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ACCIDENTS INVESTIGATION BRANCH  
Department of Trade and Industry

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**Piper PA-28 Series 180 G-AVBI  
and  
Piper PA-28 Series 180 G-AVBD  
Report on the collision near Hamble  
on 27 February 1970**

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**Including the Review before  
R M Yorke, QC  
and  
Captain R R Critchley, MBE  
*Technical Assessor***

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List of Civil Aircraft Accident Reports issued by AIB in 1972

<i>No.</i>	<i>Short title</i>	<i>Date of publication</i>
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2/72	Bristow Helicopter Agusta Bell 206A Jet Ranger G-AVSV near Fetteh Gomoah, July 1970	February 1972
3/72	Piper PA 23-235 G-ASKW in the sea off Southwold, Suffolk, February 1971	February 1972
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5/72	Brookland Hornet Gyrocopter G-AWTZ at Woodford Aerodrome, Cheshire, June 1970	March 1972
6/72	Bensen Gyrocopter G-AWBO near Mount Kerrin, Isle of Man, September 1969	March 1972
7/72	Auster 5 Series J I Autocrat G-AIRB at English Bicknor, Gloucestershire, April 1971	March 1972
8/72	Piper PA 23-250 Aztec G-APXN at Gleneagles, Perthshire, June 1971	March 1972
9/72	HS 125 Series 3B G-AXPS at Turnhouse Airport, Edinburgh, July 1970	May 1972
10/72	Piper PA-28 Series 180 G-AVBI Piper PA-28 Series 180 G-AVBD at Hamble, February 1970: including the Review before R M Yorke, QC and Captain R R Critchley, Technical Assessor	April 1973
11/72	Beagle 206 Series G-AVAM at Jersey Airport, Channel Isles, August 1970	June 1972
12/72	Piper PA 22 Series 150 Tri-Pacer G-APXS at Kingsdown, Kent, June 1971	July 1972
13/72	Piper PA 19 G-AYPN at Ditcham Woods, Hampshire, August 1971	October 1972
14/72	Piper Cherokee Arrow PA 28R-200 D-EHBR at Saron, Carmarthenshire, May 1971	November 1972
15/72	BEA Vanguard G-APEC at Aarsele, Belgium, October 1971	December 1972

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Department of Trade and Industry  
Accidents Investigation Branch  
Shell Mex House  
Strand  
London WC2  
4 April 1972

*The Rt Honourable John Davies, MBE MP*  
*Secretary of State for Trade and Industry*

Sir

I have the honour to submit the report by Mr N S Head an Inspector of Accidents, on the circumstances of the collision between Piper PA 28 Series 180, G—AVBI and Piper PA 28 Series 180, G—AVBD which occurred near Hamble, on 27 February 1970.

I have the honour to be  
Sir  
Your obedient Servant

V A M Hunt  
*Chief Inspector of Accidents*





Accidents Investigation Branch  
Civil Accident Report No EW/C 338

*Aircraft:* (1) Piper PA-28 Series 180 G-AVBI  
*Engine:* Lycoming O-360-A4A  
*Owner and Operator:* College of Air Training, Hamble  
*Pilot:* Mr J M Skellon – Killed

*Aircraft:* (2) Piper PA-28 Series 180 G-AVBD  
*Engine:* Lycoming O-360-A4A  
*Owner and Operator:* College of Air Training, Hamble  
*Pilot:* Mr A J Proctor – Killed

*Place of Accident:* 1 mile north-northeast of Hamble Aerodrome

*Date and Time:* 27 February 1970 at 1405 hrs

All times in this report are GMT

## Summary

The two aircraft were flying in a right hand circuit at Hamble aerodrome; G-AVBI had joined the circuit on the up-wind leg to the west side of the aerodrome and G-AVBD was on a climb out after take-off from Runway 02. They collided at a height of approximately 900 feet and immediately after the collision G-AVBI spun down almost vertically to the ground; G-AVBD went into a steep dive from which it did not recover. The pilots were killed.

