

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



CEN23LA337

VIDEO FILE

Specialist's Factual Report

December 27, 2023

A. ACCIDENT

Location: Winsted, Minnesota
Date: July 30, 2023
Time: 1655 central daylight time (CDT)
Airplane: Cub Crafters CCX-2000, private operator, N967DT

B. VIDEO FILE SPECIALIST

Specialist: Steven Smith
Mechanical Engineer (Recorder Specialist)
National Transportation Safety Board (NTSB)

C. DETAILS OF THE INVESTIGATION

In agreement with the Investigator-In-Charge (IIC), a group was not convened, and a summary was prepared. The NTSB Vehicle Recorder Division received the following video file:

Video File: GX010255.MP4

1.0 Device Recording Description

The video file was generated from a point of view (POV) GoPro camera. The exact model of the POV GoPro camera was not noted by the IIC.

2.0 Video File Information

The accident recording was made at a resolution of 3840 x 2160 pixels at a frame rate of 29.97 frames per second (fps). The length of the recording is 2 minutes and 32 seconds and captured the accident. An associated audio track was also recorded from the pilot's headset adapter. This audio track did not include sounds from the engine. The camera was mounted to the frame of the aircraft behind the pilot on the left side and was oriented to show a forward-facing field of view that included a view of the instrument panel, the pilot, and an external view forward and to the left of the airplane. The field of view of the accident recording is digitally illustrated in figure 1 below.



Figure 1. Image showing typical field of view (pilot and reflection on canopy and cell phone redacted).

3.0 Timing and Correlation

The time used in this report is expressed in the local time of the accident, CDT. Timing of the transcript was established by correlating the video events to common events on the Garmin G3X data. Specifically, the Garmin G3X display in the GoPro video was examined at 5 different times and compared to the Garmin G3X data.

Therefore, a relationship between the Garmin G3X data to Video Elapsed Time (time from the beginning of the recording) can be developed.¹

For this report, CDT = Video Elapsed Time + 16 hours, 53 minutes, and 36 seconds. Therefore, for the rest of this report, all times are referenced as CDT.

4.0 Summary of Recording Contents

The video began with the pilot flying on a north northeasterly heading about to turn left onto the downwind leg to land at Winsted Municipal airport. The pilot made a communication with intent to land on runway 9 and back taxi. The pilot then made several inputs to reduce engine power and to turn onto left base. The final portion of the video continued with the aircraft on final approach when the engine stopped running at approximately 45 feet above ground level (AGL). The aircraft was able to land but slid during landing rollout. The video ended shortly thereafter.

¹ For more information, see Electronic Flight Instrument System – Specialist’s Factual Report in the docket.

D. SUMMARY OF EVENTS

Time CDT (HH:MM:SS)	Observation
16:53:36	The video began at an airspeed of 74 miles per hour (mph) and an altitude of 2100 feet (ft), as the pilot was about to enter a left downwind.
16:54:17	The pilot performed a before landing checklist. Noted items were: • "we've got the boost on," and the pilot checked the aux fuel pump. The orange light was already on, as shown in figure 2. • "gas set to both," and the pilot toggled a switch below the throttle. • "undercarriage," was stated, and no action was taken. • "carb heat," was stated, and no action was taken. • "mixture extra full rich," and the pilot pressed the mixture red knob, as shown in figure 2. • "prop fully forward," and the pilot checked the prop lever. • "safety belts," was stated, and no action was taken. The pilot had the safety belt on and was visible in the frame.
16:54:33	The pilot pulled back on the throttle. One second later engine power, engine rpm, engine exhaust temperature (EGT), and cylinder head temperature substantially began to reduce.
16:54:35	The pilot pulled the flap lever aft approximately one third.
16:54:40	The oil pressure yellow caution first illuminated on the Garmin G3X, as shown in figure 3. The oil pressure displayed was 60 psi.
16:54:47	The pilot made a radio communication stating that he had turned onto the left base.
16:54:54	The pilot pulled the flap lever aft approximately another third.
16:54:55	An automated 500-foot callout was observed.
16:55:00	The aircraft began to turn onto final approach.
16:55:04	As the runway was appearing in sight, the pilot pulled the flap lever full aft.

