



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

September 1, 2021

Specialist's Factual Report

AIR TRAFFIC CONTROL

ERA20LA262

A. ACCIDENT

Location: Malbis, Alabama
Date: July 29, 2020
Time: 1901 Central Daylight Time (CDT)
0001 Coordinated Universal Time (UTC)
Airplane: Beechcraft F33A, N3156W

B. AIR TRAFFIC CONTROL SPECIALIST

Specialist Charles Olvis
National Transportation Safety Board
Washington, D.C.

C. DETAILS OF THE INVESTIGATION

The air traffic control investigator did not launch in support of the investigation. However, a data request was made to the Federal Aviation Administration (FAA) and data was provided for the investigation. Data included Automatic Dependent Surveillance – Broadcast (ADSB), communications from Pensacola Terminal Radar Approach Control (P31 TRACON) and Mobile TRACON (MOB), MOB Plot Play Back (PPB) radar and weather data, Pilot Weather Reports (PIREPs), FAA facility Covered Event Reviews (CERs), and MOB Facility Logs.

D. ACCIDENT SUMMARY

On July 28, 2020, about 1901 central daylight time, a Beech F33A, N3156W, was substantially damaged when it was involved in an accident in Malbis, Alabama. The private pilot and the passenger were fatally injured. The airplane was operated as a Title 14 Code of Federal Regulations Part 91 personal flight.

E. FACTUAL INFORMATION

1.0 History of Flight

According to preliminary air traffic control (ATC) radar data provided by the Federal Aviation Administration (FAA), the airplane departed the Jack Edwards Airport (JKA) at about 1845¹ and flew under visual flight rules (VFR) to the north (see figure 1).

At about 1847 the pilot contacted the P31 air traffic controller and requested VFR flight following, and advised that his intended altitude was 3,000 ft.

At about 1854, the airplane turned left about 90 degrees (heading west) and descended from 3,200 feet (ft) Mean Seal Level (MSL)² Mode C³ to 2,500 ft (see figure 2).

¹ All times CDT unless otherwise noted.

² All altitudes MSL unless otherwise noted.

³ Mode C is the pressure altitude obtained from an altitude encoder and transmitted as part of the transponder.

At about 1854:17, the P31 air traffic controller asked the pilot, "Do you need any help on that that cell off to your north there? Looks like you took uh pretty harsh westbound turn." The pilot did not reply. About 30 seconds later, the P31 controller contacted the pilot, and advised him that if he continued westbound for about 10 miles, he would be "clear of all that weather north of you." The pilot did not respond.

At about 1855:53, the P31 air traffic controller transferred responsibility for the flight to the MOB air traffic controller. The airplane began a turn to the north. When the MOB air traffic controller asked the pilot what his intentions were, the pilot replied, "right now I'm trying to get through [unintelligible] clouds here." The MOB air traffic controller then asked the pilot if he intended to continue to toward the northwest and advised that a west heading for about 5 or 6 miles would "get you in to less precip." The pilot acknowledged.

At about 1856:25, the MOB air traffic controller advised that there was an area about 5 miles north of his current position, about 10 miles in diameter, of "heavy to extreme precipitation." The pilot did not respond and there were no further communications between the pilot and ATC for the next four minutes. The airplane's track continued in a north-northeasterly direction (see figure 3), and climbed to an altitude of about 5,200 ft.

At about 1859, the airplane began a 360° turn to the left, during which the altitude increased from 5,000 ft to 5,800 ft and then decreased back to 5000 ft. Over the next two minutes, the track became erratic and started a right 360° turn as the altitude decreased from 5,000 to 1,275 ft and the groundspeed varied between 150 and 34 knots (see figure 4).

At about 1900:23, the pilot transmitted a partial callsign and there were no further communications from the pilot. The airplane's last position was recorded at 19:00:47, located about 0.1 nautical mile northeast of the accident site (see figure 5).

