



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Central Region

3/2/2022

INVESTIGATION SUMMARY

CEN21LA121

A. INVESTIGATION PARTICIPANTS:

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B. ACCIDENT

1.0 Accident Flight Summary

On February 2, 2021, at 1744 central standard time, a Cessna 182Q airplane, N4765N, was destroyed when it was involved in an accident near Hackberry, Louisiana. The private pilot and flight instructor were fatally injured. The flight was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to a co-owner of the airplane, the private pilot had just purchased a share of the accident airplane and was in the process of accumulating flight hours for complex and high-performance aircraft endorsements. The day before the accident, the co-owner was in the back seat of the airplane when the two accidents pilots were conducting a training flight. He stated that the private pilot completed the flight maneuvers well and he did not notice anything of concern.

According to the airplane broker, on the day of the accident the private pilot called to report that he had just completed a 1-hour flight in the accident airplane to satisfy the insurance policy requirements. The airplane departed from Southland Field Airport (UXL), Sulphur, Louisiana, about 1326 and terminated about 1436.

Two witnesses were in close proximity to the accident site, but different locations, stated that they observed the airplane in a rapid descent with the nose pointed at the ground. They both observed the bottom of the airplane and did not notice any rotational movement.

The airplane impacted soft ground on an island about 1.5 nautical miles northeast of Hackberry. The initial impact crater extended about 15 ft deep and contained a majority of the airplane, to include the engine, propeller, fuselage, and empennage. A debris field that consisted of the wings and smaller airplane components extended about 40 yards from the crater.

The recorded ADS-B data revealed that the airplane departed again at 1713 and proceeded south toward the Gulf coast. The data showed that the airplane maneuvered near the coast then proceeded north as the altitude and airspeed increased. The airplane reached about 4,500 ft above ground level (agl), as the airspeed decreased. The airplane began a slow descent, which increased rapidly until the final recorded point. In the last 12 seconds of recorded data, the airplane made a

right turn and had descended about 3,200 ft. Figure 1 shows the end of the recorded flight track and the accident location.