Time CDT (HH:MM:SS)	Observation
16:55:06	The angle of attack (AOA) aural alert activated and beeped for 6 seconds. Figure 4 shows the AOA visual warning on the Garmin G3X PFD. Figure 5 shows the pilot guidance on the AOA aural and visual warning on the PFD.
16:55:08	The pilot made a radio communication stating that the aircraft was on final.
16:55:10	The runway was in full view and the aircraft was lined up with runway 9.
16:55:18	The pilot pulled aft on the stick. The AOA aural and visual alert immediately became active. The AOA aural alert was a slow beep with one visual yellow chevron for 2 seconds.
16:55:20	The pilot continued to hold the stick aft and a faster persistent AOA aural beeping with two visual yellow chevrons were observed for 7 seconds (as seen in figure 6).
16:55:23	The EGT yellow caution illuminated on the Garmin G3X, as shown in figure 7. The airspeed was 49 mph and the altitude was 1120 ft (approximately 105 ft AGL).
16:55:28	The pilot increased the throttle. One AOA aural beep with one visual chevron was observed for 1 second.
16:55:29	The propeller stopped rotating and the oil pressure red warning illuminated on the Garmin G3X, as shown in figure 8. In addition, a crew alerting system (CAS) "AMPS" yellow caution message was displayed. Faster persistent AOA aural beeping and two visual yellow chevrons were observed.
16:55:30	The pilot pulled full aft 3 times on the control stick until contacting the ground 2 seconds later.
16:55:31	One single chime was heard and a CAS "OIL PRESS" red warning illuminated on the Garmin G3X, as shown in figure 9. The airspeed was 52 mph and the altitude was 1040 ft (approximately 25 ft AGL).
16:55:32	The aircraft contacted the ground and bounced. The aircraft rolled out after the bounce and continued straight down the centerline for 2 seconds.
16:55:35	The aircraft began to veer to the right of the runway. The pilot immediately attempted to counteract the veer by applying left control stick.
16:55:38	The AOA aural and visual AOA alerts cleared.

Time CDT (HH:MM:SS)	Observation
16:55:39	The aircraft began to skid with the nose yawing to the left while the aircraft continued to slide in the direction of the landing.
16:55:42	The aircraft came to a complete stop. The aircraft came to a rest upright and on the right side of runway 9 with the nose of the aircraft facing an approximate heading of 290 degrees.
16:56:08	The pilot powered down the avionics and began to egress from the aircraft and the recording ended.

Submitted by:

Steven Smith
Mechanical Engineer (Recorder Specialist)



Figure 2. Aux fuel pump (red rectangle) and mixture control knob (blue circle). Screenshot taken at 16:54:17 CDT.



Figure 3. Garmin G3X PFD display with oil pressure yellow caution (red rectangle). Screenshot taken at 16:54:40 CDT.



Figure 4. Garmin G3X AOA visual alert for pilots (red rectangle). Screenshot taken at 16:55:06 CDT.

AOA AURAL ALERT

When a G3X is configured with a GSU 25, a GAP 26 and AOA is configured. The G3X will issue an aural alert when the aircraft's pitch attitude approaches a stall. A persistent beeping will begin at the first red chevron and will become progressively faster as the AOA is increased. A constant tone will be heard at the second red chevron indicating a stall condition.

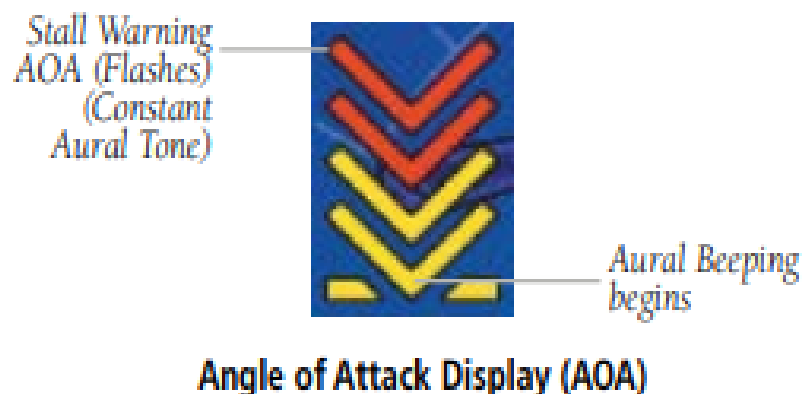


Figure 5. Garmin G3X pilot guidance on AOA aural alert.



Figure 6. AOA visual alert on Garmin G3X with two chevrons (red rectangle). Screenshot taken at 16:55:20 CDT.



Figure 7. Garmin G3X PFD display with EGT yellow caution (red rectangle). Screenshot taken at 16:55:23 CDT.



Figure 8. Garmin G3X PFD display with oil pressure red warning (red rectangle) and CAS AMPS yellow caution (blue rectangle). Screenshot taken at 16:55:29 CDT.



Figure 9. Garmin G3X PFD display with CAS OIL PRESS red warning (red rectangle). Screenshot taken at 16:55:31 CDT.