

ACCIDENTS INVESTIGATION BRANCH  
Department of Trade

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Beagle A.61 Series 2 (Terrier) G-ATMS  
Report on the accident near Saltby,  
Leicestershire, on 18 August 1973

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# List of Civil Aircraft Accident Reports issued by AIB in 1974

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1/74	McDonnell-Douglas DC8 — 63 CF N 801 WA and Aerospatial Caravelle 6 N 00-SRG approximately 10 nautical miles southeast of Lands End VOR, March 1973	April 1974
2/74	Piper PA 30 Twin Comanche G-AXRW at Shipdham Aerodrome, Norfolk, January 1973	April 1974
3/74	Slingsby T61A G-AYUO near Wycombe Air Park, Bucks., February 1973	May 1974
4/74	Viscount 802 G-AOHI at Ben More, Perthshire, Scotland, January 1973	May 1974
5/74.	Owl Racer 65-2 G-AYMS at Greenwich Reach, River Thames, London, May 1971	May 1974
6/74	British Caledonian Airways BAC 1-11 at Corfu Airport, Greece, July 1972	May 1974
7/74	Wallis WA-117 Autogyro G-AXAR at Farnborough, Hants., September 1970	(forthcoming)
8/74	AA-1 Yankee G-AYHD at Beverley Nursery, near Uxbridge, Middlesex, April 1973	June 1974
9/74	Cessna F172H G-AYDC near Humphrey Head, Lancashire, December 1972	June 1974
10/74	Beagle A.61 Series 2 (Terrier) G-ARZT at Home Farm, Leigh, near Tonbridge, Kent, August 1973	July 1974

Department of Trade  
Accidents Investigation Branch  
Shell Mex House  
Strand  
London WC2R 0DP

9 May 1974

*The Rt Honourable Peter Shore MP*  
*Secretary of State for Trade*

Sir,

I have the honour to submit the report by Mr R D Westlake, an Inspector of Accidents, on the circumstances of the accident to Beagle A.61 Series 2 (Terrier) G-ATMS which occurred near Saltby, Leicestershire on 18 August 1973.

I have the honour to be  
Sir  
Your obedient Servant

W H Tench  
*Chief Inspector of Accidents*



Accidents Investigation Branch  
Civil Aircraft Accident Report No 11/74  
(EW/C463)

<i>Aircraft:</i>	Beagle A.61 Series 2 (Terrier) G-ATMS
<i>Engine:</i>	Gipsy Major 10-1-1
<i>Registered Owner:</i>	Mr J Knight
<i>Operator:</i>	The Buckminster Gliding Club
<i>Pilot:</i>	Mr M S Dawson – Killed
<i>Passengers:</i>	One – Killed
<i>Place of Accident:</i>	Near Saltby, Leicestershire
<i>Date and Time:</i>	18 August 1973 at 1215 hrs

All times in this report are GMT

## Summary

Whilst taking-off towing a glider the tug aircraft fouled a wire, which had been left lying on the runway following a previous glider reverse pulley launch. The wire became caught around the port undercarriage and caused the aircraft to nose dive into the ground from a height of about 70 feet. The aircraft was destroyed by impact and fire; both the pilot and his passenger were killed. When he saw the aircraft diving towards the ground the glider pilot released himself from the tow and made a safe landing in a nearby field.

# 1. Investigation

## 1.1 History of the flight

During the morning of 18 August the Buckminster Gliding Club carried out a number of reverse pulley glider launches from Runway 06 at the disused airfield near Saltby. A detailed explanation of this method of glider launching is given in paragraph 1.17.

At 1214 hrs G-ATMS with Mr M S Dawson as pilot in the left hand seat and his three year old son in the right hand seat took off on Runway 06. The aircraft was towing a YS 53 glider, on a 36m tow-rope, with an instructor in the rear seat and a pupil in the front seat. From the position where the aircraft started its take-off run there was approximately 1,095m of runway available. Appendix 1 shows the probable position of the reverse pulley tow-wire on the runway at the time the aircraft started its take-off.

During the take-off run the glider became airborne before the tug aircraft, as is usual, and it was held by its pilot at a height of 6-10 feet above the runway. According to the glider pilot the tug aircraft took-off in the normal manner, although he considered that its ground run had been a little longer than usual. After becoming airborne the tug aircraft climbed away at a speed of about 55 knots to a height of approximately 70 feet. At this height the tug suddenly disappeared below the nose of the glider and the glider pilot lowered the nose in an attempt to keep the tug in view. As the nose of the glider came down, the pilot saw the underside of the tug aircraft's tailplane and realising that something was seriously wrong he pulled the tow release and made a safe landing in a field to the right of the runway.

