

Pegasus XL-Q Microlight, G-MWOX

AAIB Bulletin No: 3/2004	Ref: EW/C2003/05/01	Category: 1.4
Aircraft Type and Registration:	Pegasus XL-Q Microlight, G-MWOX	
No & Type of Engines:	1 Rotax 462 piston engine	
Year of Manufacture:	1991	
Date & Time (UTC):	7 May 2003 at 1710 hrs	
Location:	Fristling Hall Farm, Stock, Essex	
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:	Private Pilot's Licence	
Commander's Age:	67 years	
Commander's Flying Experience:	168 hours (of which 22 were on type)	
	Last 90 days - 0 hours	
	Last 28 days - 0 hours	
Information Source:	AAIB Field Investigation	

Synopsis

The pilot, who had not flown in the preceding seven months, was flying solo in good weather conditions from Fristling Hill Farm Airstrip in Essex. He made several attempts to land on both Runway 13 and the reciprocal Runway 31. The later stages of each approach however became unstable resulting in a go-around. During the final go-around from Runway 13 and re-positioning for a further approach to Runway 31 the aircraft climbed away at slow speed, in line with gently rising ground, and hit a solitary tree 30 feet agl. No defects were found in the airframe or engine that would have affected the normal handling or performance of the aircraft.

History of the flight

The pilot, who normally preferred to fly his aircraft accompanied by a more experienced pilot, had not flown in the preceding seven months. On the day of the accident no other pilots were available to join him so he asked a friend, who had no flying experience, to travel with him and remain on the ground at the airstrip while he carried out the flight alone. When they arrived at the airstrip the pilot proceeded to rig the aircraft. His friend, who assisted with the attachment of the wing, (permanently rigged and stored in a purpose-built shed at the airstrip) later commented on the pilot's diligence in checking and rechecking the aircraft during its assembly. After asking his friend to check that his helmet strap was correctly fastened, the pilot strapped himself into the aircraft saying that the flight would last between 20 and 30 minutes.

The engine started normally, the pilot taxied the aircraft up and down the runway four times, apparently to warm up the engine, and at 1653 hrs, the aircraft took off from Runway 13. The takeoff was normal and the aircraft became airborne when it was half way down the runway. It was then seen to climb straight ahead before commencing a left turn on to a downwind heading. Although he was aware that the aircraft remained in the vicinity, the pilot's friend did not watch all of the flight. He continued to hear the engine noise however, and reported that it sounded normal throughout.

Another pilot, one of four who maintained and operated aircraft from the airstrip, arrived by car at approximately 1700 hrs. As he approached the airstrip from the east the aircraft flew over him at approximately 500 feet agl. It appeared to be climbing away after a takeoff from Runway 13 and was seen turning left onto a westerly heading. On arriving at the airstrip this witness had a brief

conversation with the pilot's friend before watching the aircraft make an approach to Runway 13. As the aircraft neared the runway threshold it drifted to the left of the centreline and commenced a go-around. After a short turn to the left the aircraft re-positioned, at an estimated height of 100 feet agl, for a right hand circuit and approach to Runway 31. In the final stages of this approach the aircraft drifted to the right of the centre-line and went around again. It climbed more positively than on the previous go-around and overflowed the runway, levelled at 500 feet and eventually entered the downwind leg to carryout a right hand circuit to land on the reciprocal Runway 13.

The aircraft eventually turned to position for a long final approach to Runway 13. As it neared the threshold the pilot was seen to be making large control inputs to the wing. The aircraft then veered to the left of the centreline, a small increase in engine power was heard, the noise reduced momentarily and then increased again. The aircraft turned sharply to the left, climbed away at slow speed to the east of the runway and flew across a field and in line with the gently rising ground. Approximately 225 metres to the north-east of the airstrip, abeam the upwind end of Runway 13, the outer part of the aircraft's left wing struck the only tree in an elevated hedgerow 30 feet agl. A copse of similar height trees was situated some 50 metres to the north and to the left of the aircraft's track. The aircraft immediately yawed to the left and descended nose down and out of control into the field beyond.

The two men on the ground at the airstrip, witnesses to the accident, rapidly went to the scene to render assistance. They were joined by a walker who had also seen the accident. The pilot, who survived the accident, was eventually attended to by the emergency services and airlifted to hospital but he subsequently died of his injuries. There was no fire.

A post-mortem report revealed no evidence of any medical condition that may have caused or contributed to the accident.

Pilot's background

The pilot started microlight flying in 1988 and in 1992 became the owner of a Pegasus XL-R microlight. By 2001 he had accrued 97 hours on the type. The majority of this flying had been from the airstrip at London Colney (see Figure 1) located in a large field with good clearance from hedges and trees.



