ACCIDENT

Aircraft Type and Registration:	Piper PA-32-301 Saratoga, G-BMDC
No & Type of Engines:	1 Lycoming IO-540-K1G5 piston engine
Year of Manufacture:	1980
Date & Time (UTC):	16 September 2007 at 1609 hrs
Location:	Shotteswell, near Banbury, Oxfordshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (Fatal) Passengers - N/A
Nature of Damage:	Damaged beyond economic repair
Commander's Licence:	Private Pilot's Licence
Commander's Age:	58 years
Commander's Flying Experience:	Approximately 200 hours (of which 4 were on type) Last 90 days - N/K hours Last 28 days - N/K hours
Information Source:	AAIB Field Investigation

Synopsis

The pilot was attempting to take off from the shorter of two runways at a private airstrip at Shotteswell, near Banbury, having earlier landed on the longer runway. Advice in the airstrip's entry in a general aviation flight guide indicated that a takeoff by that type of aircraft, from that runway and flown by a pilot of his experience was not recommended. During the takeoff the aircraft cleared a hedge at the upwind end of the runway but stalled and struck trees on the far side of a road running alongside the airstrip. The aircraft crashed in the field beyond and the pilot was fatally injured. There was no fire.

Subsequent performance calculations indicated that there was insufficient clear distance on the short runway for the takeoff to be successful.

History of the flight

The pilot had hired the aircraft for the afternoon and had advised the owner/operator (a flying club) that he was planning to fly from Wellsbourne Mountford Aerodrome to the south-east, then to an unspecified destination to pick up a friend. He then intended to fly west along the south coast to overfly a member of his family who lived in the Exeter area, before dropping his friend back at their meeting point and returning to Wellesbourne Mountford. There was also some suggestion that he might land at Turweston en route to the south-east.

The aircraft departed Wellesbourne Mountford at 1107 hrs with full fuel and only the pilot on board. It overflew a private grass airstrip at Shotteswell, 10 nm to the south-east, and continued south, crossing the

south coast of England at Seaford and arrived at Dieppe [Saint-Aubin] Airport, France at 1243 hrs. (This was established from data that was subsequently retrieved from GPS equipment which was recovered from the aircraft after the accident.) The pilot carried out two approaches to Dieppe Airport, landing successfully off the second attempt. He did not make any radio calls and, after landing, told ATC that he could receive calls on the radio but was unable to transmit.

The pilot had experienced difficulty with the radio at Wellesbourne Mountford before his departure. He had been able to transmit but did not seem to be receiving incoming calls. The problem was diagnosed as an incorrect switch selection and was resolved before G-BMDC took off. Apart from his initial calls on departure from Wellesbourne Mountford, there was no record of the pilot making any other radio calls southbound or, later, northbound.

The pilot was seen to make some phone calls while he was on the ground at Dieppe, then, without refuelling, G-BMDC took off at 1417 hrs, again with only him on board. He returned across the English Channel and followed much the same track back towards Wellesbourne Mountford. As it approached the airstrip at Shotteswell, the aircraft completed a right-hand circuit and was seen to make a low approach to Runway 33, the longer of its two runways. The aircraft carried out a go-around and completed another circuit before landing. On both approaches it was apparent to observers on the ground that the pilot had to contend with a crosswind from the left. The GPS data indicated that during the touchdown the aircraft veered to the left, possibly off the runway, before returning to the prepared runway surface (see Figure 1). After landing, G-BMDC remained at the end and to the left of Runway 33 for two and a half minutes before backtracking along Runway 33 to the threshold, where