On the airfield the duty instructor, who was watching the take-off from the launch point on the runway, saw the glider, followed by the tug aircraft become airborne. As the tug aircraft left the runway he saw the reverse pulley wire start to move very rapidly along the runway and the parachute, attached to its end, opened. He then saw the tug aircraft at a height of about 50 feet, in a very steep nose-down attitude, with its engine apparently still under full power. The aircraft hit the ground and immediately caught fire.

Members of the gliding club rushed to the crash which was in a field of sugar beet about 66m beyond the upwind end of the runway. When they arrived at the wreckage the wings were already burnt out and the cockpit area was burning fiercely. There was nothing they could do to rescue the two occupants. One of the club members went immediately by motorcycle to Saltby village, some two miles away, to telephone for the emergency services. The police, fire brigade and ambulance arrived at 1240 hrs and the fire brigade had the fire under control by 1256 hrs.

## 1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
Fatal	1	1	—
Non-fatal	—	—	—
None	—	—	—

## 1.3 Damage to aircraft

The aircraft was destroyed by impact and the subsequent fire.

## 1.4 Other damage

Some damage was caused to crops growing in the field into which the aircraft crashed.

## 1.5 Crew information

Commander:	Mr Michael Stephen Dawson, aged 30.
Licence:	Private pilot's licence, valid until 21 March 1976.
Aircraft rating:	Aeroplanes, Group 'A'.
Last certificate of experience:	14 January 1973 (Valid for 13 months).
Last medical examination:	26 June 1972, assessed fit (Valid for two years).
Total pilot hours on powered aircraft:	187.
Total hours on Beagle A61 aircraft:	54.

Mr Dawson was an experienced glider pilot having flown 467 hours. He had carried out a substantial number of glider towing flights, commencing on January 1969. He first flew G-ATMS in May 1970, and had since flown the aircraft on glider towing operations at regular intervals.

## 1.6 Aircraft information

Beagle A.61 G-ATMS had originally been in service with the Royal Air Force. It was rebuilt and reconditioned by Beagle Aircraft Limited and first issued with a Certificate of Airworthiness (C of A) on 11 January 1966. The aircraft had flown a total of 2,165 hours, including 616 hours while in service with the RAF. It had a current C of A in the General Purpose Category and was approved for glider towing. It had been maintained in accordance with an approved maintenance schedule.

The Gipsy Major 10-1-1 engine was installed in G-ATMS on 3 October 1968; its total running time since a complete overhaul was 691 hours. A Fairey Reed fixed pitch metal propeller was fitted.

At take-off the aircraft's tanks contained approximately 14 gallons of 100 Avgas. Its weight was 444 lb less than the maximum permissible take-off weight of 2,400 lb and the centre of gravity of the aircraft was within the prescribed limits. In the opinion of the Chief Flying Instructor the aircraft was fairly heavy in the context of the launching of a heavy two-seater glider, although not excessively so.

#### **1.7 Meteorological information**

There are no weather reporting facilities at Saltby. An assessment of the weather conditions there at the time of the accident, prepared by the Meteorological Office, is as follows:

Surface wind:	120°/5 to 10 knots.
Visibility:	6 to 9 kilometres.
Cloud:	5/8 stratocumulus at 1,700 feet*.
Weather:	Smoke haze.
Temperature:	19.5° C.

#### **1.8 Aids to navigation**

Not applicable.

#### **1.9 Communications**

Not applicable.

#### **1.10 Aerodrome and ground facilities**

The disused airfield near Saltby is situated approximately six miles south-southeast of Grantham and is at an elevation of about 460 feet. The main concrete Runway 24/06, from which the aircraft took-off to the northeast has a length of 1,800m. On this occasion however only part of the runway was being used, the launch point for the gliders using reverse pulley launches being about 1,215m from the upwind end. A northwest/southeast runway crosses Runway 06 at about the launch point and that part of it lying just south of Runway 06 was used as a glider assembly area from which gliders were moved into position to the launch point on Runway 06.

#### **1.11 Flight recorders**

No flight recorder was required or fitted.

#### **1.12 Wreckage**

The aircraft had crashed about 66m past the upwind end and on the extended centre line of Runway 06. It had hit the ground in a steep nose-down attitude, somersaulted onto its back and caught fire. Examination of

\* The Chief Flying Instructor stated there was nil cloud at the time of the aerotow launch.



the burnt-out wreckage showed that the aircraft had been structurally complete at the time of impact and that the engine and flying controls had been functioning correctly. The flap selector lever in the cockpit was selected to the 15° (take-off) position, but because of impact damage to the operating mechanism the flaps were in the 'up' position.

