AAIB Bulletin No: 4/93	**Ref: EW/C92/12/2** **Category: 1c**
Aircraft Type and Registration:	Cessna 182N Skylane, G-WACV
No & Type of Engines:	1 Continental 0-470-R piston engine
Year of Manufacture:	1971
Date & Time (UTC):	6 December 1992 at 1653 hrs
Location:	Near Luxter's Farm, 3.5 nm west-south-west of Wycombe Air Park, Buckinghamshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - Fatal Passengers - Fatal
Nature of Damage:	Aircraft destroyed
Commander's Licence:	Private Pilot's Licence with Night and IMC ratings
Commander's Age:	57 years
Commander's Flying Experience:	963 hours (of which 887 were on type) Last 90 days - 45 hours Last 28 days - 7 hours
Information Source:	AAIB Field Investigation

History of the flight

On Saturday 5 December 1992 the pilot and his wife embarked on an uneventful two hour flight from Wycombe Air Park to Newcastle. On the day prior to the accident, a club instructor had refuelled the aircraft with 138 litres of 100LL aviation fuel bringing the tanks to their full capacity of 299 litres. This gave the aircraft an estimated endurance of just over 6 hours.

At approximately 1400 hrs, on Sunday 6 December 1992, the pilot reported to the flight planning and briefing facility at Newcastle Airport. Declining the offer of a meteorological information folder from the ATC assistant on duty at the time, the pilot booked out for his return flight to Wycombe.

Having departed Newcastle at 1418 hrs, the pilot continued southwards requesting en-route Radar Information Services (RIS) from Teesside and RAF Leeming. At 1509 hrs the Leeming radar controller advised the pilot of conflicting traffic which was ahead of his aircraft and heading

towards him. The pilot, who was in cloud, could not see the confliction and asked for a heading to avoid the traffic but he was told that the controller could not provide this service as the aircraft was at the base of the radar cover at 2,000 feet and below the sector safety altitude. The pilot then, in the hope of clearing the cloud, descended to 1,500 feet.

The pilot next contacted the radar units at Humberside, RAF Waddington and East Midlands. At 1559 hrs, while still in contact with the East Midlands controller, he requested the weather at Wycombe Air Park . The East Midlands controller obtained this by telephone from the Wycombe controller, who was not a qualified meteorological observer, and passed it to the pilot with the caution that the weather report was "very unofficial". The information transmitted was: "RUNWAY 25. THE SURFACE WIND IS BETWEEN 150° AND 180°, 15 TO 30 KT, ITS RAINING. THE UNOFFICIAL VISIBILITY 4,000 METRES AND THE CLOUD BASE IS BETWEEN 800 FEET AND 1,200 FEET.....AND DO YOU INTEND TO CONTINUE TO BOOKER?". The pilot replied in the affirmative and passed his ETA as 1650 hrs.

At 1607 hrs the aircraft was 16 nautical miles north of Daventry at 1,500 feet. The pilot, now in contact with Luton Radar, requested a Radar Information Service but was told that he could only receive a "LISTENING WATCH" until he was in radar contact and he was passed the Regional QNH. At 1631 hrs the Luton controller transmitted "CHARLIE VICTOR, IDENTIFIED ABOUT SIX MILES NORTH OF WESCOTT. RADAR INFORMATION SERVICE WHICH IS LIMITED DUE TO WEATHER CLUTTER. I CAN ONLY PROVIDE INFORMATION ON OTHER AIRCRAFT WITH TRANSPONDER. CONTINUE OWN NAVIGATION. LUTON QNH 995 MB". The pilot replied that he understood and copied the QNH as 995 mb.

At approximately 1623 hrs the pilot briefly left the Luton frequency to obtain a weather update direct from the Wycombe controller. The controller passed a report of rain with the wind of 140°/18 to 25 kt occasionally 30 kt and a cloud base report (made 10 minutes earlier) of 1,200 feet with the Wycombe QFE of 974 mbs. Having noted the details the pilot returned to the Luton frequency.

At 1637 hrs the Luton controller asked the pilot to report his altitude. He replied that he was now at 1,000 feet. The controller transmitted " THAT'S UNDERSTOOD. DUE TO THAT LEVEL I'VE LOST YOU FROM RADAR CONTACT SO I'LL HAVE TO SUSPEND THE RADAR SERVICE AND I DON'T HAVE A PRIMARY (radar contact) ON YOU EITHER AT THAT LEVEL.....LISTENING WATCH ONLY". At 1640 hrs the pilot advised that he was changing to the Wycombe frequency.