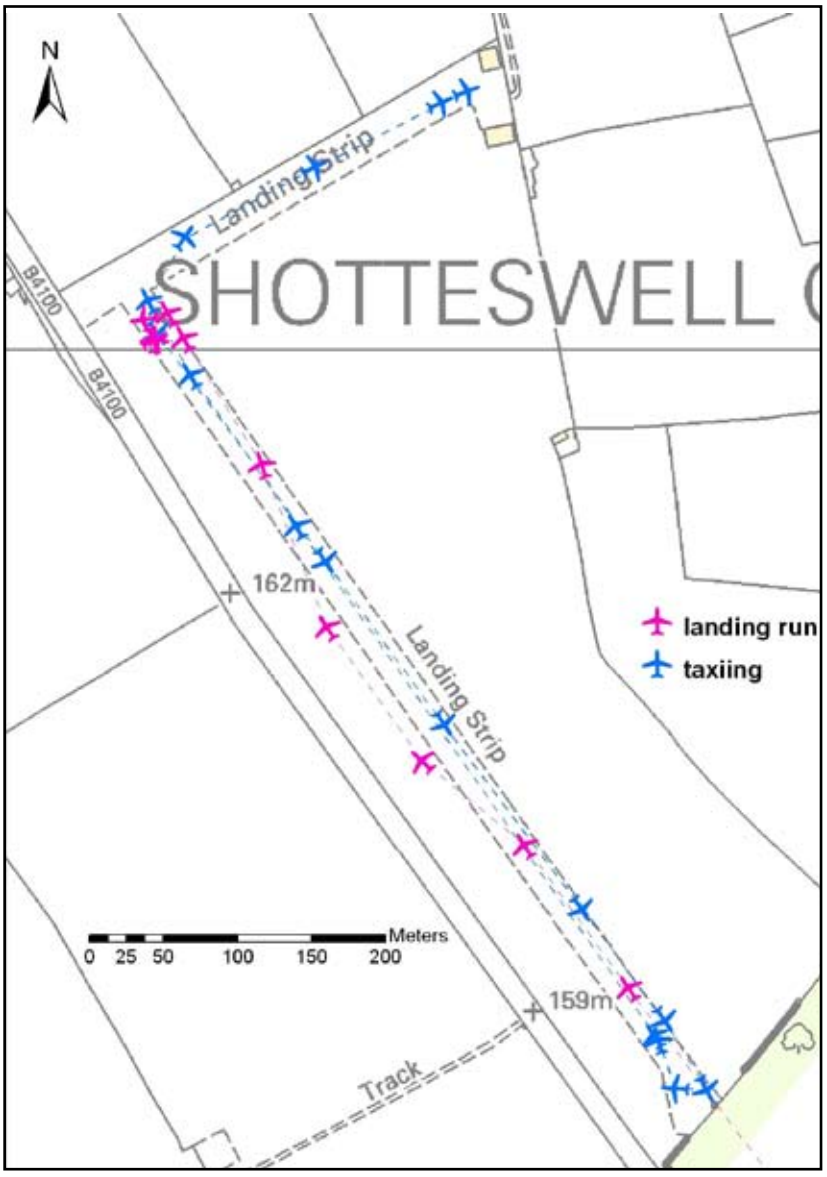

Figure 1

Landing and subsequent taxiing at Shotteswell airstrip prior to accident flight

it remained for three and a half minutes. It then taxied back along the runway and down the shorter Runway 25 to its threshold. The aircraft was last recorded at that position, by the GPS unit, at 1608:36 hrs.

Between 1600 hrs and 1700 hrs, two members of a family, who were walking along a footpath in an adjacent field, about 800 metres away, saw a light coloured aircraft trying to take off from Runway 25. Before it had completed the takeoff, the aircraft disappeared from their view behind a hedge although one of these two witnesses did recall seeing the aircraft's wheels leaving the ground. Within a few seconds, the sound of the high revving engine stopped, silence returned and they thought that the pilot had either aborted the takeoff or been successful and flown off into the valley to the west.

At about 1610 hrs a couple were driving south along the B4100, a road which runs parallel to and immediately to the west of the grass airstrip. As they approached the airstrip they were startled by a small white aircraft which rose up sharply from behind a hedge on their left, about 100 metres ahead. It was in a nose-up attitude, banked steeply to the left, possibly as much as 90°, such that they could view the underneath of the fuselage. It flew across the road from left to right, with the roar of its engine clearly audible, appeared to clear the trees on their right and descended into the field beyond. Although he did not see the aircraft strike the ground, the driver immediately stopped the car, got out and ran across the road. Through a hedge, he could see the aircraft on the ground, inverted in the middle of the field.

Whilst he ran towards the aircraft, his wife phoned the emergency services; the call was timed at 1609 hrs. When the driver arrived at the left side of the aircraft he saw the pilot motionless inside the cabin, suspended upside down in his harness. The aircraft's left cabin door was jammed, so the driver ran to the opposite door, which did open, and, after removing the front passenger seat, which was blocking his access, released the pilot from his harness and pulled him half out of the aircraft. The pilot seemed to be unconscious but there were signs of life.