Figure 1

London Colney Airstrip

In 2001 the pilot joined a syndicate of pilots operating from the airstrip at Fristling Hall Farm (see Figure 2). Landing or departing aircraft from this strip are presented with more obstacles than at London Colney. The pilot flew his XL-R from this airstrip on three occasions in 2001.



Figure 2

Runway 31 at Fristling Hall Farm Strip

In March 2002 the pilot bought a more powerful, faster and heavier Pegasus XL-Q microlight. This aircraft, with its superior lift to drag ratio, has a different response to control inputs and is more demanding to land than an XL-R. During 2002 the pilot completed 13 hours in his XL-Q, often accompanied by a more experienced pilot. Three of the pilots who flew with the owner described his tendency to overcontrol the aircraft during the approach and his difficulty in maintaining the runway centreline during the final phase of flight. On occasions the owner had to initiate a go-around, sometimes with assistance from the other pilot.

The pilot was considered to be cautious in his approach to flying, took great care when rigging his aircraft and would not undertake a flight unless the weather was good. He was also recognised as being meticulous when it came to maintenance and paperwork. No log book entries, however, could be found recording his flying in the XL-Q. Furthermore there was no record of a current Certificate of Experience (C of E); the previous certificate having expired on 31 March 2003. Evidence that the pilot had completed 13 hours of flying in 2002 was derived from entries in the Aircraft and Engine Log Books, anecdotal evidence, and personal diary entries. This evidence indicated that, although a current C of E could not be found, the pilot had the requisite experience to maintain his currency.

Meteorological information

At the time of the accident a ridge of high pressure covered southern England giving light winds and fine conditions. The weather recorded at 1650 hrs and 1720 hrs at Southend Airport (approximately 10 nm to the south-east) gave the surface wind as 120°/6 kt and 140°/6 kt respectively. The temperature was +17°C with the dew point +6°C. The weather at Stansted Airport (15 nm to the north-north-east) was similar. Although a windsock was available at the airstrip it was not rigged and

the pilot had assessed the wind direction by throwing some grass in the air. This showed that the wind was blowing down Runway 13. Because an accurate assessment of the surface wind strength at the strip could not be made, it is not possible to say whether there were any significant wind rotors or turbulence present as a result of the nearby trees. Witnesses, however, did not comment that any turbulence was present.

Flight Recorders

Global Positioning System (GPS) equipment, installed in the aircraft, was retrieved from the wreckage. Although the equipment was damaged, it was possible to recover recorded data that enabled the aircraft's track to be reconstructed (see Figure 3).



Figure 3

Aircraft's track

(First circuit - green track; second circuit - blue track; final track - black track)

The recorded data ties in the aircraft's movements with those witnessed by the observers at the airstrip. Examination of the final go-around track shows that the aircraft turned approximately 30° to the left as it approached a position abeam the mid-point of the runway. There then followed a small turn to the left just before it struck the tree.

Survival aspects

The Pegasus XL-Q is equipped with a lap strap seat belt only. It restrains the occupant in the seat but does not prevent the upper torso from being thrown forward in an impact. The post mortem report indicated that the pilot suffered severe internal injuries to the chest and in particular the abdominal

area. It is possible that an upper torso restraint may have reduced the extent of these injuries, but given the severity of the impact with the ground, the accident may still not have been survivable.

Accident site information

The aircraft wreckage had been moved from the crash site prior to the arrival of AAIB personnel. According to eyewitness evidence, the aircraft struck the upper branches of a tree with its left wing before descending out of control into a field. The impact with the tree was confirmed by the presence of freshly broken twigs and small branches on the ground and in the undergrowth below. Impact marks in the soil and fragments of fibreglass from the trike fairing and the outer part of one of the propeller blades confirmed that the aircraft struck the ground approximately 35 metres beyond the tree.

Wreckage examination

An initial examination of the wreckage was conducted at the airstrip with the assistance of a British Microlight Aircraft Association (BMAA) Inspector. The wreckage was later recovered to the AAIB for more detailed examination.

Inspection of the wing revealed what appeared to be chord-wise scrape marks from foliage on the outboard section of the left wing leading edge. These could have been caused by contact with the tree, although this cannot be said for certain, given that the wreckage was dragged some distance over the grass when it was recovered back to the airstrip. The wing keel beam and left-hand leading edge tubes exhibited overload fractures that were probably associated with the ground impact. The wing may have incurred some structural damage when it struck the tree, but the severity of the damage caused by the ground impact precluded any assessment of this. There was a large tear and several smaller punctures in the fabric of the right wing upper surface close to the trailing edge. The fabric was also heavily stained with fuel and oil. The most likely explanation for this is that the trike had come to rest on top of this part of the wing after the impact.

