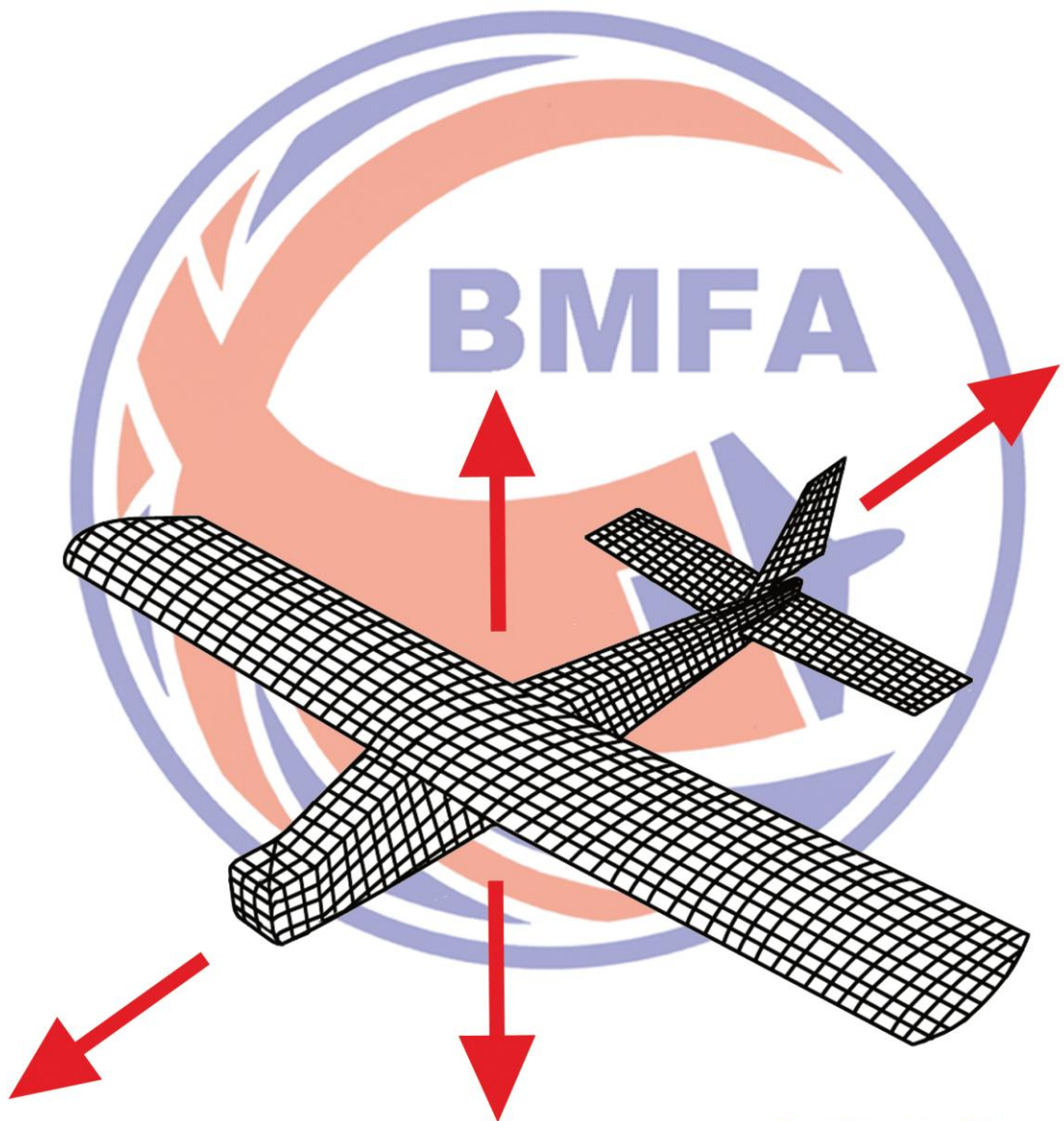


British Model Flying Association
Flight Challenge 2
Kit-lift



2018



**ROYAL
AERONAUTICAL
SOCIETY**

**British Model Flying Association
2018 University and Schools
Flight
Challenges**

Dates Notice

1st, 2nd, 3rd June 2018

**National Centre for Model Flying
BMFA Buckminster
Sewstern Lane
Grantham
Lincolnshire
NG33 5RW**

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

2018 **Payload Challenge 2** **Kit Class**

The information contained in this brochure provides a detailed overview of the 2018 Flight Challenge 2 (Kit Class) as well as all information and forms for prospective entrants. We look forward to meeting your staff and students in 2018.