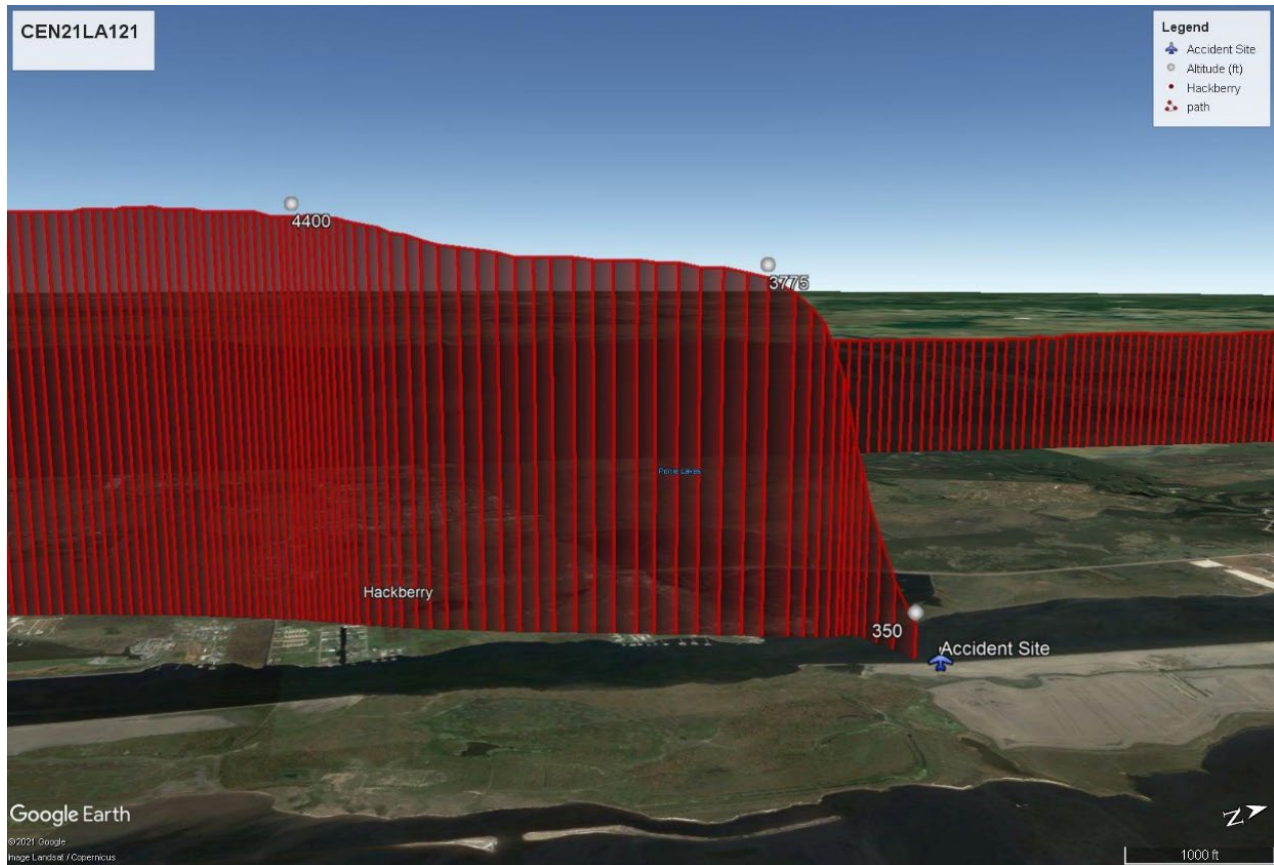


Figure 1. The recorded flight path and accident location overlaid on Google Earth.

Date	Time (UTC)	LAT	LON	Altitude	Heading	Speed		
2/2/2021	11:41:50 PM	29.95815	-93.3425	4350	352	116		
2/2/2021	11:42:05 PM	29.96598	-93.3436	4325	354	115		
2/2/2021	11:42:09 PM	29.96856	-93.3438	4300	355	114		
2/2/2021	11:42:14 PM	29.97113	-93.344	4350	356	105		
2/2/2021	11:42:19 PM	29.97341	-93.3442	4400	357	98		
2/2/2021	11:42:24 PM	29.97544	-93.3443	4425	359	94		
2/2/2021	11:42:34 PM	29.97931	-93.3441	4550	3	75		
2/2/2021	11:42:44 PM	29.98293	-93.3437	4475	9	82		
2/2/2021	11:42:49 PM	29.98476	-93.3432	4450	13	84		
2/2/2021	11:42:54 PM	29.98663	-93.3427	4450	13	78		
2/2/2021	11:42:59 PM	29.98821	-93.3422	4475	16	69		
2/2/2021	11:43:04 PM	29.98965	-93.3416	4475	19	67		
2/2/2021	11:43:09 PM	29.991	-93.341	4450	22	62		
2/2/2021	11:43:13 PM	29.99216	-93.3405	4450	23	57		
2/2/2021	11:43:18 PM	29.99323	-93.34	4400	25	51	3,162 fpm descent	
2/2/2021	11:43:23 PM	29.99424	-93.3393	4375	30	48		
2/2/2021	11:43:28 PM	29.99562	-93.3385	4275	26	74		
2/2/2021	11:43:33 PM	29.99774	-93.3376	4075	21	105		
2/2/2021	11:43:38 PM	30.00023	-93.3366	3975	18	119		
2/2/2021	11:43:43 PM	30.00302	-93.3356	3925	18	126		-11,250 fpm
2/2/2021	11:43:49 PM	30.006	-93.3345	3775	18	127		
2/2/2021	11:43:54 PM	30.00813	-93.3338	2750	8	57		
2/2/2021	11:43:55 PM	30.00832	-93.3339	2500	353	46		
2/2/2021	11:43:56 PM	30.00851	-93.3338	2125	357	43		
2/2/2021	11:43:57 PM	30.00868	-93.3337	1850	28	47		
2/2/2021	11:43:59 PM	30.009	-93.3329	1275	66	83		
2/2/2021	11:44:00 PM	30.0092	-93.3322	925	74	122		
2/2/2021	11:44:01 PM	30.00939	-93.3312	550	76	142		

Figure 2. Final 3 minutes of ADS-B data with calculated descent rates. The descent rates shown are calculated from that point in the flight until the end of the data. From 11:43:48 UTC until the end of the flight, the calculated descent rate was 11,250 ft per minute (fpm).

2.0 ATC Summary

2314 UTC – N4765N contacts Lake Charles Approach Radar East/West combined (RL), heading to the Southwest practice area, departing from Southland Field (UXL). N4765N was given the KLCH altimeter, issued a squawk code, radar identified and to proceed on course.

2325 UTC – RL issues an altitude restriction to N4765N for at or above 2,500 ft for traffic. N4765N acknowledges restriction and advises his maneuver might cause a loss of descent at their current position. RL acknowledges.

2336 UTC – N4765N advises climbing back to 2,500 ft or above. RL acknowledges. RL asked if N4765N needed to go down below the restriction. N4765N responds not until they get to UXL. RL acknowledges.

2345 UTC – RL issues radar contact lost to N4765N. No response received from N4765N.

C. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

The airplane was highly fragmented due to a high-speed collision with terrain and related impact forces. According to the FAA, the airplane impacted soft, muddy terrain in a near vertical (nose low) attitude. The airplane came to rest upright on a 060° magnetic heading with the propeller and engine buried approximately 15 ft deep in the mud. The right and left wings were observed with extensive accordion style crush damage and separated at the attached fittings on both forward and aft. Ailerons and flap surfaces remain attached. The tail had all surfaces attached and was observed separated at the aft canted bulkhead. All flight control surfaces were observed in the wreckage. Flight control cable continuity was established for all flight control surfaces through tensile overload separations to the cockpit area. Flight control cables from rudder and elevator remain attached to the respective bellcrank and measure approximately 10 ft from the tail. Aileron cables in both wings remain attached to the bellcranks and were observed overload at the wing root. Flaps were in the full up position. The elevator trim was 10° tab up. The fuel selector valve was observed positioned to BOTH. All fuel selector valve positions were tested with water and the valve operated as designed with no blockages. All seats were intensively damaged due to impact forces. Two lap restraints were observed with the buckles latched.

