



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Central Region

Aircraft Examination and Accident Site Summary

CEN22FA424

A. ACCIDENT

Location: Longmont, Colorado
Date: September 17, 2022
Aircraft: Cessna 172S & Sonex Xenos
NTSB IIC: Michael Folkerts

B. SUMMARY

On September 17, 2022, about 0853 mountain daylight time, a Cessna 172S, N2117Y, and a Sonex Aircraft Xenos, N255BF, were destroyed when they were involved in a mid-air collision near Longmont, Colorado. The flight instructor and student pilot aboard the Cessna and the pilot aboard the Sonex sustained fatal injuries. The Cessna was operated as Title 14 *Code of Federal Regulations* Part 91 instructional flight. The Sonex was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

A review of air traffic control (ATC) flight track data revealed the Cessna departed Rocky Mountain Municipal Airport (BJC), Denver, Colorado, about 0843, and the Sonex departed Platte Valley Airpark (18V), Hudson, Colorado, about 0838. The airplanes climbed to about 7,000-7,500 ft mean sea level (msl) and were operating under visual flight rules (VFR).

The Cessna flew northbound and the Sonex flew westbound toward the Longmont area. After the Cessna completed a left 360° turn, it turned eastbound. The flight track data of the two airplanes merged and subsequently showed both airplanes rapidly descending. Fragmented sections of the outboard left wings of both airplanes were found in a field below the point where the two flight tracks merged .

Both airplanes impacted nose down in a rural area with a ground elevation of about 5,100 ft msl. The main wreckage site of the Cessna was in a field about 1,800 ft southeast of the wing fragments. The main wreckage site of the Sonex was adjacent to a tree about 1,100 ft southwest of the wing fragments.

At the time of the accident, both airplanes transmitted a transponder code of 1200 (VFR) and neither airplane was in radio contact, nor was required to be in contact with ATC. Both airplanes operated within the Mode-C veil of the Denver International Airport Class B airspace that required automatic dependent surveillance broadcast (ADS-B) “out” transmissions.

The Cessna was equipped with ADS-B “in/out” equipment and transmitted ADS-B data during the accident flight. The Sonex did not transmit ADS-B data during the accident flight; ATC records indicated the Sonex last transmitted ADS-B data on July 14, 2022.

Examination of the two aircraft was conducted at the accident site by the NTSB IIC, other NTSB NTSB investigators, FAA personnel, and a Textron Aviation safety representative. A follow up examination occurred at a recovery facility by NTSB, FAA, Lycoming, and McAir Aviation personnel.

C. DETAILS OF THE INVESTIGATION

Accident Site Information

The two aircraft collided over a rural farm area. Examination revealed a 5 ft section of the left wing and aileron had separated from the Cessna 172 (N2117Y) and a 2 ft long section of the left wing tip had separated from the Sonex Xenos (N255BF).

The wing fragments of both aircraft were found in a field. The Cessna 172 was located about 1,800 ft southeast of the wing fragments; the Xenos was about 1,100 ft southwest of the wing fragments (see Figure 1).