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 2 (kit class) has been developed as a structured introduction to the more advanced concepts of aircraft design and build and also a meaningful lead in to Challenges 3, 4 and 5 where teams are required to design from "scratch"

The academic requirements are far less rigorous and the category makes use of a commercially available pre-cut cut airframe, the SLEC Sky 40 training aircraft.

Teams are required to construct the aircraft using the comprehensive instructions and plans provided within the kit and to utilise a standard electric propulsion unit.

In addition, teams are required to develop a payload module(s) to be attached to the aircraft to accommodate and transport a payload of tennis balls.

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, teams are required to demonstrate their aircraft in flight in its empty state as well as with payload in place.

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 2018 Payload Challenge 2.

In Partnership with the Royal Aeronautical Society

- The Royal Aeronautical Society (RAeS) is pleased to be able to once again join the BMFA Payload Challenge event.
- The RAeS will provide Aerospace Professional support for judging and operation of the competition
- This support for the competition is part of the RAeS outreach programmes to schools, colleges and universities.
- The RAeS also provides career support to aspiring and established Aerospace Professionals and details can be found on its website at <https://www.aerosociety.com/careers-education/>



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SUMMARY OF RULES

Note: This summary is intended as a simplified guide to the rules. Competitors should ensure that they have read the full rules before committing to design and manufacture of their aircraft.

OBJECTIVES AND SCORING

- The objective is to construct the specified SLEC Sky 40 aircraft kit to an appropriate standard of airworthiness.
- Teams must design and develop an add on payload module(s) to accommodate the specified payload.
- Each team will be required to give a presentation of five minutes duration outlining the airframe construction and the development of the payload module(s).
- teams are required to demonstrate their aircraft in flight both empty and also with payload.
- The winner will be the team achieving the highest combined score from all elements.

FLIGHT COMPETITION

- For the flight competition teams are required to demonstrate their aircraft in flight over three 6 minute rounds.
- At the start of each round the aircraft will be without payload.
- The aircraft is to be piloted around a predetermined course and landed after each circuit.
- After each circuit one additional payload item is to be added (standard size tennis ball)
- The score is the total number of payload items collected in the three rounds.

CONTEST ELIGIBILITY

- The competition is open to members of youth groups and students at schools and colleges and those in further education.
- Teams will comprise not more than five students plus a manager and pilot.

THE PAYLOAD

- The payload will be supplied by the organisers.
- The payload module(s) must be designed to accommodate standard sized tennis balls.
- Payload modules may be attached to the aircraft in any way and the fuselage may be modified to accommodate as appropriate.

- Modules may be permanently attached or may be removable for loading.

THE AIRCRAFT

- The aircraft must be the standard airframe constructed from the SLEC Sky 40 kit.
- The power system will comprise one E-flight Power 10 motor, an E-flight 40 amp speed controller (or prescribed equivalent) and a 3 cell Lithium Polymer battery of not more than 2200 mAh capacity.
- The electrical circuit must include the specified isolator wired such that the motor cannot be run with the isolator removed.
- The aircraft undercarriage must enable operation from a grass runway.

CONTROL

- Control of the aircraft will be by means of radio control operating on the 2.4 GHz waveband.
- No aids to stabilisation are permitted.
- The system must include an operating Failsafe facility.

SCRUTINEERING

- All entrants will be required to satisfy the scrutineers that their aircraft and control system comply with the regulations.
- The scrutineers must also be satisfied that the aircraft and systems are safe for flight.
- Teams will be required to demonstrate their Failsafe operation.

CONDUCT AND SAFETY

- All members of competing teams will be expected to conduct themselves in a sportsman-like and safe manner.
- Teams not meeting these criteria may be penalised or excluded.
- The word of the contest director is final in all matters.

K 1 OBJECTIVES

Teams are to construct a standard SLEC Sky 40 airframe.

Teams are required to design and construct an add on module(s)/modify fuselage to accommodate and transport the prescribed standard tennis ball payload.

Teams are required to participate 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.

K 2 CONTEST ELIGIBILITY

The competition is open to members of youth groups and students at schools and colleges and those in further education.

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 if required.

K 3 PAYLOAD

K 3.1 Having constructed a standard SLEC SKY airframe teams are required to design and develop a standard module(s) to accommodate the largest number of standard sized tennis balls possible.

K 3.2 The module(s) may be affixed to the aircraft in any way and the fuselage may be modified as required to accommodate, the flying surfaces must not be altered.

K 3.4 The payload module(s) must be mounted in a location that does not substantially alter the centre of gravity of the aircraft between empty and full.

K 3.5 Lightweight foam packing blocks may be used to restrain the payload in flight as required.

K 4 AIRCRAFT REQUIREMENTS

K 4.1 The aircraft is to be a standard Sky 40 airframe constructed from the SLEC laser cut kit.

K 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, ESC or battery is permitted.

