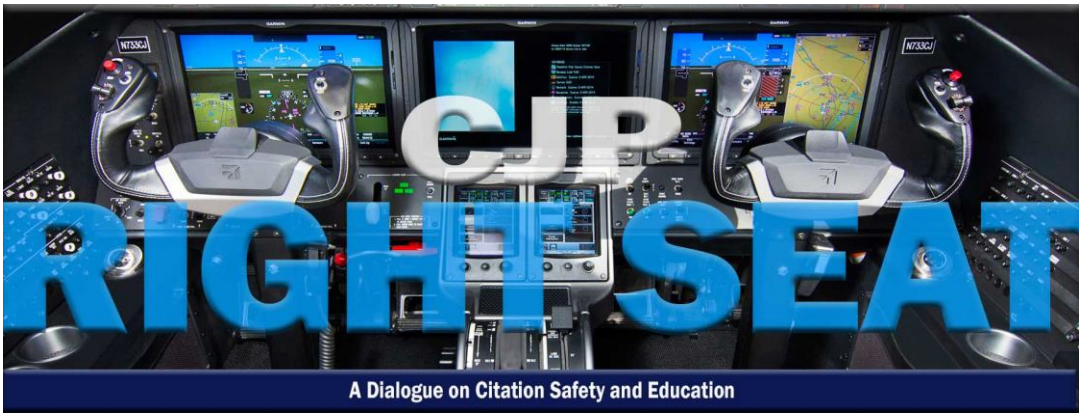
July 2023



— LATEST BRIEFING —

A Solemn Reminder of Pilot Incapacitation Dangers

by Charlie Precourt, CJP Safety Committee Chairman

Pilot incapacitation and depressurization are once again hot topics of conversation among our members following the unfortunate loss of a Citation V, N611VG. You can follow the CJP forum thread here for lots of good discussion, as well as see the NTSB preliminary report attached at the end of this column.

We are unlikely to get a definitive root cause here as to whether it was loss of cabin pressure or pilot incapacitation due to a health issue, as there is reportedly not much at the wreckage site to go on given the nature of the crash.

What we learn in training are the only defenses we have to these scenarios, so I hope if you haven't yet, that you'll consider programs CJP has established like our Companion course at FlightSafety, and the companions' sessions at our convention, as well as altitude chamber courses to expose you to your hypoxia symptoms.

We plan to host another CJP altitude chamber event in 2024 and will get more details out on date and location soon. As a reminder, the time of useful consciousness tables (below) are provided for you in the CJP Inflight Guides available at the safety page on the website... an occasional review of those numbers is worthwhile.

One of our very own Citation V pilots, Endre Holen, provided a nice interview about his aircraft with David Miller, which we've included here as part of this edition of *Right Seat*. Also, as part of the Safe to Land Initiative, the CJP Safety Foundation has created a weekly video series highlighting multiple aspects of the program. Released each Sunday morning through an eBlast and also on Spotify, these short broadcasts include such topics as how to use the STL cue card, and real-world use of new approach and landing practices.

CJP members Jonathan Bailey and Endre Holen recently provided content in their CJ2 and Citation V aircraft. Over thirty videos are planned for the series running through the end of 2023 and will also be available soon on the CJP STL webpage. There's a lot of great content in there about this initiative that has been compiled by Jonathan Bailey, Neil Singer and David Miller.

TIMES OF USEFUL CONSCIOUSNESS AT VARIOUS ALTITUDES		
Standard Ascent Rate		After Rapid Decompression
Altitude (Feet)	Time	Time
18,000	20 to 30 minutes	10 to 15 minutes
22,000	10 minutes	5 minutes
25,000	3 to 5 minutes	1.5 to 3.5 minutes
28,000	2.5 to 3 minutes	1.25 to 1.5 minutes
30,000	1 to 2 minutes	30 to 60 seconds
35,000	30 to 60 seconds	15 to 30 seconds
40,000	15 to 20 seconds	7 to 10 seconds
43,000	9 to 12 seconds	5 seconds
50,000	9 to 12 seconds	5 seconds

Excerpt from CJP Inflight Guides - Time of Useful Consciousness

And to round out this edition of *Right Seat*, Neil Singer provides an article on non-precision GPS approach techniques that dovetail quite nicely with our Safe to Land initiative.

