

Memo for Record

Date: 4 June 2018

Subject: GA-10 Accident

Background: The flight was the ninth flight of my participation in the one-turn spin evaluation of the GA-10 outfitted with a cargo pod. On the 7th and 8th flights of the buildup one of the entries took a little longer to recover than expected. The flight planned for 1 June was cancelled and the decision was made to go back to a more forward cg (80" vs 81.7") and repeat some test points previously flown as an additional buildup to mitigate the risk.

Prior to the briefing, the aircraft was ballasted to 4,475 lbs and the cg at 80.3" aft of datum and weighed with the crew in the airplane. The flight briefing was done with the test aircrew (Greg Lewis and David Wheatland), the chase crew (Nigel Speedy and Dan Murphy). The flight was focused on power on spin entries with left rudder and right aileron for one turn. The test cards are attached.

Takeoff was at 11:05 and the flight proceeded to the West Spin area within R2515 just southeast of Mojave Air and Spaceport. Prior to any spin entries, planned stall test points were completed. Stalls with flaps up, takeoff and landing were flown with power on (49 psi), slowing at 1 kt/sec. All stalls were typical, defined by full aft stick for 2 seconds. Stall characteristics were normal and benign. It was easy to keep the wings level throughout the stall and recovery.

The first spin entry was a wings level, power on, flaps landing spin with left rudder and right aileron. At stall full left rudder was input followed by right full aileron. At the end of the first turn the throttle was moved to idle and right rudder and forward yoke inputs were made. The recovery was delayed beyond 2 turns, but in other respects the recovery was normal. The nose pitched down and the yaw rate decreased continuously. Discussion in cockpit ensued as the recovery took longer than expected. I reported to David that I thought I had incorrectly delayed the rudder input by perhaps ½ turn. We decided to repeat the point and report our decision to chase. A repeat of the same entry resulted in a very similar spin with recovery at exactly one additional turn. In both cases there were no noticeable pitch forces required to move the yoke forward and the pitch attitude always stayed low, both indicators of normal recoveries.

The second test point (third spin entry of the flight) on the card was next flown next with the same configuration except that the entry was done from a left turn (30 deg of bank) decelerating at 1 kt/sec. At stall the full left rudder and full right aileron inputs were made. The aircraft departed as before and entered a spin normally. At one turn the throttle was moved to idle, the rudder moved fully right and the yoke moved progressively forward. The aircraft pitched down as before but the spin settled into a consistent, fully developed spin even with the yoke full forward. After 3 total turns, chase called "3 turns" as briefed. I held the yoke full forward with full opposite rudder and tried aileron full right to see if that would have any effect on the yaw rate. It did not, and I returned the yoke to neutral, still holding full forward yoke and rudder full right. At about 10,000 ft the chase called "chute, chute, chute" as briefed. I pulled the spin chute lever aft to fire the anti-spin chute and nothing happened. David did the same without effect. I tried a third time and visually checked the spin firing lever at the full aft travel – still no effect.

At about 8,500 ft MSL (500 ft above the briefed minimum bailout altitude) David and I both called for and executed a bail out. The door came away without difficulty and I pulled my D-ring right away and the parachute functioned normally. I believe my helmet came off during the opening shock, but it may have separated earlier. I descended under the chute for a long time, two to three minutes. I had time to check my parachute and perform the four-line jettison, enabling me to steer the parachute into the wind. Landing was to the rear and the parachute landing fall was okay. I was able to get up and walk right away. I walked 100 yards to David's landing site as he was standing up.

Greg Lewis

Accident Report

GippsAero GA10 VH-XMH Edwards AFB, California USA.

Preamble

The GA 10 is a high wing ten seat turbo propeller utility aircraft designed and built in Australia's and certified under FAR 23 in Australia's and USA. Subsequent to certification of the standard aircraft a program was put in place to conduct testing for the option of a conformal cargo pod under the fuselage.

After initial testing in Australia on the first prototype aircraft, X1 VH-XGY to assess the stall speeds and flying qualities, a campaign to complete the spinning campaign IAW FAA AC23-8A was tasked. This campaign was planned to be conducted in association with the National Test Pilot School (NTPS) in Mojave California. Aircraft P1, the first production aircraft VH-XMH, was shipped to USA and assembled at Mojave IAW GippsAero documentation and procedures, then test flown to ensure correct rigging and flight handling. The aircraft was weighed and the spin recovery system ground tested successfully prior to commencement of testing. Initial tests were focussed on confirming stall speeds and stall handling, which conformed to those of X1! And were as expected almost identical to the standard aircraft with no negative or anomalous behaviour.

Extensive spinning had been conducted on the prototype, with about 1600 entries conducted by three pilots over a two year period, concluding with the certification flights conducted by Greg Lewis, Test Pilot Instructor at NTPS, and David Wheatland, Chief Pilot GippsAero.

Flight Number 9. 04 JUNE 2018

On the specific flight on which the event occurred the test point weight and Centre of Gravity (C ofG) of the test aircraft had been adjusted to a conservative loading to conduct data gathering to assist with the matrix test point planning. The aircraft was weighed and then weight/C of G checked by re weighing in accordance with normal procedure to ensure accuracy. This was conducted prior to the pre flight staff briefing. The nitrogen rocket was charged to high pressure and checked over a 30minute period to ensure it maintained a stable and adequate discharge pressure.

