

ACCIDENT

Aircraft Type and Registration:	Schempp-Hirth Nimbus-3 glider, G-EENN	
No & Type of Engines:	None	
Year of Manufacture:	1981 (Serial no: 9)	
Date & Time (UTC):	4 September 2012 at 1233 hrs	
Location:	Portmoak Airfield, Scotlandwell, Kinross	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Fatal)	Passengers - N/A
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	FAI Gold C Certificate and 2 Diamonds	
Commander's Age:	49 years	
Commander's Flying Experience:	1,325 hours (of which at least 100 were on type) Last 90 days - 1 hour Last 28 days - 1 hour	
Information Source:	AAIB Field Investigation	

Synopsis

The glider was being winch launched from a grass airfield. At an early stage of the launch the right wing tip contacted the ground, the left wing lifted and the glider cartwheeled to the right before coming to rest, inverted. The pilot was fatally injured.

Three Safety Recommendations are made to the European Aviation Safety Agency and the British Gliding Association concerning cable release mechanisms.

History of the flight

On the morning of the accident the pilot travelled from his home to Portmoak Airfield, where his glider was kept in a trailer. During the morning he rigged the glider himself and then towed it behind his car to the launch

area. Two winch cables were laid out for use, a southern one and a northern one. He positioned his glider ready for the launch approximately 31 metres to the south of the southern cable, in order to avoid a marked area of bad ground. When he was ready for the flight the winch operations had finished for the morning so he waited in his glider for the launching to resume.

The weather conditions were clear with a gusty wind from the south-west at an average speed of 18 kt. An 18 kt wind at 20° off the runway direction (Runway 27) would give a crosswind component of 6 kt.

At approximately 1230 hrs the winch operator was ready to resume. Two student glider pilots walked out from

the clubhouse to assist with the launch. The first one, the wing holder, spoke with the pilot to check he was ready and hooked the southern winch cable onto the glider. He then picked up the right wing tip to steady it in preparation for the launch. He commented, afterwards, that the wing was moving up and down considerably in the wind but that he was still able to hold it. When the pilot indicated that he was ready, the wing holder gave the 'take up slack' followed by the 'all out' signals.

The second student, the signaller, was in the launch hut, positioned approximately 60 metres from where G-EENN was launched. He advised the winch operator of the type of glider, using a handheld radio, and relayed the 'take up slack' and 'all out' to the winch operator by the use of light signals. The winch operator did not have a clear view of the gliders at the launch area, because of a slight rise in the ground, but he could see the gliders as soon as they became airborne.

During the launch, the wingtip holder was unable to keep pace with the glider for more than a step or two before he had to release the wing. As soon as he let go he saw the right wing drop towards the ground, then lift up again. The wing then dropped again and the wingtip ran along the ground. He expected the pilot to release the winch cable, but the launch continued with the right wing running along the ground. After a short period, the left wing lifted and the glider briefly became airborne before cartwheeling and coming to rest upside down.

The wingtip holder ran over to the pilot who was trapped under the aircraft and tried to assist by lifting up on a wing. Finding the glider was too heavy, he attempted to help the pilot, who was trapped under the aircraft, but realised that he had suffered fatal injuries.

Airfield information

Portmoak is an all-grass airfield with two separate runways, 27/09 to the north, and 28/10 to the south, divided by a paved track. The northerly runway is generally used for aerotowing and the southerly for winch launches.

The airfield has a weather station which is mounted on top of the clubhouse and records the wind parameters once a minute. The conditions recorded at the time of the accident are shown in Table 1.

Time (hr/min) GMT	Wind speed (kt)	Gust speed (kt)	Direction (°M)
1226	18	18	248
1227	16	16	248
1228	14	16	248
1229	13	12	248
1230	14	21	248
1231	17	21	248
1232	16	16	248
1233	16	16	248

Table 1

Recorded wind speed and direction

Pilot information

The pilot had been gliding for more than thirty years and had attained a Fédération Aéronautique Internationale (FAI) Gold 'C' Certificate with 2 diamonds. He had owned this glider for 2 to 3 years and had flown it regularly during the summer months, using both aerotows and winch launches. His flights were typically in excess of two hours duration.

In the 12 month period preceding the accident the pilot had recorded in his personal log book 59 hours of flight time with 17 launches, 9 of which were winch launches, all at Portmoak. The most recent flight entered in this log book was for 26 May 2012.

The aircraft log book recorded that there were no flights in June or July 2012.

The Portmoak club records for the pilot showed that he had undertaken one winch launch on 9 August 2012 with a flight duration of 12 minutes. No evidence was found of any other flights made by the pilot between 26 May 2012 and 4 September 2012.

Medical and pathological information

The pilot was employed as an Air Traffic Controller (ATCO) and held a valid European Class 3 medical certificate for ATCO duties.

A post-mortem examination revealed that the pilot had died as a result of multiple injuries, including a severe head injury, consistent with having been caused at the time the glider crashed. A consultant aviation pathologist advised that the injuries suggested an impact deceleration in excess of 80g and that no additional or alternative personal safety equipment would have affected the outcome.