It is considered that, because of concentration on flying their aircraft, the pilots' look-out at the crucial time was inadequate. The main reason for this was their inexperience.

# 1. Investigation

## 1.1 History of the flights

Mr Skellon, the pilot of G—AVBI (BI) had been briefed by his instructor to carry out a solo exercise of take-offs and landings at Lee-on-Solent, an aerodrome about 6 miles southeast of Hamble. He was also told that on his return he was not to 'rush' into a base leg or make a direct approach but should join the circuit 'up the dead side' of the strip in use. As the circuit for Runway 02 is right handed, the 'dead' side is to the west of the aerodrome.

Mr Skellon commenced his solo detail at 1305 hrs and flew to Lee-on-Solent where he made seven touch and go landings; he left the Lee-on-Solent circuit at 1358 hrs to return to Hamble. The aerodrome controller at Hamble believes that BI called for joining and landing instructions and on being told that the strip in use was 02 joined the circuit on the west side of the aerodrome as instructed. Shortly after this the aircraft was seen by witnesses in the control building. Their evidence indicates that after joining the circuit fairly close in on the dead side it turned on to the crosswind leg and was established in straight and level flight for some seconds before the collision with G—AVBD (BD) occurred. The aircraft's height at this stage should have been 1,000 feet and the airspeed between 100 and 110 knots.

Mr Proctor, the pilot of BD, had been authorised to carry out an exercise of solo take-offs and landings at Hamble; he commenced his detail at 1325 hrs. It is not known how many circuits BD made, but the aircraft was seen to make a normal take-off from Strip 02 at about 1405 hrs. Whilst it was making, or just after completing, a climbing turn to the right to enter the crosswind leg the collision occurred.

Following normal circuit procedure BD would have started a climbing turn at 500 feet so as to be at the circuit height of 1,000 feet at the start of the downwind leg. The airspeed would have been about 80 knots.

According to the evidence of witnesses on the ground, just before the collision BD was slightly ahead of and below BI but making a climbing turn into its flight path. Examination of the wreckage of both aircraft indicates that in the collision the port wing of BD (the climbing aircraft) was most probably struck from below by the starboard wing of BI. After the collision the two aircraft slewed together momentarily, then separated; BI spun down almost vertically and may have been on fire from the time of collision: BD went into a steep dive from which it did not recover.

As far as can be ascertained, at the time of the collision there were eight aircraft airborne in the Hamble circuit. In addition, there was a Chipmunk approaching to join the circuit from the northeast.

Two of the aircraft, both Cherokees were seen to be rather 'bunched' together at the up-wind end of the aerodrome and were in process of turning from the crosswind leg to the downwind leg.

## 1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
Fatal	2	—	—
Non-fatal	—	—	—
None	—	—	—

## 1.3 Damage to aircraft

Both aircraft were destroyed, BI by fire and BD by impact with the ground.

## 1.4 Other damage

A garden shed was destroyed; a power cable and the wooden gables of a house were damaged.

## 1.5 Crew information

- 1.5.1 Mr John Miles Skellon, aged 22, was the holder of a valid private pilot's licence endorsed for Group 'A' single engine aeroplanes below 12,500 lbs maximum total weight authorised. He was assessed fit at a medical examination on 22 August 1968. He was required to wear spectacles to correct for distant vision whilst exercising the privileges of his licence. This limitation was imposed following a medical examination in December 1965.

Mr Skellon commenced flying in July 1964 at the Lancashire Aero Club where he obtained his private pilot's licence in November 1964. In November 1969 he was accepted as a student at the College of Air Training and started his flying training there on 5 February 1970. His total flight experience as pilot was 62 hours of which 35 hours were in command; he had flown 12 hours 30 minutes in Piper PA-28 aircraft at the College of Air Training. Although there is no positive evidence to show that Mr Skellon was wearing his spectacles during his last flight, a pair of spectacles in a case was found in the wreckage. It is reasonable to assume that this was his second pair which he was required to carry and that the pair he was wearing was destroyed in the crash. In any event, specialist ophthalmic opinion discounts the possibility of the defect in vision of Mr Skellon's right eye as being a factor in the accident.