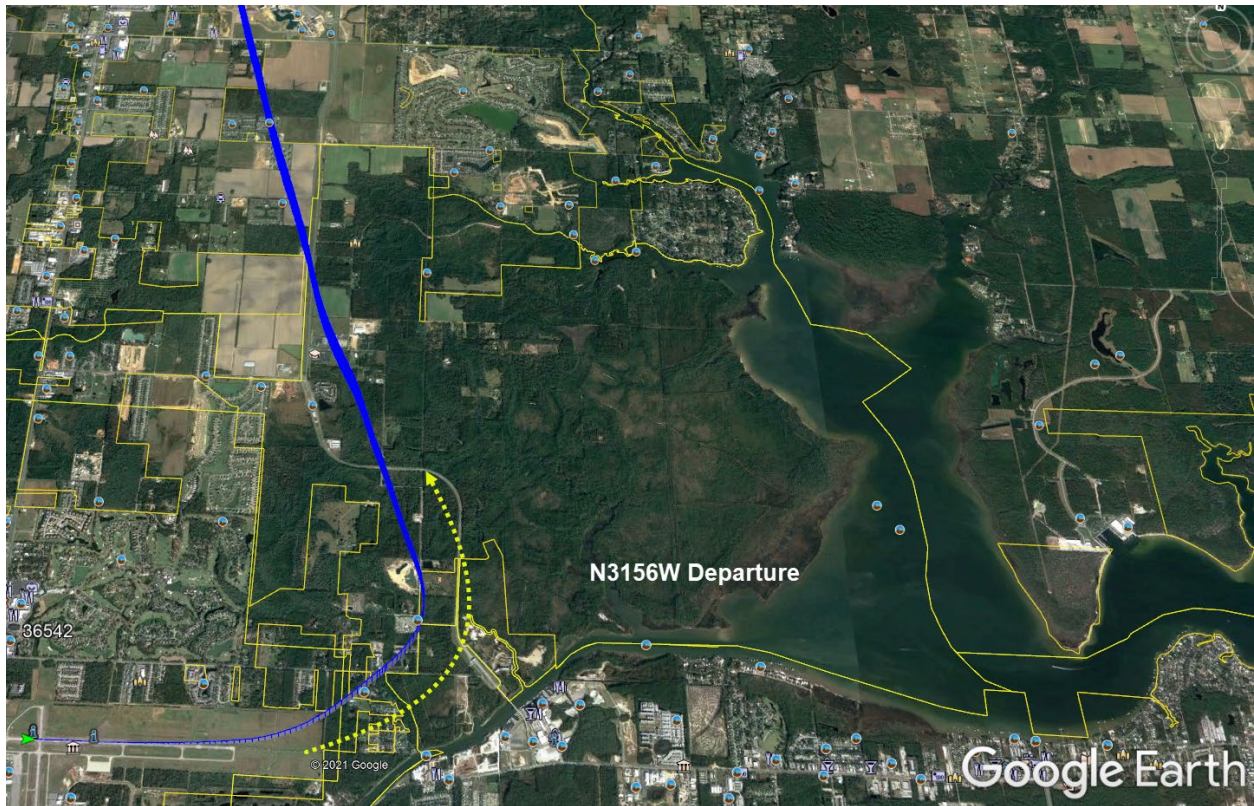


Figure 1 – N3156W departure from Jack Edwards Airport (JKA).

