



# Aviation Investigation Final Report

|                                |                                      |                         |            |
|--------------------------------|--------------------------------------|-------------------------|------------|
| <b>Location:</b>               | Norco, California                    | <b>Accident Number:</b> | WPR19FA118 |
| <b>Date &amp; Time:</b>        | April 22, 2019, 12:09 Local          | <b>Registration:</b>    | N9MB       |
| <b>Aircraft:</b>               | Northrop N9M                         | <b>Aircraft Damage:</b> | Destroyed  |
| <b>Defining Event:</b>         | Loss of control in flight            | <b>Injuries:</b>        | 1 Fatal    |
| <b>Flight Conducted Under:</b> | Part 91: General aviation - Personal |                         |            |

## Analysis

The pilot was conducting a local post-maintenance test flight following the completion of the airplane's annual inspection. Radar information showed the airplane flying on a roughly easterly heading before the accident; however, no altitude information was captured. Multiple witnesses located adjacent to the accident site reported observing the airplane flying at low altitude when it pitched upward and banked left before abruptly banking right and nosediving toward the ground. One witness stated that, as the right roll continued, the rpm of the engines increased quickly, and the airplane entered a "diving right corkscrew turn" until it descended out of sight. A video provided by a witness near the accident site did not capture the airplane but did capture the sound of modulating engine noise before the impact, likely a result of an in-flight loss of control.

Wreckage and impact signatures were consistent with a near-vertical, high speed impact with terrain. All major structural components of the airplane were accounted for during the examination of the accident site and recovered wreckage, and no evidence of any preexisting mechanical malfunction was observed with the airframe, engines, or propellers; however, the extent of damage sustained in the accident sequence precluded functional testing of the flight control system, its associated hydraulics, and the engine systems. The location of the canopy located within the debris path and the unlatched seat restraint suggest that the pilot, who was wearing a parachute, may have initiated egress following a loss of control, but it is likely that he did not have sufficient altitude to do so before impact occurred.

Although toxicology revealed the presence of ethanol in the pilot's muscle tissue, it is likely that some or all the detected ethanol may have been from sources other than ingestion. Additional testing from a secondary laboratory found unspecified amounts of ethanol and pseudoephedrine/ephedrine. It is unlikely that ethanol or medication use contributed to the accident.

It is likely that the pilot experienced an inflight loss of control; however, given the significant fragmentation of the wreckage, the reason for the loss of control could not be determined from the available information.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's loss of control for undetermined reasons.

### Findings

|                         |                                    |
|-------------------------|------------------------------------|
| <b>Not determined</b>   | (general) - Unknown/Not determined |
| <b>Personnel issues</b> | Aircraft control - Pilot           |

# Factual Information

## History of Flight

|             |  |
|-------------|--|
| Maneuvering | Loss of control in flight (Defining event) |
| Maneuvering | Collision with terr/obj (non-CFIT)         |

On April 22, 2019, about 1209 Pacific daylight time, a Northrop N9M airplane, N9MB, was destroyed when it was involved in an accident near Norco, California. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Representatives from the Planes of Fame Air Museum, Chino, California, reported that the accident flight was a post-maintenance check flight in preparation for their annual air show.

Multiple witnesses adjacent to the accident site saw the airplane flying on an east-northeasterly heading at a low altitude. One witness, who was a pilot, was located about 0.5 mile southeast of the accident site and reported seeing the accident airplane in level flight with what sounded like a cruise power setting; both engines appeared to be functioning. The witness said that the airplane then pitched upward no more than 15°, and during the climb, the airplane banked left about 10 to 20°, before it abruptly banked to the right until the airplane was inverted. The witness added that once the airplane was inverted, the engines began to sputter; however, as the roll continued, the engines' rpm increased quickly, and the airplane entered a "diving right corkscrew turn." The airplane continued to descend below a tree line out of the witness's view; however, he could hear "a very loud noise from the engines" followed by the sound of impact; he subsequently saw a rising plume of black smoke.

Another witness stated that the airplane appeared to initiate a "barrel roll" at a low altitude and begin to wobble back and forth before the canopy separated from the airplane. The witness added that the airplane wobbled a second time before it rolled to the right and descended into the ground.

Review of radar data obtained from the Federal Aviation Administration (FAA) showed a primary radar target on an easterly heading about 3 miles south of Chino Airport, Chino, California, as seen in figure 1; no altitude information was available. The last return was about 0.3 mile west of the accident site.

