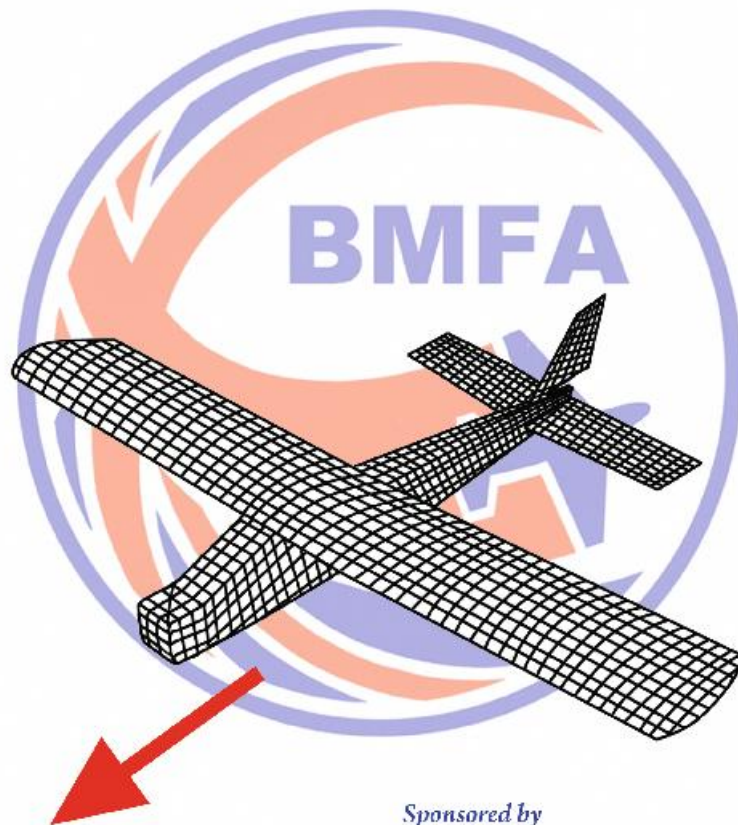


**British Model Flying Association  
Payload Challenge 1  
Distance**



**2015**

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**British Model Flying Association**  
**2015 University and Schools Payload**  
**Challenges**

**Dates Notice**

**27<sup>th</sup>/28<sup>th</sup> June 2015**

**Elvington Airfield**  
**Elvington**  
**York**  
**YO41 4AU**

**(Final timetable and arrangements to be confirmed)**

The British Model Flying Association invite your school or youth group to enter a team or teams in the

**2015**  
**Payload Challenge 1**  
**Distance**

The information contained in this brochure provides a detailed overview of the 2015 Payload Challenge 1 (distance) as well as all information and forms for prospective entrants. We look forward to meeting your staff and students in 2015.

Should you require any assistance please contact the BMFA Challenge Co-ordinator.

Manny Williamson

(Address as on the entry form, final page)

**NOTE**

These competitions are supported by cash prizes, both for the school/department and the individual members of the winning team.

## INTRODUCTION

The Payload Challenge 1 (distance) has been developed as an introduction to the concepts of aircraft design and build and also a meaningful lead in to the two well established BMFA payload competitions.

The competition is specifically aimed at teams from schools, youth groups, cadets and scouts where all team members are aged 17 or below on the date of the flying competition.

The academic requirements are less rigorous than the more advanced challenges 2 and 3 (Quantity and Weight) and teams are not required to submit reports in advance of the competition, however teams are required to produce a brief written summary of their design process and finished aircraft including simple 3 view drawings, teams are also required to conduct a 5 minute presentation to a team of expert judges prior to the flight element of the competition.

For the flying element of the competition, teamwork, planning and a well-structured approach combined with a well designed and practical airframe will be key elements to success in this competition.

Please note that it is strongly recommended that the help of an experienced aero modeller is enlisted from the very start.

Local contacts are available from the BMFA office.

We look forward to receiving your team's entry for the 2015 Payload Challenge 1.

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## **D 1 OBJECTIVES**

Contestants are to research, design, build and prove an electric powered, radio controlled aircraft, to transport the designated payload over the longest distance possible in a prescribed 5 minute time slot utilising a standardised propulsion unit.