At that point the driver's wife arrived, still in contact with the emergency services on her mobile phone. They provided continuous first aid advice until the first ambulance arrived at 1621 hrs, shortly followed by the other emergency services. Attempts to revive the pilot were unsuccessful and he was pronounced dead at the scene. There was no fire.

Pilot

In August 2004 the pilot began a course of instruction for a Private Pilot's Licence (Helicopters). He did not complete the course and commenced a course for a Private Pilot's Licence (Aeroplanes) PPL(A). In August 2005 he qualified for his PPL(A), with a Single Engine Piston (SEP) (Land) class rating. This rating was revalidated in May 2007 and was valid until July 2009.

One week before the accident he received an instructional flight in G-BMDC, his first flight in that type of aircraft. This check flight, which included general handling and circuits, enabled him to hire the aircraft for private flights from the owner/operator, a local flying club.

For about six months the pilot had been a part-owner of a Piper PA-28R-201T. There was anecdotal evidence that he may have flown into the airstrip at Shotteswell prior to the accident, but no record of such flights could be found. He was also known to have conducted cross-country flights to Belgium, France, the Scilly Isles and Dublin.

The pilot held a Joint Aviation Authorities (JAA) Medical Certificate Class 2 which was issued on 11 April 2007 and expired on 11 April 2008. His total flying hours declared on his medical form on the date of issue were 175 hours. His log book for his fixed wing flying could not be located but it was understood that he had flown approximately 200 hours in total.

Aircraft information

The aircraft was a Piper PA-32-301 Saratoga powered by a 300 hp Lycoming IO-540-K1G5 piston engine driving a three-bladed constant speed McCauley propeller. The aircraft was of conventional design with conventional mechanical flying controls and fixed tricycle landing gear. It was equipped with six seats including the pilot's seat. The aircraft's last annual inspection was in November 2006 and its last 50-hour check was completed on 31 August 2007. At the time of the accident the airframe had accumulated 3,980 hours; the engine had accumulated 598 hours; and the propeller had accumulated 91 hours.

Meteorology

During the investigation an aftercast was obtained from the Met Office. The synoptic situation indicated that a cold front, which was orientated from north-east to south-west, lay to the north-west of Shotteswell and was moving in a south-easterly direction. It was estimated that there was scattered or broken cloud at the accident site with a base at 2,200 ft agl, although it was possible that the cloud base was higher than that, between 2,600 ft and 3,800 ft agl. Visibility was assessed as being greater than 20 km, possibly as much as 60 km, and the surface temperature was estimated to be +18°C.

There was no inclement weather affecting the area, but there was a strong westerly gradient resulting in a surface wind estimated to be from 220° at 15-20 kt, gusting from 25 to 30 kt. The wind at 1,000 ft agl was estimated to be from 260° at 35 kt. It is likely that there was moderate turbulence. The airfield has an elevation of 530 ft amsl and the QNH pressure setting at the time was 1,007 hPa.

At 1609 hrs, a meteorological observation at Wellesbourne Mountford recorded a surface wind from 250° at 15-18 kt and a temperature of 19°C.

Airstrip information

Shotteswell Airfield is a private unlicensed airstrip for which visiting aircraft require no prior permission. Its details, as supplied by the airstrip owner, appear in a number of general aviation flight guides, and the pilot was carrying a copy of an entry for the airstrip from an edition of such a guide, with an effective date of 25 November 2004. This gave details of two grass runways; 15/33 and 09/27. Their lengths were given as 853 metres and 400 metres respectively, and these distances were also listed as the relevant Take-Off Runway Available (TORA) for each runway. Under ***Remarks***, there was a note which stated:

> *'Rwy 09/27 use only when crosswind precludes use of Rwy 15/33… Rwy surface maintenance excellent.'*

And, under an adjacent section headed ***Warnings***, it stated:

> *'Rwy 09/27 only recommended for use by microlights, STOL ACFT & experienced pilots due to parked ACFT & hangars Rwy 27 Thr. Also upslope from Rwy 27 Thr.'*[1]

Footnote

[1] STOL ACFT means aircraft capable of conducting a 'Short Takeoff and Landing'.

The entry for Shotteswell, in the 2007 edition of the flight guide being used by the pilot (effective date 23 November 2006), which was current at the time of the accident, showed two grass runways; 15/33 and 07/25. Their respective lengths were given as 853 metres and 350 metres, with the TORA for Runway 15/33 being 700 metres in each direction. Hence, between November 2004 and November 2006 the orientation and length of Runway 09/27 had been changed and shortened. The entries in the ***Remarks*** and ***Warnings*** sections were the same as in the earlier edition, but with Runway 09/27 now identified as Runway 07/25. The runway length information in the guide was based on the information provided by the owner of the airstrip and was not independently verified. Using owner-provided information is common practice when compiling these guides.

