

FINAL REPORT

AAIU Synoptic Report No: 2006-001

AAIU File No: 2005/0018

Published: 17/01/06

In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Accidents, on 2 April 2005, appointed Jurgen Whyte as the Investigator-in-Charge to carry out a Field Investigation into this occurrence and prepare a Synoptic Report.

Aircraft Type and Registration: Savannah MXP-740, EI-DGI

No. and Type of Engines: 1 x JABIRU 2200

Aircraft Serial Number: 0310-51-236

Year of Manufacture: 2004

Date and Time: 02 April 2005 @ 17.51 hrs

Location: Runway (RWY) 15/33, Granard Airfield, Ferriskill, Granard, Co Longford.
(N53 45 490 W007 31 982)

Type of Flight: Private (Flight Permit No 9135)

Persons on Board: Left Seat Pilot - 1 Right Seat Pilot - 1

Injuries: Left Seat Pilot - Serious Right Seat Pilot - Serious

Nature of Damage: Substantial

Commander's Licence: See Section 1.7

Commander's Details: Male, aged 48 years

Commander's Flying Experience: 104 hours, of which 6 hours were on type

Information Source: Accident Report Form submitted by both Pilots'.
AAIU Field Investigation.

SYNOPSIS

While performing a go-around from a low/slow pass along the runway of a private unlicensed airfield, the ultralight aircraft nose-dived into the ground. The ultralight was substantially damaged and both occupants suffered serious impact injuries. There was no fire.

NOTIFICATION

At 18.45 hrs, Granard Gardaí informed Shannon Air Traffic Control (ATC) that an air accident had occurred near Granard. Shannon in turn informed the AAIU Inspector-on-call. A go-team consisting of Jurgen Whyte, Inspector of Air Accidents, Investigator-in-Charge (IIC) and Graham Liddy, Inspector of Air Accidents, routed directly to the accident site and on arrival at approximately 21.00 hrs on the same day, commenced the investigation.

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1. FACTUAL INFORMATION

1.1 History of the Flight

On the day of the accident, the owner of EI-DGI went to Granard Airfield, where the ultralight was hangared, with the intention of conducting a local flight. The weather at the time was, wind south-south-easterly 5-6 kts, visibility 10+ km, with a cloud base of approximately 3,000 ft. He met up with a pilot friend, who had just completed a local flight in his X-AIR microlight and the owner asked if he would like to accompany him on the flight. The pilot friend, who had flown in EI-DGI once before, agreed.

The owner then pulled the ultralight out of its hangar and went about refuelling to approximately 55 litres. Sometime after refuelling, the owner carried out a pre-flight inspection and then occupied the left-hand seat (LHS), which is the command seat. The pilot friend occupied the right-hand seat (RHS). The owner taxied out to RWY 15, carried out an uneventful take-off at 17.32 hrs. A short time after take-off, as EI-DGI turned towards the general direction of the southeast, the LHS occupant handed over control to the RHS occupant. Following a brief flight to the southeast, EI-DGI returned to the field, with the intention that the RHS occupant would carry out an approach and go-around to RWY 15. Following a normal approach, the ultralight levelled over the runway at approximately 50 ft above ground level (AGL). The RHS pilot then initiated a go-around and in his own words stated, *“I inadvertently pushed the joystick forward and pulled the throttle back. This caused the ultralight to nose dive into the ground. This error was due to the fact that in my microlight (X-AIR) the joystick is in the right hand and the throttle is in the left hand. Reaction was instinctive.”* This configuration of controls is the opposite to that of the RHS of EI-DGI.

After the ultralight came to a rest, the RHS occupant extracted himself from the wreckage. The LHS occupant came to from being unconscious, while still strapped to his seat. Looking to his right he saw the RHS empty. He vacated the aircraft to find the RHS occupant standing beside the wreckage. Following a 999 call, an ambulance arrived a short time later and brought both pilots to Mullingar General Hospital, where they were treated for sudden impact injuries.

1.1.1 Eyewitness

An eyewitness, who was tending to his sheep in the next field, approximately 200 metres to the southwest, observed the ultralight approaching the field. He was familiar with the comings and goings of aircraft from Granard Airfield. He considered that the approaching aircraft appeared to be flying very slow but that the engine sounded normal. He saw it level above the top of the hedgerow and then suddenly it nose dived. This was followed by a loud bang. He immediately ran across the field and into the airstrip where he went to the aid of the two occupants.

1.2 Injuries To Persons

Both occupants suffered serious sudden impact injuries. The LHS occupant suffered a broken ankle, leg and facial injuries. The LHS occupant also stated in his submitted Accident Report Form that he had suffered amnesia as a result of impact injuries. The RHS occupant suffered a fracture of the heel bone, a broken jaw and some facial injuries

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1.3 Global Positioning System (GPS) Data

A Garmin GPSMAP 296 was recovered intact from EI-DGI. A download facility on the unit provided the Investigation with a “track flown” map (See **Appendix A**) and a number of additional parameters, including, date, time, height (AGL) distance travelled, speed (MPH), heading (True) and Longitude/Latitude.