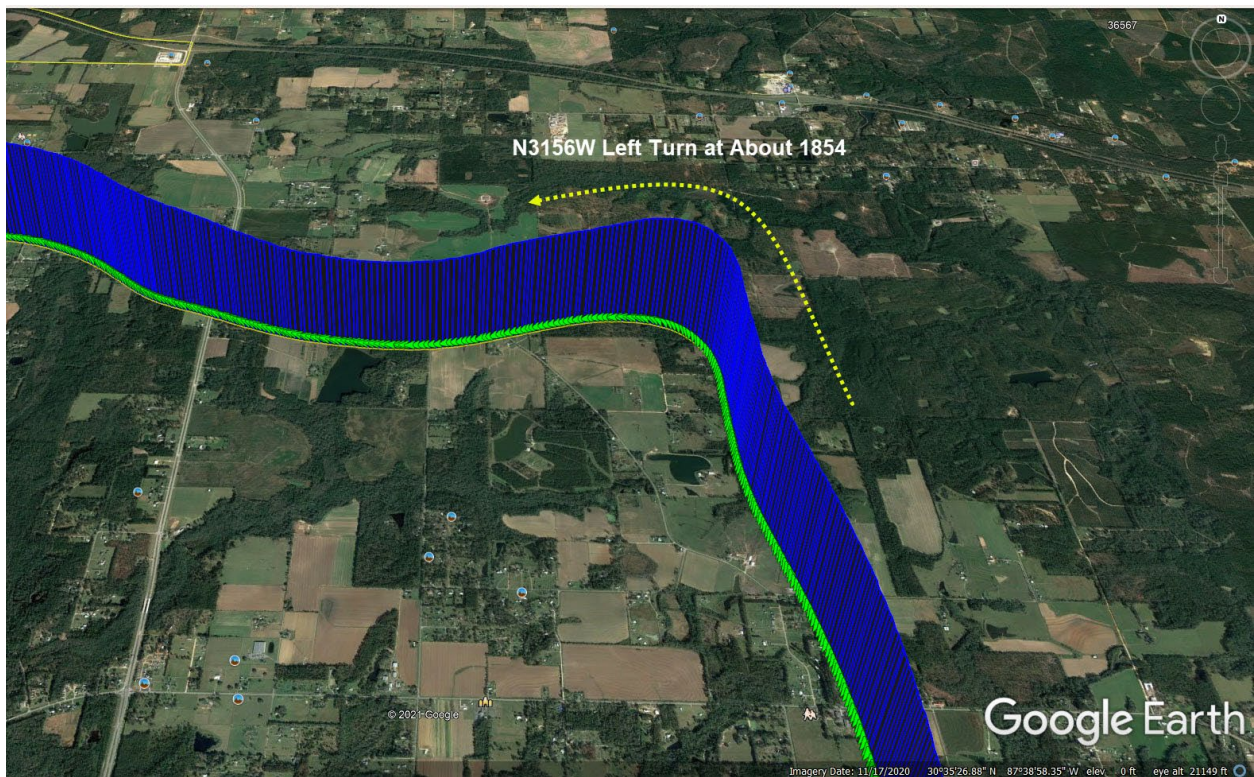


Figure 2 – N3156W making a left turn.



Figure 3 - N3156W at 1856:25.