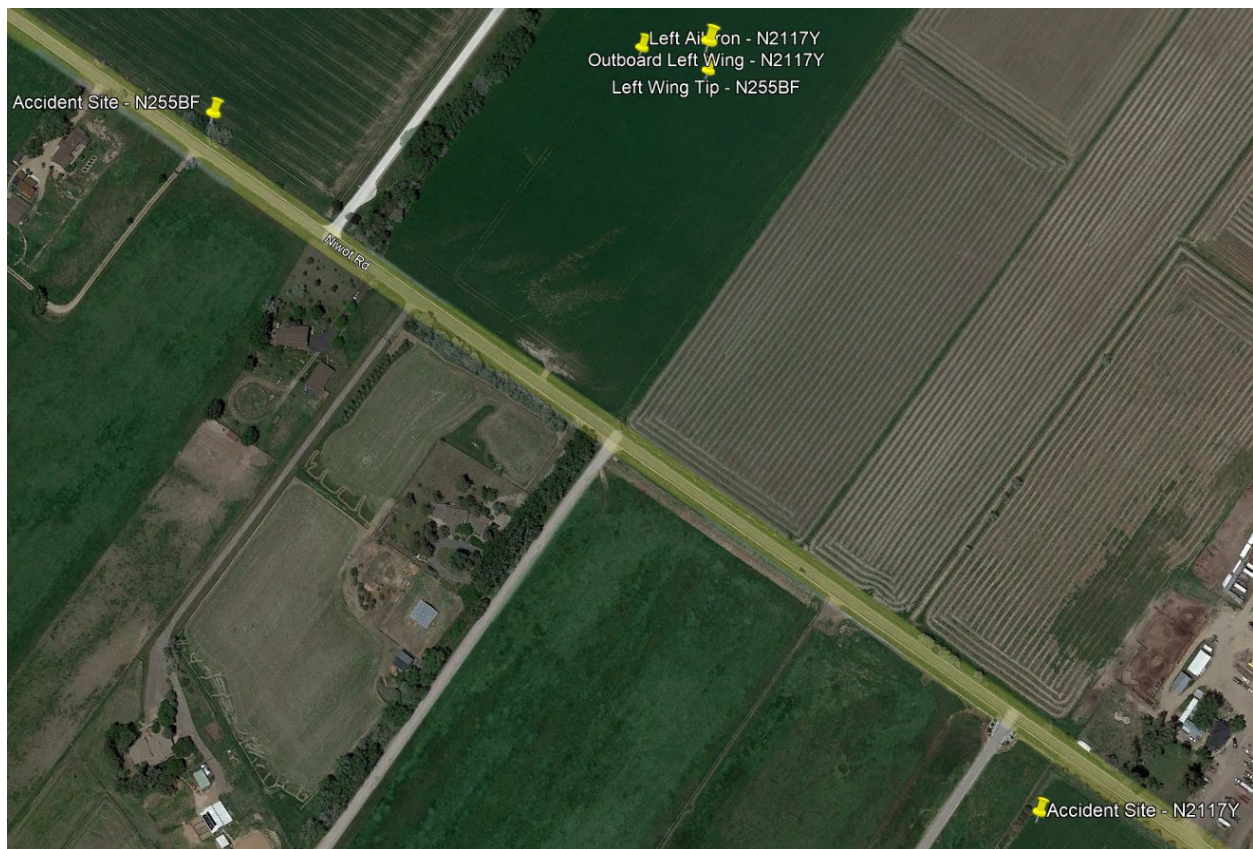


Figure 1. Overhead View of Accident Sites

Cessna 172S Wreckage

The Cessna impacted an open, rural field with a near vertical, nose-down attitude (see Figure 2).



Figure 2. Cessna 172S Wreckage at Accident Site.

The right wing tip was fractured into multiple small pieces and the right wing leading edge skin was crushed. The right aileron and right flap remained attached to the right wing. The center wing portion of the forward wing spar remained attached to the right wing. The leading edge of the left wing exhibited deformation and compression damage. The aft fuselage exhibited significant deformation and compression damage. The tail remained attached to aft fuselage. The vertical stabilizer and both horizontal stabilizers were crushed; the rudder and elevators remained attached. Flight control cable continuity was not established due to fragmentation and deformation.

The left main landing gear strut remained attached to the aircraft. The left main tire and wheel assembly had separated from the left gear strut and was found about 150 ft east of the fuselage. The right main landing gear strut and wheel assembly separated from the fuselage and were found approximately 50 ft south of the fuselage. The nose wheel assembly sustained ground impact damage and was found next to the engine and instrument panel. The propeller was twisted and exhibited leading edge polishing and rotational scoring near the spinner.

Sonex Xenos Wreckage

The Sonex Xenos, a light sport experimental aircraft, impacted terrain between a corn field and Niwot Rd (see Figure 3).



Figure 3. Sonex Xenos at Accident Site

The aircraft struck a tree in a near vertical descent and came to rest inverted on the edge of the roadway drainage ditch.

