Team Minimax 91, G-MYKZ, 14 July 1996

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Aircraft Type and Registration:	Team Minimax 91, G-MYKZ
No & Type of Engines:	1 Rotax 503 piston engine
Year of Manufacture:	1994
Date & Time (UTC):	14 July 1996 at 1630 hrs approximately
Location:	East Ginge Down near Wantage, Oxfordshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - N/A
Injuries:	Crew - None Passengers - N/A Others - 1 (serious)
Nature of Damage:	Substantial to main landing gear, engine and propeller
Commander's Licence:	Private Pilot's Licence (Microlight Aeroplanes)
Commander's Age:	50 years

Commander's Flying Experience:	500 hours (of which 80 were on type) approximately Last 90 days - 17 hours Last 28 days - 6 hours
Information Source:	AAIB Field Investigation

The home-built aircraft had been completed by the pilot in 1994and was kept at Ginge Farm airstrip close to East Ginge, approximatelyhalf a mile to the north of the 'Ridgeway', which is a publicright-of-way and scenic walk on the crest of the Downs.

On the day of the accident the pilot, accompanied by his wife,brother and partner, and two dogs, arrived at the farm airstripfor the start of an afternoon walk along the 'Ridgeway'. The pilotremained behind, in order to prepare his aircraft for take off,as the group ascended the hill. He planned to reposition the aircraftin a large 100 acre field on top of the Downs and to meet up withhis group for the walk. On their return he would depart the field,fly for some 20 minutes and return to the farm strip in the valleybelow. The pilot reported that the weather at the time was finewith visibility in excess of 25 km with a light north-westerlywind of 5 kt, broken cloud above 2,500 feet and a temperatureof approximately 25°C. Having landed in the upper field thepilot parked his aircraft in some rough grass close to a lineof trees, removed the aircraft keys, closed the canopy and rejoinedhis family.

When the group returned to the field after their walk the pilotdecided that, as there was now insufficient time available forthe planned 20 minute flight, he would just take off, climb toa suitable height and position for a downwind right-hand circuitto land on the farm strip below. His wife, with the two dogs,remained in the field to watch his departure while his brotherand partner started to make their way down the hill.

After engine start the pilot manoeuvred the aircraft in a sweeping'S' turn to take off in a north westerly direction. After takeoff the aircraft was seen to climb sharply and enter a steeplybanked turn to the right. The pilot reported that as he enteredthe turn the canopy appeared to come unlocked and he removed hisleft hand from the throttle to hold the canopy closed. As he didso engine power reduced. The pilot was not aware of the reasonfor the power reduction at the time although he later surmisedthat engine vibration may have caused the throttle to close. Believingthat he had an engine failure, he continued to turn right in orderto land back close to his point of departure. With the tree lineclose by he tightened the turn which resulted in the aircraftstalling, 'flicking' into a level attitude and descending in astalled condition. With the wings level and the aircraft in ahigh nose attitude there was insufficient time and height forthe pilot to effect a stall recovery. His only option was to stallstraight ahead. The aircraft hit the ground in a high nose attitudeand came to rest within a very short distance damaging the mainlanding gear and dislodging the engine from its mountings. Assoon as it was stationary the pilot switched off the fuel andfully opened the canopy whereupon he became aware that his wifelying on the ground close to the rear of the fuselage in a stateof distress. It was only at this time that the pilot realisedthat his wife had been struck by the aircraft during the landing.

The pilot's wife, who had been watching the manoeuvring aircraft,did not realise until it was too late that the aircraft was outof control and heading straight for her. The aircraft collidedwith her and the propeller struck her head as she passed beneaththe fuselage but above the strut connecting the two main wheels.Although suffering from head and leg injuries she remained conscious.The dog that she had been holding in her left hand on a lead waskilled in the collision. The pilot was quickly joined by the twoother members of the group who tended to his injured wife. A nearbywitness summoned help using a mobile 'phone. The emergency serviceswere alerted and at 1650 hrs the Thames Valley Police helicopter,flying in the vicinity at the time, landed close by the crashsite. At 1735 hrs, with a paramedic in attendance, the wife wasairlifted from the scene and arrived at hospital ten minutes later.

