

EXAMINATION NOTES

HISTORY OF FLIGHT

On August 29, 2018, about 2035 mountain standard time, a Cessna P210, N6500W, impacted terrain short of the runway in Prescott, Arizona. The pilot, who was the registered owner, was operating the airplane under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91. The airline transport pilot, the sole occupant, sustained fatal injuries; the airplane sustained substantial damage. The personal local flight departed from Ernest A Love Field Airport, Prescott, Arizona, about five minutes prior to the accident. Visual meteorological conditions prevailed and no flight plan had been filed.

The pilot was planning on taking a long cross-country trip later in the month up to the Spokane, Washington area to visit one of his sons. The purpose of the accident flight was for the pilot to acquire night currency by performing three practice touch-and-go takeoffs and landings. The pilot sent a text to his spouse at 1851 the night of the accident relaying that if it got dark, he might attempt to get his night currency.

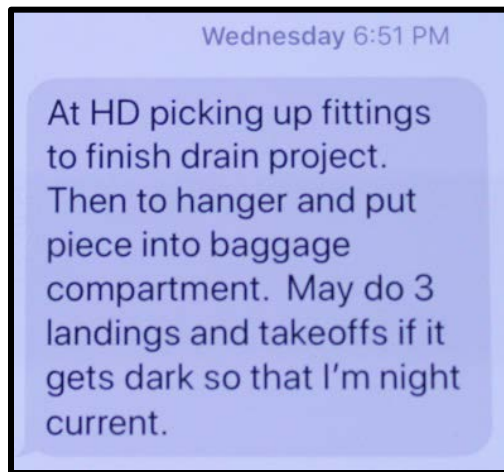


Figure 1: Text from Pilot to his Spouse

The pilot initially attempted to have air traffic controllers (ATC) clear him to perform the landings on runway 21L, but a controller relayed to the pilot that the traffic pattern was full. Thereafter, he accepted to stay in the traffic pattern for 21R.

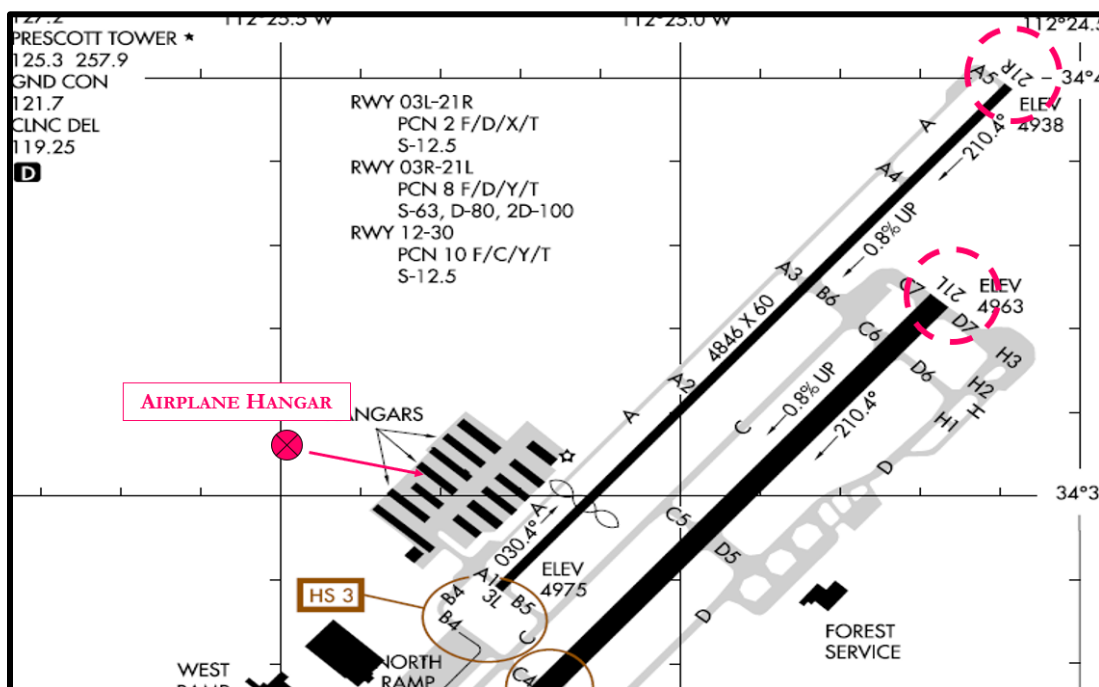


Figure 2: Text from Pilot to his Spouse

A review of the preliminary radar track data indicated that after departure, the airplane adjoined a right traffic pattern for runway 21R. On the downwind leg, the track continued toward the runway and it appeared the airplane was close to being above the approach end. The track then progressed into a long teardrop-shaped 180° turn by first heading northeast. At 2.8 nautical miles (nm) from the approach end of runway 21R, the airplane's heading turned right toward the runway. The track continued toward the southwest making a few shifts consistent with the pilot correcting the airplane to become aligned with 21R. The last recorded plot was at 2034:17 and located 740 feet northeast of the accident site. At that time, the airplane was about 5,050 ft mean sea level (msl), equating to about 145 ft above ground level (agl), at a ground speed of 99 kts.

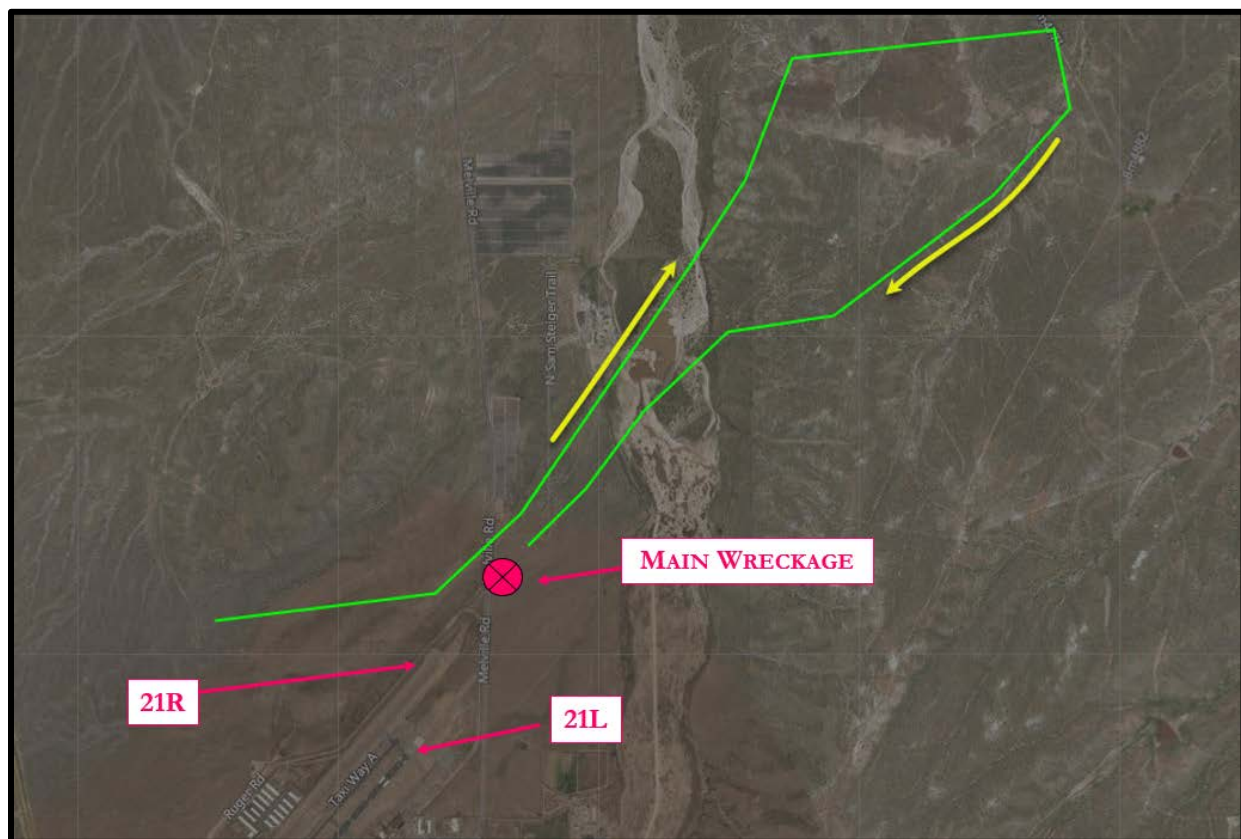


Figure 3: Radar Track Data

A witness, who was additionally a certified flight instructor (CFI), stated that he was performing touch-and-go practice takeoffs and landings on runway 21L with a student on the night of the accident. While he was on the base leg of the traffic pattern, he noticed the landing light of accident airplane overshooting the final approach leg for runway 21R. He subsequently observed the airplane about 200-300 feet above and in front of him which he noticed from the beacon, position and strobe lights. The air traffic controller cleared the airplane for landing 21R. The accident pilot confirmed over the radio that he was set-up for landing 21R which coincided with the airplane bringing to slip toward the centerline of 21R.