Thanks to Endre, David, Jonathan and Neil for this continuing great content.

Fly Safe!

Charlie

Aviation Investigation Preliminary Report

Location:	Montebello, VA	**Accident Number:**	ERA23FA256
Date & Time:	June 4, 2023, 15:23 Local	**Registration:**	N611VG
Aircraft:	Cessna 560	**Injuries:**	4 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

On June 4, 2023, about 1523 eastern daylight time, a Cessna Citation 560 airplane, N611VG, was destroyed when it impacted terrain near Montebello, Virginia. The airline transport pilot and three passengers were fatally injured. The airplane was operated by Encore Motors of Melbourne Inc. as a personal flight conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

According to individuals familiar with the airplane's flight activity the day of the accident and flight track records, the pilot's first flight of the day originated from the airplane's home airport of Melbourne International Airport (MLB), Melbourne, Florida, at 1059. The pilot conducted the flight as a single pilot and subsequently landed at Elizabethton Municipal Airport (0A9), Elizabethton, Tennessee, at 1231, where 300 gallons of fuel was added to the airplane and the three passengers were picked up. The accident flight departed at 1313 destined for Long Island Mac Arthur Airport (ISP), New York, New York.

Review of preliminary Federal Aviation Administration (FAA) air traffic control audio recordings revealed that the pilot contacted the Atlanta Air Route Traffic Control Center shortly after takeoff, and reported climbing through 9,300 ft mean sea level (msl) to 10,000 ft. The controller subsequently cleared the flight to flight level 230 (23,000 ft) and the pilot read back the clearance. At 1322, the pilot was handed off to another controller with Atlanta Center. The pilot subsequently contacted the controller, advising that the airplane was maintaining flight level 230 (23,000 ft). The controller cleared the flight to flight level 290 (29,000 ft) and the pilot read back the clearance. At 1325, the controller cleared the airplane to flight level 340 (34,000 ft) and the pilot readback the clearance. At this time the airplane was about 28,000 ft.

At 1328, the controller amended the prior altitude clearance, instructing the pilot to stop the climb at 33,000 ft for crossing air traffic. The pilot did not respond to the amended clearance, the airplane continued the climb to 34,000 ft and leveled off. No further radio transmissions

from the pilot were received for the remainder of the flight, despite repeated attempts to contact the pilot.

Review of preliminary Automatic Dependent Surveillance – Broadcast (ADS-B) data found that the airplane's flight track to the destination airport was consistent with the filed flight plan route. The airplane arrived overhead of ISP at 1432, maintaining 34,000 ft throughout the flight. The airplane subsequently continued flying southwest on a ground track of about 240°. The track showed little deviation or altitude change until 1522, where the airplane entered a rapidly descending right spiral descent into terrain.

According to a North American Aerospace Defense Command (NORAD) statement, about 1520 the airplane was intercepted by fighter aircraft. The pilot was unresponsive to several radio transmissions, intercept flight maneuvers, and flare deployments. The figure below depicts the ADS-B flight track, the filed flight plan waypoints, and select time/altitude labels.

NTSB Figure: Overview of the ADS-B flight track, flight plan waypoints, and select time/altitude labels.

The airplane impacted mountainous and forested terrain a short distance from where the spiraling descent was observed. The signatures observed during an examination of the terrain, trees, and wreckage found at the accident site all were consistent with a high velocity, near vertical descent. The wreckage was extremely fragmented, scattered around a main crater, and evidence of a post-impact fire was observed. Fragments of both wings, fuselage, empennage, in addition to both engines, were located in the debris field. Flight control continuity could not be established due to the fragmentation of the wreckage. The cockpit was

destroyed in the impact. The wreckage was recovered from the accident site and retained for further examination.

