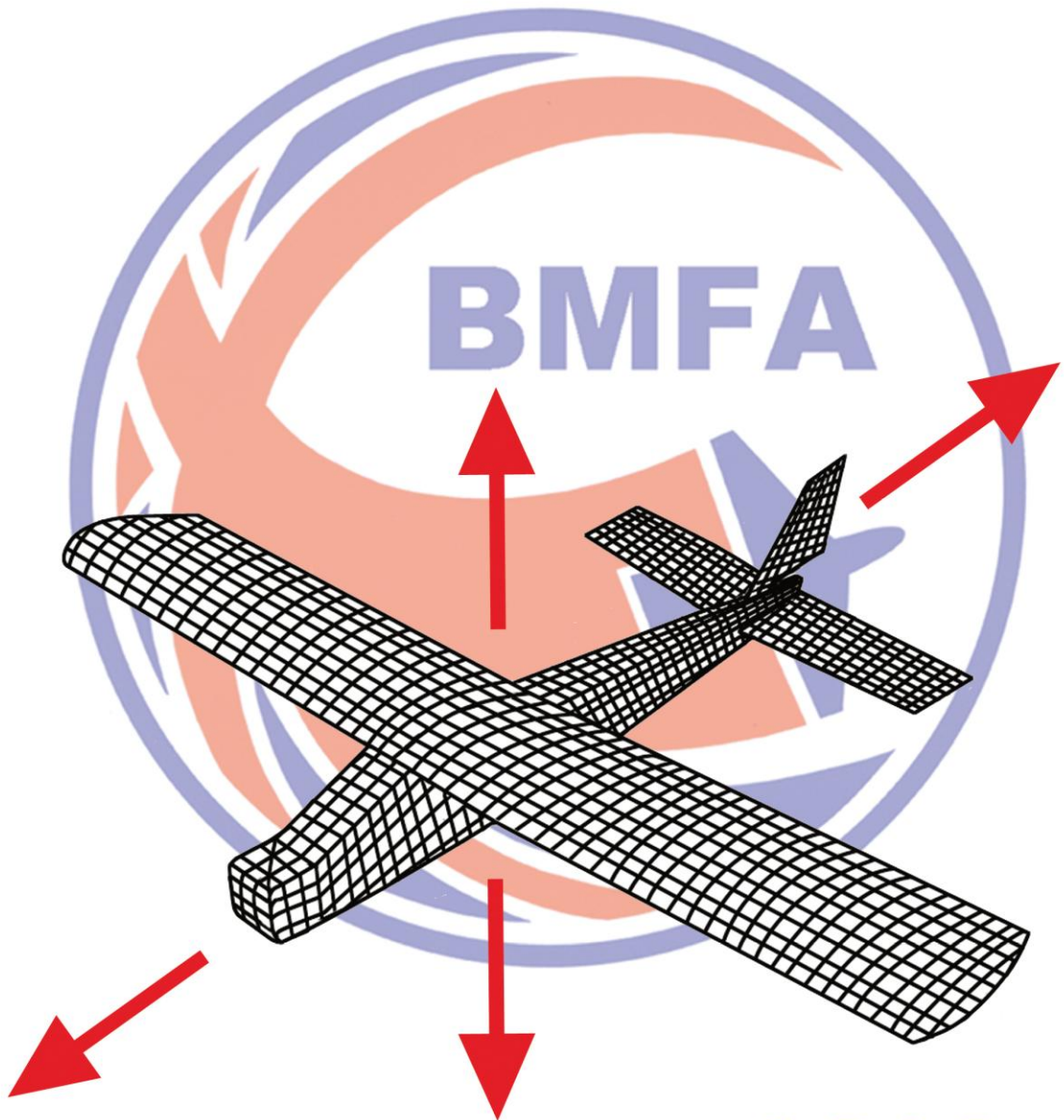


British Model Flying Association
Flight Challenge 1
Egg-lift



2018



**ROYAL
AERONAUTICAL
SOCIETY**

**British Model Flying Association
2018 University and Schools
Flight Lift
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 **Flight Challenge 1** **Egg Lift**

The information contained in this brochure provides a detailed overview of the 2018 Flight Challenge 1 Egg Lift 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 Flight Challenge 1 Egg Lift has been developed as an initial introduction to the concepts of aircraft design and build and also as a meaningful lead in to Challenges 2, 3, 4 and 5 which require a more comprehensive understanding of design and build principles.