After temporarily diverting his attention toward his student, he looked back to see the airplane, which appeared to be making a normal descent to the runway. He witnessed that the airplane had become about 100-200 feet agl, which was extremely low for how far he was from the runway. He could see the ground illuminated from the airplane's landing light and the controller instructed the airplane to perform a go-around. About 3-5 seconds later, he observed the airplane collide with the ground in a seemingly level pitch attitude and slid forward before erupting into flames.

WRECKAGE AND IMPACT

The accident site was located in the desert terrain about 1,890 ft from the approach end of runway 21R. In character, the terrain was composed of dry, soft dirt and prairie grass. The wreckage was found distributed over a 240 ft distance on a median magnetic bearing of about 222°.

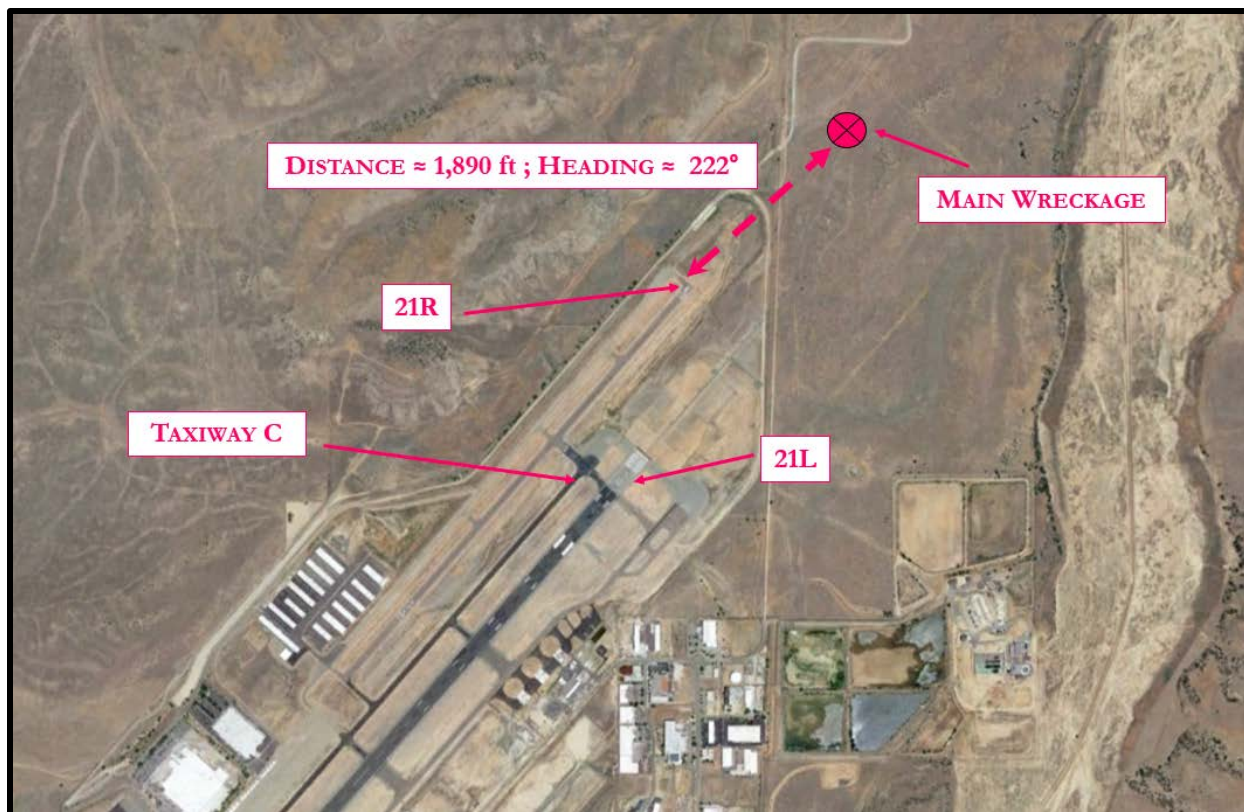


Figure 4: Accident Site in Reference to the Runways

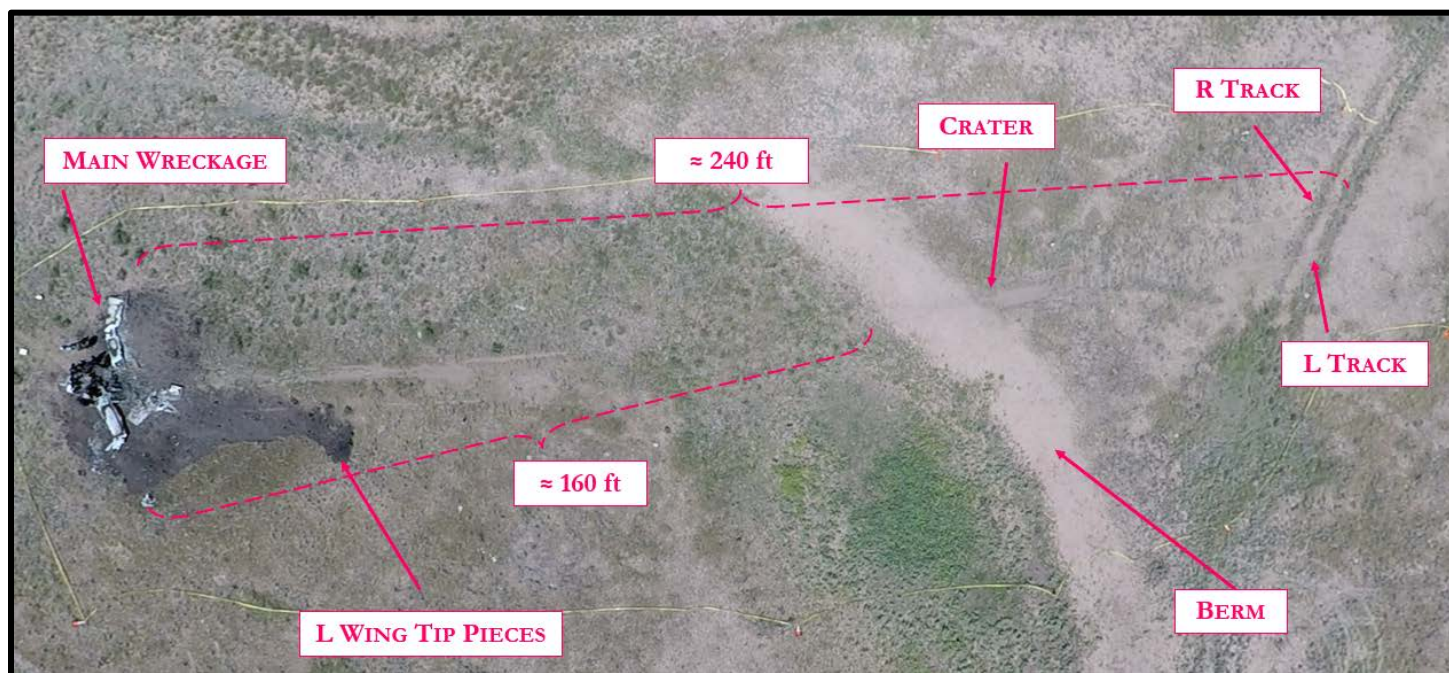


Figure 5: Debris Field Overview

The main wreckage consisted of a majority of the airframe and engine, which had been consumed by fire. The main wreckage came to rest on a heading of about 270°. The remaining wreckage was found in the debris field and adjacent to the main wreckage and principally consisted of the outboard left wing, the nose landing gear doors, a propeller blade, and nose cowlings pieces.