The pilot transmitted to Wycombe that he was now on their frequency and was instructed by the controller to join left base for runway 07 (runway 07 is 735 metres long and is equipped with threshold, side lights and a low intensity two colour approach slope lighting system set at an approach angle of 4°). At 1649 hrs the pilot asked for a magnetic track towards the airfield. The controller replied " AFRAID NOT...I'VE GOT NO DIRECTION FINDING EQUIPMENT HERE.....WE'VE GOT OUR GREEN LIGHT (aerodrome identification beacon) ON IF THAT MEANS ANYTHING TO YOU....ARE YOU BELOW THE CLOUDS OR ABOVE THEM?". The pilot replied that he was below clouds and that he was just crossing the M40 motorway. There then followed a brief discussion about where in relation to the motorway the pilot had been and whether he had seen any lights on the motorway. A moment later the pilot advised that he thought that he had "ABOUT 2 MILES TO RUN". The controller advised that the runway lights were on high intensity and that the lights from the nearby football stadium reflecting on the cloud base might also act as a guide to the airfield. At 1651 hrs the pilot transmitted that he was reasonably confident where he was but that he could not see the runway lights or the airfield beacon. Seconds later the controller asked "ARE YOU ACTUALLY FOLLOWING THE M40". The pilot replied "NO I'M COMING ON TO I HOPE ONTO ZERO SEVEN". This was the last transmission recorded from the aircraft.

The controller, unaware that the aircraft had crashed, transmitted asking the pilot if he had switched on his landing lights. He did not receive a reply but continued to transmit for a further two minutes in the hope of making contact with the aircraft. At 1653 hrs, the controller contacted the London Air Traffic Control Centre (LATCC) supervisor and initiated overdue action.

A witness, located in the village of Southend, 1 km from the crash site, reported that at the time of the accident she heard "an aircraft with a loud revving engine noise going up and down almost like revving to climb". She then heard "a sound like a falling tree; a swish followed by a thud". She looked outside and saw nothing of the aircraft but reported that "it was raining very hard and was very misty".

At 1804 hrs local police discovered the wreckage of the aircraft approximately 3.5 nm west south-west of Wycombe Air Park in woods on a ridge near Luxter's farm. The aircraft had been completely destroyed with the pilot and passenger receiving fatal injuries.

Impact and Wreckage Information

The aircraft crashed on a northerly heading, at 70° to its required track to Wycombe, colliding with trees on the crest of a ridge at 590 feet amsl. The aircraft entered the trees about 70 feet above ground level. Its collision with the trees did not provide any precise indications of its descent angle

or attitude but the general indications were that it had been upright but descending at an angle approaching 20°. Although no precise evidence was obtained of the aircraft's speed at impact, the general indications were of relatively high speed; the aircraft structure was highly fragmented by its earliest impacts with the trees. The forward fuselage contained enough energy to cause it to be wrapped round the base of a tree that it collided with 200 feet from the first impact points. The engine detached and came to rest 340 feet from the first collision. The propeller showed evidence of rotation and one blade in particular showed a degree of helical distortion which is normally associated with a high level of power. The two separated portions of wing which had contained the fuel tanks exhibited a bulging distortion which indicated that there had been a considerable quantity of fuel in the tanks at impact. An altimeter dial face was found with a subscale setting of 974 mb which was the reported QFE for Wycombe.

Further examination showed the aircraft to have been complete at impact and no evidence of any pre-impact failure of the controls was identified. The flaps had been set at 11°; all the failures in the flap system were in overload and appeared to have been a result of the crash. No evidence was found of an asymmetric flap deployment. The engine was dismantled but nothing anomalous was found in its mechanical condition. The propeller governor was rig checked satisfactorily and an examination of the pitch change mechanism revealed no pre-impact defects. Evidence from the oil pressure gauge suggested that oil pressure had been in the normal operating range at impact.

Both navigation and communication radios had been damaged and their mechanical drum type frequency displays displaced and distorted. The No 1 unit's navigation frequency display did not provide reliable evidence of the selected frequency and a VOR display, thought to be No 1, was found with the Omni bearing Selector set at 160°. The No 2 navigation frequency display was less severely damaged and its selected frequency was 114.35 MHz which is the frequency for Compton VOR. The No 2 VOR display unit was not found but it is noted that Wycombe airfield is located on the Compton VOR 070° radial.

Meteorological information

An aftercast obtained from the Meteorological Office at Bracknell confirmed the general weather situation for the route as an occluded front lying from Aberporth, Wales, to Exeter, giving a visibility in the Newcastle area of approximately 15 to 20 km with no significant weather and scattered strato-cumulus cloud around 5,000 feet with a broken layer of alto-cumulus above 10,000 feet. The mean sea level pressure was 996 mb, surface wind 170°/10 kt and temperature +4°C. The journey southwards was into progressively deteriorating conditions. The precipitation from the advancing occlusion was probably encountered in the Sheffield area with a lowering of

the alto-cumulus and alto-stratus layer of cloud and with development of stratus around 1,500 feet which also thickened and lowered in the Wycombe area.

At 1700 hrs the occlusion was lying from Southampton to Gloucester moving northeast at 25 kt. The weather at Wycombe was moderate rain, visibility between 5,000 metres and 7,000 metres with broken cloud 500 feet to 800 feet above mean sea level (amsl) and the main cloud base at 1,000 feet to 1,300 feet amsl. The mean sea level pressure was 993 mb with a surface wind of 150°/15 to 20 kt.