The pulley van, which was positioned on the southern side and about 39m before the upwind end of Runway 06 was facing west, down the runway. Examination of the pulley mechanism showed that the short length (approximately 9m) of reverse pulley wire, which had been lying close to the van, had run through the pulley until the parachute attached near to its end had jammed in the pulley wheel. Although the handbrake was set on, the van had been pulled back about three feet from concrete chocks, which had been positioned in front of its wheels. The wire ran from the jammed pulley wheel to the inverted aircraft's port undercarriage, from there it extended back to the centre of the upwind end of the runway, and then continued down the runway lying about 3m north of the centre-line. The far end of the wire was about 1,080m from the aircraft.

Examination of the port undercarriage leg showed that the wire was looped round the neck of the wheel axle. It had 'dug in' to the axle neck and was kinked; the wire was blocked in this position and could not be moved. It was evident that the 'digging in' and kinking of the wire had prevented it from running out.

#### **1.13 Medical and pathological information**

Post mortem examination showed that the death of both victims had been instantaneous and the result of multiple injuries.

#### **1.14 Fire**

The aircraft was totally destroyed by fire which is considered to have been caused by the rupture of the fuel system during the ground impact. Leaking fuel then impinged onto the hot exhaust which caused ignition. There was no fire fighting equipment at Saltby airfield nor was there a telephone on the airfield. About 10 minutes elapsed between the time of the accident and a telephone call for the emergency services made by a member of the gliding club from Saltby village. During this time the wreckage was burning fiercely and members of the gliding club could do nothing to contain the fire or attempt to rescue the occupants. Three appliances from Kesteven Fire Brigade at Grantham arrived at 1240 hrs, that is within 16 minutes of being advised and, using a water jet, had the fire under control by 1256 hrs. Ten fire fighting personnel were in attendance.

#### **1.15 Survival aspects**

The accident is considered to have been non-survivable due to ground impact forces.

Examination showed that the seat harness anchorage attachments were unbroken. The full shoulder harness straps fitted to the two front seats were totally destroyed by the post crash fire, but the buckles were found fastened.

## 1.16 Tests and research

None.

## 1.17 Other information

### 1.17.1 *Reverse pulley glider launching*

This method of glider launching employs about 1,200m of 13 gauge steel wire. One end of the wire is attached to the glider at the launch point, the wire then runs up the runway and passes round a swivelling pulley mounted on a one ton van positioned at the upwind end of the runway. After passing round the pulley the wire is attached to the rear of a car and when making the launch the car is driven down the side of the runway towards the launch point and in so doing pulls the glider up the runway towards the van. On reaching a height of approximately 800 feet the glider pilot releases the wire. The car continues down the runway to the launch point where the wire is disconnected from it and fastened to the next glider ready for launching. The car is then driven back to the pulley van and picks up the other end of the wire, and the operation is repeated. Each end of the wire is fitted with a parachute to reduce its rate of fall when it is released from the glider after take-off. It will be apparent from the foregoing that, unless some action is taken to remove it, the wire will be lying along the runway between successive glider launches. The estimated position of the wire on the runway at the time of the accident has been derived from information given by the Chief Flying Instructor who said 'this is where I would expect it to be'.

### 1.17.2 *Positioning of the pulley van*

In the existing condition of a light southeasterly wind, a glider would have tended to drift to the north after becoming airborne. Consequently, unless the pulley van was positioned on the south side of the upwind end of the runway the wire would have tended to fall into the field closely bordering the north side of the runway when the glider released. However, with the van position on the south side of the runway's upwind end the wire would tend to fall onto the runway itself. If the wire did fall into the field then club members had to walk into the field in order to retrieve it; this led to strained relations with the farmer who understandably objected to people walking over his growing crops. However, the positioning of the pulley van on the south side of the runway's upwind end led to a problem at the launch point. If the car drove down the south side of the runway during launches the part of the wire it was towing would lie along this side of the runway and therefore across the intersection of the northwest/southeast runway. It had been found that with the wire in this position there was a risk of it fouling gliders and vehicles when they moved from the assembly area to the launch point on Runway 06. To resolve this difficulty the procedure adopted when launching a glider was that the towing car crossed the runway diagonally from the pulley van and then drove down the north side of the runway. As a result the wire would then be left lying along the north side of Runway 06 and would not interfere with the movement of gliders and vehicles from the assembly area to the launch point.

From previous experience with G-ATMS towing a two-seater glider from Runway 06 the Chief Flying Instructor believed that the tug aircraft would be airborne before it reached the position where the wire was lying diagonally across the runway. When driving the car along the runway he had also observed that if one of the front wheels ran along the wire, a loop tended to form in front of, and carried along ahead of, the wheel. The loop fell flat when the wheel ran off the wire. He therefore ensured that the wire was pulled tight by hand to remove any slack before a tug-glider combination take-off and to guard against the risk of bends or loops in the wire standing proud of the runway and hazarding the aircraft. This procedure was carried out by a member of the club before the accident flight.