Aircraft information

Description of glider

The Nimbus-3 is a single-seat high-performance glider constructed from carbon fibre and fibreglass with a maximum takeoff weight of 750 kg. It has a 25.5 m wing span and conventional flying controls operated by a control column and rudder pedals. It is also equipped with airbrakes, trailing edge flaps and a single-wheel, retractable, main landing gear. The wing tips are angled upwards and rubbing strips are fitted on the lower surface of each wing close to the wing tip. The glider can also carry water ballast in integral tanks fitted inside each wing. In G-EENN the pilot was secured by a four-point harness. For winch launches, the cable is attached to the cable release mechanism situated beneath the cockpit, just in front of the main wheel. On G-EENN the cable was released by the pilot pulling on a yellow coloured 'T' handle located just in front, and to the left, of the control column. A photograph of the cockpit of G-EENN, taken by a previous owner (Figure 1), shows the position of the cable release and rudder pedal adjustment controls.

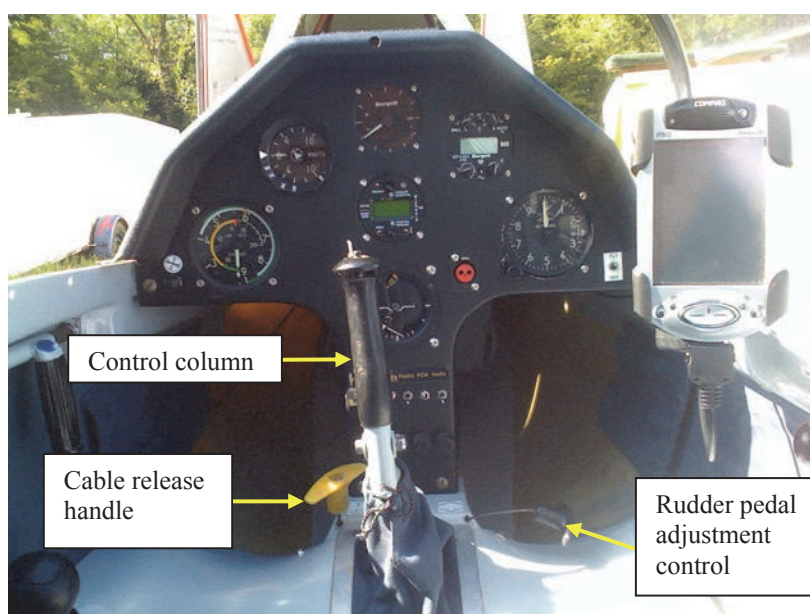


Figure 1

Photograph of the cockpit in G-EENN taken several years prior to the accident

The cable release mechanism will also automatically back-release the cable if the glider over-flies the winch with the cable still attached.

Description of the winch

A Skylaunch winch was used to launch G-EENN. This type of winch is equipped with controls that allow the operator to preset the 'glider type' and the headwind component of the surface wind, thereby providing a suggested winch speed. For the Nimbus-3 it is suggested that the 'glider type' should be set at 'A'. These presets position a gate in the throttle quadrant that introduces a resistance to the movement of the throttle beyond the suggested takeoff position; the operator can still move the throttle through this resistance. During the launch the operator watches the glider and moves the throttle forward until he feels the resistance. He then uses his experience to control the launch speed by adjusting the position of the throttle. Once at a safe height, the glider pilot may signal a low launch speed by lowering the aircraft nose or a fast launch speed by yawing the glider.

The procedure to launch a glider is as follows (Figure 2):

- The headwind is selected on (A).
- The glider type is selected on (B).
- The cable drum is selected.
- Once the operator receives the signal to 'take-up slack' he moves the transmission selector lever (C) from neutral to drive and the cable starts to wind in slowly.
- Once the operator receives the signal 'all out' he moves the throttle (D) to the gate, the winch engine accelerates and the glider is launched.
- The winch is equipped with a guillotine (E) that, in an emergency, can be used to release the cable at the winch. The winch cable brake (F) is not used during the launch.

Following the accident, the preset for the headwind component was found to be set at 15 kt and the 'glider type' was set at 'B'. The weak link fitted to the launch

