



# Air Accident Investigation Unit Ireland

**ACCIDENT REPORT**  
**Mainair Sports Ltd**  
**Gemini Flash IIA, G-MYKH**  
**Renairee, Macroom, Co. Cork**  
**2 July 2011**



**An Roinn Iompair  
Turasóireachta agus Spóirt**

Department of Transport,  
Tourism and Sport

AAIU Final Report No: 2012-012

State File No: IRL00911060

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In accordance with the provisions of SI 460 of 2009, the Chief Inspector of Air Accidents, on 02 July 2011, appointed Paddy Judge as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Final Report. The sole purpose of this Investigation is the prevention of aviation Accidents and Incidents. It is not the purpose of the Investigation to apportion blame or liability.

**Aircraft Type and Registration:** Mainair Sports Ltd,  
Gemini Flash IIA, G-MYKH

**No. and Type of Engines:** 1 x ROTAX 582-2V

**Aircraft Serial Number:** 951-0693-7-W746

**Year of Manufacture:** 1994

**Date and Time (UTC):** 2 July 2011 @ 06.05 hrs UTC

**Location:** Renairee, Macroom, Co. Cork, Ireland  
N51°53.8', W009°09.9'

**Type of Flight:** General Aviation - Cross-country flight

**Persons on Board:** Crew - 1 Passengers - 1

**Injuries:** Crew - Nil Passengers - Nil

**Nature of Damage:** Substantial

**Commander's Licences:** Private Pilot Licences (PPL); issued by the Irish Aviation Authority (IAA) and the UK Civil Aviation Authority (CAA)

**Commander's Details:** Male, aged 45 years

**Commander's Flying Experience:** 455 hours, of which 17 were on type

**Notification Source:** IAA Inspector

**Information Source:** AAIU Report Form submitted by the Pilot



## SYNOPSIS

While in cruise the aircraft's engine stopped due to fuel exhaustion. Although a second fuel tank that contained fuel was selected, engine restart was unsuccessful. A heavy forced landing in difficult terrain resulted with the aircraft being substantially damaged. There were no injuries.

## 1 FACTUAL INFORMATION

### 1.1 History of Flight

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The Pilot and Passenger were taking part in the annual National Microlight Association of Ireland (NMAI) "Mizen to Malin" run, flying from Convoy, Co. Donegal via various technical stops to Bantry, Co. Cork. Near Macroom, while flying at approximately 2,000 ft, the engine stopped and, as the Pilot was unable to restart it, a forced landing ensued.

### 1.2 Aircraft Description

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The Mainair Flash II Alpha 582 is a weight-shift, flexwing microlight<sup>1</sup> with a delta shaped hang-glider type wing that is controlled by shifting the aircraft's centre-of-gravity. The pilot and passenger sit in a tandem pod underneath the wing, with the pilot in the front seat and the passenger in the rear. A two-stroke engine drives a pusher propeller through a gearbox; the engine being located to the rear of the passenger.

Fuel is stored in two 20 litre tanks, one located below the passenger and the other below the engine. Each tank has an individual primer bulb and the tank is selected to supply the engine with fuel via a selector valve. The selector valve is located on the starboard side of the engine mount and is rotated to change tanks. The tanks have no gauges to indicate fuel remaining within the tanks and it is not possible to view the tank contents during flight.

### 1.3 Pilot's Report

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The Pilot stated that prior to departing Convoy, Co. Donegal, the previous day, he and the Passenger (also an experienced pilot) discussed the operation of the fuel selector and how to change tanks. As it was easier for the Passenger to reach the selector, it was agreed that they would both monitor flight time and that the Passenger would change the tanks when required.

The Pilot said that the first leg of the trip from Convoy to Granard, Co. Longford, took 1 hr 40 mins. At one hour into the flight the Pilot decided to change tanks from the rear tank to the forward tank. Upon landing at Granard he checked the rear tank to find 8 litres of fuel remaining, indicating a fuel burn of 12 litres an hour.