Figure 6: Main Wreckage

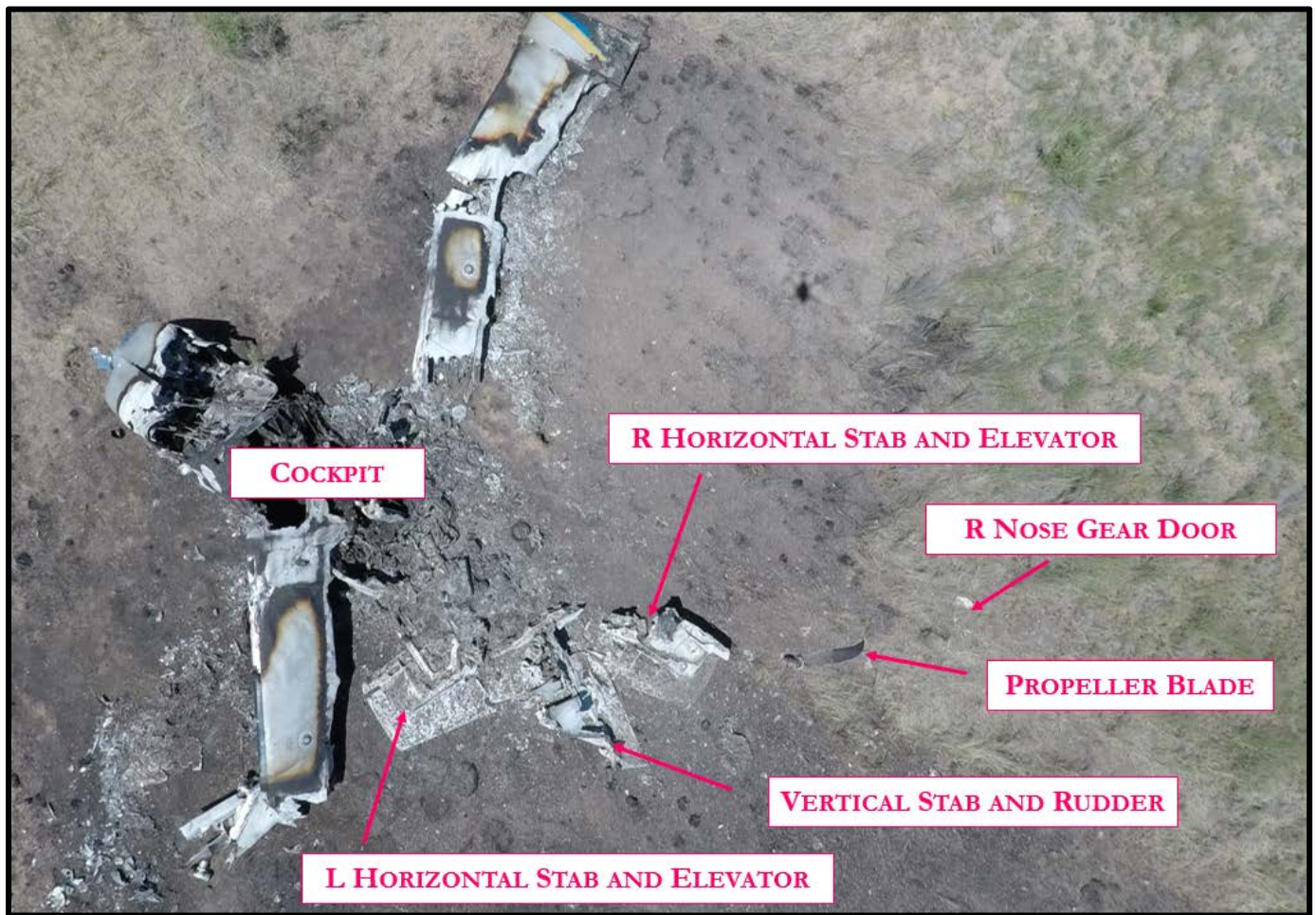


Figure 7: Main Wreckage Overview

The first identified points of contact consisted of disrupted dirt and grass on the flat desert terrain making up the far northeastern end of the debris field. The markings started as two nearly parallel indentations in the vegetation and dirt spaced about 110 inches apart. The craters were in the same location in the debris path and continued southwest toward the main wreckage. A center indentation appeared about 94 inches down the debris field and was

space equally between the right and left craters. The craters were consistent in size and orientation to that of the landing gear wheels.

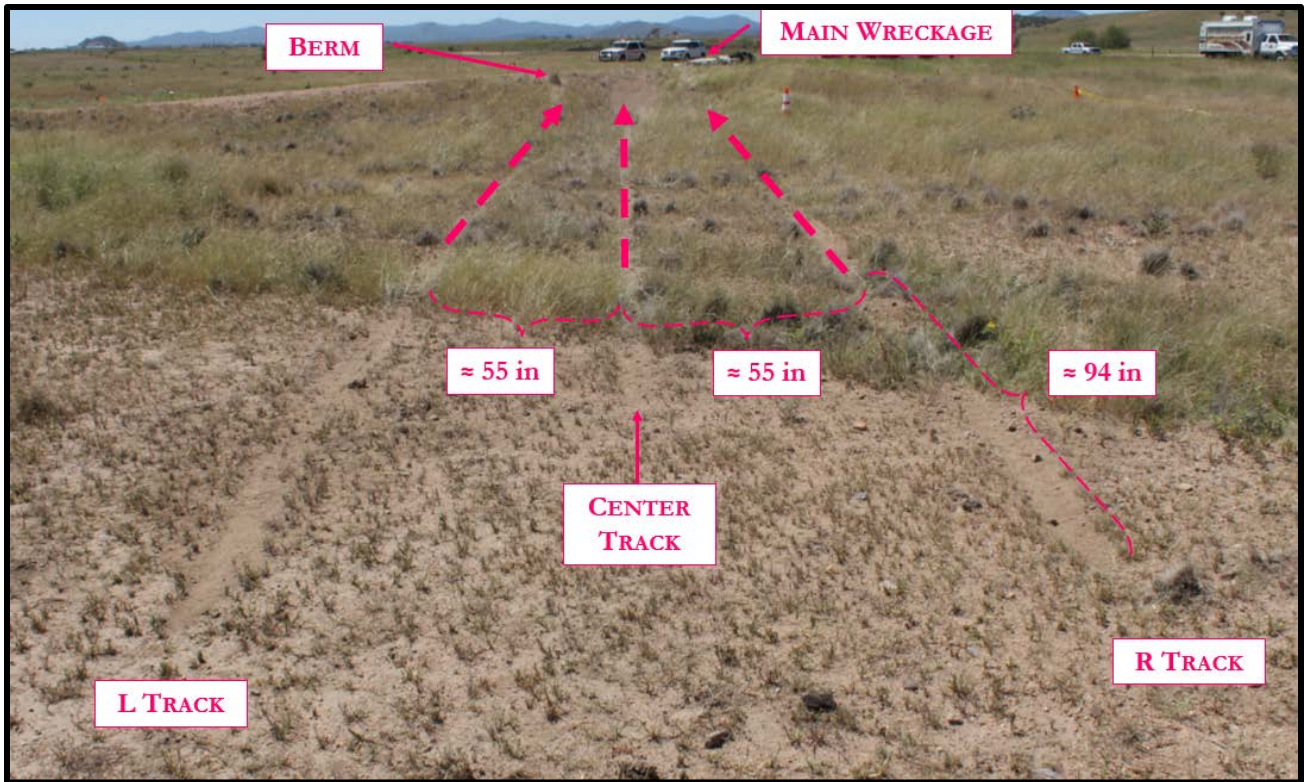


Figure 8: Beginning of Debris Field

The indentations were continuous about 60 ft until reaching a northwest-southeast oriented berm that was about 2 feet higher than the surrounding terrain. There were numerous parallel ground scars that were located perpendicular to the direction of the center indentation and immediately over it. The size and location was consistent with propeller slashes.