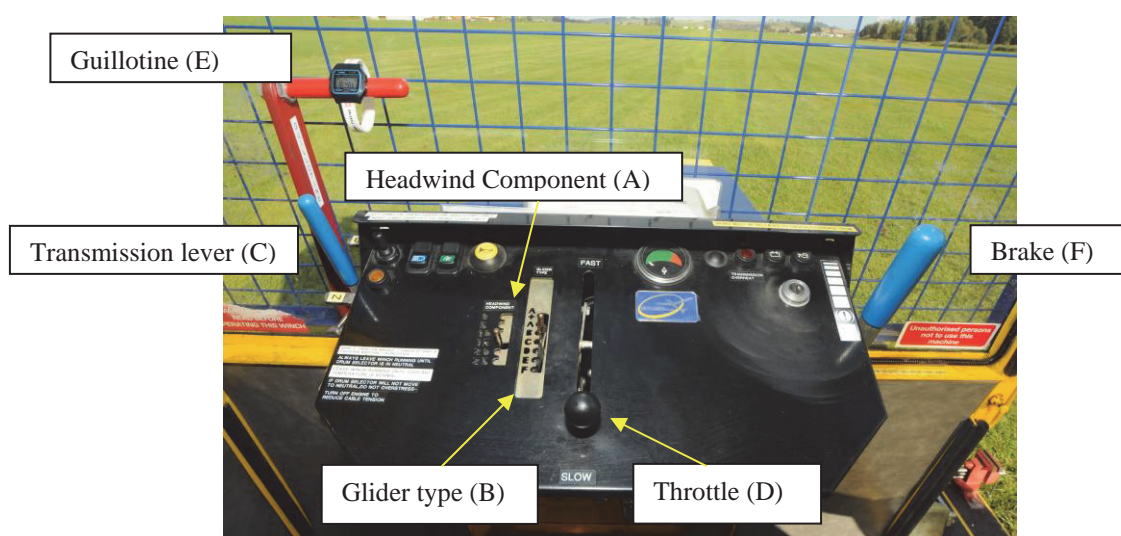


Figure 2

Winch controls

cable was coloured red, which signified that it was rated at 750 daN. This was within the Nimbus-3 design requirement that the weak link used in the winch cable should have a maximum breaking force of 910 daN.

A representative from the winch manufacturer advised that he considered the settings used for the launch of G-EENN were appropriate and he would expect the glider to become airborne in approximately 30 m and within 3 to 4 seconds.

At Portmoak, launch signals are relayed by light signals to the winch operator from a launch hut positioned alongside the launch area.

Accident site

At the time of the accident, the airfield had been set up such that the winch was situated at the western end of the southern grass runway and the launch hut was sited 916 m away, approximately 75 m from the eastern perimeter track. The gliders were launched from the south side of the launch hut on a heading of 277° and the two winch cables were identified as the 'south' cable and the 'north' cable. The grass in the vicinity of the launch

site was reasonably short and was not considered to be a factor in the accident.

The winch cables were pulled to a position marked by two cones and flags with sufficient space for a glider to be launched from either side of the cones. An area of soft ground adjacent to the cones was marked by two tyres. G-EENN was launched from the southern position using the 'south' cable and from the ground marks it was established that at the start of the launch it was approximately 60 m from the launch hut. After the accident the 'north' cable, which was still in the position where both cables had been delivered, was found to be approximately 30 m north of the position from where G-EENN was launched (Figure 3).

G-EENN came to rest in an inverted position approximately 100 m from its launch point. The pilot, who remained secured in the cockpit by his harness, had sustained a fatal head injury. Marks in the grass were consistent with the right wing rubbing along the ground for a distance of 29 m during which the heading changed from around 277° to 317° . The marks reappeared after several metres and ran for a further 22 m before



Figure 3

Launch area at time of the accident, looking north-west

disappearing when the glider would have been on a heading of 341°. The ground marks and wreckage trail indicated that the glider impacted the ground in a nose-down inverted attitude, approximately 35 m from the last mark made by the wingtip. The glider then bounced twice before coming to a halt.

Examination of the glider

The glider was examined prior to being moved and was assessed as being in a serviceable condition at the time of the accident, with no evidence of there having been a mechanical control restriction. When tested, the cable release operated when the release handle was pulled and the back-release system was found to operate correctly. There was no water ballast in the glider. From the wreckage it was not possible to establish the position of the flaps at the time of the accident.

Photographs of the launch

A number of photographs were taken of the launch sequence and from the metadata it was possible to establish the time that each image was captured. The first photograph showed the glider in a level attitude with the wingtip holder holding the right (downwind) wing. The airbrakes were closed and the winch cable was connected. The second photograph, taken 24 seconds later, is reproduced at Figure 4 and shows the glider airborne with the wing tip rubbing along the ground. The airbrakes are still closed, the left aileron is deflected upwards and the right aileron is deflected downwards. The winch cable has just released, the angle of bank is estimated to be approximately 40° to the right and the glider's cockpit is at a height of approximately 20 ft. The third photograph was taken one second after Figure 4 and shows the glider in a very steep nose-down attitude, just prior to it impacting the ground. It was not possible to determine from the photographs the precise flap setting, but they were at, or close to 0°.

Testing

Tests were carried on a Nimbus-3 glider with a similar cockpit layout to G-EENN to establish if it is possible for the pilot to operate the winch cable release handle without restricting the movement of the control column.

The winch cable release handle fitted to the test glider had a much longer operating cable, which was contained in a black conduit, than the handle fitted on G-EENN (Figure 5). Therefore the tests were carried out using the black rudder pedal adjustment handle, which although situated on the opposite side of the control column, was more representative of the winch cable release handle fitted on G-EENN. The pilot who operated the controls during the tests was approximately six foot tall and of average build.

During the tests the flaps were set at +1° and the outboard trailing edge of the right flap was used as a reference point against which to measure the position of the trailing edge of the adjacent aileron. The position of the control column was measured with reference to a point in the cockpit.