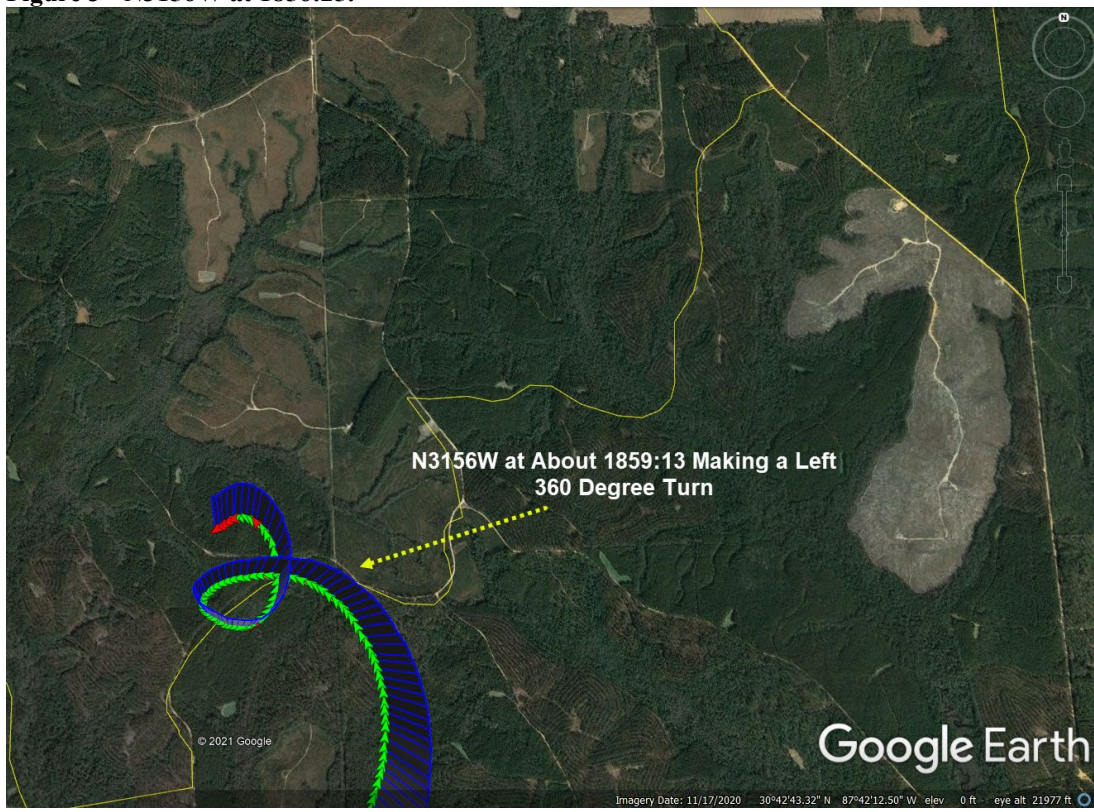


Figure 4 - N3156W starting a left 360 degree turn.



Figure 5 - N3156W final target at 1900:47.

2.0 Surveillance Data

In general, two types of radar are used to provide position and track information for aircraft cruising at high altitudes between airport terminal airspaces, and for those operating at low altitude and speeds within terminal airspaces. Additional surveillance data may be obtained through Automatic Dependent Surveillance-Broadcast (ADS-B).

Air route surveillance radars (ARSRs) are long range (250 nm) radars used to track aircraft cruising between terminal airspaces. ARSR antennae rotate at 5 to 6 rotations per minute (rpm), resulting in a radar return every 10 to 12 seconds.

Airport surveillance radars (ASRs) are short range (60 nm) radars used to provide air traffic control services in terminal areas. ASR antennas rotate at 13 to 14 rpm, resulting in a radar return every 4.6 to 5 seconds.

A radar detects the position of an object by broadcasting an electronic signal that is reflected by the object and returned to the radar antenna. These reflected signals are called primary returns. Knowing the speed of the radar signal and the time interval between when the signal was broadcast and when it was returned, the distance, or range, from the radar antenna to the reflecting object can be determined. Knowing the direction, the radar antenna was pointing when the signal was broadcast, the direction (or bearing, or azimuth) from the radar to the object can be determined. Range and azimuth from the radar to the object define the object's position.

Radar data for this report was obtained from the FAA at MOB TRACON and was derived from ASR sensors. The radar data was displayed in the MOB radar room via a display workstation (and utilized by air traffic controllers. The MOB plot playback (.PPB) data was of good quality and was part of the STARS⁴ surveillance system utilized by ATC.

ADS-B data is aircraft global positioning system (GPS) derived position reports and other aircraft information transmitted by the airplane and received through a ground infrastructure and shared with other users within the national airspace system (NAS). Air traffic controllers across the nation can monitor aircraft using either ground-based radar or ADS-B.