According to recent maintenance inspection records, the airplane as of May 2023 was equipped with a cockpit voice recorder (CVR), however, at the time of this publication, a CVR had not been located. The airplane was not equipped with a flight data recorder, nor was it required to be.

According to FAA airman records, the pilot held an airline transport pilot certificate with ratings for airplane single-engine land and sea, in addition to airplane multi-engine land. He possessed type ratings in the CE-500 (appropriate for the accident airplane make and model), CE-650, CE-680, B-737, BA-3100, EMB-110, and N-B25. He was issued a first-class medical certificate on October 10, 2022. The pilot reported on a pilot history insurance form on May 3, 2023, that he possessed 34,500 total hours, of which 850 hours were logged in the CE-500 series. He reported a total of 110 hours in the CE-500 in the last 12 months, dated from May 2023.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N611VG
Model/Series:	560 Citation V	**Aircraft Category:**	Airplane
Amateur Built:			
Operator:		**Operating Certificate(s) Held:**	None
Operator Designator Code:			

Meteorological Information and Flight Plan

Conditions at Accident Site:	VMC	**Condition of Light:**	Day
Observation Facility, Elevation:	CHO,631 ft msl	**Observation Time:**	15:53 Local
Distance from Accident Site:	33 Nautical Miles	**Temperature/Dew Point:**	21°C /12°C
Lowest Cloud Condition:		**Wind Speed/Gusts, Direction:**	6 knots / , 50°
Lowest Ceiling:	Broken / 2900 ft AGL	**Visibility:**	10 miles
Altimeter Setting:	30.01 inches Hg	**Type of Flight Plan Filed:**	IFR
Departure Point:	Elizabethton, TN (0A9)	**Destination:**	Ronkonkoma, NY (ISP)

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 Fatal	**Latitude, Longitude:**	37.921573,-79.103668

Administrative Information

Investigator In Charge (IIC):	Gerhardt, Adam
Additional Participating Persons:	Mitch A. Mitchell; Federal Aviation Administration ; Washington, DC Helen Tsai; Transportation Safety Board of Canada; Gatineau , OF Ricardo J. Asensio; Textron Aviation; Wichita, KS Kurt Gibson; Textron Aviation; Wichita, KS David Studtmann; Honeywell Aerospace; Phoenix, AZ Randolph W. Rushworth; Department of the United States Air Force; Washington, DC
Note:	

An Interview with CJP's Endre Holen

by David Miller, CJP Director of Programs and Safety Education

I recently had the opportunity to sit down with CJP Legacy Aircraft Subcommittee Lead Endre Holen, one of our most active legacy Citation members. Endre shared his insights on making the transition to a more complex aircraft, the importance of CJP's Safe to Land(sm) initiative and why he uses personalized checklists for normal operations.

The Citation V is a true "Legacy" airframe. Can you talk about the cockpit workload and how you handle flying single pilot?

The Citation V is an amazing airplane. It has 1800 NM range and with the gross weight increase STC can carry about 1300-1400 pounds with full fuel. It is true that it is an older airframe, and the factory avionics are 25-30 years old.

However, many of these airplanes have been upgraded with mostly Garmin avionics through the Columbia or JetTech STCs. When I bought the airplane, I replaced the Universal FMS with a Garmin 750/650 combination. That is a very nice addition since it has modern flight plan logic and an excellent moving map for situational awareness.

It is true that unless you go fully glass, the rest of the flight instruments come in a standard six pack configuration. I have never really flown with anything else, and I am very comfortable with that. I have found the workload to be quite manageable. The busiest time is on a departure with level off and turns and altitude restrictions. I found the best workload reduction is to simply power down and fly the departure at a reasonable speed after flaps retraction altitude.

Similarly on arrival, I generally try to get the drag in early and fly the last part of arrival and approach at slower speeds. The heaviest workload is abnormal procedures, but I think that goes for any single pilot plane. The best advice there is to go slow, use the checklist and be methodical. All in all, the Citation V is a great platform for travel and exploration.