In its introduction, the flight guide used by the pilot stresses, that it:

> *'is a guide only and it is not intended to be taken as an authoritative document.'*

A survey of the airfield immediately after the accident indicated that the useable length of Runway 25 was 302 metres, with a 1.6% upslope; this distance did not include the grass area in front of the hangar which was not considered useable by an aircraft of the size of G-BMDC. Including the grass area in front of the hangar resulted in an approximate 'hedge-to-hedge' distance of 330 metres. At the western end of the runway was a hedge which was approximately 18 to 22 ft tall. Immediately on the other side of that was a single carriageway road, the B4100, on the far side of which stood trees that were approximately 30 to 40 ft in height. See Figures 2 and 3.

During the investigation it was noted that the information given for this airstrip in the 2007 edition of another flight guide relating to private airfields, was also incorrect.

Figure 2

Runway 25 from the threshold

Figure 3

Approximately halfway along Runway 25

The east-west runway was designated 09/27 and given as 853 metres in length. This publication includes the advice that:

> *'it should be used as a guide only and must not be treated as official work, and the editor, publishers, owners and operators cannot be held responsible for any inaccuracies or omissions therein.'*

The inaccuracies in the flight guide being used by the pilot, and the other relating to private airfields, were brought to the attention of the owners of the airstrip and the publishers of the two guides.

The Civil Aviation Authorities (CAA's) General Aviation Safety Sense Leaflet 12d, entitled *Strip Sense,* provides comprehensive guidance on the use of unlicensed aerodromes and private airstrips. Included is the following advice to pilots:

> *'It is important to realise that the CAA criteria for the licensing of an aerodrome, e. g. clear approaches without power or other cables, no trees or obstructions close to the runway and so on, are unlikely to have been applied to the strip….'*
>
> *Tell the operator of the strip what experience you have, which strips you have used recently, and what aeroplane you intend using. He has probably seen pilots with similar aeroplanes flying into and out of the strip and you can benefit from local knowledge….*
>
> *The length of the strip must be accurately established….*
>
> *Consider having a familiarisation flight to and from the strip with a pilot who knows the strip and*

is both current on your aeroplane and operations into grass strips….

If the strip is shorter than you are used to or has difficult approaches, you should arrange for a flying instructor to appraise your flying skills and revise and improve short field, soft field, general circuit and airmanship skills….

Work out an acceleration check point from which you can stop if you haven't reached sufficient speed to make a safe take-off.'

Procedures

The Pilot's Operating Handbook (POH) for the PA-32-301 specifies the procedures to use during takeoff. For a short field takeoff with obstacle clearance it states:

'Lower flaps to 25°, accelerate aircraft to 58 to 66 KIAS, depending on aircraft weight, and ease back on the wheel to rotate. After breaking ground, accelerate to 61 to 71 KIAS, depending on aircraft weight, and climb past obstacle. Continue climb and accelerate to best rate of climb speed 90 KIAS, and slowly retract the flaps.'

The POH also gives advice on *STALLS*. It states:

'The gross weight [3,600 lbs] stalling speed with power off and full flaps is 58 KIAS. With flaps up this speed is increased by 4 KTS. Loss of altitude during stalls can be as great as 500 feet, depending on configuration and power.'

The POH details airspeeds '*which are significant to the safe operation of the airplane'*. Included is the aircraft's maximum demonstrated crosswind velocity of 17 kt.

The owner/operator of the aircraft stated that they did not permit the operation of the aircraft from grass runways.

Accident site and wreckage examination

The aircraft wreckage was found lying inverted in a field beyond the end of Runway 25. The ground scars and wreckage distribution were consistent with the aircraft having hit the ground with its left wing tip first, in a steep left bank, before impacting on its nose and cartwheeling to the right. Both wing spars failed during the impact sequence. There was evidence that the aircraft's left wing had struck trees that were approximately 30 metres from the end of Runway 25, as depicted in Figure 4. The aircraft's left wing tip strobe light housing was found at the base of these trees which were approximately 30 to 40 ft high.