Teams are required to consider their aircraft to be a prototype for a courier specialising in the transportation of fragile organic products. In this case the 'passenger' egg must be treated with due care and allowed to enjoy an uneventful journey to and from its destination. The starting point and destination is an egg cup which represents a safe haven for our intrepid egg.

Competing Teams are required to:

1. construct a lightweight and cost effective aircraft utilising the provided wing template from foam-board or 'Depron' / expanded sheet polystyrene foam.
2. develop a payload module to be attached to or incorporate into the aircraft, to accommodate and safely transport the payload of a single medium sized chicken egg.
3. For the flying element of the competition, teams are required to demonstrate their aircraft in flight in its unladen state as well as with the payload in place with the ultimate aim of a safe delivery to and from the prescribed landing area via the competition circuit.

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 Flight Challenge 1 Egg Lift.

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

- Teams must design an original aircraft utilising the specified wing as a basis, the design must include provision to safely transport the required payload of a single medium sized chicken egg. Aircraft may be of any design and configuration (other than the standard wing requirement)
- For the flight element of the challenge teams will be required to fly three rounds, for each round the aim is to perform a single circuit 'empty', after which they will land, the egg will be inserted and the second circuit completed laden. Scoring of the flight will be based on the total time taken to complete the two circuits. If the egg is discovered to be damaged, teams will forfeit their score for the 'duty of care' to their passenger (50% of flight marks). The specifics of the flight element may be modified on the weekend of the competition to reflect the conditions and number of teams present.
- The winner will be calculated as a product of the scores of the team who completes the flying element successfully in the shortest time and 5 minute presentation of their design to a judging panel.
- Credit will be awarded for teamwork in the safe loading, launching and landing of the aircraft as well as in the presentation and explanation of their concepts.

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 a single medium sized chicken egg.
- The payload will be supplied by the organisers.
- The payload module must be designed to protect the payload during all phases of flight.

THE AIRCRAFT

- The aircraft main wing must be of the dimensions shown in the diagram E15 (+/- 10mm).
- Aircraft configuration is otherwise unrestricted.
- The aircraft must use the specified power system.
- A single motor must be used.
- The electrical circuit must include the specified isolator wired such that the motor cannot be run with the isolator removed.
- The fitment of an undercarriage is optional.
- Where no undercarriage is fitted provision must be made for safe hand-launching.
- The aircraft undercarriage (if fitted) 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 band.
- Aids to stabilisation (gyros) 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.

E 1 OBJECTIVES

Teams are to construct an airframe which includes a fixed wing of specified dimensions

Teams are required to design and construct an add on module(s) to accommodate and transport the prescribed payload (a single, medium chickens egg).

Teams are required to give a 5 minute presentation on their aircraft.

Teams are required to participate in a flight competition to demonstrate the performance of their aircraft.

E 2 CONTEST ELIGIBILITY

The contest is open to students in full time education up, 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 element of the contest a pilot can be supplied by the contest organisers if required.

E 3 PAYLOAD

E 3.1 Teams are required to consider their aircraft to be a prototype for a courier specialising in the transportation of fragile organic products. In this case the egg must be treated with due care and arrive safely at the arrivals lounge (egg cup).

E 4 AIRCRAFT REQUIREMENTS

E 4.1 The aircraft is to utilize a standard fixed wing of specific dimensions. Teams may wish to make themselves aware of the 'Flite Test Versa' wing which meets these specifications and gives less experienced teams the option of downloading files and following the on-line guidance for construction. The aircraft must be substantially made of foam /paper based materials. Plywood etc may only be used for motor mounts and spars for local stiffening and adhesive tape/glass weave tape may be used as required. Control horns, servo mounts and hinges must be securely fixed so as to meet scrutineering requirements.