Two videos were submitted by witnesses who were located along the flight path and near the accident site. In the first video, the airplane was seen flying in a level attitude with both engines operating. The airplane was not visible in the second video; however, the sound of both engines could be heard from the start of the recording until a plume of smoke could be seen in the upper left corner of the video frame. Variances in the tone of the engine noise could be heard during the last 14 seconds of the

recording.



Figure 1. View of radar track information, with witness video locations depicted.

## Pilot Information

|                                  |  |  |                |
|----------------------------------|--|--|----------------|
| <b>Certificate:</b>              | Airline transport  | <b>Age:</b>                              | 51,Male        |
| <b>Airplane Rating(s):</b>       | Single-engine land; Multi-engine land; Multi-engine sea                  | <b>Seat Occupied:</b>                    | Center         |
| <b>Other Aircraft Rating(s):</b> | None   | <b>Restraint Used:</b>                   | Unknown        |
| <b>Instrument Rating(s):</b>     | Airplane   | <b>Second Pilot Present:</b>             | No             |
| <b>Instructor Rating(s):</b>     | Airplane multi-engine; Airplane single-engine                            | <b>Toxicology Performed:</b>             | Yes            |
| <b>Medical Certification:</b>    | Class 1 With waivers/limitations   | <b>Last FAA Medical Exam:</b>            | March 18, 2019 |
| <b>Occupational Pilot:</b>       | Yes  | <b>Last Flight Review or Equivalent:</b> |                |
| <b>Flight Time:</b>              | 20029 hours (Total, all aircraft), 25 hours (Total, this make and model) |  |                |

The pilot held type ratings in A-320, ATR-42, ATR-72, Cl-65, CV-LB30, DC-9, B-25, and SF-340 aircraft. Personnel from Planes of Flame Air Museum estimated that the pilot had

accumulated about 25 hours of flight time in the accident airplane over the span of about 4 years. The pilot was wearing a parachute during the accident flight.

#### Aircraft and Owner/Operator Information

|                                      |                                 |                                       |                |
|--------------------------------------|---------------------------------|---------------------------------------|----------------|
| <b>Aircraft Make:</b>                | Northrop                        | <b>Registration:</b>                  | N9MB           |
| <b>Model/Series:</b>                 | N9M                             | <b>Aircraft Category:</b>             | Airplane       |
| <b>Year of Manufacture:</b>          | 1945                            | <b>Amateur Built:</b>                 |                |
| <b>Airworthiness Certificate:</b>    | Experimental (Special)          | <b>Serial Number:</b>                 | 04             |
| <b>Landing Gear Type:</b>            | Retractable - Tricycle          | <b>Seats:</b>                         | 1              |
| <b>Date/Type of Last Inspection:</b> | May 3, 2018 Condition           | <b>Certified Max Gross Wt.:</b>       |                |
| <b>Time Since Last Inspection:</b>   |                                 | <b>Engines:</b>                       | Reciprocating  |
| <b>Airframe Total Time:</b>          | 732.8 Hrs as of last inspection | <b>Engine Manufacturer:</b>           | Franklin       |
| <b>ELT:</b>                          | Installed, not activated        | <b>Engine Model/Series:</b>           | XO-540-7       |
| <b>Registered Owner:</b>             |                                 | <b>Rated Power:</b>                   | 300 Horsepower |
| <b>Operator:</b>                     |                                 | <b>Operating Certificate(s) Held:</b> | None           |

The single-seat, tricycle retractable gear flying wing airplane, serial number 04, was powered by two 300-horsepower Franklin XO-540-7 engines, serial numbers 88 and 89, driving two Hamilton Standard 2B20-225 constant speed propellers. The airplane's flight control system primarily comprised control cables that extended to all primary flight controls, with hydraulic-boosted actuators.

