

Accident Narrative

Sunday morning, June 4, 2017, at approximately 8:15 AM MDT, I was flying in my Excalibur, returning to Double Eagle Airport from a flight along the Rio Puerco (a river bed ten or so miles west of Double Eagle Airport). I had just climbed to pattern altitude (6,800 feet msl), heading east and approaching the West Escarpment (the edge of the mesa upon which Double Eagle Airport is located), when my fore-and-aft control went berserk. I was flying straight and level at approximately 75 mph with the engine at 6,500 rpm at the time. The stick started slamming fore and aft to the limits, despite my attempts to hold it centered, and the nose began pitching up and down. The plane was buffeting like it was going to come apart. At the time the control malfunction occurred, I had been flying a little over an hour since take-off at Double Eagle Airport, without apparent problems.

I declared an emergency, and reduced to minimum power (@2,000 rpm) and to around 50 mph, which lessened the fore and aft stick slamming and the nose up and down movement, but did not eliminate it. Not having enough altitude to reach the mesa without power, I turned back west to clear the steep and broken terrain below and in front of me. Beyond that, there was nowhere suitable to land, but I still had directional control, so I was able to make final corrections to get to a relatively flat piece of ground between broken terrain, arroyos, mesquite, etc. I was afraid to either add power or attempt much of a flare as the nose was still gyrating up and down uncontrollably. Adding power could have resulted in a nose low attitude on impact, and flaring could have resulted in a stall. I did my best to keep it in something like a slow flight attitude, the attitude I normally

land in, but it was bouncing up and down above and below the attitude I was trying to maintain.

I basically flew it into the ground with a slightly nose-up attitude at around 35 mph, just above stall speed, and estimated 200 to 300 fpm rate of descent. (Subsequent analysis of Cloud Ahoy data indicated exactly 214.4 fpm rate of descent at impact - just over three feet per second - not much more than a normal touch down) The plane stayed upright, but the nose gear and the left main gear sheared off. It gouged a shallow trench in the desert floor and skidded about thirty yards, turning 180 degrees, ripping off the aircraft belly fabric and metal in the process, and ending up with the left wing and horizontal stabilizer in the dirt. The point of impact based on ForeFlight and Cloud Ahoy analysis, was 35°06'50.4"N and 106°53'26.0"W, roughly 5 miles from the Double Eagle control tower on an approximate magnetic heading of 232°. The entire episode, from onset of control malfunction until the plane came to rest was 58 seconds. It seemed remarkable that the plane held more or less together for that length of time, given the extreme buffeting.

I turned off the ignition and master power, exited the plane and called for rescue using my cell phone. It took about an hour and a half, but the Bernalillo County Sheriff Metro Air Support unit eventually picked me up with their helicopter, and flew me back to Double Eagle. The Fire Department EMTs checked me over, and let me go after I signed their release form. I did not suffer any injuries.

After I had made all the calls I could at the scene, and was waiting for rescue, I examined the plane to see if I could

determine what went wrong. I found a broken elevator control rod.

By design, the elevator on the Excalibur is split in two, with two linked control rods, each controlling one half. They are both connected to one central elevator control rod, before splitting in front of the empennage. The control rod attached to the right side of the elevator was broken in the center, apparently having come apart in the air. The forward piece of the broken control rod (facing aft) was only slightly bent, and sheared off cleanly. The aft portion (facing forward) was bent where it dug into the ground when the aircraft hit. The broken control rod may have caused the extreme flutter (uncontrolled up and down elevator movement) or, conversely, the elevator may have gone into extreme flutter for some other reason, and that broke one of the two control rods. In any event, the flutter was not eliminated by reducing power or speed. It continued until impact.

As to other potential causes of the extreme elevator flutter, none of the expected pre-conditions seemed to exist. The aircraft was going well below VNE, approximately 75 mph at the point the extreme flutter started. The hinges and hinge bolts appeared normal on preflight and on a recent annual. The aircraft had only approximately 64 hours total time at the time of the accident, so hinge or hinge bolt wear is unlikely.