1.4 Aircraft Description

1.4.1 General

The Savannah MXP-740 is a conventional, three axis, strut braced, monoplane, constructed of aluminium alloy. It has a high-wing, with a fixed tricycle landing gear. The high-lift wing incorporates leading edge slats and up to 40° of flap (flaperons) for short take-off and landing performance (STOL). EI-DGI is a home built kit ultralight aircraft and not Type Certificated.

Seating for two persons is provided side-by-side with a Y-shaped control column between the two seats. Each seat has a four-point attachment seatbelt. It is equipped with two sets of rudder pedals and two throttles. Two wing tanks and an in-line collector tank located behind the seat have a total fuel capacity of 80 litres. The useable fuel is 77 litres.



1.4.2 Leading Particulars

Empty Weight	267 kg
Maximum All Up Weight (MAUW)	450 kg
VNE	108 kts
Max Speed	87-95 kts
Cruising Speed	78-84 kts
Manoeuvring Speed	74 kts
Approach Speed	31 kts
Stall Speed	23 kts
Fuel Capacity	80 litres
Fuel Consumption 75% power	12-14 litres/hr
Range	800 km
Take-off roll	30 to 40 metres

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1.4.3 Weight and balance

The estimated weight of EI-DGI on impact, with an estimated fuel load of 37 kg (51 litres), was 465 kg. This was 15 kg over the MAUW, however, it still remained within the middle range of the Centre of Gravity (C of G) Limits and this is not considered to be a factor in this accident.

1.5 Airfield Information

Granard Airfield is an unlicensed private airfield, located approximately 2 miles southwest of Granard. The field, in which the airstrip is located, measures 510 metres in length and 20 metres in width, at an elevation of approximately 290 feet above mean sea level (AMSL).

The airstrip itself (RWY 15/33) has a prepared grass surface measuring 510 metres in length and 10 metres in width. The runway edge is defined by painted markers located on either side of the runway and spaced approximately 25 metres along the length of the runway.

1.6 On Site Investigation

An examination of ground scars on the runway surface determined that the ultralight initially impacted on RWY 15, slightly right of runway centre, at a point 62 metres from the start of the runway.

The ultralight impacted the ground heavily at low forward speed and at a considerable nose down attitude. This is evidenced by the short ground run of 9.2 metres to its final resting position (**Photo 1**). The initial impact also showed evidence of a high vertical speed, as evidenced by the damage to the ultralight. The rearward collapse of the nose wheel and the main undercarriage further supports this analysis. Analysis of the impact marks indicate that the ultralight was in a nose down attitude of approximately 30° at the point of impact and that it was descending at an angle of approximately 25°.



Photo 1.

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The right wing tip made ground contact during the initial impact sequence. However, it should be noted that this wing also collapsed forward and down, and that both main wheels made approximately equal impact marks at initial impact. This would indicate that the roll angle at impact might have been slightly right wing low.

The right wing became partially detached due to impact failure of the drag attachment point, which was in turn caused by the compaction of the cabin and hard contact between the right wingtip and the ground. The lift struts remained intact and the wing rotated forward about the fuselage lifting strut attachment point.

The propeller was made of wood. Both blades shattered close to the hub. There were slash marks in the ground, containing propeller fragments, in the initial impact area. Portions of propeller fragments were scattered over a wide area, both left and forward of the direction of flight. Some fragments were approximately 40 metres to the left of the impact point, while others were 30 metres forward of this point in the 11 o'clock position. This indicates that the fixed pitch propeller was turning at high RPM, and operating at high power, at impact. This conclusion is reinforced by the fact that the engine tachometer froze at approximately 2,550 RPM (**Photo 2**). The likelihood is that following the closure of throttle in error, the throttle was re-applied just prior to or during the impact sequence.



Photo 2. Tachometer frozen at approximately 2,550 RPM following impact

The 3 fuel tanks (2 wing tanks and a fuselage collector tank) were examined and found to contain fuel. Some fuel had spilled out through the main tank vents, due to the nose down altitude of the ultralight when it came to rest. However, the remaining contents were sufficient for a considerable period of further flying. A sample was taken from the collector tank and was found to be free of water and contaminants. The fuel was MOGAS, which is approved for use with the Jabiru 2200 engine.

The control cables and linkages were examined and found to be functioning correctly, except where disrupted by impact damage.

No evidence of any pre-impact damage was found.

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The cockpit space was compacted in the impact. The forward floor moved upwards and the rudder pedals upwards and rearwards. The instrument panel and firewall moved rearwards. This compaction of the cockpit was a significant factor in the injuries suffered by the persons on board. However, the use of a four-point shoulder harness by both occupants contributed greatly to their survivability. The Investigation has seen similar accidents (low speed approach at high rate of descent with a nose down attitude) with similar or greater impact in certified light aircraft (Cessna 150, PA 28 etc), where the cockpit space was not compromised, and no/minor crew injuries resulted. The comparative loss of cockpit integrity suffered by this ultralight in this accident was striking (**Photo 3 & 4**).



