

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

April 10, 2020

Onboard Image Recorder

Specialist's Factual Report
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1. EVENT

Location:	Oliver Springs, TN
Date:	July 13, 2019
Aircraft:	Quicksilver MXII, N3889Z
Operator:	Private
NTSB Number:	ERA19FA225

2. GROUP

A group was not convened.

3. SUMMARY

On July 13, 2019, at 1718 EDT, an experimental, amateur-built Quicksilver MXII, N3889Z was substantially damaged when it impacted terrain shortly after takeoff from Oliver Springs Inc. Airport (TN08), Oliver Springs, Tennessee. The non-certificated pilot, who was also the owner of the airplane was fatally injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight that was conducted under the provisions of Title 14 *Code of Federal Regulations Part 91*.

4. DETAILS OF INVESTIGATION

On July 19, 2019, the National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following image recorder:

Recorder Manufacturer/Model:	MobileSpec Dash Cam
Recorder Serial Number:	Unknown

4.1. Recorder Description

The MobileSpec Dash Cam is a compact digital camera recording device. The camera is capable of recording high definition (HD) video and can additionally capture audio through a built-in microphone.

4.2. Recorder Damage

Upon arrival at the NTSB Vehicle Recorder Division, it was evident that the image recorder had sustained only minor impact damage and the video and audio information was extracted from the accompanying SD card. Due to the abrupt end of the power cycle for the last recording, the video corresponding to the accident flight was not saved properly and digital forensic techniques were employed to extract the entire video and audio.

4.3. Video Files

The SD card contained three recordings. Two of the recordings displayed an internal time stamp on July 12, 2019, the day before the accident, and one of the recordings displayed an internal timestamp on July 13, 2019, the accident date. The two recordings before the accident date were not of the aircraft and were unremarkable. The third recording captured the accident flight and is discussed below in the summary.

The accident recording was made at a resolution of 720x480 pixels at a frame rate of 30 frames per second (fps). An associated audio track was also recorded from the camera's internal microphone. The camera was mounted to the frame of the aircraft and was oriented to show a forward-facing field of view that included a view of the instrument panel and rudder pedals. The field of view of the accident recording is digitally illustrated in figure 1 below.



Figure 1. Digital Illustration of Camera View

4.4. Timing and Correlation

Timing of the transcript is expressed as Video Elapsed Time, which is time from the beginning of the recording in the format mm:ss; where mm is minutes and ss is seconds.

4.5. Summary of Recording Contents

In agreement with the Investigator-In-Charge, a video group did not convene and a summary report was prepared.

Accident Flight:

The video contains an associated time stamp. The timestamp of the first frame was July 13, 2019 at 17:07:21

At the beginning of the recording, the aircraft was stationary in a small turf field that had surroundings consistent with Oliver Springs Inc Airport (TN08). At 00:04, the operator sat down in the left seat of the aircraft. The right seat was unoccupied. The aircraft remained stationary in this position until 01:44. During this time, the engine was audible at an idle state.

At 01:44, there is an audible increase in engine RPM and the aircraft begins to taxi forward. From 01:44 to 02:41, the aircraft taxied from the original starting position to what appeared to be a mowed taxiway.

The operator continued to taxi along the mowed taxiway until he came to a stop at 03:04 at the intersection of the taxiway and a turf runway. The operator then turned left and back-taxied down the runway until 04:01 when he reached a teardrop shaped taxiway used to turn around at the end of the runway. The operator came to a complete stop at 04:33 at the intersection of the taxiway and runway. The aircraft was not yet lined up with the runway.

At 04:39 the engine RPM audibly increased and the operator taxied the aircraft from the taxiway onto the runway. At 04:50 the operator had completed a right 90 degree turn onto the runway and the engine RPM was audibly advancing as the aircraft began its takeoff roll. During the takeoff roll, the airspeed indicator was increasing and at 05:00 the aircraft appeared to lift from the runway surface. At the time the aircraft left the runway surface the airspeed indicator was just below the green arc.

As the aircraft pitched up, it immediately entered a slight left bank and yaw and began to drift left sharply. The aircraft continued drifting left; however, the left yaw motion seemed to have ceased. The aircraft continued briskly towards the left edge of the runway while in flight. As the aircraft began to cross the left edge of the turf runway there was an audible decrease in engine noise. By 05:01, the aircraft was completely over an area of tall grass to the left of the runway. At 05:02, the engine sound returned. This level of engine RPM was audible for the rest of the recording.

During the time the aircraft flew off the left edge of the runway, the operator appeared to have introduced a right rudder pedal input. However, it is unclear if the right rudder pedal was translating forward consistent with a right rudder deflection or if the right rudder pedal was rotating downward consistent with an application of the right toe-brake.

The position of the rudder pedals remained constant as the aircraft continued to make a flat, climbing, leftward turn.

At 05:07 a tree line bordering the left turf area of the runway became a prominent obstruction to the current trajectory of the aircraft.

At 05:12, the aircraft continued its left flat turn and was now perpendicular from the direction of takeoff and was facing the approaching tree line head-on. The aircraft's altitude was not yet above the top of the tree line.

The aircraft continued to climb away from the runway toward the trees and at 05:15 there was a quick, slight right bank coupled with a slight nose down pitch and the aircraft appeared to stop its leftward turn. At 05:16, the aircraft appeared to return to a wings level attitude and the leftward turn began slightly again. The bottom of the aircraft appeared to be close to brushing the tree tops.

At 05:17, the top of a tree appeared prominently in front of the instrument panel. The aircraft is suddenly jerked into a sharp left yawing motion that developed into a steep left roll. At 5:18, the aircraft was in a roughly 90-degree left roll in a nose down attitude. The left roll continued briskly until the aircraft was inverted and pointing at the ground.

The video ended just prior to impact, while the aircraft was inverted and pitched towards impacting a turf area just beyond the tree line.

The timestamp of the last frame is July 13, 2019 17:12:40

An approximate visualization of the flight path of the aircraft and the location at corresponding video time stamps is shown below in figure 2. The position information is based on simple visual references from the recorded video, not GPS data.



Figure 2. Approximate Visualization of Flight Path.