You recently added a Dynon D3 Pocket Panel unit to your cockpit. Why?

The backup AI on the legacy Citation is always placed in a strange out of the way location. And it is fairly small. In my V, it is over to the right side and down low. It is very difficult to see, and I would be hard pressed to fly by it in a real emergency. The good news is that we have two gyros and the ability to revert from either co-pilot or pilot side gyro.

The redundancy is very good. However, in my Citation I, I had a gyro go out at FL430 at night over the Gulf of Mexico heading to Florida. I had to hand fly from the copilot side instruments until I got on the ground. So, I installed a Dynon D3 in that airplane right in front of the pilot, and when I purchased the Citation V, I decided to do the same.

It is not a permanent installation and does not replace the legally required back up AI. But works great and is less than $1000 and only requires a power chord to the USB port. It is probably more redundancy than required but makes for good peace of mind.

Has the Safe to Land(sm) Initiative affected how you handle your approach procedures?

It sure has. It is a great and required initiative given how many accidents happen on landing. I have always been one to slow down early and be stabilized on any arrival, approach and landing. The safe to land approach has made my flying during the arrival phase more methodical and systematic. I like the discipline the 1000, 500, 200 feet gates forces. The landing cue card lives in the side pocket always and gets reviewed before any approach.

You have created your own normal checklists for the Citation V. Why?

Single pilot flying is always higher workload than crew. I found using the Citation book checklist to be way too cumbersome and out of order with my desired flow. The net result is often to miss or skip items or get overloaded at critical phases of flight.

Of course, the book needs to be onboard and available always. This is a legal requirement. I have figured out the absolutely critical items for each phase of flight and my preferred flow. The checklist is merely a list of those items in the flow preferred. It is one double-sided page laminated and is used every time and diligently. And I have added the simplified criteria in the Cessna manual for takeoff data including the required N1 settings.

And, I have a table similarly for the VREF calculations for various landing weights. Although, on a side note, I find myself using my AOA indicator for most approaches and landings these days. I can highly recommend using a checklist like this in single pilot operations.

You have appeared in several "What Good Looks Like" videos specific to the Legacy Citations and chair the Legacy Committee. Can you talk about this effort?

Yes, a year or so ago, CJP decided that we needed to engage the owners of the "Legacy" jets better. These airplanes are loosely defined as all the out-of-production airplanes with strange old avionics. They include the 500 series and many of the older CJs. We formed a subgroup of the safety committee and have been pursuing an agenda to get better simulator training, more visibility to maintenance issues and providers, creating a community through webinars and finally be included in the "What Good Looks Like videos".

Over the last year, we have filmed a few with topics particularly tailored to the uniqueness of these older aircraft. This has been taking off with parking brake engaged, turning of avionics and inverter switches instead of ignitions and many more relevant topics. The members are more engaged and eager for more in the coming year!

How challenging was your transition to the V? Do you have any recommendations for others moving up to higher performance Citation models?

The transition to the V was not particularly difficult. My previous airplane was a Citation I Stallion conversion. This is real hot rod plane with excellent performance. I vividly remember that transition as being challenging. I had been flying an Aero Commander 690B prior to that.

Safe to Land(sm) Video Podcasts Feature CJP Members

As part of the Safe to Land(sm) Initiative, the CJP Safety Foundation has created a weekly video series highlighting multiple aspects of the program.

Released each Sunday morning through an eBlast and also on Spotify, these short broadcasts include such topics as how to use the STL cue card, and real-world use of new approach and landing practices. CJP members Jonathan Bailey (above, with "Captain Dave") and Endre Holen recently provided content in their CJ2 and Citation V aircraft.

Over thirty videos are planned for the series running through the end of 2023 and will also be available soon on the CJP STL webpage.

While a turboprop, it is a docile aircraft and slows down really fast. And the reverse on landing is fabulous.