- 1.5.2 Mr Anthony James Proctor, aged 19, was the holder of a valid student pilot's licence; he was assessed fit at a medical examination on 5 January 1970. His total flying experience as a pilot was 18 hours 30 minutes of which 2 hours 50 minutes were in command. All his flying had been on the Piper PA-28 aircraft.

Mr Proctor was on the same course at the College of Air Training as Mr Skellon and had also commenced his flying training on 5 February 1970; he had made his first solo flight four days prior to the day of the accident.

## 1.6 Aircraft information

The Piper PA-28 aircraft is a single engine low-wing monoplane with an enclosed cabin. The non-transparent roof of the cabin meets the front windshield at a position just above the pilot's head. There are two windows on either side of the cabin which extend back about 6 feet from their junction with the windscreen. Dual controls are provided and the pilots sit side by side; solo flying is carried out from the left hand seat.

From the left hand seat the field of vision to the right is restricted particularly in a downward direction.

Both aircraft had valid certificates of airworthiness and certificates of maintenance; their weight and centres of gravity were within prescribed limits. Before commencing their respective details they had been re-fuelled to full tanks with 91 octane avgas.

	<i>G-AVBD</i>	<i>G-AVBI</i>
Airframe hours	1,656	1,872
Engine hours	1,627 (since new)	141 (since complete overhaul)

## 1.7 Meteorological information

The weather in the Hamble area at the time of the accident was:

Surface wind:	NNE 10-14 knots
Visibility:	Over 10 kilometres
Weather:	Cloudy
Cloud:	2/8 - 4/8 cumulus at 2,000-2,500 feet 6/8 strato-cumulus at 2,500-3,500 feet

Weather was not a factor in the accident.

## 1.8 Aids to navigation

Not applicable.

## 1.9 Communications

At many flying schools the initial flying training is carried out without radio-telephony (R/T). However, at Hamble, because of the fairly large number of training aircraft using the circuit, a limited form of R/T procedure had been introduced as a safety measure. Whenever weather conditions were suitable, that is when the cloud base was above 1,000 feet and the visibility more than 6 kilometres, R/T calls made by the pilot of an aircraft to Air Traffic Control (ATC) were treated as advisory calls for the benefit of other aircraft in the circuit and would not be acknowledged by ATC; the calls would be those normally made on the circuit, ie lining up for take-off, airborne, etc. The object of this procedure was to reduce the amount of R/T traffic.

From the evidence of the aerodrome controller at Hamble it appears most likely that BI called when joining the circuit and again when up-wind to the west of Strip 02. It is also most likely that BD called 'lining up for take-off'.

There was no tape recording of R/T conversation.

### 1.10 Aerodrome and ground facilities

Hamble aerodrome has a grass surface and at the time of the accident a take-off/landing direction of 02 (022<sup>0</sup>M) was in use. The take-off and landing strips were indicated by two lines of markers. Landings are made to the left of the left hand markers whilst take-offs are made to the right of the right hand markers. The area between the markers was reserved for taxiing aircraft. The length of the strip is 886 metres.

When flying is in progress, the reported positions of aircraft are marked on a board in air traffic control by means of plastic slips bearing the last two registration letters of the aircraft. From this board a controller can see at any time the state of the circuit and the positions of aircraft, ie those taxiing, those up-wind on the dead side, those downwind etc. However, as there was no permanent record it was necessary for the controller to review the situation that applied at the time of the accident. This was done shortly after the accident and from this evidence and the evidence of other witnesses it seems likely that at the time of the accident there were eight aircraft airborne on the circuit. Of these aircraft, two were those involved in the collision. Two more, both Cherokees were on the start of the downwind leg whilst two others were in the process of taking-off. Another aircraft was on final approach or had just landed and a Chipmunk was flying up-wind on the dead side. In addition to the eight aircraft on the circuit a Chipmunk was approaching to join the circuit from the northeast.