## Meteorological Information and Flight Plan

|   |                                  |   |                  |
|---|----------------------------------|---|------------------|
| <b>Conditions at Accident Site:</b>     | Visual (VMC)                     | <b>Condition of Light:</b>                  | Day              |
| <b>Observation Facility, Elevation:</b> | KCNO, 650 ft msl                 | <b>Distance from Accident Site:</b>         | 4 Nautical Miles |
| <b>Observation Time:</b>                | 18:53 Local                      | <b>Direction from Accident Site:</b>        | 312°             |
| <b>Lowest Cloud Condition:</b>          | Few / 11000 ft AGL               | <b>Visibility</b>                           |                  |
| <b>Lowest Ceiling:</b>                  | None                             | <b>Visibility (RVR):</b>                    |                  |
| <b>Wind Speed/Gusts:</b>                | 11 knots /                       | <b>Turbulence Type Forecast/Actual:</b>     | /                |
| <b>Wind Direction:</b>                  | 250°                             | <b>Turbulence Severity Forecast/Actual:</b> | /                |
| <b>Altimeter Setting:</b>               | 30 inches Hg                     | <b>Temperature/Dew Point:</b>               | 21°C / 11°C      |
| <b>Precipitation and Obscuration:</b>   | No Obscuration; No Precipitation |   |                  |
| <b>Departure Point:</b>                 | Chino, CA (CNO )                 | <b>Type of Flight Plan Filed:</b>           | None             |
| <b>Destination:</b>                     | Chino, CA (CNO )                 | <b>Type of Clearance:</b>                   | VFR              |
| <b>Departure Time:</b>                  | 12:02 Local                      | <b>Type of Airspace:</b>                    | Class G          |

## Wreckage and Impact Information

|                            |         |                             |                       |
|----------------------------|---------|-----------------------------|-----------------------|
| <b>Crew Injuries:</b>      | 1 Fatal | <b>Aircraft Damage:</b>     | Destroyed             |
| <b>Passenger Injuries:</b> |         | <b>Aircraft Fire:</b>       | None                  |
| <b>Ground Injuries:</b>    | N/A     | <b>Aircraft Explosion:</b>  | None                  |
| <b>Total Injuries:</b>     | 1 Fatal | <b>Latitude, Longitude:</b> | 33.929443,-117.575279 |

The airplane impacted the outpatient housing yard of the California Rehabilitation Center. The debris path was oriented on a heading of about 124° magnetic and measured about 474 ft long and 200 ft wide. The first identified point of contact (FIPC) was green lens fragments, consistent with the right wing navigational light lens, as shown in figure 2. From the FIPC, a blue-and-yellow colored mark extended about 32 ft to a large ground impression/crater that measured about 2 ft deep and 3 ft wide. Within the ground scar were remains of the right engine. The ground scar extended about 16 ft and contained portions of the cockpit, nose landing gear, and airframe structure. Wood debris, various fragments of both engines, and airframe structure were located throughout the debris path. The left and right propeller assemblies were located about 100 ft from the FIPC. The farthest portion of debris was a propeller blade tip, located about 474 ft from the FIPC.