K 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.

K 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.

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

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

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

K 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.

K 4.9 Teams are permitted to utilise duplicate airframes of the same design but where a substitute airframe is utilised as an aid to completing the flight competition a penalty of 30 points will be applied.

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

K 5 RADIO RESTRICTIONS

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

K 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.

K 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.

K 5.4 Aids to flight stabilisation such as gyros and auto level are permitted but pilot authority must be maintained at all times, fully autonomous flight is not permitted.

K 5.5 Equipment on the 2.4GHz band only.

K 5.6 All radio equipment must be UK compliant.

K 6 COMPETITION PROCEDURES

K 6.1 There will be two elements to the competition in which all participants are required to compete. The first, the construction and design competition, will enable the

contestants to present their completed airframe and module designs to a panel of expert judges.

K 6.2 The second, the flight competition, will determine which aircraft is able to successfully transport the highest number of payload items.

K 6.3 Each team must display their designated entry reference on the wing 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.

K 7

K 7.1 Presentation: Prior to the first competition flight, each team will present their aircraft and module(s) design before a panel of professional engineers.

K 7.2 Order of presentation will be established by the organisers and announced at the start of the competition.

K 7.4 Each team will be allocated five minutes in which to describe the build process and the design of the payload module(s), content falling outside of the allocated time will not be considered during marking.

K 7.5 Visual aids will not be permitted, however teams may utilise material/test samples, aircraft cross section samples and replica components as part of the presentation to judges. The aircraft should be available for the presentation and a **10 point** penalty will be incurred if the complete aircraft does not feature as part of the presentation.

K 7.6 The presentation is worth **30 points**. Judging criteria for the presentation will include:

- Balance and continuity
- Articulation
- Technical highlights

K 7.7 Subsequent to each team's presentation, aircraft details will be recorded. 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 additional 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.

K 8 THE FLIGHT COMPETITION

K 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.

K 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 one tennis ball. 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”.

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

K 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.

K 8.5 Following a completed circuit the aircraft should be landed, rendered safe and returned to the loading bay where a second tennis ball is added, the process is to be repeated with one payload item added at each cycle until the end of the allocated slot time is reached.

K 8.6 At the end of the prescribed time slot the number of tennis balls will be counted, only payload items transported during full laps will be counted towards the flight score.

K 8.7 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.

K 8.8 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.

K 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.

K 8.10 The aim is for each team to fly three, 6 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.

K 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.

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

K 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.

K 9 SCORING

Overall score = Presentation score (max. 30) - Penalties + Normalised flight score.

Penalty points are assessed as follows:

- **10 points deducted for no aircraft at presentation**
- **30 points for substitution of complete airframe.**

The flight score will be normalised, **100 points** will be awarded to the team who transport the largest number of payload items over all rounds 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).

K 10 GENERAL CONDUCT AND SAFETY

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

K 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.

K 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.

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

K 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.

K 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.

K 10.7 The pilot of the aircraft should ensure 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.

K 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.

K 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.

K 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.

K 11 ENTRY

PLEASE SEND YOUR COMPLETED ENTRY FORMS TO THE CHALLENGE COORDINATOR 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

To facilitate planning, we must receive, by 1st February 2018, a formal notification of your intent to enter the 2018 competition.

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.

K 12 PRIZE AND AWARD DETAILS

1st Place

The BMFA Innovation 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).

Certificates will be awarded to all competitors.

* Note: the BMFA Innovation 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.

K 13 POWERTRAIN AND KIT NOTES

The specified motor for the Quantity Challenge is:

Eflight Power 10 or 4 Max PO-3541-70 motor - £34.50 inc VAT

Eflight 40amp or 4 Max PP-TESC45AU speed controller - £36.50 inc VAT

Fuse Holder Unit 60A - £9.50 inc VAT

Time Delay Fuse 40A - £2.00 inc VAT

Postage and Packing will be charged at £10.00 per order

SLEC SKY 40 kit available directly from:

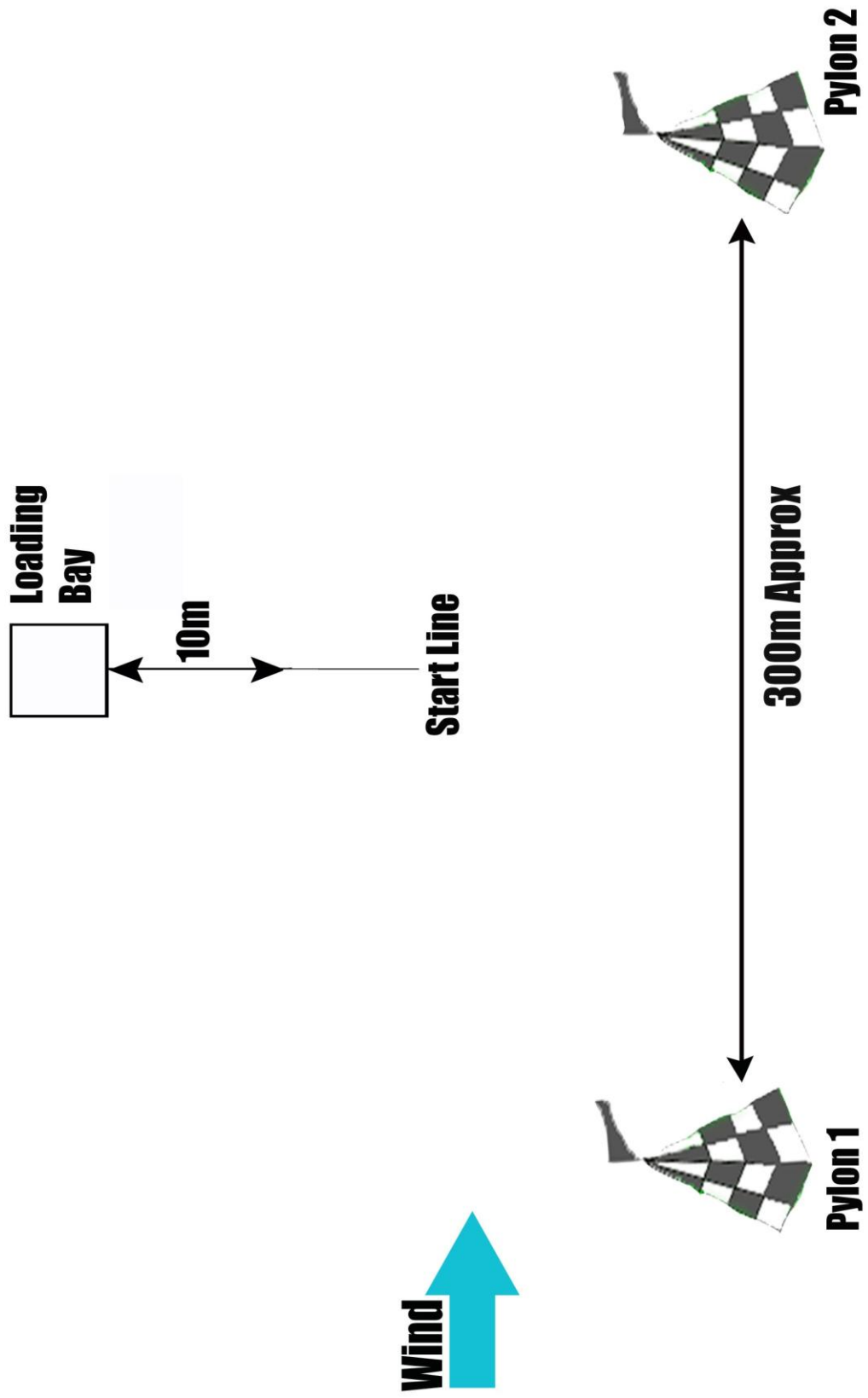
SLEC Ltd
Units 8 - 10 Norwich Rd Industrial Estate
Watton
Norfolk
IP25 6DR
01953 885279
Sales@SlecUK.com
www.slecuk.com

Motors and speed controllers also available directly from 4-max

<http://www.4-max.co.uk>

Tel: 01256 782 512

Flight Pattern Subject To Wind Direction



Entry form for 2018 Payload Challenge 2 Kit

Note: Please copy this form and complete one form per team.

Forms to be received by 1st February 2018

Name of University, School, youth group or organisation:

Name of Tutor/Teacher responsible for entry: _____

Team Name: _____

Names of 5 Team Members:

1. _____

2. _____

3. _____

4. _____

5. _____

Pilot: _____

Name and Address of Team Manager

Name: _____

Address: _____

Contact Number: _____

Email: _____

All correspondence relating to the 2018 Challenge will be conducted through the addresses and numbers given on this form

Do you require technical assistance from local aeromodellers? YES / NO

Do you require a pilot? YES / NO

Please note a fee of £50.00 is payable per Team entered (non refundable).

Cheque to be made payable to BMFA or alternatively to pay by credit/debit card please contact the office.

Cheque enclosed

BMFA
Chacksfield House
31 St Andrew's Road
Leicester
LE2 8RE

Telephone: 0116 2440028

Please note on receipt of completed Entry Form and payment each team will be issued with a unique reference number which must be quoted in all correspondence including submissions to the judges and also displayed on each aircraft as detailed in the Rules Brochure.

Office Use Only

Payment Received: Date: _____ Signature: _____

Reference Number: _____