The number of aircraft allowed in the circuit was regulated according to the weather conditions. For example, with the conditions which applied at the time of the accident the limit was ten.

### 1.11 Flight recorders

There was no requirement for flight recorders on the aircraft and none were fitted.

### 1.12 Wreckage

In each case the aircraft wreckage was compact within the immediate area of its respective point of impact with the ground.

BI had crashed on to a shed in the rear garden of a house approximately one mile north-northeast from the aerodrome. Impact had been almost vertical and the wreckage was deeply embedded in a crater; the aircraft was consumed in the subsequent ground fire.

BD had crashed into the front garden of another house, approximately 100 yards south of BI. The starboard wing had taken the main ground impact and was extensively broken up; the fuselage had telescoped and the cockpit was severely smashed. The outer section of the port wing was turned up in a manner which could have been caused by a mid-air collision.

### 1.13 Fire

Because of the almost total burn-out of BI it was not possible either to confirm or to dismiss statements by witnesses that fire occurred in the air. The wreckage of BD was unburnt.

### 1.14 Survival aspects

Both pilots were using lap-belt/shoulder strap type harnesses, but the accidents were considered to be non-survivable.

### 1.15 Tests and research

An approximate reconstruction of the flight paths of both aircraft is contained in the Appendix to this report. This is based on the evidence of witnesses and on the normal speeds the aircraft would be using at their particular phase of flight. The 'zero' time has been taken as the start of the take-off of BD and it is estimated that the collision occurred at zero plus 73 seconds.

At zero it can be seen that BI was in the area of the eastern shore of Southampton Water and about to start its up-wind leg to the west of the aerodrome. From this position onwards, the changing relative bearings of the two aircraft can be seen. From performance information it seems that BD would have reached a height of about 900 feet between the time of start of take-off and the collision.

Based on the reconstruction in the Appendix a series of test flights were carried out with two PA-28 aircraft from the College of Air Training at Hamble to assess the range of visibility from each aircraft relevant to the circumstances of this accident.

The tracks and timing (as shown on the Appendix) were followed as closely as safety allowed. It is considered that these tests showed that whilst flying straight and level up-wind on the 'dead side' of the aerodrome a pilot would have an aircraft taking-off on Strip 02 visible throughout its ground run and climb to about 500 feet. As the aircraft on the 'dead side' was rolled out of its turn on to the crosswind leg the aircraft taking off would disappear out of view below the starboard wing.

With regard to the aircraft taking off, the pilot would have the other aircraft in view just forward of his beam for a few seconds before starting his climbing turn at 500 feet. Thereafter the other aircraft would be out of his view behind him.

### 1.16 Other information

When take-offs and landings are in a northerly direction at Hamble, the circuit is right handed, and when in a southerly direction, left handed. This is in order to provide separation between aircraft on the circuit and aircraft approaching from, or holding over, the Fawley non-directional radio-beacon (approximately 3 nautical miles west of the aerodrome).

When returning to Hamble from Lee-on-Solent on occasions when landings were to the north or northeast, student pilots were instructed to join the circuit by flying up-wind on the west or 'dead side' of the aerodrome. They were to keep well clear of aircraft on base leg and final approach and although the up-wind leg was to be made closer in than would be the case for a normal circuit, it was to be made at a sufficient distance so that aircraft taking off could be observed. The crosswind leg was to be made over the up-wind end of the aerodrome boundary.

## 2. Analysis and Conclusions

### 2.1 Analysis

#### 2.1.1 *Sequence of events leading to the collision*

The train of events which led to the collision began when BI, as instructed, joined for a right hand circuit on the 'dead' or left hand side of Runway 02. At the same instant BD began its take-off run on Strip 02 with the intention of remaining in the circuit.

