Grumman AA-5B, G-OCAZ, 5 May 1996

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Aircraft Type and Registration:	i) Grumman AA-5B Tiger, G-OCAZ ii) Schleicher, ASK13 Glider
No & Type of Engines:	i) 1 Lycoming O-360-A4K piston engine ii) None
Year of Manufacture:	i) 1977 ii) 1996
Date & Time (UTC):	5 May 1996 at 1005 hrs
Location:	Westcott, near Aylesbury, Bucks
Type of Flight:	i) Private ii) Private
Persons on Board:	i) Crew - 1 Passengers - Nil ii) Crew - 1 Passengers - 1
Injuries:	i) Crew - Fatal Passengers - N/A ii) Crew - Nil Passengers - Nil
Nature of Damage:	i) Destroyed ii) Right wing tip destroyed
Commanders Licences:	i) Private Pilot's Licence ii) BGA Assistant Instructor
Commanders' Ages:	i) 27 years ii) 36 years
Commanders' Flying Experience:	i) 82 (of which 79 were on type) Last 90 days - 4 hours Last 28 days - 1 hour ii) Total 450 hours
Information Source:	AAIB Field Investigation

History of the flights

The accident was a mid-air collision in Class G airspace in daylightVMC conditions. The meteorological aftercast reported the weatheras surface wind 300°/5 to 10 kt, visibility 25 to 30 km,temperature 5°C, no precipitation and scattered cumulus cloudat base 4,000 feet.

Both aircraft departed their respective airfields at about 0940hours. The glider was being flown partly by the instructor fromthe rear seat and partly by the passenger who was once an activeglider pilot. They were winch launched from Aylesbury (Thame)airfield which is on the north-western side of the village ofHaddenham. One mile south of the airfield the base of Class Acontrolled airspace is 3,500 ft but to the north of it thebase is flight level 55 (approximately 5,500 feet). Immediatelyafter releasing the winch cable the glider entered a strong thermaland climbed to 3,400 feet over the village. To avoid penetratingcontrolled airspace the instructor then headed north into windalong a 'cloud street'. Intermittently the glider penetrated regionsof rising and sinking air and the airspeed was varied to suitthe conditions: 38 kt in lift and 55 kt in sink. The glider lostheight and, as it approached the village of Westcott, it had descendedto about 2,500 feet on a heading of about 330°.

The Grumman Tiger pilot took off from Elstree aerodrome near Watfordon a pre-planned navigation exercise for which the first leg wasa direct track from overhead the aerodrome to the disused airfieldat Westcott. The exercise had been planned on a proprietary VFRflight log and the headings and leg times took account of theprevailing wind conditions. The pilot had planned to fly at 2,000feet altitude and 100 kt IAS. This airspeed is more applicableto the AA-5A with the lower powered engine but the club operatedboth AA-5A and AA-5B types and the pilot had previously flownboth variants.

Recorded secondary radar data showed the Tiger was transpondingon Mode A code 7000 but not on Mode C (encoded altitude). Primaryradar returns from the glider were also recorded but not secondaryreturns since it had no transponder. The radar at Heathrow trackedthe Tiger as it made its way towards Westcott; in the processit overflew Aylesbury and appeared to be following the A41 Trunkroad which leads from there to Westcott. Just before Wescott theTiger passed over Waddesdon Manor on a westerly heading; the Manoris on top of a hill about a mile and half to the east of Westcott.The angle of convergence between the two radar tracks was some60°. The Tiger was in the glider's 3 to 4 o'clock positionand the glider in the Tiger's 10 o'clock position. The sun wasin the glider's 6 o'clock position.