There were three propeller slash marks in the ground where the nose of the aircraft had hit. All three propeller blades had separated from the hub. One blade was embedded in the ground by the slash marks. Another blade was resting on the ground 24 metres further along the wreckage trail, and the third blade was resting on the ground 95 metres south-east of the aircraft wreckage. All three blades had chordwise scratches consistent with rotation at impact. The distance between the first two propeller slash marks was measured at 25 cm which meant that a linear relationship between ground impact speed and engine rpm could be established. If one assumed that the engine was turning at the normal takeoff rpm of 2,700 then the ground impact speed was approximately 66 kt. If one assumed a low impact speed of 40 kt then the rpm could have been as low as 1,650. However, the extent of damage to the aircraft and injuries to the pilot would suggest a ground speed of greater than 40 kt and closer to 66 kt, so an engine rpm of greater than 1,650 was likely, which would indicate that the engine was producing power.

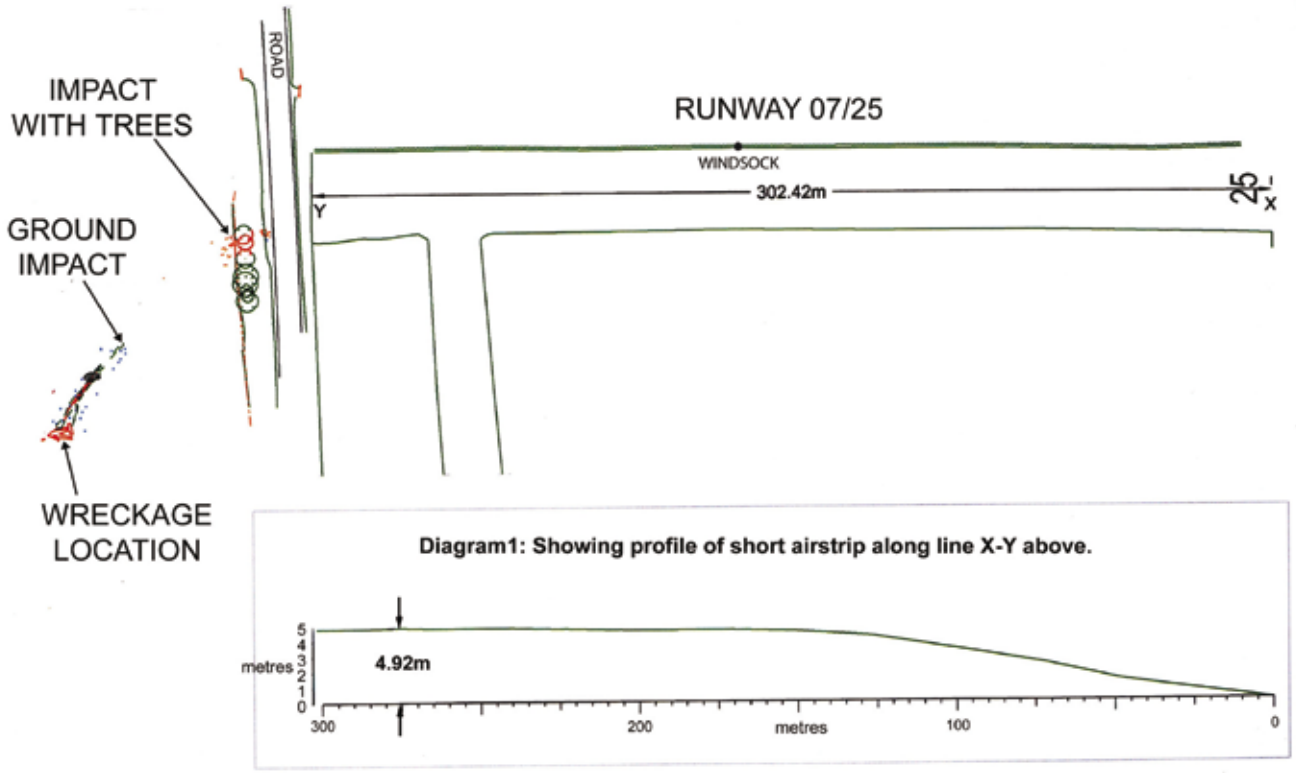

Figure 4

Runway length and profile with relative impact and wreckage locations.
(Note that the x and y axes in the vertical profile have different scales;
the total upslope gradient is 1.6%.)

