

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	MA Scale F4 Phantom	
<b>No &amp; Type of Engines:</b>	1 Turbine engine	
<b>Year of Manufacture:</b>	2021 (Serial no: N/A)	
<b>Date &amp; Time (UTC):</b>	16 September 2021 at 1430 hrs	
<b>Location:</b>	Near Kenyon Hall Farm Airfield, Warrington, Cheshire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - N/A	Passengers - N/A
<b>Injuries:</b>	Crew - N/A	Passengers - N/A
<b>Nature of Damage:</b>	Destroyed	
<b>Commander's Licence:</b>	Other	
<b>Commander's Age:</b>	72 years	
<b>Commander's Flying Experience:</b>	Unknown hours (of which unknown were on type) Last 90 days - unknown hours Last 28 days - unknown hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further AAIB enquiries	

**Synopsis**

A turbine powered model aircraft suffered a loss of control during its maiden test flight. It continued to fly beyond visual line of sight before crashing on a railway track and was subsequently run over by a passing train. Safety actions taken as a result of this accident include publication of enhanced guidance for members by the British Model Flying Association (BMFA). The model flying club also amended its procedures relating to flying turbine powered models.

**History of the flight**

The F4 Scale Phantom is a 1:10 scale flying model of the McDonnell Douglas F4 Phantom jet aircraft. It has a takeoff mass of 6.4 kg and is powered by a turbine engine using kerosene.

The recently-built model aircraft was undergoing its first test flight. Pre-flight preparation had included an independent check of the control surface sense and deflections, as well as range checks between the transmitter (on the controller) and the receiver (on the aircraft), from multiple angles.

A normal takeoff was performed to a height of approximately 200 ft agl, for a flight that predominantly comprised of left hand 'race-track circuits.' During the flight the pilot noted that the aileron response was "sluggish", but he considered it sufficient for safe flight. He

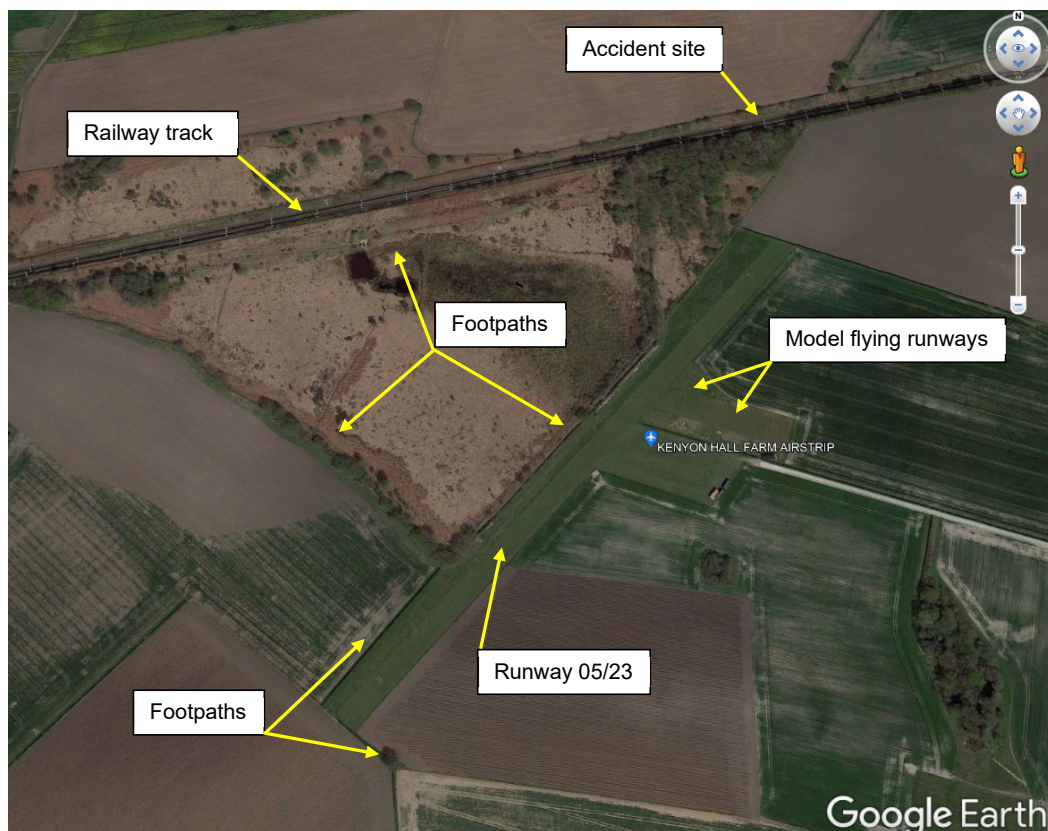
subsequently noted that up elevator was required to maintain level flight and progressively applied 'up' trim. During a 180° downwind turn, the aircraft suddenly veered to the right putting it on a north-west heading. Despite the pilot applying corrective aileron inputs, the aircraft did not respond and control was lost. It subsequently stalled, entered a spin and disappeared out of visual line of sight below a tree line.

