# Robin R1180T Aiglon, G-BLZD and Robin DR400/140B Major, G-OEBA

## AAIB Bulletin No: 5/97 Ref: EW/C96/10/9Category: 1.3

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| **Aircraft Type and Registration:** | (i) | Robin R1180T Aiglon, G-BLZD |
| | (ii) | Robin DR400/140B Major, G-OEBA |
| **No & Type of Engines:** | (i) | 1 Lycoming O-360-A3AD piston engine |
| | (ii) | 1 Lycoming O-320-D2A piston engine |
| **Year of Manufacture:** | (i) | 1979 |
| | (ii) | 1981 |
| **Date & Time (UTC):** | | 26 October 1996 at 1010 hrs |
| **Location:** | | Near Dover, Kent |
| **Type of Flight:** | (i) | Private |
| | (ii) | Training |
| **Persons on Board:** | (i) | Crew - 1 - Passengers - 1 |
| | (ii) | Crew - 2 - Passengers - None |
| **Injuries:** | (i) | Crew - None - Passengers - None |
| | (ii) | Crew - 2 (fatal) - Passengers - N/A |
| **Nature of Damage:** | (i) | Damaged beyond economic repair |
| | (ii) | Aircraft destroyed |
| **Commander's Licence:** | (i) | Private Pilot's Licence |
| | (ii) | Commercial Pilot's Licence with Flying Instructor and Instrument Ratings |
| **Commander's Age:** | (i) | 68 years |
| | (ii) | 62 years |
| **Commander's Flying Experience:** | (i) | 1,217 hours (of which 162 were on type) |

Last 90 days - 16 hours

Last 28 days - 3 hours

(ii) 1,768 hours (of which about 1,600 were on type)

Last 90 days - 32 hours

Last 28 days - 16 hours

**Information Source:** AAIB Field Investigation

**History of flight**

At 0937 hrs, G-BLZD ('ZD') took off from Fairoaks Airport fora VFR flight to Midden-Zeeland in Holland. G-OEBA ('BA') tookoff from Lashenden (Headcorn) Airfield at 0945 hrs on an instrumentflying training detail.

At 1005 hrs, the pilot of 'ZD' called Manston Approach on 126.35MHz and passed the following position report: "Golf ZuluDelta is a Robin aircraft from Fairoaks to Midden-Zeeland - atpresent just past Ashford town - routing Dover - Mike Kilo - 13miles to run to Dover at present 3,000 feet on 1019 squawking7000 - request Flight Information Service". The controllerreplied "Golf Zulu Delta Flight Information Service - ChathamQNH 1014 - report Dover". There was no evidence of any communicationbetween 'BA' and Manston ATSU.

From 1009 hrs, recorded secondary returns from Debden radar head(see Appendix A) showed an aircraft, believed to be 'ZD', trackingabout 095°M; the ground speed was about 150 kt. A seriesof primary returns from the same radar head approached 'ZD's trackfrom the north east; the nature of the data was such that onlyan informed estimate could be made of the track and ground speed. The final track was about 245°M and the ground speed about95 kt. The two tracks crossed at about 1010 hrs and thesecondary returns continued, turning initially to track about140°M. No further primary returns were recorded and it wassubsequently found that 'BA' had hit the ground vertically athigh speed in the area just to the south of the point where thetwo tracks crossed. Note: The Manston AR1 radar is not recordedand it was not possible to determine what radar information wasavailable to the controller over the period of the accident. Data recorded at LATCC from the Debden radar was used for theinvestigation but this information was not available to the Manstoncontroller.

The pilot of 'ZD' reported that a "dark shadow" movedover the cockpit, there was a loud bang and the aircraft shuddered. At 1010:35 hrs, he made a MAYDAY call on the Manston frequencyin which he reported "I THINK I'VE BEEN STRUCK - MY TAIL'SBEEN STRUCK BY ANOTHER AIRCRAFT". He was given a track tosteer (QDM) to Manston of 194°. This was incorrect as theaircraft was south of Manston at the time; the next QDM, passedabout a minute latter, was 005°. About 20 seconds afterhis MAYDAY call, the pilot asked "MANSTON, DO YOU HAVE ARECORD OF OTHER AIRCRAFT IN THE VICINITY" to which the controllerreplier ".....NOTHING KNOWN AT THIS MOMENT".

Immediately after the collision 'ZD' lost about 1,500 feet ofaltitude. The pilot had no rudder control and only severely limitedelevator control; he found it necessary to apply almost full aftcontrol

column. He managed to exercise some control, by the co-ordinateduse of power and aileron, and climbed and turned the aircrafttowards Manston. Assisted by further QDMs from Manston ATC, thepilot positioned the aircraft for a landing on Runway 28; thesurface wind was 240°/20 kt. At 1016:11 hrs, the pilot reportedthat he had "DIFFICULTY MAINTAINING CONTROL - ELEVATORS ORTRIMMERS DAMAGED". The controller acknowledged that he understoodthis and told the pilot to change frequency to Manston Tower on119.27 MHz.