The fuel tank in the right wing was intact and contained approximately 15 gallons (US) of fuel. The left wing fuel tank had suffered some impact damage and was leaking from the leading edge. The remaining fuel content in the left wing tank was approximately 4.5 gallons (US). The unusable fuel in each tank was 2.4 gallons (US) and the fuel capacity of each tank was 53.4 gallons (US). Fuel samples were drained from both tanks and contained no water or sediment.

The power lever, propeller control lever and mixture control lever were in the full forward position although the impact force on the engine could have disrupted these lever positions. The master and fuel pump switches were in the on position. The magnetos were turned off and the key had been removed. The flap lever selector was in the full down position which corresponded to a flaps up selection. The flap lever selector was latched into this position, although it was possible that the latch had released during the impact sequence. The control linkages to both flaps had failed in overload which rendered the flaps free to pivot on their hinges, and made flap position determination difficult. The right flap was almost undamaged and the left flap had buckled at the inboard edge.

Aircraft weight

The aircraft's basic empty weight (including full oil and unusable fuel) was 2,164 lb. The pilot's weight was 180 lb and there was approximately 10 lb of miscellaneous items

in the aircraft. The recovered fuel, totalling 19.5 gallons (US), weighed 117 lb, although some fuel may have leaked out following the impact so this should be taken to represent a minimum fuel weight. The aircraft weight at takeoff was therefore at least 2,471 lb. The aircraft's maximum takeoff weight is 3,600 lb.

Powerplant examination

The engine was taken to an approved overhaul facility for a strip examination. The number two cylinder (front left as viewed from the pilot's seat) had suffered considerable impact damage. The remaining cylinders were in good condition. There was no evidence of any internal heat distress or evidence of a pre-impact failure of a mechanical component. The oil filter was clear of debris and the oil scavenge pump rotated freely. The timing of the magnetos was checked. The left magneto was within specification, but the right magneto was firing 3° early. The engine manufacturer was consulted about this and it was their opinion that this small difference would not have had a significant effect on engine operation or power output. The magnetos were both rig tested and operated normally. The spark plugs were in good condition apart from the two plugs from cylinder number two. One of these contained some debris and the other had a slightly bent electrode – this evidence was not surprising given the impact damage to cylinder number two. The remaining engine and accessory strip examinations did not reveal any evidence of a pre-impact fault that might have affected the engine's operation.

Survivability

The post-mortem examination revealed that the pilot had died of multiple injuries, the most serious of which were a severe head injury and a transaction of his thoracic aorta. The head injury was consistent with his face having struck the instrument panel and would have almost certainly rendered him unconscious. The transected aorta would have resulted in a rapid loss of blood and consequently it was the pathologist's opinion that any medical intervention would have been unlikely to have affected the fatal outcome. The transacted aorta is an injury associated with peak decelerations in excess of 80g.

Despite the crushing damage to the nose of the aircraft and the damage to the roof structure, a survivable space around the left pilot's seat was retained. The pilot's seat was provided with a three-point inertial reel harness and injuries to the pilot's body indicated that it was being used at the time of impact. However, damage to the instrument console indicated that his head probably struck the centre section rather than the instruments immediately in front of him. The lateral forces during the cartwheel may have caused his upper body to slip out of the shoulder harness strap and flex forwards and to the right. It is possible that a secure four-point harness would have prevented this from happening and would have prevented the head injury and also reduced the peak deceleration of the upper body, therefore reducing the g-force on the aorta. However, it is not possible to be certain that a four-point harness would have altered the fatal outcome of the accident.

Performance

The *Performance* section of the POH provides a means of calculating the Takeoff Ground Roll and the Takeoff Distance Required (TODR), to a height of 50 feet, for a '*Normal Procedure Takeoff*, a *Maximum Effort Takeoff – Flaps 0°*, and a *Maximum Effort Takeoff – Flaps 25°'*. All three techniques require an engine speed of 2,700 rpm and full throttle before brake release. Thereafter, the lift off and 50 foot barrier speeds are given as follows:

Normal Procedure Takeoff – Lift off speed 80 KIAS. Barrier speed 80 KIAS.

Maximum Effort Takeoff – Flaps 0°: Lift off speed 68 KIAS. Barrier speed 74 KIAS.

Maximum Effort Takeoff – Flaps 25°: Lift off speed 65 KIAS. Barrier speed 70 KIAS.

