

# Piper PA-38-112 Tomahawk, G-CWFC

<b>AAIB Bulletin No:</b> 12/2002	<b>Ref:</b> EW/C2002/4/2	<b>Category:</b> 1.3
<b>Aircraft Type and Registration:</b>	Piper PA-38-112 Tomahawk, G-CWFC	
<b>No &amp; Type of Engines:</b>	1 Lycoming O-235-L2C piston engine	
<b>Year of Manufacture:</b>	1979	
<b>Date &amp; Time (UTC):</b>	1 April 2002 at 1010 hrs	
<b>Location:</b>	2 miles west of Cwmbran, Wales	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - 1 (Fatal)	Passengers - 1 (Fatal)
<b>Nature of Damage:</b>	Destroyed	
<b>Commander's Licence:</b>	Private Pilots Licence	
<b>Commander's Age:</b>	57 years	
<b>Commander's Flying Experience:</b>	142 hours (of which 91 were on type)	
	Last 90 days - 4 hours	
	Last 28 days - 3 hours	
<b>Information Source:</b>	AAIB Field Investigation	

## Synopsis

The PA38 Tomahawk aircraft, with two qualified private pilots on board, was en-route from Cardiff to Shobdon when it encountered deteriorating weather conditions. The aircraft turned north towards high ground several miles before the planned turning point, and hit an electricity pylon. The aircraft was destroyed and both pilots received fatal injuries.

## History of the Flight

The pilot and passenger, both PPL holders, arrived at the flying club with the intention of carrying out a return flight to a local airfield. The two pilots regularly flew together, with one flying the outbound leg and the other the return to Cardiff. Having assessed the weather as being unsuitable at Haverford West, the passenger called Shobdon Airfield and was told by the office administrator there, that the weather was very hazy and there was cloud lying on the hills to the west. He told Shobdon that they would attempt to fly there anyway, stating that they could always turn back if they encountered poor weather. The pilot requested an aircraft equipped with a VOR and an ADF

and having been told that GCWFC was available, both pilots met with the Deputy Chief Flying Instructor (DCFI). The DCFI, having been told by the passenger that 'the cloudbase at Shobdon was 1,800 feet and the visibility was good', authorised the flight and before both pilots walked to the aircraft, he asked them if they were happy with the weather and emphasised the need to keep clear of cloud. They replied that they were planning to route towards Monmouth rather than the direct track to Shobdon that would have taken them over high ground. Members of the flying club recalled that they were in good spirits and good humour as they prepared for the flight.

At 0959 hrs, they took off and departed the Cardiff Zone to the northeast via the Wenvoe Mast visual reporting point. At Cardiff there was a light southerly wind, 8 km visibility and a main cloudbase of 5,000 feet. Radio contact was made with the Cardiff Approach controller who provided them with a Flight Information Service and asked them what their maximum operating height was going to be. They replied that they would BE STAYING AT AROUND 1,500 FEET and were provided with the regional pressure setting. No further RT contact was made and the aircraft was last seen on Cardiff's radar approximately eight miles south east of the Brecon VOR. The aircraft was last seen by an eyewitness positioned on the western side of Cwmbran where the ground begins to rise steeply. This witness, a previous PPL holder, saw the aircraft flying in and out of the cloudbase at an estimated height of 200 feet agl. He recognised the aircraft as a Tomahawk and remembers it flying straight and level on a track of approximately 350°M. The engine sounded normal and there was nothing to suggest any sign of distress or difficulty.

At 1011:35 hrs the aircraft hit an electricity pylon close to the summit of Mynydd Maen, some 2 miles north west of Cwmbran. The pylon base was approximately 1,450 feet amsl and the aircraft hit the pylon approximately 80 feet above the ground. ATC initiated full overdue action at 1200 hrs, one hour after the aircraft was due to arrive at Shobdon and a Police Helicopter found the wreckage at 1236 hrs. The impact however had destroyed the aircraft and both occupants had received fatal injuries.

### **Radar Records**

Although Cardiff radar is not recorded, much of the aircraft's flight was detected and recorded by the Clee Hill radar situated to the south of Shrewsbury. This was capable of recording both primary and secondary radar returns but no height transmissions (mode C) were received. The aircraft was first detected at 1007:16 hrs proceeding along its planned track having just crossed the M4 motorway to the north of Cardiff. At 1010:35 hrs, overhead the southwesterly tip of Cwmbran, there was a positive turn onto a track of 350°M. This track was maintained until the aircraft's final recorded position, approximately 500 metres from the pylon, at 1011:24 hrs. Along this final track, the height of the ground rises rapidly from 400 feet to 1,500 feet amsl.

### **Pathology**

Post mortem examinations, carried out on both pilots, showed no evidence of pre-existing disease, drugs or alcohol which may have caused or contributed to the accident.