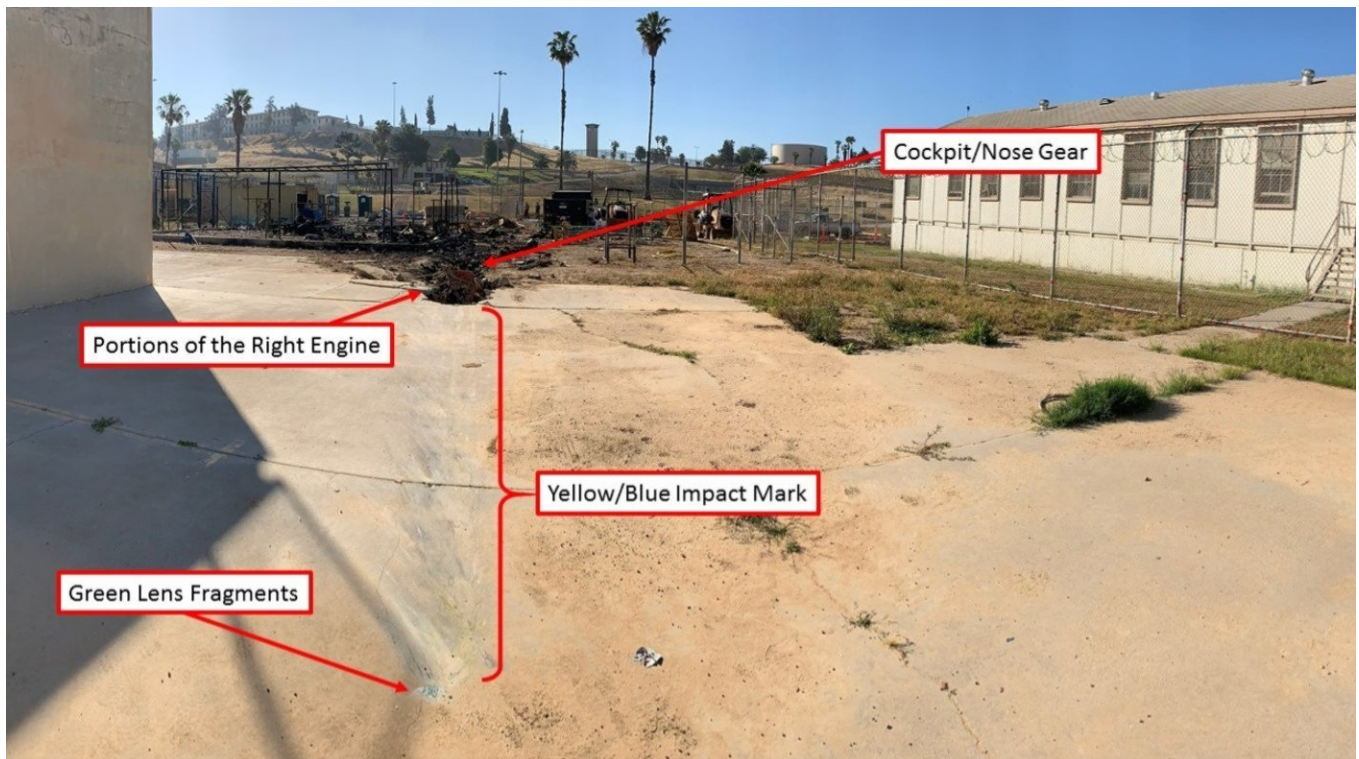


Figure 2. Initial impact marks and start of debris path.

Canopy structure and window debris was located about 60 ft northwest of the FIPC and about 330 ft west of the FIPC. Both areas where window and canopy structure were located were in the opposite direction of the debris path, as shown in figure 3.