The POH advises pilots that:

> *'The performance charts are unfactored and do not make any allowance for varying degrees of pilot proficiency or mechanical deterioration of the aircraft… Effects of conditions not considered on the charts must be evaluated by the pilot, such as the effect of soft or grass runway surface on takeoff…'*

The CAA's General Aviation Safety Sense Leaflet 7c, entitled Aeroplane Performance, provides guidance on performance calculations. Under the heading USE OF PERFORMANCE DATA it states:

> *'a) Many light aeroplanes are…. certificated with UNFACTORED data, being the performance achieved by the manufacturer using a new aeroplane and engine(s) in ideal conditions flown by a highly experienced pilot.'*

> *To ensure a high level of safety on UK Public Transport flights, there is a legal requirement to apply specified safety factors to un-factored data (the result is called Net Performance Data). It is strongly recommended that those same factors be used for private flights in order to take account of:*
>
> *• Your lack of practice*
> *• Incorrect speeds/techniques*
> *• Aeroplane and engine wear and tear*
> *• Less than favourable conditions ……*
>
> ***SAFETY FACTORS***
>
> *a) **Take-off***
>
> *It is strongly recommended that the appropriate Public Transport factor, or one corresponding to that requirement, should be applied for all flights. For take-off this factor is x 1.33 and applies to all single engined aeroplanes…'*

The Leaflet contains a table, (Table 1) which gives pilots of aeroplanes, for which there is only unfactored data, guidance on the factors to use in certain conditions. A reminder is given that:

> *'where several factors are relevant, they must be **multiplied**. The resulting Take-Off Distance Required to a height of 50 feet, (TODR), can become surprisingly high.'*

CONDITION	*INCREASE IN TAKE -OFF DISTANCE TO HEIGHT 50 FEET*	*FACTOR*
Dry grass - Up to 20 cm (8 in) (on firm soil)*	*20%*	*1.20*
*A 2% slope**	*Uphill 10%*	*1.10*
*Notes: 1. * Effect on Ground Run/ Roll will be greater.*		
***NOW USE ADDITIONAL SAFETY FACTORS** (if data is unfactored)*		***1.33***

Table 1

Using the *Maximum Effort Takeoff* charts in the POH, the aircraft's weight of 2,471 lb and the meteorological conditions from the aftercast[2], the following takeoff performance figures were determined for a paved level runway, a grass level runway, a grass runway with a 1.6% upslope, and a grass runway with a 1.6% upslope including the 1.33 safety factor, (Table 2)

Although a 50 foot obstacle height is normally used for takeoff performance planning purposes, in this case the aircraft only needed to clear a hedge at the end of the runway which was approximately 18 to 22 feet high. Therefore, for the purposes of this accident investigation, it was considered useful to calculate the approximate takeoff distance to an obstacle height of 20 feet. The trees that were approximately 30 to 40 feet high were to the south of the runway centreline and would not have posed an obstacle if a straight track had been maintained.

The POH did not provide a method for calculating takeoff distance required to a height of 20 feet, so the geometric method depicted in Figure 5 was used.

The estimated takeoff distances to a height of 20 feet are shown below, together with the 1.2 factor for grass, the 1.08 factor (for the 1.6% upslope), and the 1.33 safety factor, (Table 3).

Analysis

The pilot appears to have had some difficulty during his approach to Runway 33 at Shotteswell Airstrip, veering to the left during the landing. This was probably due to the crosswind from the left, which was gusting beyond the maximum demonstrated for the aircraft. The wind direction also meant that Runway 33 was in the lee of a tall hedge on its left, which would have disrupted the airflow at ground level. The strength of the crosswind

Takeoff Performance	Paved, Level Rwy	Grass, Level Rwy (x 1.2)	Grass, 1.6% up-slope (x 1.08)	Plus Safety Factor (x1.33)
Ground Roll, Flaps Up	213 m	256 m	276 m	367 m
Distance to 50 ft, Flaps Up	335 m	402 m	434 m	577 m
Ground Roll, Flaps 25	183 m	220 m	237 m	315 m
Distance to 50 ft, Flaps 25	244 m	293 m	316 m	421 m

Table 2

Estimated Takeoff Performance	Paved, Level Rwy	Grass, Level Rwy (x 1.2)	Grass, 1.6% up-slope (x 1.08)	Plus Safety Factor (x1.33)
Distance to 20 ft, Flaps Up	262 m	314 m	340 m	452 m
Distance to 20 ft, Flaps 25	207 m	248 m	268 m	357 m

Table 3

Footnote

[2] 13 kt headwind component using Runway 25; temperature of 18°C; pressure altitude of 710 feet.