### **Weather**

The synoptic situation showed a light southwesterly flow over South Wales with a cold front moving eastwards to affect the area during the afternoon. An aftercast from the Meteorological Office, Bracknell, suggested that stratus, with a base of 600 to 1000 feet, could have been expected in the area particularly on the windward side of hills. Several people living in the area reported the

cloud as covering the mountaintop at the time of the accident with poor visibility on the mountainside and in the Cwmbran valley. The eyewitness positioned to the west of Cwmbran recalled some drizzle and very low cloud being blown on a brisk southwesterly wind. Another witness, several miles south of Cwmbran, remembered very poor conditions on the lower ground. This witness, another PPL holder estimated the visibility to be 3000 metres with a low cloudbase and drizzle. Satellite imagery showed isolated shower activity in the area.

### **Examination of site and wreckage**

The damage to the electricity pylon occurred around the top crossarm on the west side of the pylon, some 80 feet above ground level. The insulator suspended from this crossarm was struck at about its midpoint and the upper discs of the insulator had fallen to the ground. The separation of the insulator from the top crossarm allowed the top conductor to drop onto the middle crossarm and create an electrical short circuit, tripping the power supply. A number of the steel structural members were also damaged in the aircrafts impact.

The aircraft was badly disrupted by the impact with the pylon. The right wing and the empennage were both separated from the fuselage and were found close to the pylon. The top of the cockpit canopy was also separated from the fuselage and was found lodged in the middle crossarm. The right wing, the empennage and the canopy all showed distinctive impact damage and there were also marks from an impact to the leading edge of the left wing, close to the fuselage.

The pattern of damage to the pylon and the aircraft were a clear match, with the right wing striking the tower itself, the canopy and empennage striking the top crossarm and the left wing fracturing the insulator. The geometry of these contacts indicated that the aircraft did not have any significant rate of climb or descent at impact and that the first contact occurred with G-CWFC in straight and level flight. The distribution of the wreckage on the ground was consistent with a ground track of about 350°M before impact and with the impact occurring at cruising speed.

Examination of the aircraft wreckage showed that the airframe was structurally intact before contact with the electricity pylon. All the mechanical fractures found in the flying control system were consistent with the damage sustained in the impacts with the pylon and then with the ground.

### **Analysis**

The two pilots, who regularly flew together, arrived at the flying club intent on a return flight to a local airfield. Having decided that conditions were unsuitable for a flight to Haverford West they elected to depart for Shobdon knowing that the weather there was marginal for VFR flying. The DCFI stated that the passenger had told him the weather was suitable at Shobdon with a cloudbase of 1,800 feet and good visibility and the weather at Cardiff was well within the limits for VFR flight when they departed.

The initial part of the flight appears to have been flown as planned and having transmitted briefly to Cardiff Approach, there were no further R/T communications. The change to the planned routing occurred at Cwmbran when a positive turn off track towards the high ground was initiated. The reason for this turn could not be determined.

It is probable that ahead of them they were faced with weather conditions outside the limits of VFR. They would therefore have had the choice of climbing above the weather or turning to avoid it. As neither of them held a current IMC or instrument rating, it is unlikely they considered the

option of climbing into cloud. A turn back towards Cardiff, where the weather was known, would have been the more logical choice. Why they turned left towards the high ground could not be determined. It may have been that the weather looked brighter in that direction or that the turn kept them closer to their planned route. In turning however they then found themselves flying in and out of the cloudbase, making it difficult to navigate and maintain visual contact with the ground. Although their chart showed the height of the ground ahead of them, it did not show the pylons. The pylons, being less than 300 feet high, are not required to be depicted on the aeronautical chart (1:500,000) and thus the pilots may have been unaware of their presence. It is possible that they maintained level flight throughout this period for they hit the pylon at approximately 1,500 feet amsl, their planned altitude for the route. The ground that rose rapidly beneath them was relatively featureless and there would have been few visual cues as to the reducing vertical separation. Post accident investigation showed that on their track the pylons contrasted very poorly with the background. The fact that the impact with the pylon was in straight and level flight suggests that neither of the pilots had any significant warning of their presence.

Another less likely scenario was the possibility of a navigational error. Colleagues from the flying club stated that, although they carried a GPS with them, both pilots had recently been trying to use basic map and compass navigation techniques to prevent an over reliance on the GPS system. In the poor visibility they may have mistaken the town of Risca for Cwmbran and turned earlier than intended. Their planned track after the turn, however, was 010° M, 20° to the right their flown track of 350° M. Furthermore, the planned turning point was a lake close by Cwmbran and not the town itself.

In the event they encountered deteriorating weather conditions and struck the pylon in apparently controlled flight. Although the reasons leading to them adopting their final track remain unresolved it is apparent that the option to turn back towards Cardiff was not taken.