Two people standing in the grounds of Waddesdon Manor were watchingthe glider whilst they waited for relatives. They became awareof the Tiger when it flew almost overhead. It appeared to be flyingstraight and level at a steady speed and they were surprised whenit did not take early action to avoid the glider. They continuedto watch both aircraft and at a very late stage, they saw theTiger bank to the right as if to avoid the glider. They thoughtthat the aircraft had come extremely close to each other but hadnot touched. However, almost immediately the Tiger entered a divingturn to the left from which it did not recover. The witnessesheard the Tiger's engine running all the way down the dive andboth were of the impression that the aircraft was behaving asif there was no corrective action from the pilot. Another witnessin the garden of a house close to the impact site saw the Tigerin the final moments of what appeared to be a vertical, high-speeddive. She immediately instigated a 999 telephone call andthe police logged the reporting time as 1105 hr (1005 hrs UTC).

The glider pilot had been on the point of returning to Thame whenhe heard a loud bang and felt the glider shudder. He looked atthe left wing first which was undamaged and then at the rightwing which had obvious damage at the tip and shreds of fabricand tape trailing behind it. He realised almost at once that hestill had control of the glider and then he became aware of alight aircraft below him in his one o'clock position. It was ina gentle left turn but about 20° nose low and he soon lostsight of it beneath the glider's nose. His passenger had a betterview in the front seat and he too saw it ahead and beneath themon their right hand side. Initially the Tiger was in a right turnbut it

steadily rolled to the left and reversed its turn fromright to left. He too remarked upon the nose-low attitude andlost sight of the Tiger some distance away but beneath the glider'sleft wing. Initially the instructor attempted to return to Thamebut he lost height rapidly through sink and the increased dragcaused by the damage and the requirement for crossed yaw and rollcontrol inputs. He selected an open field and made one left turnto land into wind without difficulty.

Wreckage Examination

Examination of the glider after its landing showed most of thedamage to be confined to its right-hand wing tip. In the ASK13glider, the wing structure is of conventional plywood and fabricconstruction with a fibreglass tip: at the trailing edge the outboard240 mm of this wing tip was missing, leaving the aileron and itsmechanism intact. The line of damage into the wing was diagonaland approximately 1350 mm of the leading edge was missing: thiscorresponded to about half the width of the aileron and to a lengthof fabric, with pieces of fibreglass and plywood attached, foundin an adjacent field. Further structural damage, just inboardof the aileron, confirmed that the glider wing tip had been struckpredominantly from the rear. Lateral movement of the control stickshowed a slight constriction near the end of travel but the instructorcommented that this had not affected his control of the glider.

The ground impact damage to the AA-5B Tiger was, in contrast,massive and showed that the aeroplane had dived into the groundat high speed and at an angle of some 85° to the horizontal.The impact damage was distinctly symmetric, with similar groundimpact damage to both wings and both wing tips. During the recoveryof the wreckage, the airframe was closely examined for evidenceof collision with the glider. There was no evidence of any suchcontact on the fuselage, propeller or wing leading edges but anumber of small pieces of plywood were found in the ground impactmarks made by the Tiger's left-hand wing tip and substantial fibreglass pieces of the glider's right-hand wing tip were found withinthe remnants of the Tiger's left-hand wing tip.

The physical evidence showed, therefore, that the airborne contactwas simply between the glider's right-hand wing tip and the left-handwing tip of the Tiger; analysis of the geometry and relative speedsat contact show that the Tiger's tail surfaces would not havestruck the glider. The AA-5 design does, however, incorporatea mass balance cantilevered from the aileron hinge mechanism andthis mass moves within the cavity of the fibreglass wing tip.It was within this cavity that portions of the glider's wing tiphad lodged, with the probability of interference with free movementof the Tiger's aileron system.

Human factors

Post-mortem examination of the pilot did not reveal any medicalcondition which was likely to have contributed to the accidentand he had no need for corrective spectacles. He was wearing sunglassesat the start of the flight and the frames of sunglasses were recoveredfrom the accident site.

Gliders which are painted white (a structural integrity requirementfor GRP gliders) can be notoriously difficult to see in certainlight conditions, especially when they are viewed against a backdropof cumulus clouds. Other aircraft are often first seen becausethey are moving relative to the aircraft from which they are viewedor sometimes because the sun glints off the canopy or structure.In this case, the sun was directly astern the glider and sinceboth aircraft were on steady headings, neither would have beenmoving relative to the other.