Figure 4

G-EENN, cable just released

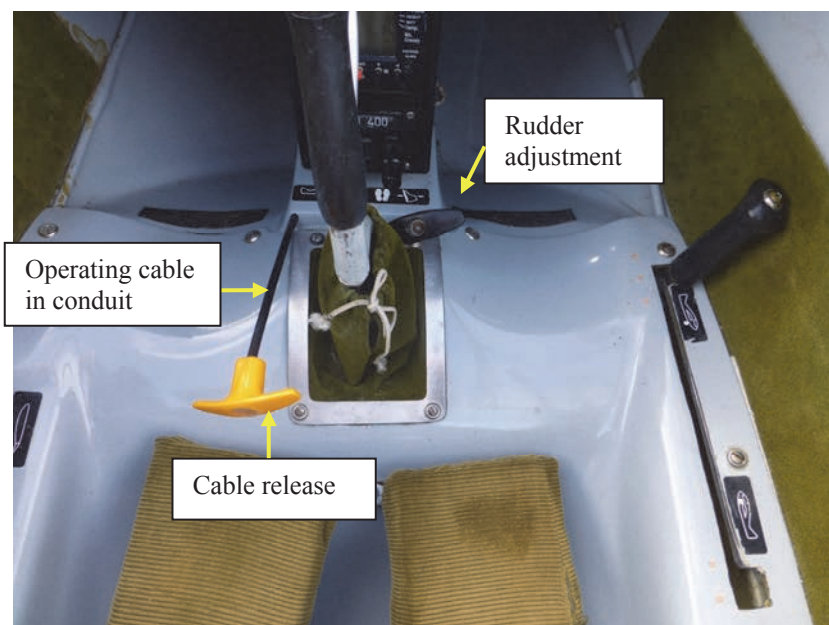


Figure 5

Cockpit layout in glider used in test

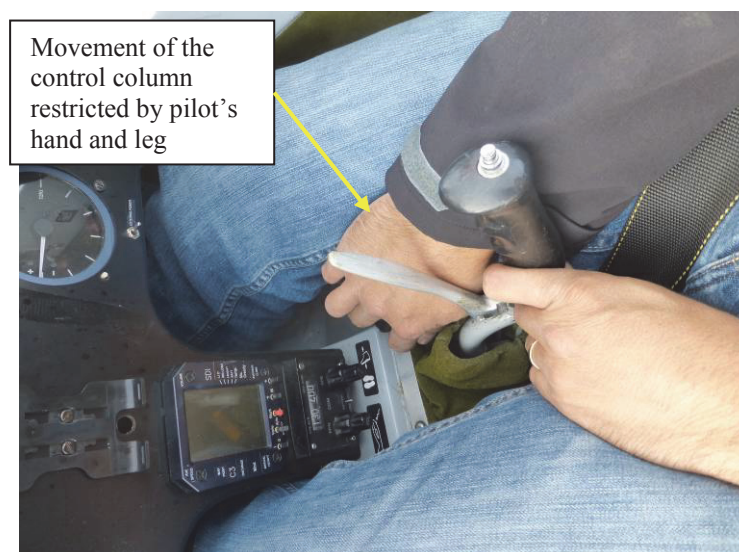
In the first test the range of movement of the right aileron trailing edge was established with the control column in the neutral, full right (full up) and full left (full down) position. In the second test the pilot used his left hand to hold the control column while he moved the control column as far as he could to the right; the position of the aileron (restricted up) and control column was measured. The control column was then moved fully left the same distance that the pilot had been able to move it to the right. The position of the aileron (restricted down) was measured. The results are:

Neutral	5 mm up
Full up	30 mm up
Full down	7 mm down
Restricted up	18 mm up
Restricted down	2 mm down

The tests showed that when the pilot kept his hand on the rudder adjustment handle, movement of the control column to the right was restricted by the control column making contact with his right hand, which was constrained by his leg (Figure 6). The maximum distance

that the control column could move corresponded to the aileron surfaces moving approximately 55% of their full range. When the test was repeated using the winch cable release handle equipped with the longer operating cable contained in the black conduit, the control column and ailerons could be moved through their full range of travel.

The release mechanism on another model of glider, from the same manufacturer, was examined and it was noted that the cable release handle was in the same location as on G-EENN. On this glider it was assessed, given the length of the operating cable, that some pilots might not be able to operate the cable release without restricting the range of movement of the ailerons. The investigation was advised that similar arrangements exist on some other gliders. However, not all gliders are fitted with a 'T' handle and some, for example, use a spherical knob, which can be difficult to operate quickly. The investigation was advised that some pilots attach a lanyard to the release mechanism.

**Figure 6**

Movement of control column restricted by pilot's hand

Previous winch launch accidents

Schleicher ASW 20L, September 2006

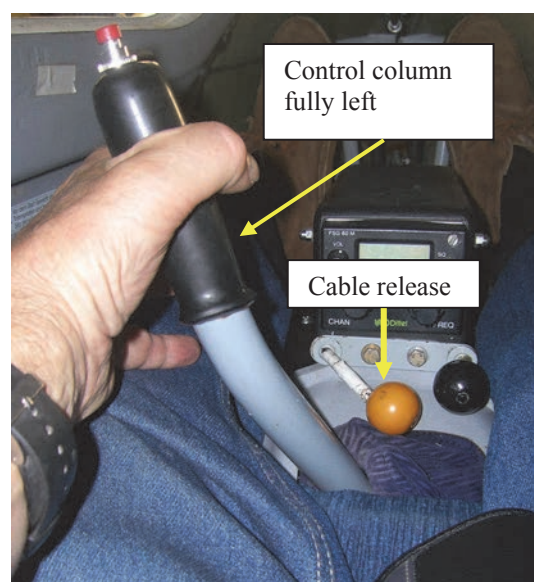
In September 2006 a Schleicher ASW 20L glider, BGA 4354, was launched from Runway 13 at Keevil airfield. As the glider became airborne its right wing tip made contact with the ground and it rolled uncontrollably to the right and came to rest in an inverted attitude. The pilot was fatally injured. The winch cable remained attached to the glider throughout the accident sequence. With regard to the location of the cable release handle the AAIB accident report¹ records:

'The application of left aileron would properly have made it difficult to reach the release handle and operate it in the very short time available to regain control of the aircraft....it is possible that he was unable (Pilot) to apply sufficient force to it (release handle) to release the winch cable, especially if he was simultaneously applying full left aileron.'