To improve the consistency and reliability of ADS-B and radar returns, airplanes are equipped with transponders. For ADS-B equipped airplanes, the transponders are assigned a unique Mode-S address for each airplane. The accident airplanes assigned Mode S transponder address was A35CA3 and the accident airplane was assigned a transponder beacon code of 7425 when the airplane departed JKA and changed to a transponder beacon code of 2622. The ADS-B data for this report was obtained from the FAA and was of good quality and utilized by air traffic control.

Flight track data for this report was also obtained from L3/Harris OpsVue, a commercially available web-based product that aggregates and georeference's FAA data sources including data from FAA ASDE-X and ASSC systems, FAA Terminal and En Route Radars, the FAA certified ADS-B Network, and Flight Plan data from the En Route Automation Modernization (ERAM) system.”

3.0 Federal Aviation Administration Directives

3.1 FAA Order JO 7110.65Y, *Air Traffic Control*

This order prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services. Controllers are required to be familiar with the provisions of this order that pertain to their operational responsibilities and to exercise their best judgment if they encounter situations not covered by it.

3.2 Purpose

Paragraph 2-1-1 of FAA Order JO 7110.65Y, *Air Traffic Control*, prescribes the purpose of the ATC system and addresses when the application of those services may be precluded and states [in part]:

2–1–1. ATC SERVICE

- a.** The primary purpose of the ATC system is to prevent a collision involving aircraft operating in the system.
- b.** In addition to its primary purpose, the ATC system also:
 - 1. Provides a safe, orderly, and expeditious flow of air traffic.
 - 2. Supports National Security and Homeland Defense missions.

⁴ Standard Terminal Replacement System (STARS) is a digital automation system capable of tracking all aircraft within the defined airspace using information from available FAA and U.S. Department of Defense (DoD) surveillance systems.

c. The ATC system must provide certain additional services to the extent permitted. The provision of additional services is not optional on the part of the controller, but rather required when the work situation permits. It is recognized that the provision of these services may be precluded by various factors, including, but not limited to:

1. Volume of traffic.
2. Frequency congestion.
3. Quality of surveillance.
4. Controller workload.
5. Higher priority duties.
6. The physical inability to scan and detect situations falling in this category.

3.3 Duty Priority

Paragraph 2-1-2 of FAA Order JO 7110.65Y, *Air Traffic Control*, prescribes the duty priority for air traffic controllers to apply when working air traffic within the National Airspace System (NAS) and states [in part]:

2-1-2. DUTY PRIORITY

a. Give first priority to separating aircraft and issuing safety alerts as required in this order. Good judgment must be used in prioritizing all other provisions of this order based on the requirements of the situation at hand.

c. Provide and/or solicit weather information in accordance with procedures and requirements outlined in this order

3.4 Weather Familiarization

Paragraph 2-6-1 of FAA Order JO 7110.65Y, *Air Traffic Control*, prescribes the requirement for air traffic controllers to be familiar with the current and forecasted weather for the shift and states [in part]:

2-6-1. FAMILIARIZATION

Controllers must become familiar with pertinent weather information when coming on duty, and stay aware of current and forecasted weather information needed to perform ATC duties.

3.5 PIREP Solicitation and dissemination

Paragraph 2-6-2 of FAA Order JO 7110.65Y, *Air Traffic Control*, prescribes the requirement for air traffic controllers to solicit and disseminate PIREPs and states [in part]:

2-6-2. PIREP SOLICITATION AND DISSEMINATION

Emphasis must be placed on the solicitation and dissemination of Urgent (UUA) and Routine (UA) PIREPs. Timely dissemination of PIREPs alerts pilots to weather conditions and provides information useful to forecasters in the development of aviation forecasts. PIREPs also provide information required by ATC in the provision of safe and efficient use of airspace. This includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, wind shear and turbulence (including clear air turbulence) of moderate or greater intensity, braking action, volcanic eruptions and volcanic ash clouds, detection

of sulfur gases in the cabin, and other conditions pertinent to flight safety. Controllers must provide the information in sufficient detail to assist pilots in making decisions pertinent to flight safety.