The airfield at Wycombe is 520 feet amsl. The weather conditions at the time of the accident would therefore have given rise to areas of cloud on or close to the surface.

Pilot's flying experience

The pilot started flying training in November 1978. By July 1980 he had flown a total of 52 hours on Cessna 150 aircraft and obtained his Private Pilot's licence. Six weeks later, on his first flight since becoming qualified, he was involved in an accident when his aircraft crashed into trees whilst low flying in the vicinity of Chinnor, Oxfordshire. As a result, he was convicted by magistrates on two charges of endangering an aircraft. By March 1984 he had accumulated 80 hours all of which was on the Cessna 150/152.

In April 1984 the pilot bought a Cessna 182, an aircraft with more sophisticated navigation equipment than a Cessna 150, which he based at Wycombe Air Park (Booker). From that date until June 1992 he flew his own aircraft accumulating 747 flying hours mainly within the United Kingdom but with some flights to France, Germany and Spain. One of the resident flying clubs at Wycombe Air Park administered the aircraft on his behalf, overseeing the maintenance and hiring it to other club members when it was not being used by the owner.

In July 1992 the pilot started a Twin Engine conversion course intending to sell his Cessna 182 and purchase a twin engined Cessna 310. At the time of the accident he had sold his own aircraft and was awaiting the arrival of its replacement. The accident flight was conducted in another Cessna 182 belonging to the club.

Medical aspects

At the age of 18 years the pilot had suffered a head injury which gave rise to post-traumatic epilepsy. At the time his first CAA medical certificate was issued he had not suffered any fits for

over 20 years and was not receiving treatment. The pilot also had a long medical history of gradually increasing blood pressure but this was kept under control with treatment. At the time of the accident his fitness to hold a private pilot's medical certificate was under 6 monthly review by the CAA Medical Branch. The normal medical certificate renewal period for a private pilot aged 50-70 years is 12 months.

Post mortem examination revealed that both the pilot and passenger had suffered multiple injuries consistent with the impact. Furthermore the pathologist's report considered that although the medical condition of the pilot could not be ruled out as a cause of the accident it was considered 'inherently unlikely'.

Radar and RT information

Computerised radar information, obtained from the radar transmitter situated at London Heathrow, was used to plot the aircraft's track and ground speed. The radar plot confirmed the aircraft's route, in the later stages of the flight, as having overflown the village of Chinnor on a southerly heading before passing close to the telecommunications relay tower at Stokenchurch, adjacent to the M40 motorway. The aircraft then overflew Ibstone Common and Turville Park before passing 500 metres to the east of the village of Stonor. The final ten plots then showed the aircraft on a track of approximately 090°(M) before it turned on to a northerly heading just prior to impact. The average ground speed in the final seconds of flight was measured as 75 kt. With a wind of 150°/20 kt this would have given an IAS of 85 kt.

RTF transcripts from Wycombe Air Park and the radar units contacted by the pilot whilst en-route were used, in conjunction with the radar information to determine the interrelation of events.

Aerodrome operating minima for private pilots

Civil Aviation Authority Publication (CAP) 507 advises on aerodrome operating minima for private pilots.

Relevant extracts from this document are reproduced below:

> 'The purpose of this publication is to assist pilots to make sound judgements, appropriate to the circumstances on
>
> (a) the minimum visibility and cloud ceiling for take off,
>
> (b) the minimum height to which they should continue an approach on instruments, and

(c) the minimum visibility and visual reference required to continue an approach to a safe landing

by informing them of the methods of calculating aerodrome operating minima and the factors to take into account.

AERODROMES WITHOUT INSTRUMENT APPROACH PROCEDURES

Pilots should not deliberately attempt to make approaches in bad weather to aerodromes without published instrument approach procedures. The procedures outlined below are only for use when caught out by unforecast bad weather.

The International Civil Aviation Organisation has established criteria by which instrument approach procedures are designed. The designer's task is complex and requires considerable knowledge and up-to-date survey information of obstacles. It is most unwise to devise do-it-yourself instrument approach procedures since the necessary information and expertise will not be available and the desired obstacle clearance will not be achieved.

For landings at aerodromes that do not have published procedures pilots should use the procedure at a nearby aerodrome to achieve safe visual contact with the surface and then fly to the destination while conforming with the privileges of his licence, the visual flight rules (*At speeds of 140 kt or less: clear of cloud, in sight of the surface with a forward visibility of not less than 1,500 m or 1,800 m if taking off or landing*), and low flying rules (*No closer than 500 ft to any person, vessel, vehicle or structure unless landing or taking off in accordance with normal aviation practice*). If visibility for navigation and collision avoidance, at least 1 nm but preferably 3nm forward visibility, cannot be maintained at a safe height the pilot should climb and divert to a suitable aerodrome.

The minimum height to which an en-route instrument descent in cloud may be made is 1,000 ft above the highest obstacle within 5 nm of track provided that the low flying rules are not contravened.....'