Footnote

¹ AAIB report BGA 4354, 23 September 2006, EW/C2006/09/06. Published in AAIB Bulletin 08/2007.

Figure 7 shows the location of the cable release on a Schleicher ASW 19 glider, which has a similar arrangement to the ASW 20L. The photograph was taken with the control column in the full left position.

**Figure 7**

Location of cable release on ASW 19 glider

Nimbus-2 in September 2007

A Nimbus-2 glider was involved in a similar accident² in 2007 when the left wingtip contacted the ground during a winch launch and the aircraft cartwheeled. The pilot was seriously injured in the accident. He commented afterwards that he had not realised that the wing had touched the ground during the launch. He also said that he had considered that, in the event that the wing did touch the ground, there could be time for a stop signal to be sent from the signaller (launch controller) to the winch operator.

Certification standard

Under European legislation, each aircraft type is categorised as either an EASA Type Certificated (TC) aircraft, which is subject to European airworthiness regulations, or an EASA Annex II aircraft, which are subject to National airworthiness regulations. In April 2012, approximately 2,350 EASA TC and 500 Annex II gliders operated in the UK. The Annex II gliders operate under a British Gliding Association (BGA) Certificate of Airworthiness under the delegated approval of the Civil Aviation Authority.

The Nimbus-3, which is classified as an EASA TC aircraft, was originally certified against Joint Aviation Authority JAR-22³. With regard to cockpit controls, the current specification for cockpit controls detailed in the EASA Certification Standard for Sailplanes and Powered Sailplanes, (CS) 22.777, states:

'(b) The controls must be located and arranged so that the pilot, when strapped in his seat, has full and unrestricted movement of each control without interference from either his clothing (including winter clothing) or from the cockpit structure. The pilot must be able to operate all the controls necessary for the safe operation of the aeroplane from the seat designated to be used for solo flying.

(c) In sailplanes with dual controls it must be possible to operate the following secondary controls from each of the two pilots' seats –

(1) release mechanism;'

Dynamics of a wing drop

The dynamics of a winch launch involve a number of complex forces and moments that can quickly develop and place the glider in an unrecoverable situation. Some of the factors that cause these forces and moments are:

Location of the release hook

The hook used for winch launching is normally located below and forward of the glider Centre of Gravity (C of G) (Figure 8a). If the hook is located along the centre of the lower fuselage, then during the launch the force on the cable will initially attempt to rotate the glider nose upwards about the C of G. If the hook is off-set from the centre line, or the winch cable is set at an angle to the glider's heading, then there will be an additional rolling moment during the launch once airborne (Figure 8b). In general, the greater the misalignment between the glider and the winch cable the greater the rolling moment.

Footnote

² Investigated and reported by the BGA.

³ April 1980, Change 1.

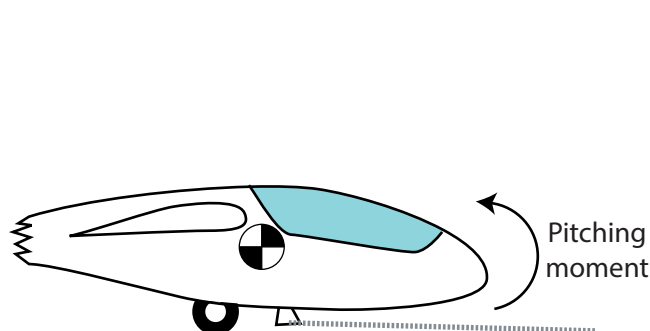


Figure 8a

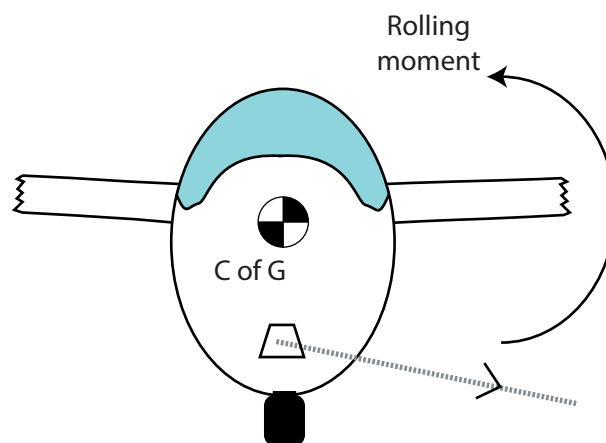


Figure 8b

Figure 8a and 8b

Location of winch hook

Wing tip in contact with the ground

The drag from a wing tip running along the ground will impart a yawing moment in the direction of the dropped wing. The longer the wing span the greater the yawing moment. There is also a risk that the wing tip will dig into the surface, even at relatively low speeds, and cause the glider to ground loop or cartwheel. The speed of the glider, shape of the wing tip and the texture and softness of the ground are all variables that will determine the outcome of a wing drop.