There is one thing that may have foreseen the flutter problem that I had forgotten until I reviewed my pilot log book. On a flight on May 29, seven days prior, and approximately three flight hours before this incident, I noted in my log book that I had experienced a slight stick feedback that could have indicated incipient flutter.

The control rod that separated was a factory-supplied part - a 1/2 inch aluminum tube with bearings at each end. The bearings were still connected and safetied, as were all other control rod linkages and connections. I tried all the controls on the ground, and all still worked perfectly, excluding the right side of the elevator, the side controlled by the broken rod.

On Monday, I went out with a recovery crew and we disassembled the aircraft and had it moved to a commercial storage facility, awaiting final disposition.

I met with the FAA accident investigation representative Tuesday morning, and we went over photos of the aircraft and impact site, examined the broken control rod, and all my documentation for the plane and my own flight records. The FAA representative took possession of the broken control rod to have it submitted for fracture analysis. He complemented me both on my documentation and on managing to put the plane down without more damage or serious injury. There will not be any FAA action against me as a result of this accident.

I have already settled with the insurance company, who consider the plane to be a total loss. I will hand it over to them to sell for salvage, and they will pay the full insured value.

This accident and the outcome reinforced a basic flight safety lesson that every pilot has heard many times. "In an emergency, fly the plane all the way down." If you don't let it stall, and do the best you can to steer it away from or between major obstacles, your chances of surviving the accident are best. As the aircraft contacts the surface in a

“still flying” attitude, and above stall speed, the surface and whatever minor obstacles you hit will absorb forward energy and slow the plane. It is fine to shear off landing gear, wings, aircraft skin, etc., along the way, because everything you lose helps to slow the plane, and lessen the abrupt deceleration that otherwise could result in injuries or fatalities. As the saying goes: “It is not the fall that kills you, it’s the sudden stop.”

All’s well that ends well.

Epilogue:

Having read over and revised this narrative several times, and discussed the accident ad nauseam with friends and fellow pilots, one thought has struck me. I have either said or inferred that I made a number of good decisions along the way. At the first sign of trouble, I reduced to minimum power. I decided to turn back to the west, rather than trying to make the mesa and risking running head-on into the escarpment. I chose the best available touch down point in the midst of an area of generally unfavorable terrain. I decided to fly the plane into the ground just above stall speed, and accept the forward deceleration, rather than risking a stall and possibly fatal vertical deceleration.

That is all only partially true. When the buffeting started, my hand was already on the throttle, where it normally rests. My hand reduced the throttle to minimum RPM without any thought on my part. I was aware that the throttle was reduced, and thought it best to leave it that way, but I did not consciously decide to reduce it.

I did turn away from the mesa. Long after the fact, I justified doing so by the possibility of impacting the escarpment if I tried to reach the mesa on minimum power. That is a good justification, but it only occurred to me after the fact. I think the real reason I turned away was that there was unsuitable terrain below and in front of me, and I turned away from it without thinking.

I managed to reach a relatively clear impact point, only partially by using lateral control. The fact that I reached it at all was determined by my height above terrain, and the minimum power glide ratio of the plane. For most of the terrain I flew over, having lateral control would not have been much help. I obviously was not at pattern altitude so I could reach the best landing area in this particular emergency. I was at pattern altitude because I always approach airfields at pattern altitude well before actually reaching the pattern entry point.

I landed at a slow flight attitude as best I could, but not because I decided to at the time. It is the way I always land to get a squeaker. The Excalibur does not behave well in a stall even a few feet above the runway. It behaves very well being flown into the pavement at a slow speed and minimum rate of descent.

Perhaps all of the above constitutes another important lesson. In a sudden emergency, a pilot is not very likely to think things through, or have the time to do so. Actions are much more likely to be immediate, without much thought, and result from habits learned and practiced throughout his or her flying career.