## 2. Analysis and Conclusions

### 2.1 Analysis

There can be no doubt that at some point during its take-off run the tug aircraft ran over the reverse pulley wire, which became looped over the port undercarriage wheel axle. As a consequence the end of the wire lying close to the launch point started to move rapidly down the runway so that its parachute opened. Eventually the other end of the wire, lying close to the pulley van, was pulled through the pulley until the parachute attached near its end jammed in the pulley wheel. It was probably these two factors, one end of the wire being caught in the pulley and the other end with an open parachute acting as a brake, that caused the wire to dig into the wheel axle and to kink thus preventing any further movement round the axle. By the time this occurred the aircraft was airborne and it was then pitched almost vertically nose-down. There was nothing the pilot could do to retrieve the situation and the aircraft dived into the ground from a height of approximately 70 feet.

Although the mechanics of the manner in which the wire caught round the port undercarriage cannot be established with certainty, there appear to be two possibilities. The first is that despite the system of taking up slack by hand a loop of the wire was standing proud where it crossed the runway diagonally and was caught up on the port undercarriage. The second is that at some point the aircraft's port wheel ran along the wire and that it was pushed into a loop ahead of the wheel so that when the wheel ran off the wire the loop collapsed around the axle. It is considered that the first hypothesis would appear to be the more probable.

The circumstances whereby an obvious hazard such as the wire lying on the runway had come to be ignored are considered to be as follows. The gliding club had carried out numerous aerotow launches with G-ATMS in the past during which the reverse pulley wire had been left lying on Runway 06 in a position similar to that in which it is estimated to have been at the time of the accident. The Chief Flying Instructor has said that on these occasions he believed the tug/glider combination was always airborne before reaching that part of the runway where the wire lay diagonally across it. Therefore, apart from guarding against the possibility of loops standing proud of the runway by having the wire pulled tight, he did not regard the wire as a hazard. It would appear that over a period of time he had been lulled into accepting this situation as normal and had not appreciated the inherent danger.

The weather on the day of the accident was warm and there was only a very small headwind component. The aircraft was fairly heavy and it was towing a glider that was relatively heavier than normal. These factors would add extra distance to the ground run of the tug aircraft in comparison with

previous aerotow launches. It is apparent that the distance which served as a safety margin between the point where the tug could have expected to become airborne and the position where the wire crossed the runway, could well have been eroded. With the benefit of hindsight it is evident that it would have been better if the wire had been moved clear of the runway.

It is considered that the lack of any form of fire fighting equipment on the airfield made little difference in this accident because of the immediate and fierce fire which developed and the fact that the occupants were killed as the result of impact forces. However the outcome could still have been tragic if the impact had been survivable and only a small fire of manageable intensity had originally developed.

Following the accident the Chairman of the British Gliding Association sent a letter to the chief flying instructors of all gliding clubs drawing their attention to the circumstances of the accident and making certain recommendations. A copy of the letter is at Appendix 2.

## 2.2 Conclusions

### (a) Findings

- (i) The aircraft had been maintained in accordance with an approved maintenance schedule and its documentation was in order.
- (ii) The pilot was properly licensed and had adequate experience of glider aero-tow launches.
- (iii) The wire from a glider reverse pulley launch had been left lying on the runway. This was the normal practice and the wire had been positioned so that it was considered to be clear of the aircraft's take-off path.
- (iv) During a combination tug/glider take-off the tug aircraft ran into the wire which became caught around the port undercarriage.
- (v) On reaching a height of approximately 70 feet the pull of the wire caused the tug aircraft to nose over into an almost vertical attitude.
- (vi) There was nothing the pilot could do to retrieve the situation and the aircraft nose dived into the ground; the glider made a safe field landing.
- (vii) The dangers inherent in leaving a wire loose on the runway during a combination tug/glider take-off were not fully appreciated.
- (viii) Although not relevant to survivability in this case the absence of any telephonic or radio facility at the site delayed the arrival of the emergency services.

### (b) Cause

The accident was caused by a glider launching wire which had been left lying on the runway and became caught around the port undercarriage of the



aircraft during take-off. The pull of the wire caused the aircraft to nose dive into the ground soon after it became airborne.

### **3. Recommendations**

There is a need for proper provisions for fire fighting at gliding sites operating powered aircraft. It is also recommended that a method of telephonic or radio communication should be established at all gliding sites so that emergency services can be alerted without delay should they become necessary.

R D Westlake  
*Inspector of Accidents*

Accidents Investigation Branch  
Department of Trade

May 1974