At this time no risk of a collision between the two aircraft would have appeared likely to either pilot, particularly as BI would normally have been expected to make its right turn on to the crosswind leg at 1,000 feet over the up-wind boundary of the airfield and thus pass well above aircraft taking off from 02.

In the event however, the pilot of BI flew beyond the up-wind boundary before making his right turn. The reason for the delayed turn is not known precisely but it may have been to space himself comfortably behind other aircraft in the circuit ahead of him. Consequently, when he eventually made his turn across wind, he passed closer to the climb out path of aircraft taking off from Strip 02 than would normally be the case. The first significant event, therefore, which led to the collision was the extension of the into-wind leg flown by BI on joining the circuit.

The Appendix to this report is an attempt to reconstruct the tracks followed by the aircraft. It is based on aircraft performance, weather data and eye witness reports. It has obvious limitations, nevertheless, these tracks taken in conjunction with information gained from the test flights indicate with reasonable certainty that whilst BI was flying up the 'dead' side of the circuit BD was in view during its take-off and initial climb. Whether in fact the pilot of BI saw the other aircraft is not known but if he did, no risk of collision would have existed or been apparent until he started his turn on to the crosswind leg.

The evidence of reliable witnesses that BI had been established on a steady crosswind leg for some seconds prior to the collision indicates that its pilot had not noticed BD during his turn and thereafter was unaware of its presence because by this time it would have gone out of view below his starboard wing. Consequently the only time BD would have appeared as a collision risk to the pilot of BI was during his turn to the crosswind leg.

It is understandable that in this short period of time the pilot of BI could have missed seeing the other aircraft as his attention may have been occupied by the need to keep an adequate distance from the aircraft 'bunching' on the circuit ahead of him.



Whilst it may be said with reasonable certainty, that it was possible for the pilot of BI to have seen BD during his turn on to the crosswind leg, the situation regarding the pilot of BD is more critical. In making an assessment whether BI was visible from BD the most important factors are the heading of BI prior to the collision and its distance out from the aerodrome when it made its flight up-wind on the 'dead' side.

If the heading of BI was northeasterly, as suggested by two witnesses, or if the pilot had made his up-wind leg very close in, it may not have been possible for the pilot of BD to have seen it at any time. However, the majority of witnesses, particularly those with considerable aviation experience, have said that before the collision, BI was established on a steady crosswind leg as near as could be estimated, at 90° to the take-off direction. These witnesses were in the control tower and consequently in a position to look along the length of Strip 02; they have stated that they had a complete side view of BI as it crossed the extended centre line of the strip. With regard to the circuit made by BI, apart from the extended up-wind leg, there is no evidence to suggest that it was not in accordance with the procedure the pilot had been taught to follow.

The tracks shown in the Appendix, and the flight tests indicate that BI was most probably visible to the pilot of BD, just forward of his port beam, for a few seconds before he started his climbing turn at 500 feet. Whether he saw BI is not known but this appears unlikely as a risk of collision resulting from making a turn and climbing up in front of it would have been apparent to him. To see the other aircraft it would have been necessary for him to turn his head well to the left and soon after starting the turn it would have become out of sight behind him.

Bearing in mind that the pilot of BD had flown solo for less than 3 hours it can be appreciated that the handling of the aircraft at that particular phase of flight would have demanded a high degree of concentration. It would have been normal for his attention to be directed to the right, the direction in which he was to turn, and in addition, he also may have been concerned to adjust his circuit behind the aircraft on the downwind leg. In similar circumstances it is possible that a more experienced pilot might have missed seeing the other aircraft.

