact that the chute has opened and that I was still quite high enough in the air, I looked down trying to get myself oriented. I knew I shouldn't be further than a half a mile away from the runway, and I wanted to get my bearings before I hit the ground. At this point I realized the round canopy does not provide any noticeable forward penetration, and I was at the mercy of the wind. I also realized that I was not going to hit the ground, as I had been practicing over a forested area. As the trees were getting bigger, I got ready for the landing. I pulled my legs together, pulled my chin down to protect my neck, and protected my face with my arms. My visor from the helmet had been torn away. Thanks again to my drop zone instructors for teaching me how to land in trees!

The landing was surprisingly soft, completely unlike what I imagined it would be. I also was lucky enough to come down between the trees, so I was able to get all the way to the ground. The canopy of my parachute hung from the branches of two trees above me. I got out of the parachute harness, pulled my helmet off, and took off the flying gloves. I was panting. My heart was beating loudly, and my hands were shaking uncontrollably. I could not believe that I had just bailed out of my airplane and was on the ground and *alive*! I was also worried about where the plane or the parts of the plane came down. I knew there was a house not far from the incident site, and I was concerned that the debris could have hit that property.

I didn't have my cellphone with me or any other means of communication. I could hear sirens whining in the distance, and I saw a Cessna circling around a bit to the north. I figured, if I leave the parachute hanging from the tree branches, they might notice me and come to help. I waited and waited for what seemed to have been an eternity. The Cessna didn't seem to notice the colored fabric of the parachute. I realized that I'm better off just walking in the direction of the runway since it was not far away. I could hear a helicopter and a couple of airplanes taking off and landing. I climbed up one of the trees and managed to pull the parachute down. I folded the canopy, picked up my harness and the helmet, and started making my way toward the airport. I also realize that it was getting very hard to breath.

It probably took me 15 to 20 minutes to get out of the woods. As soon as I was in the clear, I saw an ambulance parked next to a fire truck. I could barely speak to one of the firefighters, and I identified myself as the pilot of the airplane that just went down in the woods behind me. The firefighter then asked me if I knew anything about the other person. "The other person?" I was puzzled and said that my plane was a single-seat aircraft. That was when the firefighter told me I was involved in a mid-air collision; there was another airplane that had crashed.

I was trying hard to speak to the Hammonton Fire Co. responders, as my voice was getting weaker and growing hoarse, and was making a hissing sound. The paramedics approached me and asked me to come to the ambulance so they could evaluate me. That is when I lost my voice completely, and I was having great difficulty breathing. I also realized that I could barely swallow. Several minutes later, I was lying on the stretcher of the ambulance with paramedics providing me first aid. I was airlifted to a hospital in the area and spent the next three weeks in serious but stable condition.

### **Aftermath**

I was seriously injured as the result of this accident. When the parachute opened, the force was so large that I slid down in the harness. The chest strap of the parachute harness came up and hit me in the throat, crushing my upper airway. I had to undergo reconstructive surgery to restore my trachea and larynx and spent the next six weeks recovering my airway and my voice.

I am still not sure if adjustable locks on the leg straps of my parachute harness slipped, or if the harness was just a little too big for me, or if I didn't have the harness adjusted correctly to start with. One way or another, next time I will make sure the chute fits me tightly. Allen Silver will analyze the problem with my parachute in part II of this article.

When I examined my helmet, I saw that the visor was gone, the cable leading to the mike piece was ripped out, and there were some large scratches on the front part of the helmet. By the looks of it, I think if not for the helmet, I could have been knocked out or worse. The helmet definitely helped me to stay conscious throughout the accident and prevented some likely serious head injuries. The helmet probably saved my life.

Thinking back about what happened, and talking to people who witnessed the accident, it took me about four to five seconds to get out of the tumbling-forward section of the Yak. The Yak was sliced in half by the right wing of a Lancair IV, about 18 inches behind my head. That also explains why I had trouble sliding the canopy back. The canopy rails must have been bent as a result of the impact. It took another three to four seconds between the time I got out of the cockpit to when the chute opened. People on the ground estimate that the collision took place around 2,800–3,000 feet AGL, and that I was able to open the parachute at around 1,200 feet.

There are many articles about pilots hesitating for too long before deciding to bail out of the airplane and being out of altitude and options as a result. The interesting thing was that as soon as I made the decision to bail out, I did not have the slightest hesitation about it. I think a big part of the decision to bail out was my prior sky-diving experience, which I was lucky enough to have before this accident. After making several hundred sport jumps, I did not have any mental blocks about leaving an airplane, especially an airplane that had something seriously wrong with it. I would recommend, to everyone who wears a parachute when flying, to go to the nearest drop zone and make several jumps to feel what it is like to get out of an airplane and come back to the ground under a parachute. This could save you the valuable seconds that you may spend hesitating before leaving the plane. It will also help you survive after you leave the cockpit and find yourself in the clean air falling to the ground.

Please, write down your bailout procedures and rehearse them! I completely missed the item of shutting down the engine before leaving the cockpit. Yes, I was very lucky not to get hit by the propeller of the tumbling-forward section of my plane. It could have turned out very differently, if I had been less fortunate.

Unfortunately, there is a tragic side to this story. The pilot of the Lancair, David Mitchell, 71, of Voorhees, New Jersey, was killed in this accident. First and foremost, every time I think back to the events of that day, I feel a deep sadness and sorrow knowing that someone died in the accident that I was lucky enough to survive. My thoughts and deepest condolences go to David Mitchell and his family. There is nothing that could be said or done to undo this loss.

In Part II of this article, we will analyze what led up to this accident, review the NTSB report, and describe several actions you can take to prevent this from happening to you, including making sure your parachute fits correctly!