Offset cable

If the winch cable is not aligned with the glider then the glider may yaw towards the direction of the cable during the initial acceleration. The length of the grass, surface texture and the amount of misalignment between the cable and glider will all contribute to the rate and amount of yaw.

Crosswind

The glider will attempt to weathercock into the wind, principally due to the fin. The direction and strength of the crosswind can either improve or worsen the yawing effect of a misaligned cable or offset hook.

Aerodynamic factors

As the glider yaws, the outer wing travels faster than the inner wing, thereby generating a potential dissymmetry of lift that causes a rolling moment towards the inner wing. With the glider yawed, the forward fuselage may partially blank the inboard section of the inner wing causing a reduction in lift, which contributes to the rolling moment towards the inner wing. As the glider rolls towards the inner wing, the angle of attack and the lift on the outer wing will reduce thereby helping to counter the rolling moment. Moving the ailerons to counter the rolling effect will reduce the lift and drag on the outboard wing, which might reduce the yawing moment. The use of rudder to counter the yaw may also contribute to the rolling moment.

Example of a wing drop

A wing drop accident can be considered in two phases; start of launch and weight-off the main wheel. In this example the release hook is mounted along the longitudinal axis, there is a crosswind from the left, the winch cable is offset to the right and the right wing tip is on the ground (Figure 9).

Start of the launch

As the winch cable is wound in, the glider will accelerate along the ground and yaw rapidly to the right, about its main wheel, to align with the direction of the cable. The left wing will produce more lift than the right wing causing a rolling moment to the right. Releasing the cable at this early stage may prevent an accident.

While the crosswind will have the effect of countering the yaw to the right by 'weathercocking' the glider into the direction of the wind, the drag on the right wing tip will increase as the glider's speed increases, which further increases the yawing and rolling moment to the right. There is an increasing risk that the wing tip will dig into the ground and the glider's momentum will cause it to ground loop or cartwheel.

Weight off the main wheel

With a modern winch the weight will come off the main wheel approximately three to four seconds after the start of the launch sequence. With the main wheel off the ground, and the winch cable offset from the glider's heading, the force from the winch cable will introduce a rolling moment (R_c) about the glider's C of G (Figure 10).

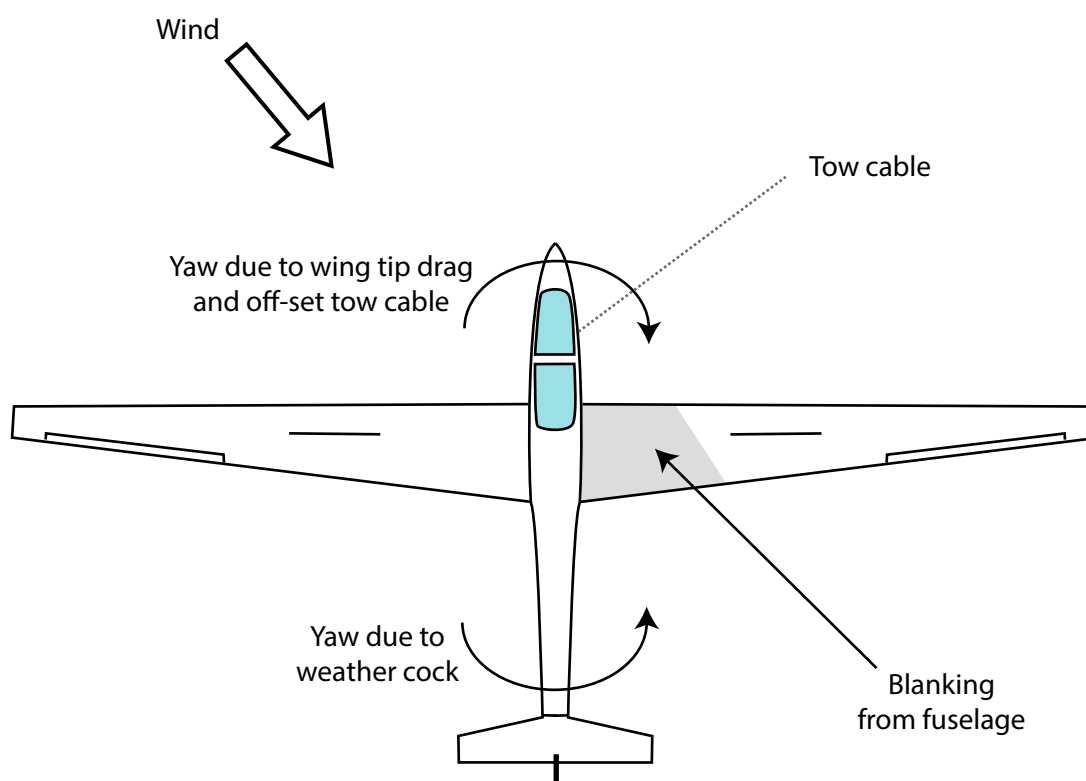


Figure 9

Example of winch launch dynamics

This rolling moment acts in addition to the aerodynamic effects (R_L), and further increases the down load and drag on the right wing tip. The risk of an accident and injury to the occupants will have substantially increased.