Briefing was a thoroughly conducted procedure and involved the engineering staff and flight crews of both the test vehicle and a chase aircraft that was a required part of the Threat and Hazard Analysis (THA) plan.

The briefing covered all planned aspects of the flight and permitted discussion of any and all considerations. No specific or major concerns were raised. Other points covered in briefing were the location and conditions of the task and safety equipment and procedures in event of emergency. These are normal items for such a briefing and thorough in detail to ensure understanding and appropriate response in such an event. When the briefing was concluded the crews moved to the aircraft to conduct aircraft inspection before flight. The test vehicle had several data acquisition systems that were activated to record aircraft motion and crew actions.

The take off and climb were standard and included arming of the recovery system and initiation of flight crew supplemental oxygen flow prior to passing 10,000 AMSL.

Prior to commencing any spin events the setting of the horizontal stabiliser was established for the three entry conditions that related to the three flap settings of Up, Take Off and Landing, all with power ON. The power setting of 48psi TRQ/NP Max, was used and had been established as correct value in a previous flight.

The initial event was conducted at Landing flap, to the left with wings level entry and adverse (right) aileron. The entry inputs resulted in an abrupt rolling departure left into a steep nose down pitch attitude, before a oscillating upward to a medium nose down and what seemed a slow rotation for approximately 1/2 to 2/3 do a turn before accelerating just prior to the recovery point at one full turn. At recovery the inputs resulted in what appeared to be an immediate slowing of turn before accelerating again to recover at more than two turns additional. This was confirmed by chase. During climb back to the minimum entry altitude the recovery was discussed and it was decided between the test crew that the spin should be repeated due to the potential that the recovery control inputs had not been applied in a correctly timed manner.

The second entry was very similar to the first event with a rolling entry to the left and slow rate with steep nose down attitude initially before accelerating at about 3/4 turn into a nose down steady spin to the left at a height turn rate. This was an unusual spin mode and one previously not encountered. At one full turn I called "recover" and Greg applied the appropriate control inputs.

The aircraft continued to rotate in a smooth fast and steady manner despite full recovery inputs, and at two additional turns the chase aircraft called "chute, chute chute" indicating that we were passed the two turns of recovery and may use discretion to deploy the recovery chute from that point onwards, until it became necessary at a pre determined altitude. Mission planning and briefing permitted the opportunity to explore spin characteristics and observe if recovery methods were working. After some control recovery sequences had been tried unsuccessfully, the decision was made to operate the recovery system to stabilise and recovery the aircraft to normal flight. I operated the lever and there was no positive recovery. I applied a second input, then moved myself in the seat to clear the operating handle and handed the deployment lever operation to Greg, who also attempted to deploy the recovery system several times. He then indicated that we should vacate the aircraft and I do not recall acknowledging this decision, but I unbuckled my seat restraint straps and moved them clear of my parachute harness to prevent fouling or entanglement.

I disconnected my helmet communications lead and oxygen hose and operated the door jettison mechanism and the RHS cockpit door flew off instantly. I moved half out of the door with my right foot on the step and observed the nose down rotation was continuing even with the altered aerodynamics of the open door apertures and myself halfway out of the aircraft. I thought this may have had a positive effect, but the spin rate did not appear to slow, or did the nose attitude vary. I then attempted to reach back into the cockpit to operate the condition lever, but did not have the free arm motion required due to my position and the restraining effect of the parachute harness. I called to Greg, "feather", but this was futile due to the fact I was no longer connected to the intercom. I paused for a moment or two to look out to the exist direction and observe any immediate airframe impact hazards, and decided that there was a good egress route due to the spin direction. I then pushed out into the free air with my arms and head tucked toward my chest.

Within a second or two I was falling backwards in a semi stable manner and twice attempted to roll into the hard arch position to enable me to have a clear view of the ground below. Both attempts resulted in tumbling and returning to the backwards fall. I waited and counted a few more seconds of fall then used

my right hand to pull the ripcords, and my left hand to “clear” the cable and ensure that it was fully extracted. The parachute opened after a brief pause, and the canopy fully opening was violent but successful. I looked down and estimated my height at about 3000 ft above ground level (AGL) and used the rear risers of the parachute to steer into the forecast wind direction. During the canopy descent I observed one of the crew doors descending slowly past on a ‘helicoptering’ manner about 50 meters from me.

At about 100-200 ft AGL a wind gust rotated my parachute 180 degrees and I believed that there was insufficient time to reverse this outcome without increasing my descent rate, so elected to land downwind at a higher ground speed than desirable, but without compromising my descent rate and potential for additional injury.

The landing did not seem unduly violent, and the parachute deflated immediately. I stood, removed the harness using the three clips and raised both arms above my head and waved to the circling chase aircraft that I was not seriously injured. I then plaited the parachute cords and roughly balled the canopy and placed the harness and container on top of it to prevent it from being caught by the wind and being damaged or causing a hazard.

Greg walked to me and I did not move significantly as I was restrained by a painful feeling in my left hip that reduced my ambulatory ability.

A Bell helicopter then arrived and picked me up for air transport to Mojave airport from whence I was transported by road ambulance to Antelope Valley Hospital for treatment.

David Wheatland

Test Pilot GippsAero
11 JUN 2018