After refuelling, the second leg from Granard to Birr, Co. Offaly; took 1 hr 05 mins following which there was also fuel remaining in the rear tank. During this leg they experienced overheating of the engine and after landing found that the coolant level in the radiator had dropped, requiring over a litre of water to re-fill it.

During the next leg, from Birr to Bantry, the engine temperature rose again after about 30 mins in flight and they made a precautionary landing at Lissenhall, Co. Tipperary where the radiator was again refilled. They then flew to Croom, Co. Limerick where the Pilot removed panniers that restricted airflow to the radiator at the rear of the trike.

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1 **Microlight:** An aeroplane with a maximum take-off mass generally not exceeding 450 kg (for a two seat landplane).

After this the engine temperature was normal on a flight test but, because it was late in the evening, departure was postponed until early the next morning.

The Pilot stated that they took off the following day from Croom at 05.00 hrs and flew south towards Bantry. The Pilot reported that the headwind had increased to between 15 and 18 mph and he increased speed. He said that one hour later the engine stopped. He immediately requested the Passenger to change the fuel tanks, as previously briefed. The Passenger did so and attempted to prime the engine but they later discovered that the incorrect primer bulb was used. The Pilot stated that his efforts to restart the engine were unsuccessful and that he then selected the only field he could see that was suitable to carry out a forced landing.

During the descent, it became apparent to the Pilot that they were not going to reach this field and that they were in danger of landing on a rocky outcrop at the field's boundary. There was also a thicket of thorn and scrub with a substantial gorse bush standing above the surrounding growth located just in front of the rocks. He approached the thicket and attempted to stall the trike into the gorse. The aircraft passed through the gorse and landed in a small grass area just beyond it. The Pilot exited the aircraft and was followed shortly by the Passenger. Apart from being quite shaken by their experience, neither suffered any injuries.

In his post-accident Report, the Pilot stated that *'the combination of increased headwind and higher revs had an effect on the fuel consumption. We were discussing changing the tanks shortly before the rear tank emptied but both felt there were a few more miles in it'*.

The Pilot said that local farmers had helped him to recover the aircraft, which he de-rigged with some difficulty due to the extensive damage, and trailered it to a nearby farm.

#### 1.4 **Damage to Aircraft**

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The aircraft suffered substantial damage in the forced landing. The forward crew pod section (**Photo No.1**) was substantially damaged and had split. The monopole had snapped, the wing sail was punctured and the wing frame destroyed. The trike frame was also bent.



Photo No. 1: Final resting position of G-MYKH (Pilot's Photo)

## 1.5 Weather

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The forecast and actual weather, as reported by the Pilot, was a wind at 10-18 MPH from a southerly direction, with clear skies and good visibility.

## 1.6 Documentation

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The Mainair Sports Ltd Gemini Flash IIA, Registration G-MYKH, was operated under a Permit to Fly, issued by the UK CAA and initially dated 18 August 2010. Its Certificate of Validity was current and dated from 15 April 2011 to 06 April 2012. Under the heading 'Exemption' the Certificate states:

*"The Civil Aviation Authority in exercise of its powers under the Air Navigation Order, hereby exempts this aircraft from the provisions of the said Order which prohibits an aircraft flying in accordance with the provisions of a Permit to Fly, from flying on any flight which does not begin and end in the United Kingdom without passing over any other country.*

*This exemption is granted subject to the condition that before flying within any other country, permission is obtained from the appropriate authority of that country".*

Information on obtaining such permission is provided in the Irish Aviation Authority's (IAA) General Advisory Memorandum (GAM) 06-10, which gives details regarding foreign microlight aircraft visiting Ireland. It is the policy of the IAA to allow foreign microlight licenced pilots and foreign licenced microlight aircraft to operate in the State on a temporary basis. In addition, it facilitates multiple applications submitted by a 'Fly-in' organiser for a single fee, but requires the organiser to contact the IAA at least 1 month in advance. However, permission must be requested by submitting IAA Form RPPL-F-155A, "*Temporary Operation for the Foreign Microlight Aircraft*"<sup>2</sup> to the IAA in advance. The IAA informed the Investigation that, although G-MYKH had a permission that expired in November 2010, it did not have permission on the day of the accident.