The model aircraft was later found to have come to rest on a railway track adjacent to the airfield, close to a pedestrian crossing, and was subsequently run over by a passing train. The wreckage was recovered by the pilot and other club members. There were no injuries or damage to property. The model aircraft was destroyed.

The pilot considered that he had let the airspeed drop too low while concentrating on applying corrective elevator trim.

### Airfield information

The model flying club is based at Kenyon Hall Farm Airstrip (Figure 1), which is an unlicensed airfield with a grass Runway 05/23 for full size aircraft. There are two runways for model flying, a 75 m strip adjacent and parallel to 05/23 and a 110 m strip, which runs in an east-west direction. A railway track passes to the north of the site. There are several public footpaths which run along the north-west boundary of the airfield, and in the area between the airfield and railway track.



**Figure 1**  
Airfield overview

## Organisational information

The model flying club was affiliated with the BMFA. The club procedures contained an airfield diagram depicting the approved overfly zone (Figure 2) and advised that members should ‘avoid flying at distance’ in the direction of the railway track.

The procedures referred to the various footpaths in the vicinity of the airfield. Regarding the footpath on the edge of Runway 05/23, they stated that pedestrians using this path can be easily seen from the pilot’s box and takeoff or landing should be avoided when people are in this area. Another footpath on the south of the site is obscured by a hedge, and the procedures stated that flying over this area should be avoided. Neither the footpaths in the wooded area between the airfield and the railway track nor the pedestrian crossing over the railway track were specifically mentioned in the club procedures.

The procedures did not include any instructions regarding what steps members should take if an aircraft crashed on or near the railway track.



**Figure 2**

Airfield overfly area from model flying club procedures

The model flying club’s risk assessment did not include any hazards specifically relating to operation of model aircraft in the proximity to the railway line or loss of control in proximity to the railway line, although it did include several other loss of control scenarios.

## Club safety investigation

Following the accident, the model flying club carried out an internal safety investigation, which determined that preparation for the flight was performed in accordance with club procedures. The investigation did not identify the reason for the loss of control but considered several possibilities.

The club carries out approximately 6,500 flights per year and reported that this was the first aircraft to have crashed on the railway in over seven years of operation. Following the accident, the club amended its procedures to require any turbine powered model to be approved by the club committee before it can be flown at the site so that its suitability can be assessed.

### **Network Rail guidance for operating unmanned aircraft in the vicinity of railway tracks**

Network Rail publishes guidance on its website<sup>1</sup> for operating unmanned aircraft (including model aircraft) in the vicinity of railway tracks. This indicates that unmanned aircraft cannot be flown within 50 m of a Network Rail track without prior permission from its Air Operations team. For recreational or commercial UAV flights, permissions can be applied for via Network Rail's flight management system<sup>2</sup>.

Network Rail advised the AAIB that an object the size and weight of the model aircraft on a railway track would be unlikely to cause damage or risk of derailment to a moving train. However, collision with a train, in particular the driver's window, could cause a substantial safety threat, particularly given the carriage of jet fuel in this particular case. It could also represent a risk to track workers or users of the pedestrian crossing.

### **Discussion**

After control of the model aircraft was lost, it continued to fly for a short time beyond visual line of sight. The aircraft crashed on an adjacent railway track and close to a public footpath, where it had the potential to cause injury to uninvolved third persons. While the model aircraft was considered unlikely to have posed a train derailment risk given its size and weight, a train running over a jet-fuel powered model aircraft is a highly undesirable situation. There was also potential risk that the aircraft could have struck the train window.

The club procedures required members to avoid intentionally flying their aircraft in the direction of the railway track, but its risk assessment did not include the hazard of an inflight loss of control resulting in an aircraft crashing beyond visual line of sight, including on or close to the railway. There was consequently no guidance on alerting Network Rail to the potential threat of an object on the track and no guidance to members about the hazards of entering an active railway track.

### **Safety actions**

Following the accident, collaboration was undertaken between the BMFA and Network Rail's Air Operations team. This resulted in the provision of tailored guidance for unmanned and model aircraft operators which will be incorporated in the BMFA's member's handbook. It included the provision of a 24-hour emergency contact telephone number for reporting railway safety threats, including the presence of people or objects on or near railway tracks.

### **Footnote**

<sup>1</sup> <https://www.networkrail.co.uk/communities/safety-in-the-community/drone-safety-and-the-law/> [accessed August 2022]

<sup>2</sup> Hosted on the <https://dronecloud.io> application.

The BMFA also published an article about this accident, and operation in proximity to railways in general, in the July 2022 edition of its member magazine 'BMFA news'.

In addition, the BMFA has updated its incident/accident reporting portal to specifically guide members to telephone Network Rail immediately in the event that an aircraft has come down on Network Rail property, in addition to the requirement to inform the AAIB.

After the accident the club amended its procedures to require any turbine powered model to be approved by the club committee before it can be flown at the site, so that its suitability can be assessed. Following this investigation the club added a section to its procedures relating to retrieval of models that land outside the airfield boundary, which directly references the Network Rail 24-hour emergency telephone number.