Wing off the ground

Once the glider gains sufficient height for the right wing tip to leave the ground then the combination of the roll and yaw may cause it to enter a sideslip that will further increase the yawing and rolling momentum. At some point the momentum and attitude of the glider is such that the glider can not be recovered and an accident is inevitable.

BGA safety initiatives

In 2005, following a study and analysis of winch launch accidents, the BGA identified winch launching as a target area for the reduction of accidents. In October 2005 the BGA Safe Winch Launching Initiative was started. This campaign was aimed at reducing the numbers of winch launch accidents by raising awareness through the distribution of information and advice to pilots. A follow-up analysis showed that for the first three years of the campaign the rate of accidents appeared to have reduced markedly, but that in the fourth year the rate increased.

On the 'Safe Winch Launching' page of the BGA website there is a note that accidents resulting from power loss during launch, for example cable break or winch failure, have declined dramatically but:

'Cartwheeling accidents - predominantly to experienced pilots - are still happening as a result of not releasing the cable if the wing drops during the ground run'

The 'Safe Winch Launching' booklet, available on the same site, contains the following advice:

'If you need to release you must be able to do that instantly. That means being strapped in tightly, with no soft cushions, and with your hand firmly on the release. It is important to understand that "if you cannot keep the wings level, release immediately" means release before the wing touches the ground.'

The BGA produced an educational DVD in 2012, for distribution to all instructors. The material includes a presentation entitled 'Stop the Drop' which specifically addresses the avoidance of wing-drop accidents. The opening slide notes:

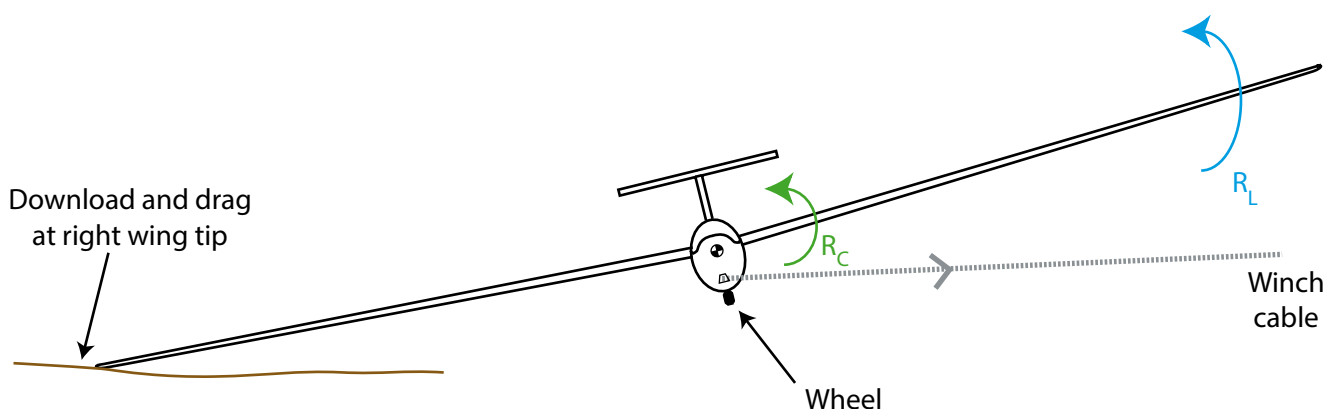


Figure 10

Rolling moment due to offset winch cable

'The aim of this presentation is to help you to stop wing drop accidents whether you are in the glider or not.'

The presentation includes material on the circumstances that may lead to a wing drop and ways of anticipating or avoiding it, for example the advice that:

'If glider is offset from cable by more than one wingspan, move the glider closer before launch.'

Analysis

A winch launch is a very dynamic process during which the glider accelerates rapidly and becomes airborne in a short space of time. In this accident, during the launch, the right wing touched the ground and there was a loss of directional control. The situation developed very rapidly, to a point from which the glider was not recoverable.

Glider and winch

It was assessed that at the time of the accident the glider was serviceable. The glider's weight and balance, the winch operation, cable and weak link, were considered not to have been factors in the accident.

Accident sequence

The ground marks indicated that shortly after the start of the launch, the glider started to veer to the right and the right wing rubbing strip ran along the ground for approximately 29 m before the mainwheel left the ground. The right wing tip then ran along the ground for a further 22 m. The photograph at Figure 4 showed that the winch cable had released by a height of approximately 20 ft; but it was not possible to establish if the pilot released the cable, or whether the

back-release mechanism had operated. The glider's heading had changed by approximately 67° before it cartwheeled about the right wing and impacted the ground in a nose-down, inverted, attitude.

The ground marks from the right wing are consistent with the experience of the winch manufacturer that the glider should become airborne in approximately 30 m and 3 to 4 seconds. With this information, and the metadata on the last two photographs of the accident flight, it is estimated that the total flight time was around 5 to 6 seconds. It was assessed that it was around 4 seconds from the start of the launch until the cable released, by which time glider was in an unrecoverable attitude.