### 2.1.2 *The dangers involved*

On the circuit of any aerodrome where flying training is taking place there is a risk of collision which will vary with the visibility, the number of aircraft in the circuit at any one time and the experience of the pilots. The ability to handle an aircraft and at the same time keep a good look-out is a necessary part of a pilot's skill but this can only be attained with practice and experience. There will be occasions among student pilots engaged in early solo flying when the handling of the aircraft will demand a degree of attention which could be to the detriment of a good look-out. Good circuit discipline, particularly adherence to rules designed to preserve aircraft separation, is an important

factor in guarding against occasional moments of inadequate look-out. Unfortunately, the action of BI in turning crosswind too far from the up-wind boundary removed one of the essential safeguards. Whilst it can be appreciated that this was an effective way of increasing the distance between the aircraft ahead of him, it made the need for increased vigilance vital. In the event, this action, together with the understandable concentration by the pilot of BD on flying his aircraft, allowed a situation to develop which led to the collision. Whilst it appears that for a very short period of time the standard of look-out by the pilots may have been inadequate, inexperience and the restricted visibility to the right from the left hand seat of the aircraft were the most important factors in the accident.

### 2.1.3 *Action to minimise the dangers*

At the College of Air Training, the inherent dangers of collision were well appreciated. In the training syllabus emphasis was placed on the need to keep a good look-out at all times. Students were taught to 'move the aircraft' to improve their view when necessary and they were not allowed to fly solo if the instructors were not satisfied with their performance in this direction. In addition to the circuit procedure referred to in para 1.16 a further safeguard to minimise the collision risk was a limitation on the number of aircraft allowed on the circuit at any one time. In the prevailing weather conditions this limit was ten.

At the time of the accident limited R/T was in force as explained in para 1.9. It is possible that had full R/T control been used the tower controller might have held BD on the ground until BI was clear of the up-wind end of the aerodrome. On the other hand, he would have been justified in assuming that the pilot of BI would follow the normal procedure of making his crosswind leg over the aerodrome boundary.

Following the accident a general review of safety measures was carried out by the safety officer of the College. Modifications have been made to the aircraft which will improve visibility. Arguments for and against full R/T control were considered and it was finally decided to introduce full R/T for a trial period after which the system will again be reviewed. Under this procedure the number of aircraft on the circuit is controlled by restricting take-offs and withholding entry on to the circuit. Separation is left to individual pilots with advice from ATC. It was felt that this type of control would best satisfy the object of leaving student pilots with the responsibility of keeping a good look-out, which is an important part of their training in basic airmanship, and at the same time prevent a repetition of the circumstances which led to this accident.

When the collision occurred, as far as can be ascertained, there were eight aircraft airborne on the circuit. Two were taking-off behind BD; another was on final approach to land and another flying up-wind on the dead side of 02. These aircraft are therefore not significant in the circumstances of the accident. It is considered that at that time the use of the limited R/T procedure was reasonable, however, as aircraft 'bunching' on the circuit could well have been a factor in this accident, it is recommended that should a decision be made, subsequently, to revert to limited R/T, the overall limit of ten aircraft should be reviewed.

## 2.2 Conclusions

### (a) Findings

- (i) The documentation of both aircraft was in order.
- (ii) There was no pre-crash failure of either aircraft.
- (iii) Both pilots were duly authorised to make their respective flights.
- (iv) The pilot of G-AVBI did not follow the instruction to turn on to the crosswind leg over the up-wind boundary of the aerodrome.
- (v) G-AVBD, while on a climbing turn to the right after take-off, was slightly ahead of and below G-AVBI.
- (vi) Whilst on a crosswind leg G-AVBI overtook and collided with G-AVBD, which was climbing as required to circuit height.
- (vii) In the concluding few seconds before the collision the aircraft were so positioned that neither pilot could see the other aircraft.
- (viii) The need to fly a right hand circuit from the left hand seat of the aircraft added to the difficulties of the pilot of G-AVBI in keeping G-AVBD in view.

### (b) Cause

Because of concentration on flying their aircraft, the pilots' look-out at the crucial time was inadequate. The main reason for this was their inexperience.

N S Head  
*Inspector of Accidents*

Accidents Investigation Branch  
Department of Trade and Industry  
April 1972