Teams are required to produce simple drawings outlining their aircraft's design and construction. Teams are then required to give a verbal presentation in front of a panel of judges on their aircraft and finally take part in a flight competition to demonstrate the performance of their aircraft.

The winners are the team who achieve the highest aggregate score for all the parts of the competition.

## **D 2 CONTEST ELIGIBILITY**

The contest is open to students in full time education up to the age of 17 (at date of flying competition), teams may be from schools, cadets, scouts or other youth groups.

The pilot of the aircraft need not be a member of the group which has entered the competition as designers and builders, but must be a member of the BMFA or the SAA and hold at least a 'B' Fixed Wing Power Achievement Scheme Certificate or equivalent. The maximum number in a team will be five students plus a manager and a pilot. For the flying part of the contest a pilot can be supplied by the contest organisers.

## **D 3 PAYLOAD**

D 3.1 Provision should be made to accommodate a payload measuring a **maximum** of 150mm x 150mm x 300mm, the payload will be supplied by the organisers and will have a **maximum** weight of 500g, the assumption must be made that the payload will include instrumentation and data recording capability, and as such must be mounted to the airframe securely to ensure that it cannot move or breakaway in flight.

**Note:** It is likely that organisers will test the payload area with a block measuring 148mm x 148mm x 298mm, it is suggested that where the provision is made for internal carriage of the payload teams do not aim for a very tight fit, as failure to accommodate the appropriate payload dimensions will remove the aircraft from the flight competition until rectified.

D 3.2 The payload may be mounted externally or internally but may in no way contribute to the strength or integrity of the airframe.

## **D 4 AIRCRAFT CONFIGURATION**

D 4.1 Only fixed wing designs will be permitted to enter the competition. The maximum total wingspan is to be 1200mm.

D 4.2 Propulsion unit is to consist of one E-flight Power 10 motor and one E-flight 40A speed controller (available at cost direct from the BMFA office). The battery must be a 3 cell Lithium

Polymer with a capacity not to exceed 2200 MAh, the pack must have the manufacturers label with the capacity shown. No modification to the motor is permitted.

D 4.3 The specified “isolator” (fuse unit) **must** be fitted in order that the motor and speed controller can be isolated from the main power supply for the purpose of safe aircraft handling and loading, the “isolator” must be mounted in such a location as to be readily accessible by team members and also easily visible to flightline marshals.

D 4.4 Additionally, the Isolator unit must be located a minimum of 100mm from the propeller arc and orientated so as to promote removal of the fuse predominantly away from the direction of the propeller arc (25 degree minimum). It is important that the unit is affixed to a suitably sturdy area of the airframe in order to prevent damage when fitting or removing the fuse.

D 4.5 It is required that a tag or pennant is affixed to the fuse to aid removal and visibility.

D 4.6 Only one flight battery may be used per flying round.

D 4.7 A propeller spinner or rounded safety nut must be fitted on forward facing motors.

D 4.8 The allocated team number **must** be displayed on the upper wing surface of the aircraft in characters a minimum of 100mm high in a contrasting colour. Aircraft not fulfilling this requirement will not pass scrutineering and processing.

**The specified fuse and holder assembly is available from the BMFA at cost and is detailed at the rear of this brochure.**

## **D 5 RADIO RESTRICTIONS**

D 5.1 Radio control will be used to fly and manoeuvre the aircraft.

D 5.2 Radio installations will be scrutinised by the organisers and must be deemed fit for the intended application. Contestants must ensure that servos and linkages are capable of handling the anticipated air loads.

D 5.3 Computer transmitters are permitted, however any extra functions, mixing or advanced programming must be explained and demonstrated during the presentation to the judges.

D 5.4 Aids to flight stabilisation such as gyros, auto pilot and auto level are not permitted.

D 5.5 Equipment on the 2.4GHz band only.

D 5.6 All radio equipment must be UK compliant.

## **D 6 COMPETITION PROCEDURES**

D 6.1 There will be two elements to the competition in which all participants are required to compete. The first, the design competition, will enable the contestants to present their designs to a panel of expert judges.

D 6.2 The second, the flight competition, will determine which aircraft is able to cover the most distance within the allotted time period (most laps of the course).