Directional control

The directional control of the glider during the launch would have been influenced by a number of factors. The surface wind was from approximately 20° to the left of the launch direction and varying in strength between 12 kt and 21 kt. The wind direction could have had two different effects, inducing a tendency to weathercock to the left, and a tendency to lift the left wing.

The starting position of the glider, to the south of the winch cable, would have caused an initial pull to the right as the launch started and the cable straightened. The rapid acceleration of the glider meant that the wing holder was not able to hold the wing for more than one or two paces. The right wing then dropped to the ground and, once on the ground, created drag, increasing the tendency to turn to the right.

The left wing would now be developing greater lift than the right, and any wind from the left at this stage could also cause the left wing to lift. Once the main wheel

left the ground the pull from the cable acting below the C of G of the glider would have imparted an additional rolling moment to the right.

Release of the winch cable

The advice from the BGA is that if the wing touches the ground during the launch then the pilot should immediately release the winch cable. Although the right wingtip of G-EENN contacted the ground at an early stage of the launch, the cable was not released and the launch continued. The investigation examined possible reasons why the pilot did not, or could not, release the cable until it was too late.

One reason that should be considered is that the pilot may not have initially been aware that his wing tip was on the ground. This type of glider has a long wing and only a small roll angle is required before the wing contacts the ground.

The pilot was an experienced glider pilot, although he had made only one flight in the previous three months. The BGA analysis suggests that experienced pilots may be more prone to not releasing the winch cable early enough, though the reasons for this are not clear. It may be that there is a greater tendency based on their own past experience with aerotows, with slower accelerations, to believe that a wing drop can be corrected. It could also be that at the time of their ab-initio training, there was a different emphasis on the need to have one hand securely on the release handle during a winch launch.

The cable release handle in G-EENN was fitted in a position such that the pilot would probably not have been able to keep his hand on it and still achieve full roll control authority. It is not known whether he was in the habit of keeping his hand on the release during a winch launch, but if not, there was the potential for a critical delay in operating the release handle.

Stopping the launch

The winch operator was too far away to be able to see what was happening at the early stages of the launch and would have needed to receive a 'stop' signal. There is provision for a 'stop' signal to be sent to the winch operator but the relay of such a signal would need to be made as soon as any launch problem became apparent. The time to signal, and for action to be taken, would be very short, and while it might work in some circumstances, it would not be a reliable method. On this occasion both the wing holder and the launch signaller saw the wing touch the ground but events then developed quickly, so it is unlikely that either of them had time to consider and make a 'stop' signal. Therefore, the responsibility to release the cable would have to rest with the pilot.

Moving the cable

One of the factors in the accident was the pilot's decision to move the cable a considerable distance away from where it had been laid out, presumably in an attempt to avoid an area of wet ground. The offset of the cable would have generated several adverse effects as the launch progressed, all of which would have contributed to the right roll, and made recovery to wings level difficult or impossible. Whether he considered these effects, and how they would have affected the launch when he moved it, is not known.

Choice of launch

There have been several previous winch launch accidents involving gliders with large wing span. The Nimbus-3 is a heavy glider with a particularly long wing and it may be that there is a greater likelihood of a wing touching the ground during takeoff, perhaps without the pilot's being aware of it. By contrast, during an aerotow there may be time for the pilot to correct a wing-drop situation, but in the case of the winch launch, time is more critical.

The choice for a pilot between a winch launch and an aerotow may be influenced by many factors and it could be that there is a relatively higher risk with a winch launch, although aerotow carries separate risks. Overall, there does not appear to be enough data to determine the relative safety of a winch launch compared to an aerotow.

Safety action

The BGA has identified winch launching as a target area for improving safety and have provided comprehensive information on their website. This safety initiative is continuing and is likely to be the most effective method of informing pilots of the pitfalls associated with winch launching and the best practice to avoid them. Therefore no safety recommendation is made in this area.

Safety Recommendations

The current EASA certification standard for Sailplanes and Powered aircraft does not specify that operation of the cable release mechanism should not restrict the range of movement of the flying controls. Therefore the following Safety Recommendation is made to the EASA

Safety Recommendation 2013-008

It is recommended that the European Aviation Safety Agency amend the certification standard for Sailplanes and Powered Sailplanes (CS 22) to include the requirement that the cable release mechanisms can be operated at any stage of the launch without restricting the range of movement of any flying control.

To ensure that action is taken to review the operation of the cable release mechanism on gliders that operate on an EASA Certificate of Airworthiness, the following Safety Recommendation is made to the EASA:

Safety Recommendation 2013-009

It is recommended that the European Aviation Safety Agency require that Type Certificate holders of EASA Type Certificated gliders ensure, where practicable, that the cable release control can be operated at any stage of the launch without restricting the range of movement of any flying control.

At the time of this accident there were approximately 500 EASA Annex II gliders operating in the UK, under BGA Certificates of Airworthiness. To ensure that action is taken to review the operation of the cable release mechanism on these gliders, the following Safety Recommendation is made to the BGA:

Safety Recommendation 2013-010

It is recommended that the British Gliding Association ensure that, where practicable, the cable release control on EASA Annex II gliders can be operated during any stage of the launch without restricting the range of movement of any flying control.