Aircraft handling characteristics

A British Microlight Aircraft Association (BMAA) test pilot, familiarwith this type of aircraft, was consulted on the aircraft's handlingcharacteristics. He stated that the aircraft shows a tendencyto 'flick' level if banked steeply and pulled through the turn,with either high or low power settings. The rate of 'flick' exceedsthe rate of roll achieved through normal aileron application.Moreover the aircraft will 'mush' in the stall with no proper'break'. In this condition the nose remains high and the viewover the front cowling is limited particularly if the engine installationis raised as in the case of the accident aircraft. Due to thefull span ailerons, the roll control remains effective throughoutthe stall envelope, though the authority is much reduced due tothe low speed.

Ground impact marks

The aircraft had landed on grass on a heading of 240º(M)on a slight up-slope. Three distinct gouges in the earth markedthe impact positions of the main wheels and the propeller. Theaircraft had then bounced nine metres forward, where it had cometo rest. The initial entry angle of the first ground mark indicatedan angle of 22º below the horizontal. The ground marks showedthat the aircraft had hit the ground with wings level at a lowforward speed and a high sink rate, compatible with being in astalled condition. The lightly loaded tail wheel had probablycontacted the ground first, arresting the descent of the tail.The main energy had been dissipated through the main wheels andtheir supporting structure.

Aircraft Information

The impact had collapsed the fixed main landing gear, and hadfractured the alloy hub on the left main wheel. The three propellerblades were still loosely attached to their boss. The tip of oneblade had detached, and another showed evidence of impact damage;the boss attachment bolts had bent and released most of the wedgesused to determine the propeller blade angles. All three glassreinforced plastic (grp) blades showed evidence of rearwards bendingin the form of gel coat fractures on their forward faces and bucklingon their rear faces.

The engine mounting structure had failed and the engine had rotatedforward through 90º allowing the nose section to ride overone propeller blade. Apart from this damage to the nose structure,the fuselage and wing structure were largely devoid of obvioussigns of damage caused by the impact.

One alloy rod in the over-centring canopy locking mechanism wasbent, preventing the mechanism from locking the canopy shut. Itwas not known whether this damage had been caused by the impact.

Engine

The engine fitted was a Rotax 503, but it had retained the Mikunifuel pump associated with its original 447 cc engine. The fuelpump output may have been marginal for the larger engine. Thecarburettor vent lines were contaminated; blockage of these linescould have prevented air entering the float chamber and causedloss of power. The fuel filter bowl was contaminated with finesilt; the fuel pump filter had been cleaned as part of the preparationfor the permit renewal.

The fuel cock was 'OFF', and the throttlewas found in the fully forward position, however, this could havebeen caused by the movement of the engine off its mountings. Thechoke cable had been similarly affected and had pulled the innercable out of its soldered housing at the cockpit end.

The nature of the Rotax engine means that the throttle is springloaded to the idle position. To apply power the carburettor springtension must be overcome. Most builders of the Minimax incorporatefriction clamping for the throttle, by using friction washersat the pivotal point on the throttle lever. The accident aircraftwas similarly fitted. There is a tendency, however, for theseto loose their friction and they regularly need tightening.

Propeller

The relative lack of damage to the propeller, and the lack ofpropeller slash marks on the ground indicated that the enginehad been running at low RPM. This would be consistent with a throttlesetting at idle power.

Documentation

The aircraft did not have a current Permit to Fly, but had satisfiedthe technical part of the application procedure. The engine andaircraft log book details were incomplete, and inaccurate regardingthe engine and propeller. The aircraft was fitted with a threebladed propeller which had not been cleared by the Popular FlyingAssociation (PFA) for the aircraft type, although it may havebeen accepted if the results of a satisfactory airtest had beenpresented to the PFA.