## D 7 DESIGN COMPETITION

D 7.1 DRAWINGS: Each team must submit a three view drawing for the aircraft which is to be flown. The drawing is not required to be to scale but must contain dimensioned front, side, and top views. Drawings must be presented to the judges in hard copy A3 format on the Saturday morning of the flight competition. Drawings must include the name of the team and the designated reference number in the title box.

The drawings will be worth a maximum of **25 points** which will be allocated as follows:

3 clear views	max <b>5 points</b>
Inclusion of relevant dimensions	max <b>5 points</b>
Description of materials utilised	max <b>5 points</b>
Manufacture/assembly notes	max <b>5 points</b>
Overall graphic quality/clarity	max <b>5 points</b>

D 7.2 Presentation: Prior to the first competition flight, each team will present their aircraft design before a panel of professional engineers.

D 7.3 Order of presentation will be established by the organisers and announced at the start of the competition.

D 7.4 Each team will be allocated five minutes in which to describe and promote their design.

D 7.5 Other than the aircraft (including transmitter if appropriate), no visual aids will be available or permitted. The aircraft should be available for the presentation and a **10 point** penalty will be incurred if the aircraft does not feature as part of the presentation.

D 7.6 Two points will be deducted for each ten-second-time period or part thereof over the five minutes allowed for the presentation.

The presentation is worth **30 points**. Judging criteria for the presentation will include:

- Balance and continuity
- Articulation
- Technical highlights

D 7.7 Subsequent to each team's presentation, aircraft details will be recorded, this will include a physical check that the total wingspan does not exceed 1200mm. A safety and airworthiness inspection will also be conducted at this time to enable teams to address any item requiring attention before flight.

Correct Failsafe operation must also be demonstrated at this time so it is important that the transmitter and batteries are made available to the scrutineering team.

**NOTE: Experience has shown that teams do not make the best use of the opportunity to gain addition points that the presentation offers, remember, your teams presentation should aim for a professional standard and “sell” the benefits of your particular design to the maximum.**



**This competition is as much a test of your organisational skills as of your engineering flair. You may well have a world-beating design....on paper. Each year several teams fail to complete their projects by the date of the Flight Competition.**

## **D 8 THE FLIGHT COMPETITION**

D 8.0 The aircraft must be rendered “safe” on all occasions that it is handled by the team for the purpose of payload loading, a team member must display the isolator/breaker for the benefit of the flight line marshals during loading and unloading.

D 8.2 At the start of the prescribed time slot the model should be without payload, on being given the start signal the team must load the aircraft with the payload. The model must then be carried to the take off line and set down facing predominantly into wind, at this time the power system can be rendered “live” by inserting the “isolator”.

D 8.3 The aircraft must take off from a standing start (no pushing) utilising it’s own undercarriage.

D 8.4 Having completed a successful take off the model must proceed to pylon number one whereupon a flag will be raised immediately the model has passed the pylon. The aircraft will then proceed to pylon two where the same process will apply. The aim is to complete the highest number of laps of the course within the permitted time allowance. Only completed laps will count towards the overall score, the initial lap including the take off will be counted as one lap.

D 8.5 Should a successful take-off not be completed, teams may retrieve the model for further attempts without reloading the payload within the allotted time period.

D 8.6 The aircraft must complete a successful landing, remaining in airworthy condition other than damage to undercarriage and propeller and come to a complete standstill before a team member may approach, disarm, then retrieve the aircraft and return it to the loading bay.

D 8.9 At the end of the time slot the details of the flight will be recorded by the CD and added to the judge’s scorecard.

D 8.10 The aim is for each team to fly two, five minute slots, however, a final decision will be announced at the morning briefing to reflect the time available, the number of teams competing and the expected weather conditions.

D 8.11 The distances indicated on the flight plan sheet are for guidance purposes only, these will be decided and set prior to the commencement of the flight competition.

D 8.12 Time for trimming flights will not be available on the day of the competition. Entrants should test fly their aircraft prior to the weekend of the competition.

D 8.13 Any protest must be filed in writing to the Contest Director by the faculty advisor or team captain. Any protest must be filed no more than 10 minutes after the Flight Competition is announced as being completed. In order to have a protest considered a team must be willing to put up **20 points**, which may be forfeit, if their protest is rejected. The Contest Director may call upon a jury of interested parties to help with his decision. This decision is final.