No information was recovered from the cockpit instruments or positions of the circuit breakers due to the heavy fragmentation and impact damage.

The autopilot electronics and related components were unable to be examined due to the extensive damage.

No pre-impact abnormalities on the airframe were noted during the examination, but the examination was limited due to the extensive damage.

2.0 Engine Examination

Engine: Continental Motors O-520-U/TS / s/n 5U210

Propeller: Hartzell / Model HC-C3YF-1RF / Hub s/n LC10B

The engine could not be rotated due to the extensive damage to the crankshaft and cylinders. The top sparkplugs were removed, and the electrodes were full of mud. Both magnetos separated during the impact sequence. All valve covers were impact damaged. Mud and debris was observed inside all cylinders and accessories. The propeller separated due to the impact. One of the three blades separated the hub and was later recovered by the coroner. The remaining two blades were loose at the hub and were observed with extensive leading-edge damage as well as S-bending and curling.

No pre-impact abnormalities on the engine were noted during the examination, but the examination was limited due to the extensive damage.

D. Garmin Automatic Flight Control System GFC500

1.0 Garmin GFC500 Manual Information

The airplane was equipped with a Garmin GFC500 automatic flight control system (AFCS) autopilot, which featured electronic stability and protection (ESP). According to the Garmin AFCS manual, the ESP function provides a soft barrier to keep the airplane within the desired operating envelope when the autopilot is not engaged. When the AFCS senses that the airplane is near the defined operating limit in pitch attitude, roll attitude, high airspeed, or low airspeed, the ESP function will automatically engage one or more servos to nudge it back to the nominal operating envelope. While ESP utilizes the same sensors, processors, and actuators as the AFCS autopilot it is a separate mutually exclusive function. ESP can be easily overpowered by the pilot and can be disabled using the AP DISC/ TRIM INT button. The Electronic Stability and Protection (ESP) is a feature that is intended to monitor the airplane and provide control input feedback when necessary to discourage operating the airplane at potentially unsafe attitudes and/or airspeeds.

Level mode as activated by ESP is limited by altitude. ESP will not be able to activate Level mode until the aircraft climbs above 2000 feet AGL. ESP will be locked out of automatically activating Level mode after the aircraft descends below 1500 feet AGL as well. Also note that Level mode as activated by ESP is different than manually selected Level mode. Manually selected Level mode is not limited by altitude at all.

ESP is enabled or disabled from the PFD Page Menu.

2.0 Garmin ESP Blog Information

[Understanding Garmin Electronic Stability and Protection \(ESP\) | Garmin Blog](#)

What is ESP? ESP is a safeguard created to assist you in maintaining safe, stable flight when hand-flying your aircraft. It monitors the aircraft's flight condition, functioning independently of the autopilot, and it applies a control force toward stable flight whenever pitch or roll deviations exceed recommended limits. ESP can also recognize when underspeed or overspeed conditions are about to occur — such as a stall or too-steep of a descent — and it makes appropriate adjustments to the controls. Plus, if the system detects that ESP has been activated for a specified period of time — such as in the event of pilot incapacitation — the autopilot will engage with the flight director in level mode to bring the aircraft back to level flight. However, if you're training or practicing, ESP can be manually disabled to allow intentional flight maneuvers.

Where is ESP? ESP can be found in many of our most popular integrated flight decks, including a number of G1000 NXi- and G3000-equipped aircraft, along with our new cost-effective GFC

500 retrofit autopilot for light single-engine aircraft, and GFC 600 retrofit autopilot for high-performance, more complex aircraft. Experimental/LSA owners and pilots can also take advantage of ESP with our G3X and G3X Touch experimental flight display systems by utilizing compatible G3X autopilot servos.

How can ESP help? Lately, an important discussion within the aviation community has centered around aircraft loss-of-control scenarios—in fact, it’s on the NTSB’s “Most Wanted” list. ESP is a direct result of these conversations. By helping to avoid the onset of inadvertent stall/spins, steep spirals or other loss-of-control situations, we want to help make the flight environment even better.

3.0 Garmin GFC500 Digital Autopilot Sales Information

[GFC™ 500 I Digital Autopilot for General Aviation Aircraft \(garmin.com\)](https://www.garmin.com/en/US/products/pagelist/index.page?product=500)

Additionally, ESP can be manually disabled to allow for intentional flight maneuvers.

