ACCIDENT

Aircraft Type and Registration:	Midget Mustang, G-AWIR
No & Type of Engines:	1 Continental Motors Corp O-200-A piston engine
Year of Manufacture:	1973 (Serial no: PFA 1315)
Date & Time (UTC):	21 July 2019 at 1630 hrs
Location:	Woods near Spanhoe Airfield, Northamptonshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Serious) Passengers - N/A
Nature of Damage:	Destroyed
Commander's Licence:	Private Pilot's Licence
Commander's Age:	56 years
Commander's Flying Experience:	677 hours (of which 10 were on type) Last 90 days - 71 hours Last 28 days - 16 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The pilot overflew the airfield to assess conditions before deciding whether to land. During the pull-up and bank that followed, the aircraft departed controlled flight and descended in to a nearby wood. The pilot was seriously injured, and the aircraft was destroyed.

History of the flight

The pilot was flying from Leicester Airfield to Sibson Airfield and on the way, he flew over Spanhoe Airfield to check the windsock and decide whether he was going to land there to visit friends. He flew overhead at approximately 600 to 700 ft and then pulled up and banked left. The next thing he remembers is hitting the tree canopy. The pilot sustained serious injuries and the aircraft was destroyed, Figure 1.

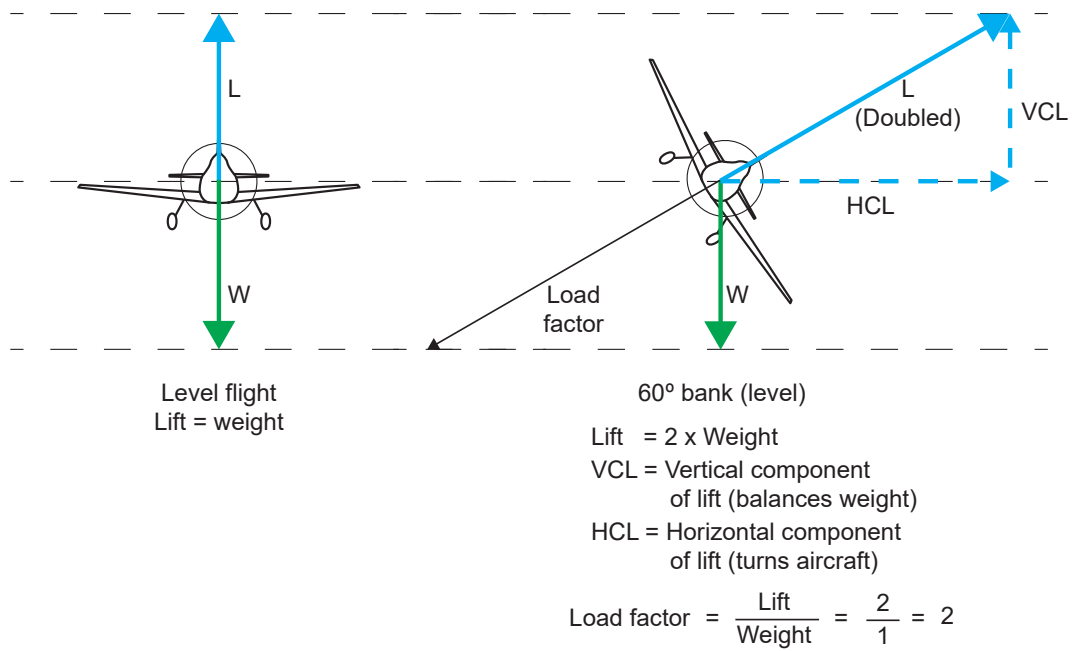**Figure 1**

Aircraft post-accident

AAIB Comment

Load factor is the ratio of the lift produced by the aircraft and its weight. In level flight, when the lift produced by the wings equals the aircraft weight, an aircraft experiences a load factor of 1. When an aircraft is banked, lift must be increased to maintain altitude because the lift vector is no longer directly opposing the aircraft's weight. At 60º of bank, the lift must be doubled to maintain level flight, this corresponds to a load factor of 2[1], Figure 2.

As the load factor increases the stall speed of the aircraft increases in proportion to the square root of the load factor so, when maintaining height with 60º of bank and a load factor of 2, the stall speed increases to 1.4 times the normal stall speed. In a level turn at 75º of bank, lift must be increased by nearly four times, and with a load factor of 4, the aircraft's stall speed will double. An additional effect of the increase in lift is that the aerodynamic drag of the aircraft will also increase.

The Midget Mustang has a published stall speed of 60 mph in the clean configuration at its maximum gross weight. A pull-up and steep banking manoeuvre would considerably increase the stalling speed due to the increased load factor. Additionally, if power was not increased, the aircraft would also slow because of the pull-up and the increased drag due to the increased lift needed to maintain the turn.

Footnote

[1]   When the load factor is 1, all occupants of the aircraft feel that their weight is normal. When the load factor is 2 all occupants feel twice as heavy as usual.

Figure 2

Effect of a level 60º banked turn

Conclusion

It seems most likely that the final manoeuvre increased the aircraft's stall speed to, or beyond the aircraft's airspeed which caused it to stall and the pilot to lose control of the aircraft with limited height available to recover before the aircraft struck the trees.