The Pilot held a Lifetime UK PPL(A)<sup>3</sup> with microlight rating issued by the Civil Aviation Authority (CAA) UK. His Class 2 medical was valid. The Pilot also held a PPL(M)<sup>4</sup> issued by the IAA. Although he had renewed his Irish PPL(M) ratings (both weight shift and 3-axis) on the 9 November 2010 and his medical was current, the IAA informed the Investigation that the English Language Component of his licence, which was also required to make the licence valid, had expired on 4 March 2011. When questioned, the Pilot said that he had not noticed the Language Proficiency expiry date in Section XIII of his licence and was unaware that his Irish licence was invalid.

## 1.7 Reporting of an Accident

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Irish Regulations S.I. No. 460 of 2009, Regulation 9 (1) require that:

*When an accident or serious incident to which these Regulations apply occurs, the pilot in command, or if he or she is incapacitated, the operator of the aircraft, shall, as soon as practicable, send notice of the accident or serious incident to the Chief Inspector at the AAIU by the most rapid practicable means available and, in the case of an accident, shall also immediately notify An Garda Síochána or, if it occurs outside the State, the appropriate local authorities.*

The Pilot did not notify the AAIU of the accident. He did however notify the National Microlight Association of Ireland (NMAI) which informed the Investigation that it inadvertently omitted to forward the accident report.

The Investigations notes that subsequent to this accident the IAA has amended the Temporary Operation for the Foreign Microlight Aircraft application form to include the following attestation:

*I will report any accident or serious incident to the Air Accident Investigation Unit (AAIU) at 01-6041293.*

## 1.8 Short Term Mutual Recognition

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The IAA informed the Investigation that it is currently working with the UK CAA to develop mutual recognition of microlight licences and aircraft certificates between Ireland and the UK.

The IAA stated that it has already published a revised Aeronautical Notice A.19 that now allows UK registered aircraft, with a valid Permit to Fly, to visit Ireland for up to 28 days at a time.

It stated that a similar arrangement for automatic recognition of UK national (non-ICAO) pilot licenses for a period of 28 days is currently being developed and has also included this issue in its current IAA State Safety Plan (item M.008). The IAA further stated that it is anticipated the UK CAA will agree a similar arrangement for Irish license holders to visit the UK and that it is expected this arrangement will be in place by late 2012.

2 Published on the IAA website at: <http://www.iaa.ie/index.jsp?p=93&n=97&a=225&pp=178&nn=512&IID=954>

3 PPL(A): Private Pilot Licence Aeroplane

4 PPL(M): Private Pilot Licence Microlight



## 2. ANALYSIS

### 2.1 General

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The day's flight from Convoy to Bantry developed into an unplanned two day operation, due to the engine overheating with the necessary trouble shooting and resultant repairs en-route. The wind conditions on the first day's flight were more benign than those on the second day. Also, on the first day, the Pilot constantly checked his fuel usage and switched to the second tank in a timely fashion.

On the second day, the wind was stronger and the Pilot increased speed with a corresponding increase on power and consequently fuel consumption increased. The outcome was that the Pilot underestimated his fuel consumption and overestimated the amount of fuel remaining in the aft tank for which there was no fuel gauge and which he could not see from his seat. As a result the rear tank was allowed to fully deplete before changing to the full front tank. This led to fuel starvation, engine stoppage and an attempt to restart the engine. This attempt was unsuccessful even though the front tank was selected. As the incorrect bulb primer was operated it is probable that fuel did not reach the engine because air had entered the fuel line when the rear tank became exhausted. Consequently, the engine failed to restart and a forced landing ensued where the choice of landing sites was limited. The aircraft was substantially damaged in this forced landing and the crew were fortunate to escape without injury.