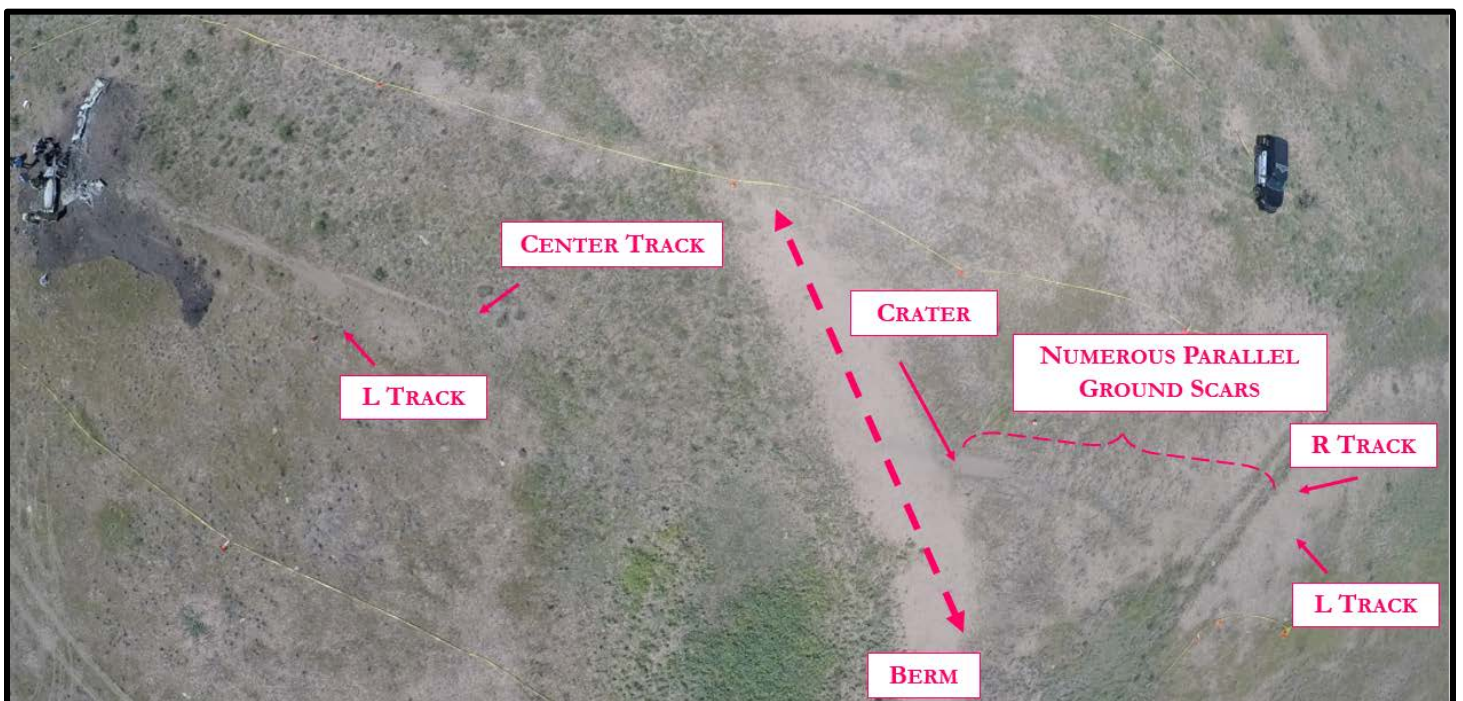


Figure 9: Debris Field Showing Ground Scars

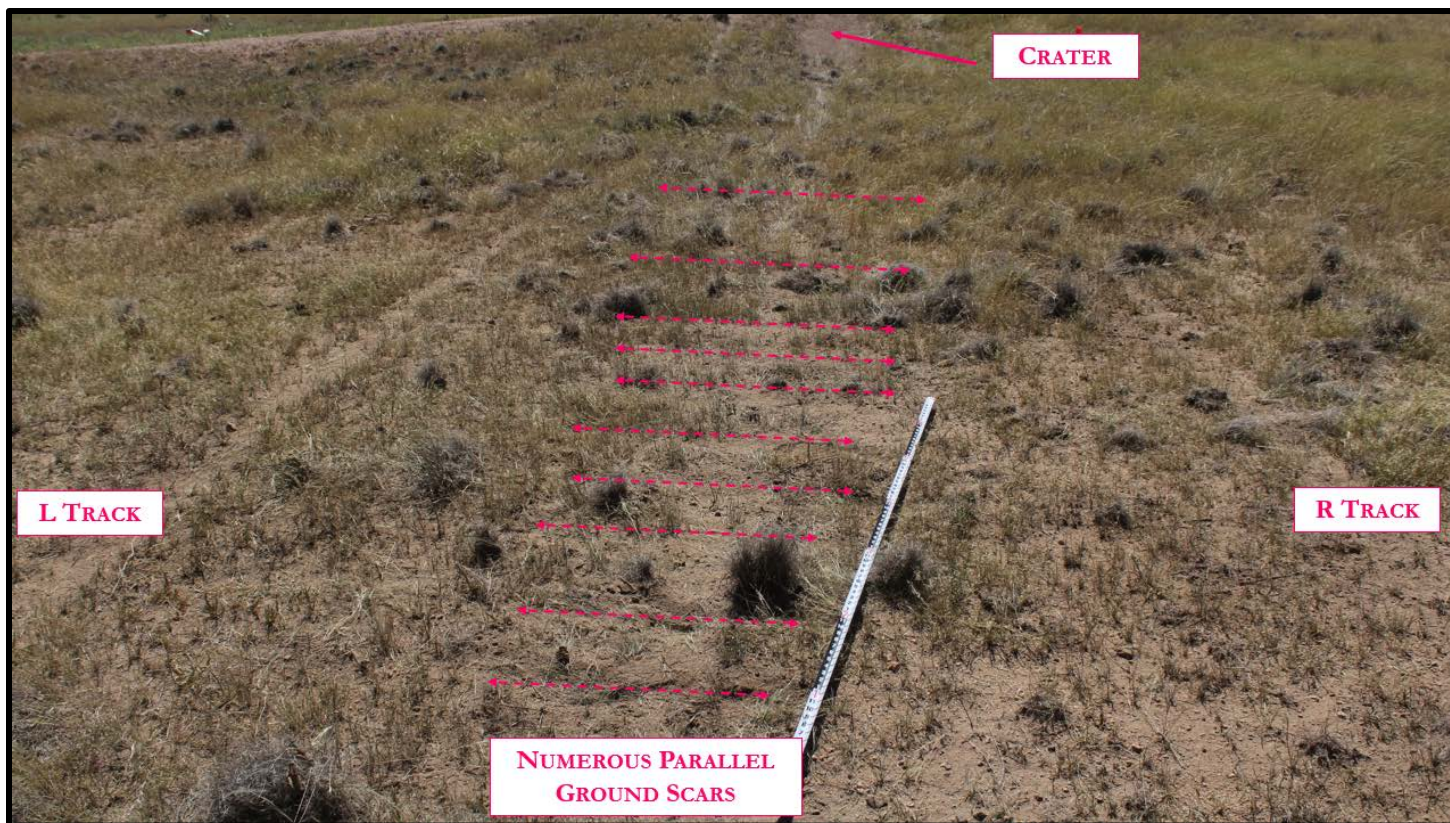


Figure 10: Ground Scars Leading Up to the Berm

Located on the east side of the berm there was a crater in the upsloping soft dirt that was 12 inches wide. The left landing-gear nose gear door, propeller hub shims, and a propeller ball bearing were located adjacent to the indentation.