When moving a jet, the speed at takeoff and the difficulty of slowing down in the terminal area took some time getting used to. These jet birds don't slow down very well unless we make them! I very much remember my first take off from KTIW (Tacoma Narrows Airport) with a level off at 1500 feet and a 90 degree turn under Seattle's class B airspace. Let's just say that I was a mile behind the airplane for the first couple of minutes. And perhaps slightly above 200 kts and with some zero-G action at level off.

I think the best advice is that we do not have to fly the airplane fast just because it can. Pulling back power on takeoff once at safe altitude, leaving the flaps in for a while if you need to turn and get the drag in early on arrivals are the best pieces of advice for new jet pilots. Train often in simulator AND in the airplane. I find in airplane training invaluable in building confidence on engine-out performance and general flying characteristics. And of course, training in the simulator is amazing for a whole host of approaches and emergency situations.

I find the Citation jets much safer and easier to fly than the turboprop and piston twins I have owned. The performance, weather capabilities and robustness and simplicity of systems, make for a safe ride when well trained.

MDA to DA

by Neil Singer, CJP Safety Consultant and Master Instructor

When IFR GPS broke onto the scene three decades ago, it caused a sea change in the way approaches could be flown into airports too small to have an ILS. Rather than conducting an approach referencing a relatively inaccurate VOR or NDB signal, every airport in the country could be approached with localizer accuracy. What the first GPS did for lateral navigation, WAAS has done for vertical navigation. Yet some pilots still aren't taking full advantage of WAAS capability in this area, and some training providers are teaching procedures that hobble a major safety benefit WAAS presents.

The issue is the ability of WAAS-capable Garmin navigators to create vertical guidance as part of most GPS approaches without published WAAS minimums. This advisory vertical guidance turns an LNAV-only approach into an "LNAV+V" approach. Where "+V" vertical guidance is available, the autopilot is fully capable of coupling to the vertical path, as if the approach was a full-blown LPV or ILS.

Yet many pilots conduct this type of approach in the same manner they would a VOR or NDB, setting the MDA in the altitude selector and using vertical speed mode to reach MDA. It is true that the presence of vertical guidance on an LNAV approach doesn't change the MDA, nor make it an official APV (approach with vertical guidance) in the eyes of the FAA. However, there's no reason not to use the same procedure to fly the approach as if it were an LPV, coupling vertically via the GP (glide path) mode, and never leveling off at MDA.

Flying an LNAV+V in the manner of a precision, rather than non-precision, approach offers several safety benefits. The most important is that the aircraft can be configured to land and on-speed outside the FAF, with no further configuration or power changes required. Wherever the pilot may be when visual contact with the runway is acquired, the aircraft will be on a stable path to the touchdown zone. In contrast a pilot who dives down to MDA at a high rate of decent may visually acquire the runway before the aircraft is in a position to begin further descent. Deciding when it's safe to leave MDA can require quick thinking at a time when the aircraft is very close to terrain, not a desirable situation.

Another benefit is that, as level-off at MDA is not required, the altitude pre-selector can be set to the level-off altitude of the missed approach once the FAF is passed. Forgetting to set missed approach altitude after level-off at MDA is one of the most common errors made by transitioning jet pilots, and beginning the missed without the correct altitude set can lead to undesirable autopilot behavior or an ATC violation.

There is one trick to turning an MDA into a DA, however. Built into a published DA is consideration that if a pilot looks up at DA, the aircraft will still be traveling downwards while the pilot makes the decision to go missed, adds power, and transitions to a climb. An MDA, in contrast, is exactly what it says – a minimum altitude below which the pilot must not go unless landing. The solution is simple – add "padding" to the MDA so that even if it takes a few seconds to get the plane climbing, MDA will not be violated.

A light jet flying on a three-degree descent path will be descending about 550 FPM, or a little over 9 feet per second. Assuming a worst-case scenario of five seconds to transition from descent to climb and rounding up, 50 feet results. So, adding 50' to the published MDA results in the new functional DA – the altitude at which the missed approach will commence, and which should be bugged as "minimums."