Photo 3.



Photo 4.

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1.7 Personnel Information

1.7.1 Left-hand Seat Occupant.

The LHS occupant (male aged 48 years) was the aircraft owner, and the aircraft commander, pilot-non-flying (PNF) at the time of the occurrence.

The Safety Regulation Group, Personnel Licensing Department of the UK Civil Aviation Authority (CAA) provided the following licence details to the Investigation:

The LHS occupant was issued with a UK National Private Pilot's Licence (NPPL) Microlight landplanes on 10/03/2005. At the time of this particular event, he did not have a Flight Instructor (Microlight) rating on his licence, nor did he have a UK Flight Radio Telephony Operators' Licence (FRTOL) associated with his pilots' licence. Under Section IX (Validity) of the issued licence, it states, *inter alia*, that, "*The licence holder is entitled to exercise licence privileges on aircraft registered in the United Kingdom.*"

The Flight Crew Licensing Section of the Irish Aviation Authority (IAA) advised the Investigation that up to the time of this particular accident, the LHS occupant had not sought permission to validate his UK licence.

Flight crew details provided by the LHS occupant to the Investigation indicate that the pilot had a total of 104 hours of which approximately 6 hours were on type. He had a valid Class 2 Air Medical Certificate.

1.7.2 Right-hand seat occupant

The RHS occupant (male, aged 49 years) was the pilot flying (PF) at the time of the occurrence.

The RHS occupant was issued with a UK Private Pilot's Licence (PPL)¹ (Aeroplane)(with Microlight rating only) on the 05/03/1998. At the time of this particular event, he did not have a Flight Instructor (Microlight) rating on his licence, nor did he have a UK Flight Radio Telephony Operators' Licence associated with his pilot licence. Because his PPL(A)(M) was of an older UK issue type, it did not have any written condition stated on it to the effect that licence privileges were restricted to aircraft registered in the UK. However, the licence holder was only entitled to exercise licence privileges on aircraft registered in the United Kingdom.

The Flight Crew Licensing Section of the Irish Aviation Authority (IAA) advised the Investigation that up to the time of this particular accident, the RHS occupant had not sought permission to validate his UK licence.

Flightcrew details provided to the Investigation by the RHS occupant indicate that he had a total of 600 hours on various microlight aircraft, which includes 450 hours on his X-Air microlight and approximately 0.45 minutes on the accident type. The RHS occupant had not carried out any formal differences training on the accident type. He had a valid Class 2 Air Medical Certificate.

¹ Since 30 July 2002, the UK Civil Aviation Authority (CAA) has not issued an ordinary PPL(A) with only a microlight Rating. Since that date, pilots who obtain only a Microlight Rating are issued with the new NPPL(M). Article 22, paragraph (2) (a) (ii) and (iii) of the UK Air Navigation Order refers.

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1.7.3 UK CAA Personal Licensing Department

In a response to the Draft Report, the UK CAA Personal Licensing Department stated on the 18 November 2005 that, *“The pilots were flying in an Irish registered aircraft in Ireland. Their UK licences were not valid, so they were flying unlicensed”*.

2. Comment

The PF, who was in the RHS, had completed the majority of his flying experience in an X-Air microlight, where the command seat is on the left-hand side, the throttle is manipulated by the left hand and the control column, which is between the pilot's legs, is manipulated by the right hand.

The accident type had a central Y-shaped control column located between the two seats with a throttle on the left side of the instrument panel (left seat/left hand) and a throttle on the right side of the instrument panel (right seat/right hand). When seated in the RHS of EI-DGI, the PF would have had his left hand on the right arm of the control column (as opposed to the throttle) and his right hand on the throttle (as opposed to the control column).

On initiating the go-around, the PF most likely automatically resorted back to a memory action that was based on his experience on his X-Air. The action of pushing the control column forward (nose down) with the left hand, and pulling the throttle back (power off) with the right hand, resulted in a profile whereby the ultralight was in a nose down attitude, at low speed, without power, approximately 50 feet above ground. Under this condition, the impact was inevitable, as the height remaining was insufficient to affect a safe recovery from the input error.

The ergonomics or layout of a cockpit can vary greatly between different aircraft. This is particularly so when it comes to a homebuilt. One way to familiarise oneself on the idiosyncrasies of different cockpit types, and indeed different aircraft types, is to carry out differences training with a qualified instructor. Had this been done in this particular case, it is likely that this accident would not have occurred.

With regard to the validity of the pilots' licences, the Investigation is of the opinion that this is a matter for the respective licensing authorities.

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Appendix A GPS derived track of EI-DGI