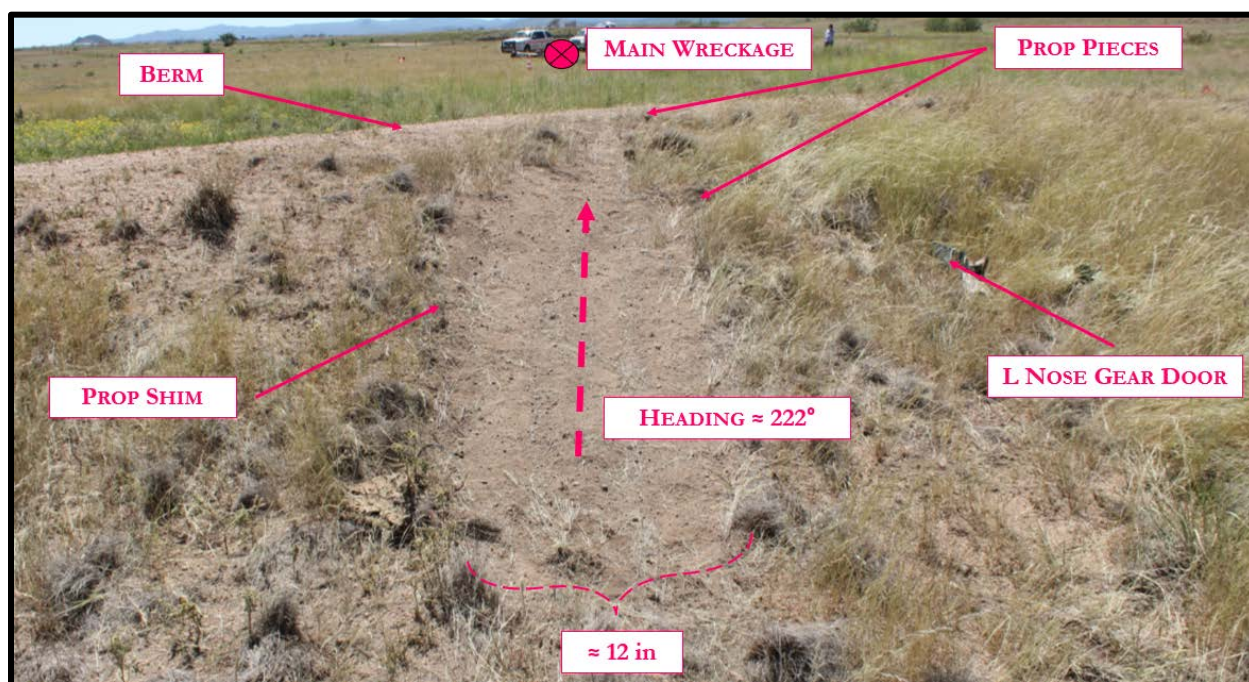


Figure 11: Debris Field Referencing the Berm

There were no indentations from the apex of the berm until about 105 ft from the main wreckage where there were several paint chips and nose fairing pieces scattered. There was an indentation left of the main indentation that continued toward the wreckage and contained red and white lens fragments imbedded in the terrain. The grass was burned in that area and up to the wreckage. From the lens fragments to the main wreckage was about 45 ft.



Figure 12: Debris Field From Berm to Main Wreckage



Figure 13: Debris Field From Berm to Main Wreckage

AIRFRAME

FUSELAGE

The fuselage came to rest upright and was partially consumed by fire.

The inboard section of the left wing still had the partially consumed aileron and wing flap control surfaces attached. The outboard section was about 10 ft from the main wreckage and consumed by fire. Flap cable continuity was established from the control surface to the cockpit area; the flap handle was in the 10° position. The aileron cable continuity was established from the control surfaces to the control yoke assembly although there were several cuts made from recovery.

The right wing remained affixed to the fuselage with the aileron and wing flap control surfaces still attached at their respective hinges. The outboard section had less burn the main wreckage and fuel was found inside. The flap actuator jackscrew was examined by measuring the exposed threads, which totaled 3.2. A representative from Textron Aviation stated that the position of the jackscrew was consistent to the flaps being extended between 5° and 10°. Flap cable continuity was established from the control surface to the cockpit area. The aileron cable continuity was established from the control surfaces to the control yoke assembly.

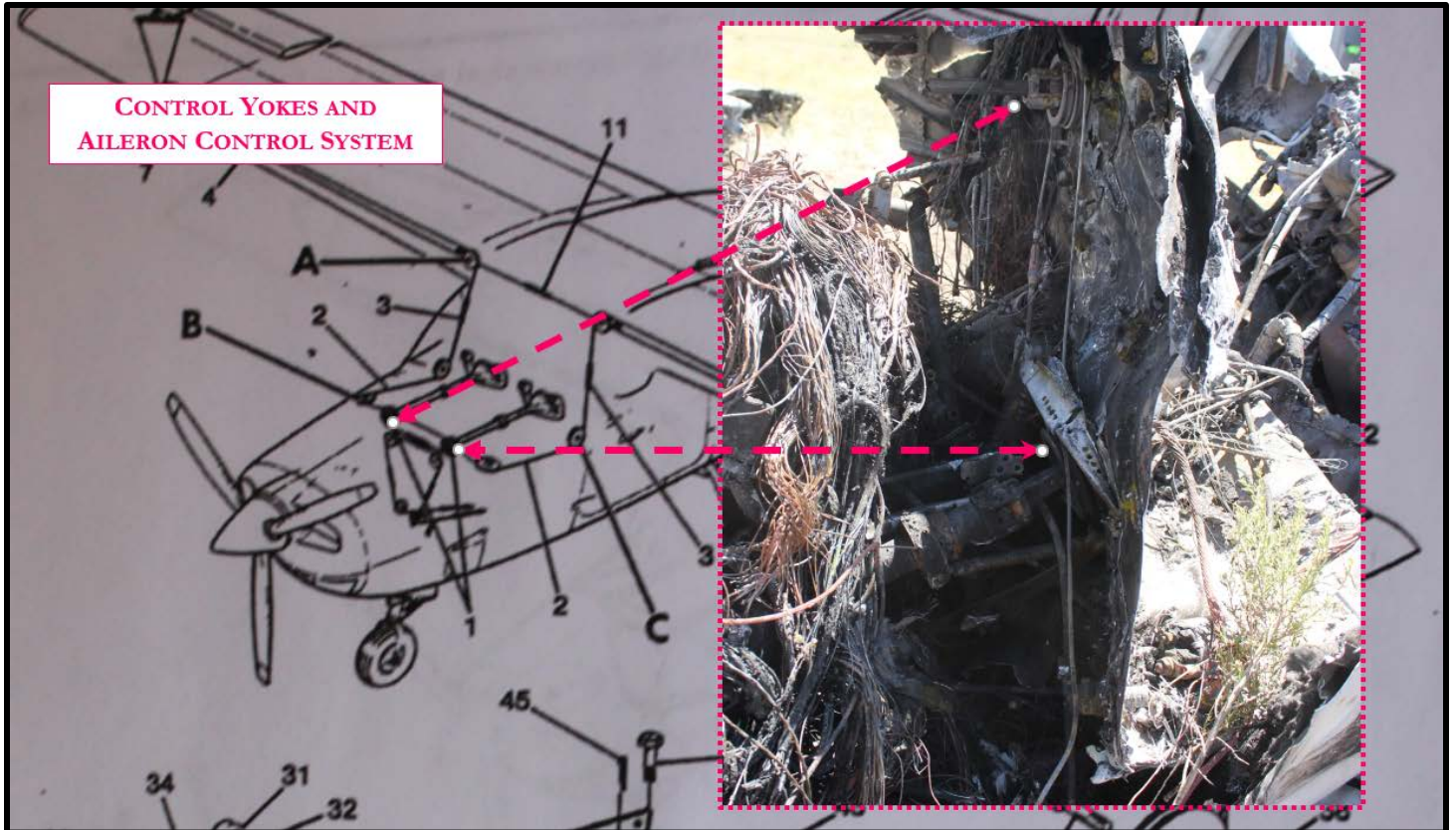


Figure 14: Cockpit Control Yokes

The rudder control surface remained affixed to the vertical fin structure. The rudder cables were attached to the rudder horn, and continuity was established to the aft baggage compartment through a series of pulleys and runs through lightning holes; the ends were attached to their respective bell cranks at the rudder pedal mixing control bar.