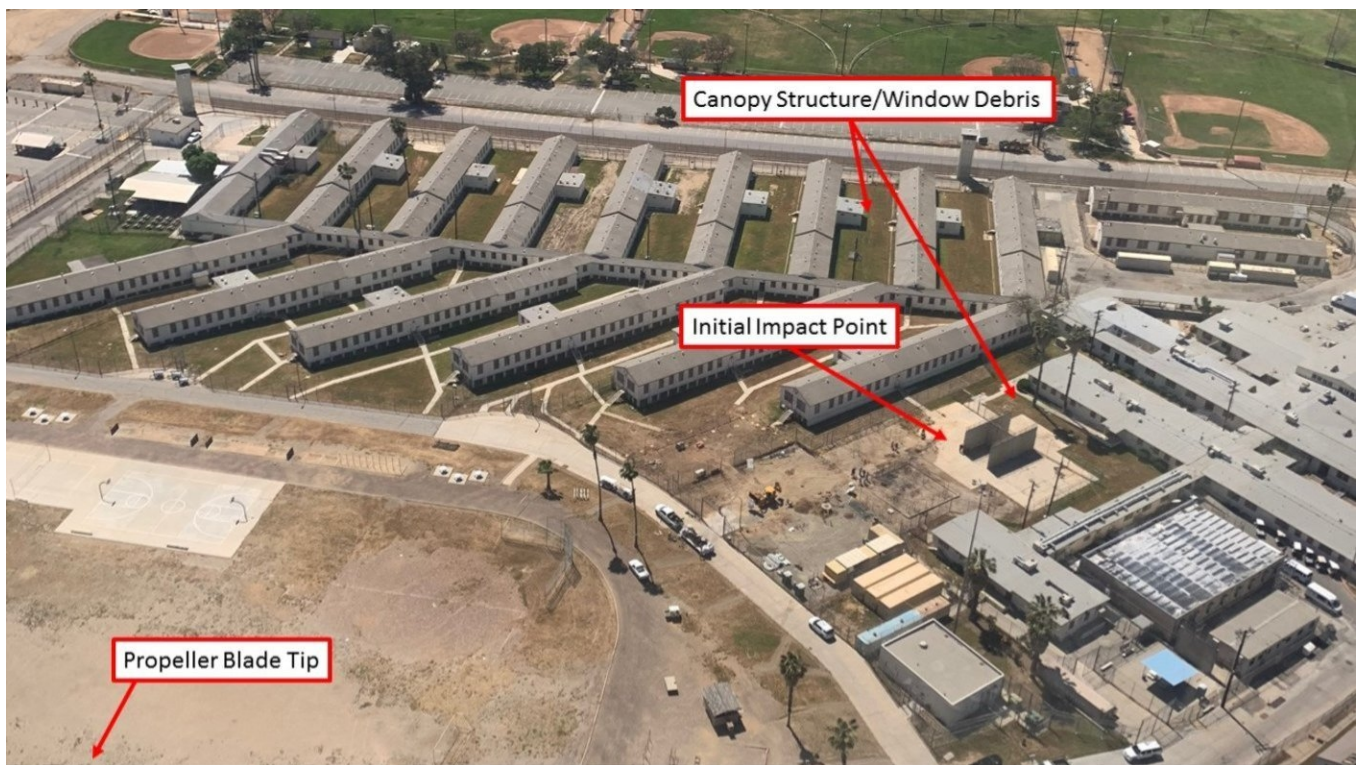


Figure 3: Accident site overview.

The heavily fragmented wreckage was recovered for further examination. Remains of all major structural components were located throughout the wreckage, including both engines, flight controls, wing structure, engine mounts, propellers, cockpit structure, canopy, and landing gear. The seatbelt clasp ends were located within the recovered wreckage and found in the unlatched position.

Remains of flight control cables were located throughout the recovered debris, in addition to portions of flight control structure. All the separations in the located cables exhibited splayed signatures, consistent with overload separation. Additionally, all of the recovered control cable turnbuckles were intact and had either safety clips or safety wire in place. The flight control trim drums were located within the wreckage with the trim cables still attached. All trim drums exhibited varying degrees of impact damage.

The left and right elevon box actuator housings were located within the recovered wreckage. Both boxes exhibited varying degrees of impact damage. The hydraulic actuators within the boxes were impact damaged. The hydraulic selector valve and follower linkages were impact damaged.

The left and right engines were both displaced from the engine mounts and were fragmented into multiple pieces. Both crankcases were severely fragmented. Remains of all sixteen cylinders, pistons, and connecting rods were observed within the recovered wreckage. Both crankshafts were severely deformed. The torque converters and driveshafts were impact damaged.

The outboard portion of one propeller was separated about 15 inches from the tip, with a large portion of



the leading edge missing, consistent with impact with a circular object. The opposing blade exhibited some aft bending with varying degrees of leading-edge damage. The other propeller exhibited "S" bending on both blades with varying degrees of leading-edge impact marks.

## Medical and Pathological Information

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The Riverside County Coroner's Office, Perris, California, performed an autopsy of the pilot. The pilot's cause of death was multiple traumatic injuries.

The FAA's Forensic Sciences Laboratory performed toxicology testing on the pilot's tissue samples, which revealed 22 (mg/dL, mh/hg) of ethanol in the muscle.

A secondary laboratory performed toxicological testing of muscle samples. Unspecified amounts of ethanol and pseudoephedrine/ephedrine were detected. The testing did not measure its quantity and did not distinguish pseudoephedrine from ephedrine.

## Administrative Information

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|--------------------------------------|-----------------|
| <b>Investigator In Charge (IIC):</b> | Cawthra, Joshua |
|--------------------------------------|-----------------|

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| <b>Additional Participating Persons:</b> | Robert W Michaelson; Federal Aviation Administration; Riverside, CA<br>Steve Hinton; Planes of Fame Air Museum; Chino, CA<br>Steve Hinton Jr.; Planes of Fame Air Museum; Chino, CA<br>John Maloney; Planes of Fame Air Museum; Chino, CA |
|--|---|

|                               |             |                             |   |
|-------------------------------|-------------|-----------------------------|---|
| <b>Original Publish Date:</b> | May 5, 2021 | <b>Investigation Class:</b> | 2 |
|-------------------------------|-------------|-----------------------------|---|

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|--------------|--|
| <b>Note:</b> | The NTSB traveled to the scene of this accident. |
|--------------|--|

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|------------------------------|---|
| <b>Investigation Docket:</b> | <a href="https://data.nts.gov/Docket?ProjectID=99294">https://data.nts.gov/Docket?ProjectID=99294</a> |
|------------------------------|---|

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).