## D 9 SCORING

**Overall score = Drawings + Presentation score (max. 30) - Penalties + Flight score (number of completed laps).**

**Penalty points are assessed as follows:**

- **2 points deducted for each ten second time period or part thereof by which the presentation overruns the allotted 5 minutes**
- **10 points deducted for no aircraft at presentation**

The flight score will be normalised, **100 points** will be awarded to the team who complete the largest number of laps in their **best** round and all other scores will be calculated as a percentage of this figure (this has been implemented in order to maintain a valid balance between the points available for the drawings, presentations and flight score).

## D 10 GENERAL CONDUCT AND SAFETY

D 10.1 The word of the contest director is final in all matters.

D 10.2 It is important that all team members including the pilot attend the morning briefing; this will consist of safety information as well as other information pertinent to the weekend's activities.

D 10.3 In the event of unsportsmanlike conduct, the team will receive a warning from the Contest Director. A second violation will result in expulsion of the team from the competition.

D 10.4 Deliberate or repeated violation of safety rules will result in the team's expulsion from the competition.

D 10.5 All competing aircraft must be fitted with a serviceable failsafe that returns the throttle to stop on loss or corruption of the radio signal.

D 10.6 All competing aircraft must be fitted with the specified unit for isolating the flight battery from the motor for safety during payload transfer and handling.

D 10.7 The pilot of the aircraft should satisfy himself before flight that all systems are functioning correctly and that all controls have full and free movement as well as operating in the correct sense.

D 10.8 The Competition Director reserves the right to ground any aircraft if in his opinion, or that of his appointee, the aircraft does not meet a safe standard of construction or radio installation.

D 10.9 The extent of the flying area will be announced during the morning briefing, any pilot flying within the briefed "no fly" area's will be directed to land immediately.

**D 10.10 Safety is of paramount importance and pilots must be prepared to "ditch" their aircraft on the order of the flight-line director should he deem it necessary on safety grounds.**

## **D 11**

PLEASE SEND YOUR COMPLETED ENTRY FORMS TO THE CHALLENGE CO-ORDINATOR AT:

The British Model Flying Association  
The Development Officer  
Chacksfield House  
31 St Andrews Road  
Leicester  
LE2 8RE

Or by email marked for the attention of the Development Officer (Manny Williamson) at [admin@bmfa.org](mailto:admin@bmfa.org)

To facilitate planning, we must receive, by January 30<sup>th</sup> 2015, a formal notification of your intent to enter the 2015 competition.

### **REPORTS AND DRAWINGS**

All reports and drawings must be submitted to the registration desk by 10.00am on the Saturday morning of the flight competition (format as detailed in D 7.1)

NOTE: On receipt of your completed entry form you will receive a confirmation and also your unique team designation reference; this reference must be quoted in **all** correspondence and appear on the aircraft wing as detailed in E 3.8.

## **D 12 PRIZE AND AWARD DETAILS**

### **1<sup>st</sup> Place**

The Doodson Payload Challenge Trophy\*

£100.00 Cash prize, paid to department or school.

£25.00 Cash prize, paid individually to each team member (up to a limit of five persons).

\* Note: the Doodson Trophy is presented to the winning team on an annual basis and remains the property of the British Model Flying Association. The trophy must be returned 28 days prior to the competition of the following year in order that it is available to present at the event.

## **D 13 POWERTRAIN NOTES**

The specified motor for the Electric Lift competition is the Eflight Power 10 1100kv Brushless Outrunner (one of).

This is to be coupled to an Eflight 40amp speed controller (one of).

Only aircraft utilising the specified powertrain will be eligible to compete in the challenge.

Horizon Hobbies who are the UK importer of the Eflight range have kindly agreed to supply these units at a much reduced cost to teams competing in the challenge. These are available directly from the BMFA office (one set per team entered) at a cost of:

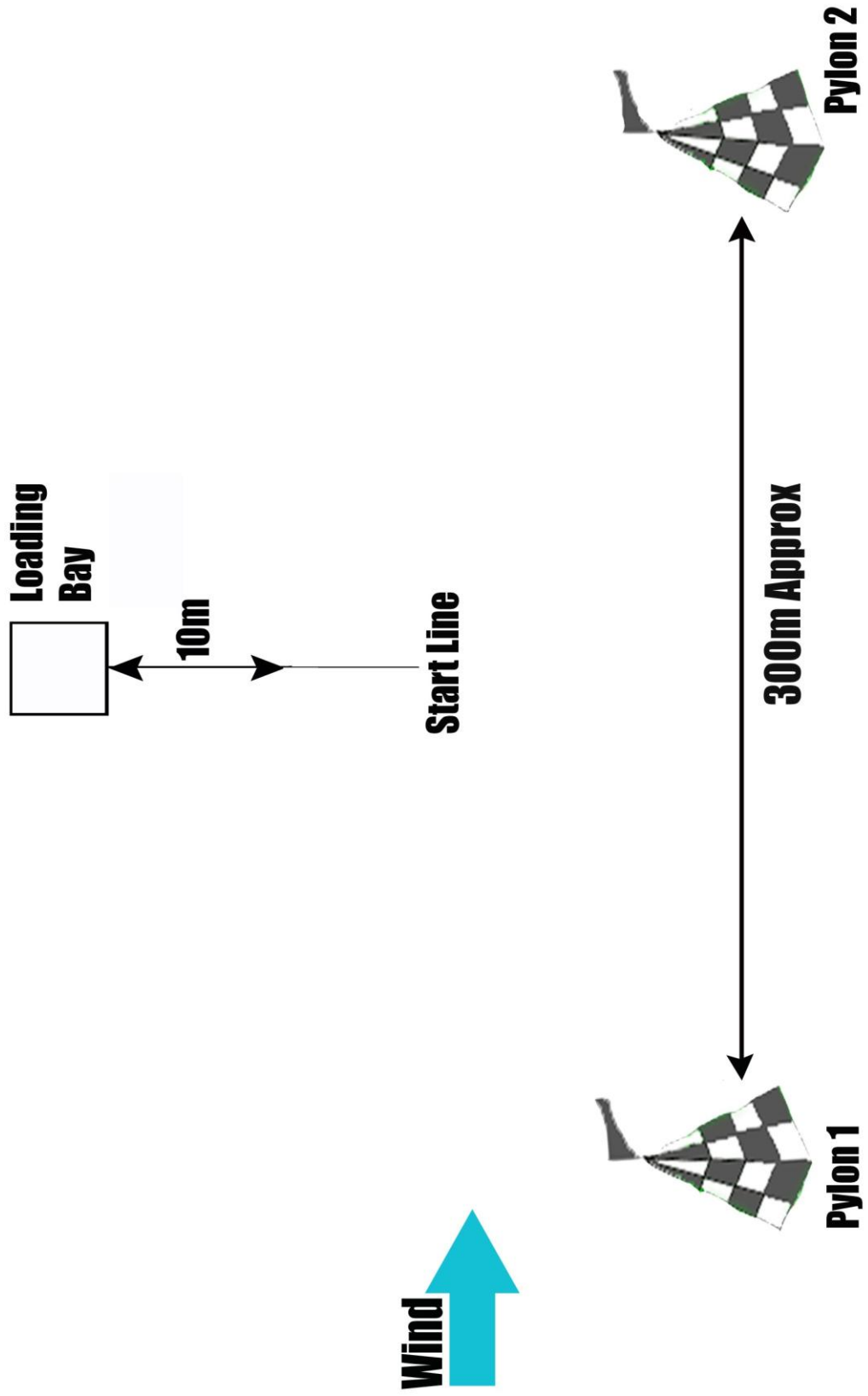
Eflight Power 10 motor £32.50 inc VAT

Eflight 40amp speed controller £34.10 inc VAT

Fuse Holder Unit 60A £8.50 inc VAT

Time Delay Fuse 40A £1.56 inc VAT

**Flight Pattern Subject To Wind Direction**



# Entry form for 2015 Payload Challenge 1

## Distance

**Note: Please copy this form and complete one form per team entered**

<p><b>Name of University or School:</b> _____</p> <p><b>Name of Tutor/Teacher responsible for entry:</b> _____</p> <p><b>Team Name:</b> _____</p>
---

<p><b>Names of 5 Team Members:</b></p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p><b>Pilot:</b> _____</p>
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<p><b>Name and Address of Team Manager</b></p> <p><b>Name:</b> _____</p> <p><b>Address:</b> _____</p> <p>_____</p> <p>_____</p> <p><b>Contact Number:</b> _____</p> <p><b>Email:</b> _____</p>
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