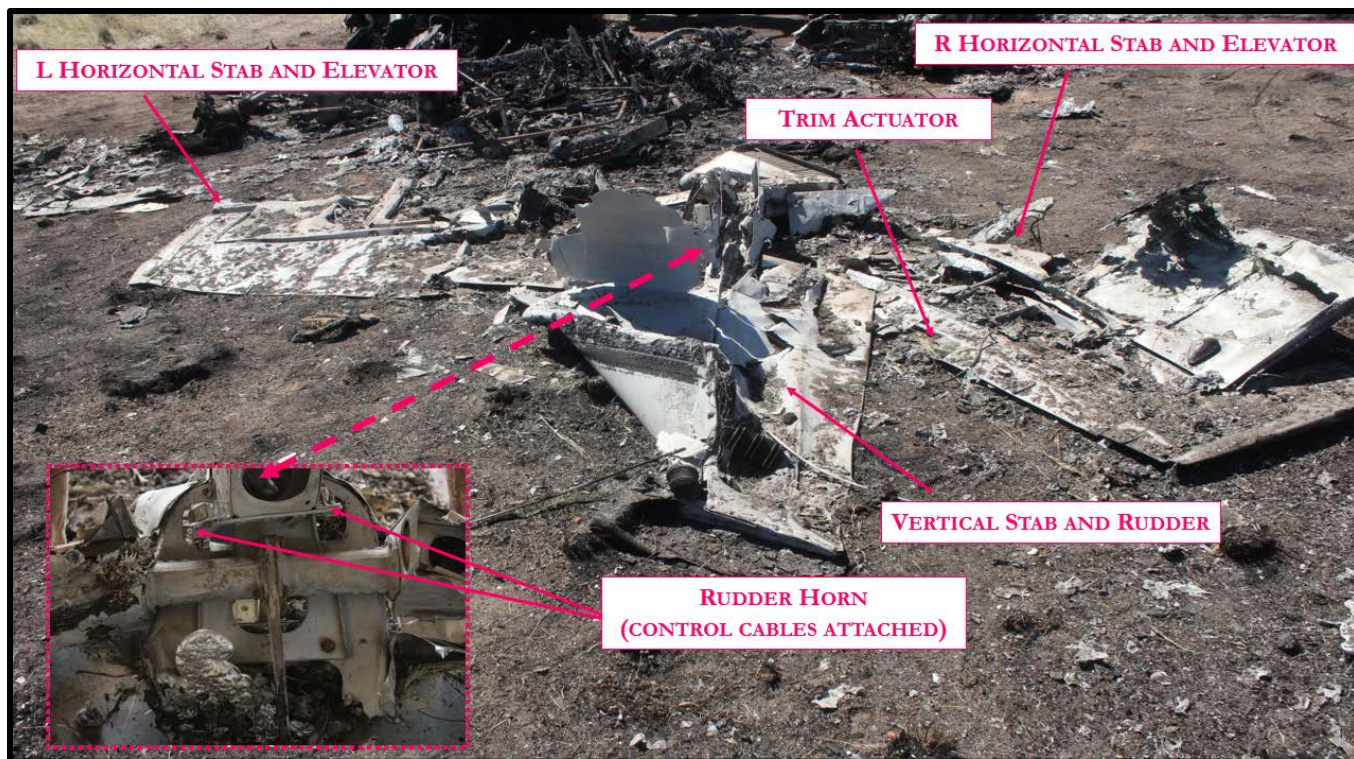


Figure 15: Tail Section

The horizontal stabilizer and elevator remained attached to the empennage. The elevator was attached to the aft push-pull tube connect, which was partially consumed. The elevator cables were attached to their respective bellcrank arms and continuity was established in the aft baggage compartment through a series of pulleys and runs through lightning holes to the control yoke area. Elevator trim tab actuator was 1.5 inches which it consistent with 5 degrees tab down

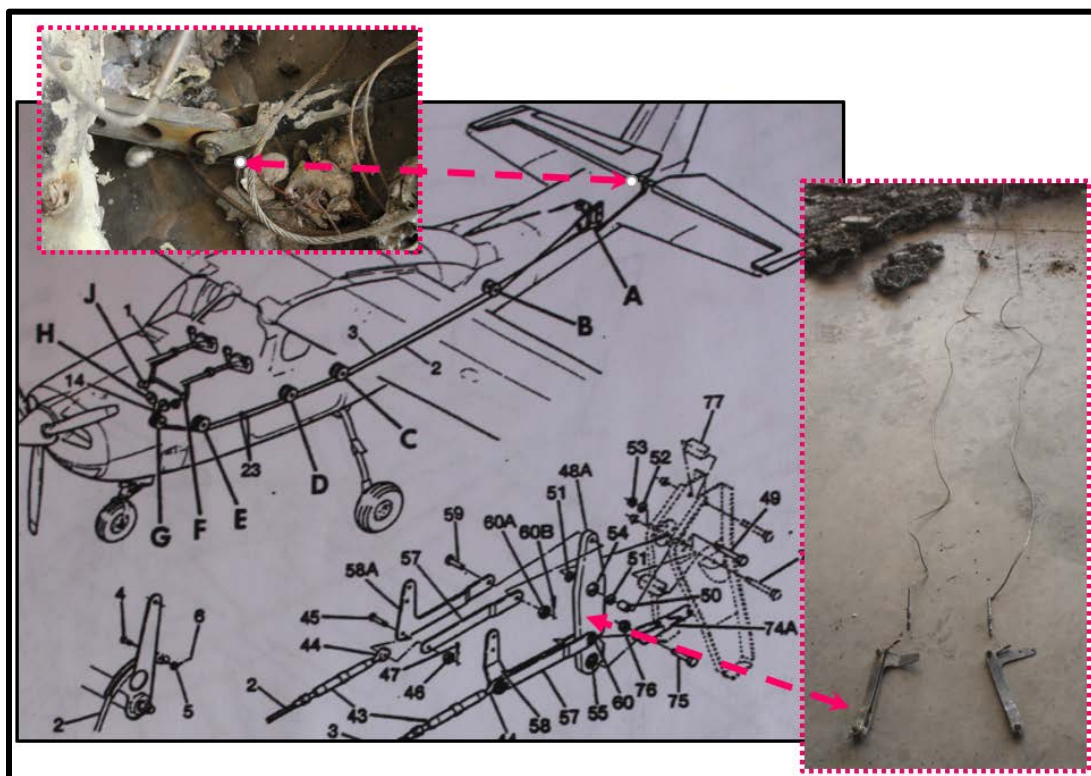


Figure 16: Elevator System

The left door pins were engaged consistent with the door being closed at the time of impact.

Fuel system continuity could not be established due to the amount of impact and thermal damage that the airplane had sustained. Fuel was present in the left outboard wing tank. The fuel selector valve was found in the "LEFT" position. Trace amounts of fuel were recovered from the fuel manifold.

SEAT BELTS

The pilot had come to rest in the frame of the left seat. On June 28, 2018 the airplane was retrofitted with BAS, Inc. shoulder harnesses in the front seats. It could not be confirmed if he was wearing a seatbelt at the time of impact.

ENGINE

The Continental Motors TSIO-520-AF(5), serial number 245258-R, was intact. Investigators achieved manual rotation of the crankshaft by rotation of the crankshaft propeller flange. Thumb compression was established in all cylinders. Valve train continuity was observed, with equal lift action at each rocker assembly; oil was found in the rocker box areas on all cylinders.