Despite his difficulties, the pilot managed to change frequencyand, at 1016:34 hrs, was offered the choice of the paved Runway28, or the grass Runway 24; he opted for the former. As he triedto reduce his speed, the aircraft yawed violently to left andright. During the landing phase, he lost lateral control of theaircraft which eventually came to rest on the grass to the rightof the runway, a short distance from the Airport Fire Stationat about 1019 hrs. The nose landing gear had separated and theaircraft was upright in a nose down attitude. The pilot carriedout the shutdown check and, with his passenger, evacuated theaircraft without injury.

**On site examination of the aircraft**

G-OEBA

AAIB examination of both aircraft commenced with the wreckageof 'BA'. This aircraft was predominantly of wooden constructionand painted in overall white with blue wing leading edges andblue/black fuselage cheat lines. It lay in a field/paddock about100 metres south of farm buildings which comprise Langdon Abbey. It was obvious that the aircraft had descended almost verticallyto the ground at a high rate. It had been in a roughly flat,left-wing-down attitude at impact which did not suggest that theaircraft was in any sense 'flying' but falling ballistically. The empennage and rear fuselage were missing from the main wreckagesite as was a considerable portion of the left wing. The radiowas selected to 122.0 MHz which is the Lashenden (Headcorn) airto ground frequency; the transponder had altitude mode capabilitybut it was too badly damaged to determine which code was selectedor whether it was switched on. Both occupants were still in thewreckage.

The missing structure of 'BA' was located in a trail to the east(approximately downwind) of the main site extending over a distanceof about 2 km. This trail comprised small pieces of the aft fuselage,the empennage and the outboard, cranked section of the left wing,including the aileron. Other, smaller, debris was identifiedfrom further inboard on the left wing. Also in the trail werelarge pieces of the metal fin and rudder from 'ZD' with very clearimpact marks exhibiting considerable blue paint smears in a linerunning roughly horizontally across the rudder chord. The completewreckage of 'BA' was recovered to AAIB Farnborough.

G-BLZD

'ZD' which was of metal construction and basically white in colourwith brown and orange trim, was examined in a hangar at RAF Manston. The nose landing gear had been detached and the right wing distortedduring the forced landing and subsequent departure from the runway. The complete fin and rudder were missing, leaving only the fin/fuselagefillet fairing. About 50% of the left stabilator was missinghaving evidently been removed by a crushing impact from the frontand left. Traces of black rubber scuffing were found in someof the folded metal and some considerable stiffness in the pitchcontrol circuit was occurring due to fouling of the stabilatoragainst structure. The aircraft carried two VHF 'whip' aerialson the fuselage decking behind the cockpit and the aft one ofthese had been bent whilst both had blue paint smears near thetips.

**Subsequent examination and analysis**

It was deemed unnecessary to recover 'ZD' to AAIB, and analysiscentred on the wreckage of 'BA'. Using scale drawings of thetwo aircraft, it was possible to devise an accurate assessmentof the relative attitudes of the two aircraft at the moment offirst impact (see Appendix B). The direction of crushing on thefin and rudder of 'ZD' and the orientation of the blue paint smearsshowed that the left wing leading edge of 'BA' had struck thefin of 'ZD' at a point somewhere inboard of where the tip cranksupwards. This led to detachment of the outboard section, completewith aileron, but also caused further disruption inboard suchthat an estimated 50% or more of the wing was probably destroyed. Minor cuts in the leading edge of the cranked section correspondedwith the whip aerials of 'ZD', which had blue paint deposits ontheir tips. This evidence, together with the orientation of theimpact marks on the fin, showed that 'BA' had been on a relativebearing of 50° to the left of 'ZD' and in a more-or-lesswings-level attitude. First contact was between the outboardwing leading edge of 'BA' and the whip aerials of 'ZD', followedby the left main landing gear of the former on the stabilatorof the latter. Almost simultaneously the left wing leading edgeof 'BA' struck and removed the fin and rudder of 'ZD' before thetwo aircraft separated.

The effect of losing such a large amount of wing area on 'BA'would be to roll the aircraft sharply to the left and this alonecould probably account for detachment of the empennage. However,there was evidence that some part of the disrupted left wing hadstruck the fuselage causing crippling of the latter, since theseparation point of the empennage was not the clean break whichmight have been expected but was associated with considerablefragmentation of the plywood fuselage skin over an area as farforward as the rear of the cockpit. The disruption of the leftwing would, however, on its own have rendered the aircraft uncontrollable.

**Meteorology**

An aftercast was obtained from the Meteorological Office at Bracknell. It indicated that for the period of the accident, there was afresh, unstable westerly airstream established over Kent. Thevisibility was between 25 and 30 km and the mean sea level pressurewas 1,021 mb; the cloud was FEW, base 2,500 to 3,000 feet. Thesurface wind was generally 250°/15 to 20 kt with gusts to30 kt; the wind at 3,000 feet was 260°/30 kt. The elevationof the sun at 1010 hrs was 24° and its azimuth was 156°.