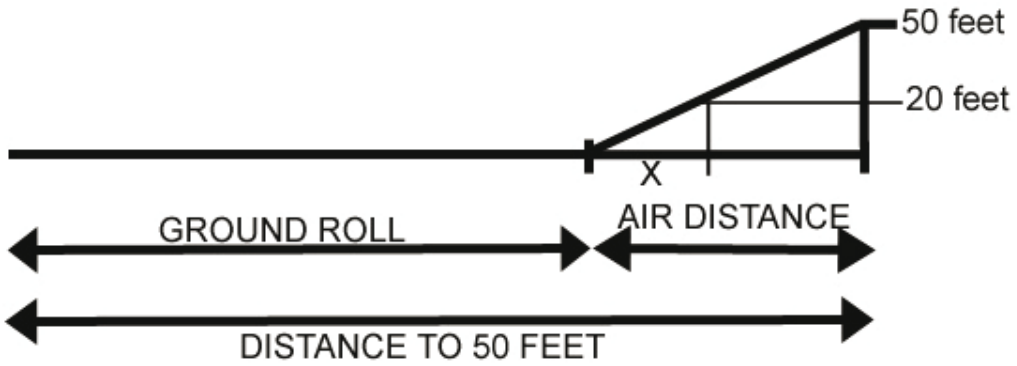

Figure 5

Method used to estimate the takeoff distance to a height of 20 feet[3]

and associated turbulence may have influenced his decision to depart from Runway 25.

The calculated takeoff distance from Runway 25 to a height of 20 feet was 340 metres (flaps up), before applying the 1.33 safety factor. This was 38 metres greater than the 302 metres of runway length available. With the 1.33 safety factor the distance required rose to 452 metres. Had the pilot used flaps 25 then the achievable takeoff distance to a height of 20 feet was 268 metres, before applying the 1.33 safety factor. This was 34 metres less than the runway length available. However, this figure makes no allowance for imperfect pilot technique, aircraft and engine wear, or less than favourable conditions. Therefore, applying the 1.33 safety factor provides a more realistic takeoff performance figure of 357 metres to a height of 20 feet with flaps 25. This was 55 metres more than the runway length available, which indicates that a successful takeoff from this runway was unlikely, even with flaps 25 set. This was, however, less than the 400 metres quoted in the pilot's out-of-date chart from the flight guide that he had used. This excessive figure for the runway length may not have been obvious to the pilot and may have contributed to his decision to depart from the shorter runway. However, the guide's incorrect designation of Runway 25 as Runway 09/27 should have been evident to the pilot from the aircraft's flight instruments when he was lined up for takeoff.

Having lifted off, it appears that the aircraft cleared the hedge at the upwind end of the runway but, in doing so, stalled. The left wing dropped as G-BMDC flew across the road and it struck the trees on the far side, before descending into the field beyond. The left wing tip struck the ground first and the aircraft cartwheeled. During the impact the pilot sustained injuries which, despite prompt attempts by a member of the public and the emergency services, proved fatal.

Footnote

[3] AIR DISTANCE = (DISTANCE TO 50 FEET) – (GROUND ROLL).
X = 20 * (AIR DISTANCE) / 50. The takeoff distance to 20 feet is equal to (GROUND ROLL) + X.

The engineering evidence was consistent with the aircraft having struck trees in a left wing low attitude following a low speed loss of control, resulting in the left wing hitting the ground in a steep left bank and the aircraft cartwheeling to the right. The flap position at impact could not be conclusively ascertained. No evidence of a powerplant fault was found that would explain a loss of performance.

The recommendation in the flight guide entry for the airstrip at Shotteswell warned against an inexperienced pilot and an aircraft of that type from using the east-west runway. Although the pilot had experience of a number of cross country flights in other SEP (Land) aircraft, this was his first solo flight in a PA-32. Landing at an airstrip of that size, in crosswinds gusting beyond the maximum demonstrated for the aircraft, would have represented a considerable challenge for the pilot. Moreover, the aircraft operator did not permit the operation of the aircraft from grass runways. Why the pilot chose to land at this airstrip during his return flight from Dieppe is not known.

CAA General Aviation Safety Sense Leaflets 7c and 12d, entitled *Aeroplane Performance* and *Strip Sense*, respectively, give comprehensive guidance for flying operations from private airstrips.