Investigators removed the upper spark plugs of all cylinders; they were light gray in color. According to the Champion Aviation Check-A-Plug AV-27 Chart, these spark plug signatures correspond to lean to normal engine operation. A borescope examination of the cylinders revealed no foreign object damage, no evidence of detonation, and no indication of excessive oil consumption. Lack of combustion deposits was consistent with low hours since overhaul and/or a lean operation.

The upper spark plugs were reattached to their respective lead and rotation of the crankshaft resulted in a visible spark at each plug; the impulse couplings were audible during rotations.

Disassembly of the fuel manifold revealed trace amounts of liquid consistent in odor to that of 100LL Avgas; there was no evidence of debris and the diaphragm was pliable. Inlet screen for the fuel metering unit was clear. The throttle body was thermally damaged. The mechanical fuel pump was intact as was the sheer shaft of the drive coupling.

The turbocharger exhibited no apparent damage and the impeller rotated freely by hand. The controller was thermally destroyed and the wastegate actuator was intact and the respective oil lines were still attached.

The vacuum pumps were removed; the vanes were all intact. Light scoring could be seen on the outside housing of both. The sheer shaft was intact.

PROPELLER BLADES

Two of the propeller blades were in the hub, one of which was partially consumed by fire. The remained blade was found in the debris field. The two blades that were not thermally consumed exhibited leading edge polishing and gouges, with the tips curled aft.

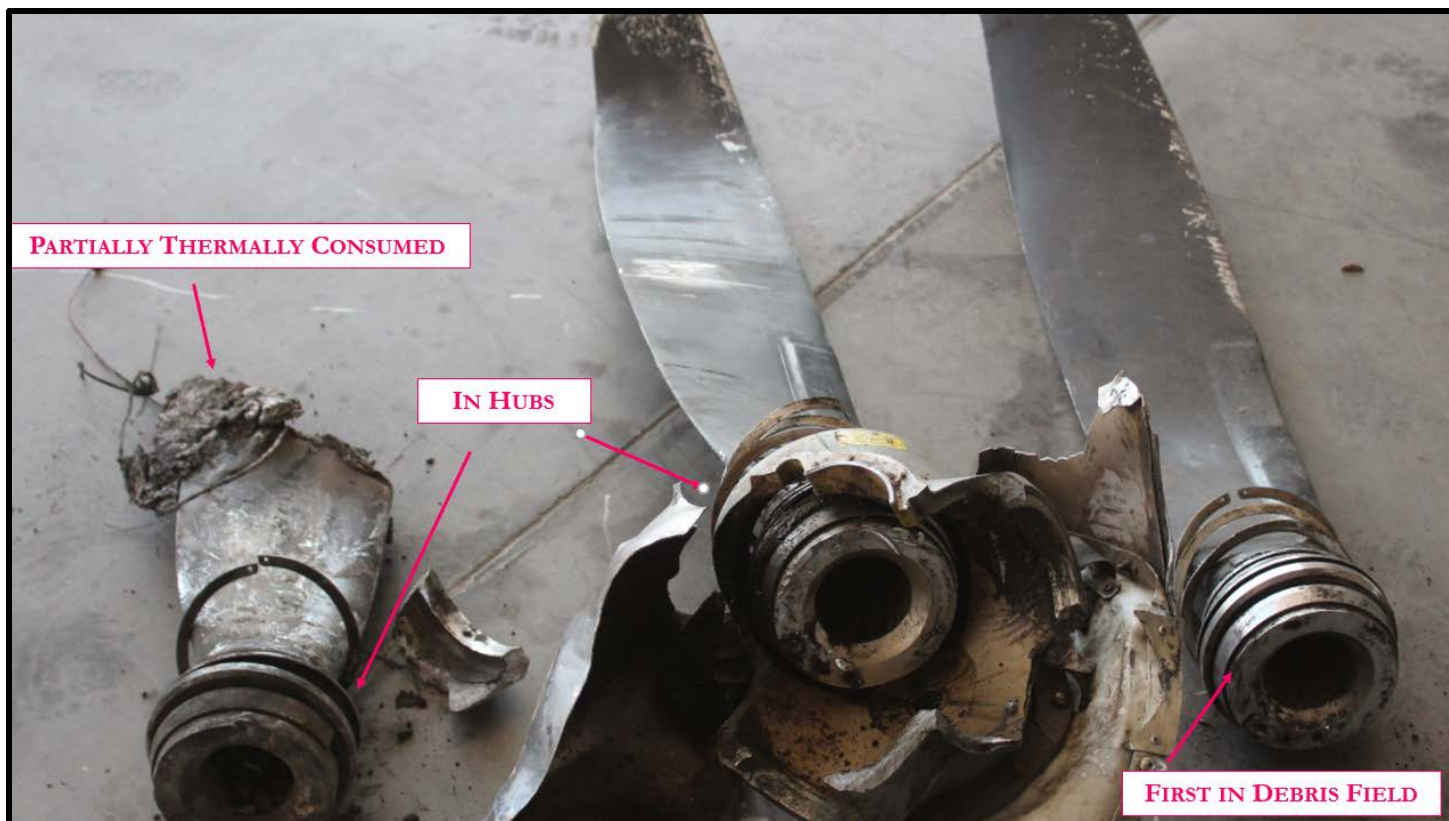


Figure 17: Propeller Blades

RECORDS

The tachometer at the accident site 2,211.5. The last annual inspection was recorded as being completed on June 27, 2018 at 2,203.1 hours, equating to 8.4 hours prior to the accident. A review of the maintenance records following the annual inspection revealed that on July 24 the airplane underwent maintenance for the air conditioning system and the vacuum pumps at a tachometer time of 2,210.8 hours, equating to 0.7 hours prior to the accident.

The engine was remanufactured and shipped from Continental Motors in May 2002.

PILOT INFORMATION

Pilot: Brian Dalen Brantner

Airline Transport Pilot Certificate (Airplane Multiengine Land), Commercial Pilot Certificate (Airplane Single Engine Land, Airplane Single Engine Sea), Private Pilot Certificate (Rotorcraft-Helicopter), Flight Instructor (Airplane Single and Multiengine, Instrument Airplane), and Remote Pilot (Small Unmanned Aircraft System), was a 71-year-old male. This pilot reported civil flight experience that included 2,350 total and 0.5 hours in last six months as of exam dated 09/18/2017. This pilot was 67 inches tall and weighed 273 lbs at the time of the last exam. This pilot was issued a Third Class Medical Certificate with the following limitation(s): Must wear corrective lenses.

From logbook:

TT: 2,480 (SE: 1215.6)(PIC: 2337.7)

6500W: 32.1(From April 28 to July 22 did 12 flights)

TYPE	DATE ISSUED
STUDENT PILOT	9-10-62
PRIVATE PILOT	3-25-64
COMMERCIAL PILOT	6-10-76
FLIGHT INSTRUCTOR	6-24-79
AIRLINE TRANSPORT PILOT	6-4-92
MECHANIC	
GROUND INSTRUCTOR	
FLIGHT ENGINEER	
SINGLE ENGINE SEA	12-15-90

Date	Departure	Takeoff	Landings	Time
4/28/2018	AZO	n/a	3	2.3
4/28/2018	AZO	STI	1	4.1
4/28/2018	STI	MHK	1	1.5
4/29/2018	MHK	SAF	1	4.5
4/29/2018	SAF	PRC	1	4
5/6/2018	PRC	PRC	3	1
5/19/2018	PRC	CMA	1	3
5/20/2018	CMA	PRC	1	2.5
5/21/2018	PRC	PRC	2	2
7/8/2018	PRC	PRC	2	1
7/21/2018	PRC	CNM	1	3.2
7/22/2018	CNM	PRC	1	3
Total in N6500W = 32.1				
Total Time= 2479.5				

Figure 18: From Pilot's Logbooks (highlighting time in N6500W)

The pilot's family stated that he had actively been looking for an airplane in the year prior to the accident. He decided on purchasing the Cessna 210 after he did a demo with a Cessna 414 and was not impressed with the maintenance on that airplane. He decided on the 210 because it had capability for him to be able to fly on every mission (e.g., ice, instruments, etc). After purchasing the airplane, he flew to Kalamazoo, Michigan to retrieve the airplane and familiarize himself with the systems. Since being in Prescott he had a lot of maintenance done and was planning on taking a long trip up to the Spokane, Washington area to visit one of his sons. He was going to get night currency on the day of the accident so he could complete this flight later in the month.