**Medical and pathology**

The pilot of 'ZD' had a current Class 3 medical. The examinationwas on 8 March 1996 and it was valid for 12 months from the endof that month. He was required to wear spectacles which correctfor distant vision and to have available a second pair while exercisingthe privileges of the licence.

Both occupants of 'BA' died as a result of multiple injuries whichoccurred when their aircraft struck the ground. Neither had anypre-existing medical condition which would have contributed tothe accident.

The instructor had a current Class 1 medical. The examinationwas on 2 May 1996 and it was valid for 6 months from the end ofthat month. He was required to wear spectacles which correctfor distant vision and to have available a second pair while exercisingthe privileges of the licence.

The pilot undergoing instruction had a current Class 3 medical. The examination was on 11 November 1995 and it was valid for12 months from the end of that month. She was required to wearspectacles which correct for distant vision and to have availablea second pair while exercising the privileges of the licence.

While there is evidence that the pilot of 'ZD' was wearing spectacles,because of the nature of the accident, it was not possible todetermine this in the case of the occupants of 'BA'. However,the instructor was known to wear spectacles at all times and,as the spectacles required were for the correction of distantvision, it would be usual for them to be worn throughout the flight.

**Visibility from the two aircraft**

Both aircraft were made by the same manufacturer and shared thedistinguishing feature of a largely unobstructed canopy givingalmost complete all round vision. They were of similar size andpredominantly white in colour. 'BA' had not been fitted withinstrument flying training screens and there was no evidence ofan instrument flying hood found among the wreckage. It was notpossible to determine positively whether the pilot undergoinginstrument flying training in the left seat of 'BA' was flyingthe aircraft by reference to instruments alone just prior to theimpact. However, it is probable that she was and therefore thelookout would have been done solely by the instructor in the rightseat. The lookout from 'ZD' would have been mainly from the leftseat as the right seat was occupied by a passenger with no formalpiloting experience.

At 1009:51 hrs, about 12 seconds before impact 'BA' was in theleft, 11 o'clock position from 'ZD'; conversely 'ZD' was in theright, 1 o'clock position from 'BA'. The aircraft were about2/3 nm apart and the aspect would have beenof the front quarter in both cases. It is possible that, fromthis time, the pilot of either aircraft could have seen the otherhad he happened to look in the right direction. However, it shouldbe borne in mind that both pilots had other tasks to perform whichwould have required the focus of their attention to be in thecockpit for significant periods between looking outside.

At 6 seconds before impact, the tracks and relative bearings ofthe aircraft had changed little, but they were now only about1,750 ft apart. To avoid impact either or both aircraft wouldhave had to bank rapidly to the right. The pilot of 'ZD' statedthat he did not see 'BA' and the near wings level attitude atimpact of the latter would imply that the pilot of 'BA' did notsee 'ZD', certainly not until it was too late to initiate anyavoiding action.

**Services to aircraft outside controlled airspace**

The attention of pilots is drawn to AIC121/1993. This circulardetails the range of services available to aircraft flying outsidecontrolled airspace from both civil and military Air Traffic ControlService Units (ATSU). Manston is a military ATSU and can providea Lower Airspace Radar Service (LARS) to pilots flying up to andincluding FL95. LARS is a structured national system within whichthe participating ATSU can provide a Radar Advisory Service (RAS)or a Radar Information Service (RIS) for pilot's flying withinabout 30 nm of the unit.

An aircraft receiving a RAS is provided with advisory instructionsto maintain the prescribed separation minima between participatingaircraft. In addition, the controller will pass the bearing,distance and, if known, the level of non-participating traffic,together with ADVICE on action necessary toresolve the confliction. An aircraft receiving a RIS is providedwith the bearing, distance and, if known, the level of conflictingtraffic. No avoiding action is offered.

The Flight Information Service (FIS) is a non-radar service inwhich information is provided to the pilot to assist the safeand efficient conduct of flight. The civilian Manual of Air TrafficServices Part 1 states that "Warnings of proximity hazardsare issued when, from aircraft reports, they are self evidentbut the decision to make any alteration to the flight remainswith the pilot. Warnings are issued entirely at the discretionof the controller". The military equivalent, Joint ServicesPublication 318A, differs in emphasis, stating that "Detailsof other traffic, from any source, will also be passed **butonly** where there is evidence that the aircraft are, or willbe, in dangerous proximity to each other."

The AIC points out that traffic proximity warnings received underFIS may be inaccurate or incomplete because many aircraft flyon a multiplicity of tracks and levels without communicating withan ATSU. It recommends that pilots ask for a Radar Services,rather than FIS on its own, whenever such a service is available. It points out that an ATSU will automatically provide FIS asan integral part of RAS or RIS.