The wing

The wing appeared to be correctly rigged and, as far as could be ascertained, no recent adjustments had been made to it by the pilot. The nose cone, which is a piece of fabric covering the opening at the apex of the wing and which should be fitted prior to flight, was missing. It could not be established if the aircraft had been flown in this condition. Given the pilot's meticulous procedures rigging, checking and re-checking the aircraft before flight however, this seems unlikely. That said, flight tests performed by the aircraft manufacturer and in-service experience have demonstrated that the absence of the nose cone does not significantly affect the low speed handling characteristics of the aircraft and it remains controllable at all speeds.

The trike

The ground impact had extensively damaged the trike, severing the keel beam just forward of the pilot's seat. The nature of the damage suggested that the aircraft was in a nose down attitude and yawed to the left at the time of impact. Two of the three propeller blades were very badly damaged, suggesting that the engine was producing significant power at the time. The fuel tank contained over 30 litres of fuel and fuel was found in the carburettor float bowl. No evidence of debris was found in the fuel system. The spark plugs were inspected and found to be in good condition and produced a good spark when the engine was turned over. The engine turned over freely and generated good thumb compression on both cylinders. There was no evidence of a throttle jam or malfunction and the hand-throttle operated normally. The foot-throttle could not be tested as its' cable had been severed in the impact. The carburettor was stripped for examination but this did not highlight any defects. The fuel, tested in another two-stroke engine, was fit for use.

Maintenance history

The general appearance of the aircraft suggested that it had been well maintained and cared for. The aircraft was subjected to an engineering inspection and a check flight on 7 April 2003 for the purpose

of the renewal of the Permit to Fly. These were conducted by an approved BMAA inspector (a different individual to that who assisted with the wreckage examination). No defects were reported during the engineering inspection and the aircraft performed normally during the check flight. The new Permit was issued accordingly on 10 April 2003 and was valid until 19 April 2004.

Analysis

Examination of the wreckage failed to identify any mechanical defects with the aircraft that might have prevented the pilot from being able to climb to a safe height during the final go around.

The pilot had hoped to carry out this flight, his first for seven months, accompanied by a more experienced pilot but this was not possible. Since purchasing this aircraft the previous year, he had often flown it dual with a more experienced pilot because it was more powerful and more demanding to land than his previous aircraft, a Pegasus XL-R. Three other pilots had flown with him during the 13 hours of flying he had completed in 2002. While they each remarked on the caution with which the pilot approached his flying, they also recalled that, when flying dual, he had a tendency to overcontrol on final approach and deviate from the runway centre-line. This had sometimes led to a go-around, occasionally requiring the assistance from the other more experienced pilot. The pilot would only fly solo if the weather was good and the winds were light.

The weather on the afternoon of the accident was fine and suitable for microlight flying. The pilot took great care checking and re-checking the rigging of his aircraft. Before takeoff he warmed the engine by carrying out four high speed taxi runs along the runway. The surface wind favoured Runway 13 and it was from that runway that the aircraft took off without any reported problems, either during the takeoff itself or the climbout.

GPS data, coupled with eyewitness reports, indicated that the aircraft made two approaches to Runway 13, an approach to Runway 31 and finally an approach to Runway 13 again. On each occasion the aircraft went around without touching down. After the penultimate approach to Runway 13 the aircraft carried out a low level circuit, estimated to be 100 feet agl, to Runway 31 and, following the final approach, it climbed in line with the gently rising ground as it turned away to the left of the runway. Approximately 225 metres north-east abeam the upwind end of Runway 13 the left wing of the aircraft struck a solitary tree in an elevated hedgerow. The wing struck the tree at a height of about 30 feet agl causing the aircraft to descend out of control into the field beyond.

The pilot was known to have had problems landing this aircraft in the previous year. Although the wind favoured a landing on Runway 13 he made approaches from both directions during this flight. The airstrip's windsock had not been raised, so the pilot did not have that visual indication of the surface wind direction and may have been assessing the best runway to land on. The aircraft was seen to drift to the east of the runway centre-line, away from a line of trees bordering the western boundary of the airstrip, on the second, third and final approaches. On the final approach the pilot was observed to be making large control inputs before going around. The aircraft then flew at low level in line with the rising ground. During the initial stages of this go-around, the pilot would have been able to see the copse 200 metres to the north-east of the runway, but the tree that the aircraft struck may have been obscured from his view by the copse. The pilot had already carried out one low-level circuit to Runway 31 and it is possible that this was his intention again.

For whatever reason, the pilot did not appear to appreciate the proximity of the tree. It is possible that, at the time of impact, he was looking to his right in the direction of the approach to Runway 31 or towards the airstrip itself. The turn to the left just prior to impact may have been a result of a control input caused by him turning to look in that direction.

Although a current C of E could not be found for the pilot, he had completed sufficient flying for the issue of such a certificate had he presented a record of his experience as pilot in command to an instructor. The absence of a certificate had no bearing on this accident and, although out of character, may have been an oversight by the pilot.