The family described his personality as being very methodical and "type A." He was driven and very precise where he could actively zero-in to any project. He was a plastic surgeon by trade and a Federal Aviation Administration (FAA) Designated Medical Examiner and wanted to continue to act in that capacity well past retirement.

On the day of the accident he woke up at his normal time of about 0630 and went to work at around 0800. He left work about 1830 and told his spouse and co-workers that he was going to get night currency. Nothing new had been occurring in his life and he had been acting like his normal happy self. He took the following medications: hydrochlorothiazide 12.5mg and Allopurinol 300mg. He had a urinary tract infection a few weeks prior and had taken antibiotics. He used green-colored hard contacts for his vision which he would take out every night.

A certified flight instructor (CFI) stated that the pilot came in for flight instruction around October 2017 with the intention of getting recurrent in flying and completing his biannual flight review. He completed a total of three flights with the pilot, the first of which consisted of several touch-and-go practice takeoffs and landings and pattern work. The other two flights were primarily focused on using the G1000. He recalled the on the first flight the first landing the pilot came in and a flat pitch attitude but had corrected on the landings following. He stated that they only landed on 21L.

WEATHER INFORMATION

According to the U.S. Naval Observatory, Department of Astronomical Applications, the phase of the moon was waning gibbous (just past full) with 87% of the moons visible disk illuminated. Sunset was at 1859 and civil twilight was at 1925. Moonrise was at 2105 and at the time of the accident the moon was about 7.4° below the horizon (including refraction) on an azimuth (heading) of 82°.

Location: Prescott, AZ, USA
Time: 29.Aug.2018, 20:35 UTC-7

Lunar data for the selected location

Moon rising: 21:05:17
Moon peak: 02:39:21
Moonset: 08:51:22
Moon distance: 392077km
Moon elevation angle: -7.04°
Moon horizontal angle: 82.65°
shadow length: n/a
Moonphase/Fraction: Waning Gibbous/87.3%
Moon Age: 18.73 from 29.34 Days
Next New Moon: 09.09.2018 11:01:46

Geo data for the selected location

Height: 1495m
Latitude: N 34°40'13.37" 34.67038°
Longitude: W 112°24'16.76" -112.40466°
Timezone: America/Phoenix MST

at an object level: 1m

Next Full Moon: 24.09.2018 19:52:51

Figure 19: Moon Information at the Time of the Accident

AERODROME INFORMATION

Ernest A Love Field Airport (KPRC) was controlled airport located about 15 north of the town of Prescott, Arizona. The airport's elevation was 5,045 feet mean sea level (msl), and was equipped with three runways all of which were paved.

Runway 21L/3R that is 7,619 by 150 feet

Runway 21R/3L that is 4,846 by 60 feet

Runway 30/12 that is 4,408 by 75 feet

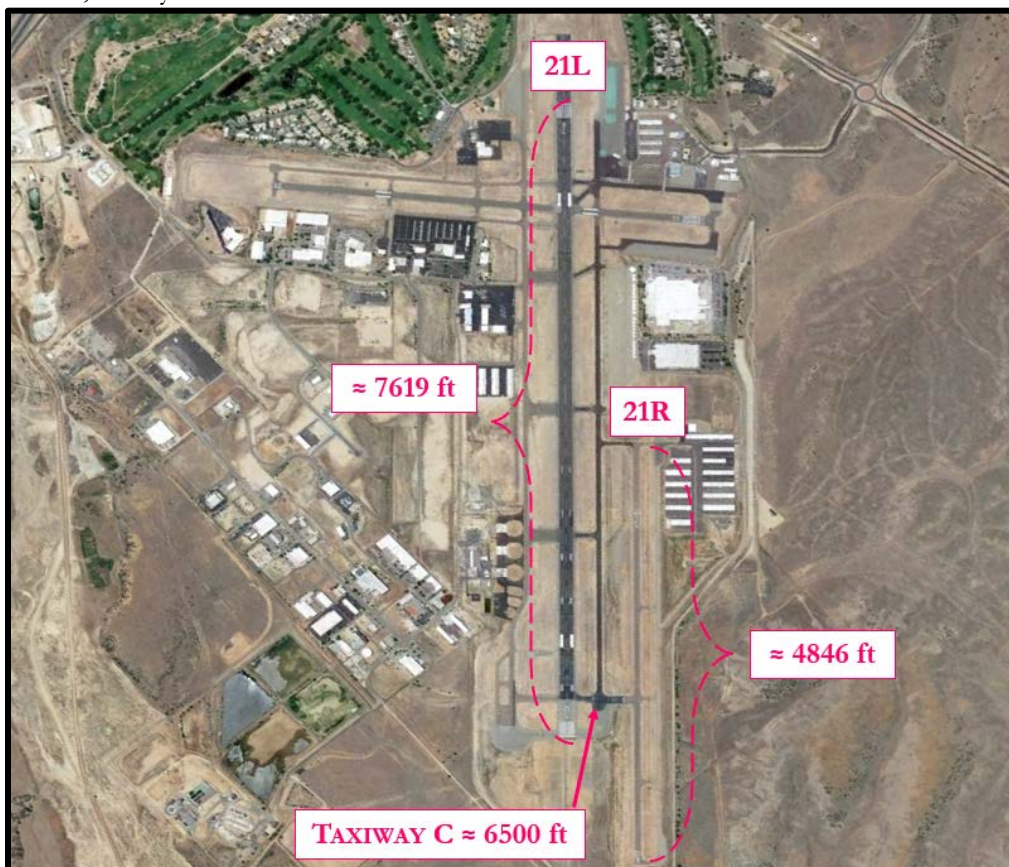


Figure 20: Airport Highlighting Runway Distances

The centerlines of runways 16R and 16L were separated by 700 ft. The paved approach (northeast) end of runway 21R began about 1,5000 feet before 21L.



Figure 21: Runway 21L and 21R (showing lengths)

Runway 21R was equipped with a 2-light PAPI (precision approach path indicator) system with an approach slope of 3.00° located to the left. According to the airport's Master Plan, the PAPI system was installed primarily to assist pilots by providing visual glide slope guidance in a non-precision approach environment. Light combinations of red and white indicate when an aircraft is slightly high, significantly high, slightly low and significantly low so that the pilot may adjust the approach accordingly. The runway was equipped with MIRL (medium intensity runway lighting system) which outlines the runway with white lights. The touch down zone was at an altitude of 4,960 ft and the end elevation of 4,937.

Runway 21L was equipped with 4-light PAPI system with an approach slope of 3.00° located to the left. It was also equipped with a REIL (runway end identification light systems) providing visual identification of the end of the runway. The system consisted of two omni-directional flashing light assemblies. Runway 21L was equipped with MALSR (medium intensity approach lighting system with runway alignment indicator lights) which was installed along the extended centerline of the runway. The MALSR, consisted of a combination of threshold lamps, steady burning light bars and flashers, for the purpose of providing visual information to pilots on runway alignment, height perception, role guidance, and horizontal references. The runway was equipped with MIRL and the touch down zone was at an altitude of 4,985 ft and the end elevation of 4,956.

Taxiway C was 40 feet wide and 6,500 feet long and was equipped with a MITLS (medium intensity taxiway lights).

The airfield lights were activated by pilots "clicking" their microphone button to the CTAF frequency for primary runway and on frequency 128.75 to activate MIRL on Runway 21L.