The Investigation notes that the AAIU has previously investigated a similar microlight accident where the engine stopped, due to fuel exhaustion in one tank, and subsequently failed to restart, although a tank with fuel was also selected. It is therefore important to conservatively estimate fuel consumption and to change fuel tanks early. Furthermore, the decision to change fuel tanks should, where possible, take into account the terrain underneath e.g. changing tanks when passing over mountains or extents of water is best avoided.

The Investigation also notes that in a number of microlight accidents investigated by the AAIU, the glide angle expected by the pilot was not achieved. The glide angle achieved with the engine stopped was steeper than previously trained for with the engine at idle.

Such forced landings generally resulted in undershoots with substantial damage to the aircraft and occasional serious injury to the occupants. Microlight pilots should bear this in mind while practicing forced landings.

### 2.2 Permit to Fly

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Although the aircraft's Permit to Fly was valid for flight in Northern Ireland, it was not valid for flight in the Republic of Ireland. Had an appropriate application been made to the IAA in advance it would then have been acceptable and the responsibility was on the pilot to ensure that he had a valid permission.

As the border between both countries is physically ill defined and generally without obvious landmarks, it can be quite easy to stray from one country's jurisdiction into the other. The Investigation notes that the IAA is currently working with the UK CAA to develop mutual recognition of each other's microlight licences and aircraft certificates when visiting the territory of each other's state for a short period. However, when it stays for longer the pilot/owner must advise the relevant Aviation Authority; if it becomes based in the other country it should transfer its registration.

### 2.3 Reportable Occurrence

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Regulation 9 (1) of S.I. No. 460 of 2009 required the Pilot to report the accident to the AAIU. Although he reported the accident to another, the responsibility remained with him to ensure that the relevant authorities were informed. In the event this was not done and the Pilot furthermore removed the aircraft from the accident site without permission, thus preventing the examination of the wreckage at the accident site.

At the time of the accident the "Temporary Operation for the Foreign Microlight Aircraft" form required confirmation that the applicant was familiar with Irish legislation, but did not specify the mandatory requirement to report accidents and serious incidents, nor where, or to whom, such reports should be made. The Investigation notes that this form has since been amended to facilitate pilots of microlight aircraft in reporting such accidents and serious incidents.

## 3. CONCLUSIONS

### (a) Findings

1. Fuel change-over from the aft tank to the front tank was delayed until the rear tank became depleted, thereby leading to fuel starvation and engine stoppage.
2. The incorrect fuel primer bulb used did not purge air from the fuel line.
3. The engine did not subsequently restart and a forced landing ensued.
4. The forced landing was conducted in difficult terrain.
5. The intended landing field was not reached and the aircraft was substantially damaged on impact.
6. The Pilot held a UK CAA PPL(A) licence with a microlight rating, his Irish PPL(M) was invalid.
7. Although the aircraft had a current UK Permit to Fly, it was not approved for flight in the Republic of Ireland.
8. The Pilot omitted to notify the AAIU of the accident and removed the aircraft from the accident site without authorisation.

### (b) Probable Cause

Underestimating fuel consumption caused engine stoppage due to fuel starvation. This resulted in a forced landing during which the aircraft was substantially damaged.

### (c) Contributory factors

Using an incorrect fuel bulb primer.

## 4. SAFETY RECOMMENDATIONS

This Investigation does not sustain any Safety Recommendations.

-END-

**In accordance with Annex 13 to the International Civil Aviation Organisation Convention, Regulation (EU) No 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of these investigations is to prevent aviation accidents and serious incidents. It is not the purpose of any such accident investigation and the associated investigation report to apportion blame or liability.**

**A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.**

Produced by the Air Accident Investigation Unit

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