The right wing remained attached to the fuselage and sustained ground impact damage to the leading edge skin. The right wing tip and aileron remained attached. The left wing remained attached to the fuselage. The left wing was fractured near mid-span and was bent downward. The left wing tip and about 2 ft of the outboard left wing skin located near the leading edge of the left wing was impact separated from the aircraft when it struck the Cessna 172S. The left aileron remained attached to the wing; there did not appear to be any damage to the outboard end of the left aileron.

The aft fuselage was found separated from the forward cabin. The lower portion of the fuselage sustained tree impact damage and was torn in multiple locations. The V-tail remained attached to the aft fuselage and did not appear to be damaged.

The engine and propeller were embedded in the soil at the base of a tree. The forward fuselage and cockpit were crushed. The instrument panel was fragmented; instrument readings and switch positions were unreliable.

A Go-Pro was found in the cockpit area. The camera appeared to have been mounted to the ceiling. The Go-Pro was sent to the NTSB recorders laboratory for download.

Recovery Site Examination

The Sonex avionics included the following components:

- Garmin GTX 330 transponder, P/N 011-00455, 60, S/N 84142720
 - Data plate indicated unit was a TSO/ETSO-C112d transponder.
 - Minor damage to pushbuttons
- Garmin GNS 430W multi-function unit, P/N 011-01060, S/N 23432031
 - Data plate indicated unit was a TSO/ETSO Class 3 GNSS
 - Unit was missing a rotary selector knob at lower left, but otherwise intact.
- 2 Garmin display units, both of which both shattered.
- Dynon EFIS-D6 display unit, which appeared largely intact.

Examination of Sonex instrument panel revealed the following switches/circuit breakers were open or off (not all-inclusive):

- Circuit breaker marked “430” open.
- Circuit breaker marked “XPNDR” open.
- Avionics Master off

Backshell connectors (on GTX 330, GNS 430W, and in backshell itself) were examined. No significant bent pins observed in units or backshell. A multi-pin connector (25-pin D-SUB) in wiring behind backshell was disconnected.

An unusual wiring pattern was noted in conjunction with a wire tagged “G430GPS”. Several wires, including this wire, were zip-tied together. This wiring eventually terminated in a break at one end, which was connected to an unmarked circuit breaker next to the AUDIO circuit breaker.

The disconnected 25-pin D-SUB connector was observed to have one pin with possible heat damage (missing part of pin), pin #22. Heat discoloration was also observed at the corresponding hole. There was no wire connected to the hole on the socket side.

Garmin GTX 330 and Garmin GNS 430W devices were harvested from the Sonex and the Appareo Stratus 3i device were harvested from the Cessna 172. All devices were shipped to NTSB recorders laboratory for evaluation/download.

Maintenance Records:

Cessna 172:

- ADS-B installation Appareo Stratus ESG per STC SA04112CH occurred on May 30, 2019.
- Hardwire kit for Appareo Stratus 3i (ADS-B In) was installed at that time.

Sonex Xenos:

- GTX 330 transponder was upgraded to GTX330ES on November 26, 2018. The software on GNS 430W was also upgraded to Version 5.4 and GPS software to version 5.0 at that time. Upgrade performed by Plane Sense Avionics (CRS 13PR698Y) of Caroline, WI.
- The last transponder test was logged on August 13, 2022.
- The owner removed the GNS 430W about July 2022 for noise in headset and delivered the unit to Freedom Avionics, Broomfield, Colorado, for repair.
- Freedom Avionics found an issue with the GNS 430W and forwarded the unit to Garmin.
- The repair start date was September 6, 2022, and the approval for return to service was September 8, 2022. Garmin replaced main board of unit during repair, then returned the unit to Freedom Avionics, who returned it to the owner about September 14, 2022 for reinstallation.
- FlightAware data indicates the accident flight was the first flight of the Sonex after reinstalling the GNS 430W.

Additional Information

FlightAware data indicated the Sonex Xenos flew nine flights between July 14, 2022, which was the last flight with ADS-B transmissions, and the accident flight. These nine flights originated from the pilot's home airport at Platte Valley. The data source for the flights was Mode S multilateration (not ADS-B).

According to a Denver FSDO representative, the Sonex was not operating under an ADS-B Deviation Authorization Preflight Tool (ADAPT) during the flights flown without ADS-B transmissions after July 14, 2022.