a. Solicit PIREPs when requested, deemed necessary or any of the following conditions exists or is forecast for your area of jurisdiction:

1. Ceilings at or below 5,000 feet. These PIREPs must include cloud bases, tops and cloud coverage when available. Additionally, when providing approach control services, ensure that at least one descent/climb-out PIREP and other related phenomena is obtained each hour.
2. Visibility (surface or aloft) at or less than 5 miles.
3. Thunderstorms and related phenomena.
4. Turbulence of moderate degree or greater.

3.6 Issuing Weather Information to Pilots

Paragraph 2-6-4 of FAA Order JO 7110.65Y, *Air Traffic Control*, prescribes the requirement for air traffic controllers to issue to pilots and states [in part]:

2-6-4. ISSUING WEATHER AND CHAFF AREAS

a. Controllers must issue pertinent information on observed/reported weather and chaff areas to potentially affected aircraft. Define the area of coverage in terms of:

1. Azimuth (by referring to the 12-hour clock) and distance from the aircraft and/or
2. The general width of the area and the area of coverage in terms of fixes or distance and direction from fixes.

b. Inform any tower for which you provide approach control services of observed precipitation on radar which is likely to affect their operations.

c. Use the term “precipitation” when describing radar-derived weather. Issue the precipitation intensity from the lowest descriptor (LIGHT) to the highest descriptor (EXTREME) when that information is available. Do not use the word “turbulence” in describing radar-derived weather.

1. LIGHT.
2. MODERATE.
3. HEAVY.
4. EXTREME.

d. TERMINAL: In STARS, ARTS, and other systems that display six levels of precipitation intensities, correlate precipitation descriptors from subparagraph c as follows:

1. Level 1 = LIGHT
2. Level 2 = MODERATE
3. Levels 3 and 4 = HEAVY
4. Levels 5 and 6 = EXTREME

3.7 Assistance to VFR Pilots in Weather Difficulty

Paragraph 10-2-8 of FAA Order JO 7110.65Y, *Air Traffic Control*, prescribes the requirement for air traffic controllers to provide assistance to VFR pilots who may encounter weather difficulty and states [in part]:

10-2-8. RADAR ASSISTANCE TO VFR AIRCRAFT IN WEATHER DIFFICULTY

- a.** If a VFR aircraft requests radar assistance when it encounters or is about to encounter IFR weather conditions, ask the pilot if he/she is qualified for and capable of conducting IFR flight.
- b.** If the pilot states he/she is qualified for and capable of IFR flight, request him/her to file an IFR flight plan and then issue clearance to destination airport, as appropriate.
- c.** If the pilot states he/she is not qualified for or not capable of conducting IFR flight, or if he/she refuses to file an IFR flight plan, take whichever of the following actions is appropriate:
 - 1. Inform the pilot of airports where VFR conditions are reported, provide other available pertinent weather information, and ask if he/she will elect to conduct VFR flight to such an airport.
 - 2. If the action in subpara 1 above is not feasible or the pilot declines to conduct VFR flight to another airport, provide radar assistance if the pilot:
 - (a) Declares an emergency.
 - (b) Refuses to declare an emergency and you have determined the exact nature of the radar services the pilot desires.
 - 3. If the aircraft has already encountered IFR conditions, inform the pilot of the appropriate terrain/obstacle clearance minimum altitude. If the aircraft is below appropriate terrain/obstacle clearance minimum altitude and sufficiently accurate position information has been received or radar identification is established, furnish a heading or radial on which to climb to reach appropriate terrain/obstacle clearance minimum altitude.

F. ATTACHMENTS

- 1. The MOB air traffic controllers were briefed on the days anticipated weather conditions at the beginning of the work shift as required by FAA directives.

Submitted by:

Charles Olvis
Senior Air Traffic Control Investigator