E 4.2 The aircraft may or may not be fitted with an undercarriage (wheels)

E 4.3 Propulsion unit is to consist of:

1 x 4 Max PO-2830-1350 motor

1 x 4 Max PP-TESC30AU speed controller

1 x 3 cell Lithium Polymer battery maximum capacity 1500mah

E 4.4 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.

E 4.5 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.

E 4.6 It is required that a tag or pennant is affixed to the fuse to aid removal and visibility.

E 4.7 Only one flight battery may be used per flying round.

E 4.8 A propeller spinner or rounded safety nut must be fitted on forward facing motors.

E 4.9 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.

E 5 RADIO RESTRICTIONS

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

E 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.

E 5.4 Aids to flight stabilisation such as gyros, auto pilot and auto level are permitted but full control authority must be available to the pilot during any phase of flight.

E 5.5 Equipment on the 2.4GHz band only.

E 5.6 All radio equipment must be UK compliant.

E 6 THE FLIGHT COMPETITION

E 6.0 The aircraft must be rendered “safe” on all occasions that it is handled by team members (other than for launch), a team member must display the isolator/breaker for the benefit of the flight line marshals during loading and unloading.

E 6.1 At the start of the prescribed time slot the model should be without payload, on being given the start signal the model must then be carried out to the flightline by the designated "launcher", at this time the power system can be rendered “live” by inserting the “isolator”.

E 6.2 The aircraft may then be launched at any time within the specified time period.

E 6.3 Having completed a successful launch 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.

E 6.4 Following a completed full second circuit of the course the aircraft should be landed, rendered safe and returned to the loading bay where the payload is to be loaded with one medium sized chicken egg (supplied by the competition organisers).

E 6.5 The second flight will be completed by repeating this process at the end of which the egg will be removed and displayed to the flightline marshal for the purpose of establishing the wellbeing and condition of the egg.

E 6.6 At the end of the prescribed time slot the details of the flight will be recorded.

E 6.7 Should a successful launch not be completed, teams may retrieve the model for further attempts without reloading the payload within the allotted time period.

E 6.8 Running repairs may be made during the allocated time period, the aircraft must be rendered "safe" and the isolator fuse must be removed and be visible to the flightline controller at all times while the aircraft is being handled.

E 6.10 The aim is for each team to fly three rounds of two circuits 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.

E 6.11 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.

E 6.12 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.

E 6.13 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.

E 7 SCORING

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

The flight score will be normalised, **100 points** will be awarded to the team who transport the specified payload in the shortest time 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 presentations and flight score).

50% of the flight score will be deducted for a round where damage to the egg is sustained during loading, unloading or during flight.

A maximum of 5 points will be awarded in respect of each of six key categories as follows:

1. Choice of materials.
2. Structures in addition to the main wing such as fuselage, tail plane etc
3. Consideration of the passenger 'egg' requirements
4. Innovation in structure and airframe
5. Innovation in manufacturing processes
6. Novelty factor such as styling/humour/aesthetic theme

E 8 GENERAL CONDUCT AND SAFETY

E 8.1 The word of the contest director is final in all matters.

E 8.2 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.

E 8.3 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.

E 8.4 Deliberate or repeated violation of safety rules will result in the team's expulsion from the competition.

E 8.5 All competing aircraft must be fitted with a serviceable failsafe that returns the throttle to stop on loss or corruption of the radio signal.

E 8.6 All competing aircraft must be fitted with the specified unit for isolating the flight battery from the motor for safety during payload transfer and aircraft handling.

E 8.7 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.

E 8.8 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.

E 8.10 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.

E 9 ENTRY

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

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.

E 10 PRIZE AND AWARD DETAILS

1st Place

The 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 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.

E 11 POWERTRAIN NOTES

Note: only aircraft utilising the specified powertrain will be eligible to compete in the challenge. the compliant items are available directly from the BMFA office, details and prices below:

The specified powertrain for the Egg Lift Challenge:

4 Max PO-2830-1350 motor - £25.49 inc VAT

4 Max PP-TESC30AU speed controller - £17.95 inc VAT

Fuse Holder Unit 60A - £9.50 inc VAT

Time Delay Fuse 40A - £2.00 inc VAT

MDF Template set for wing construction £10

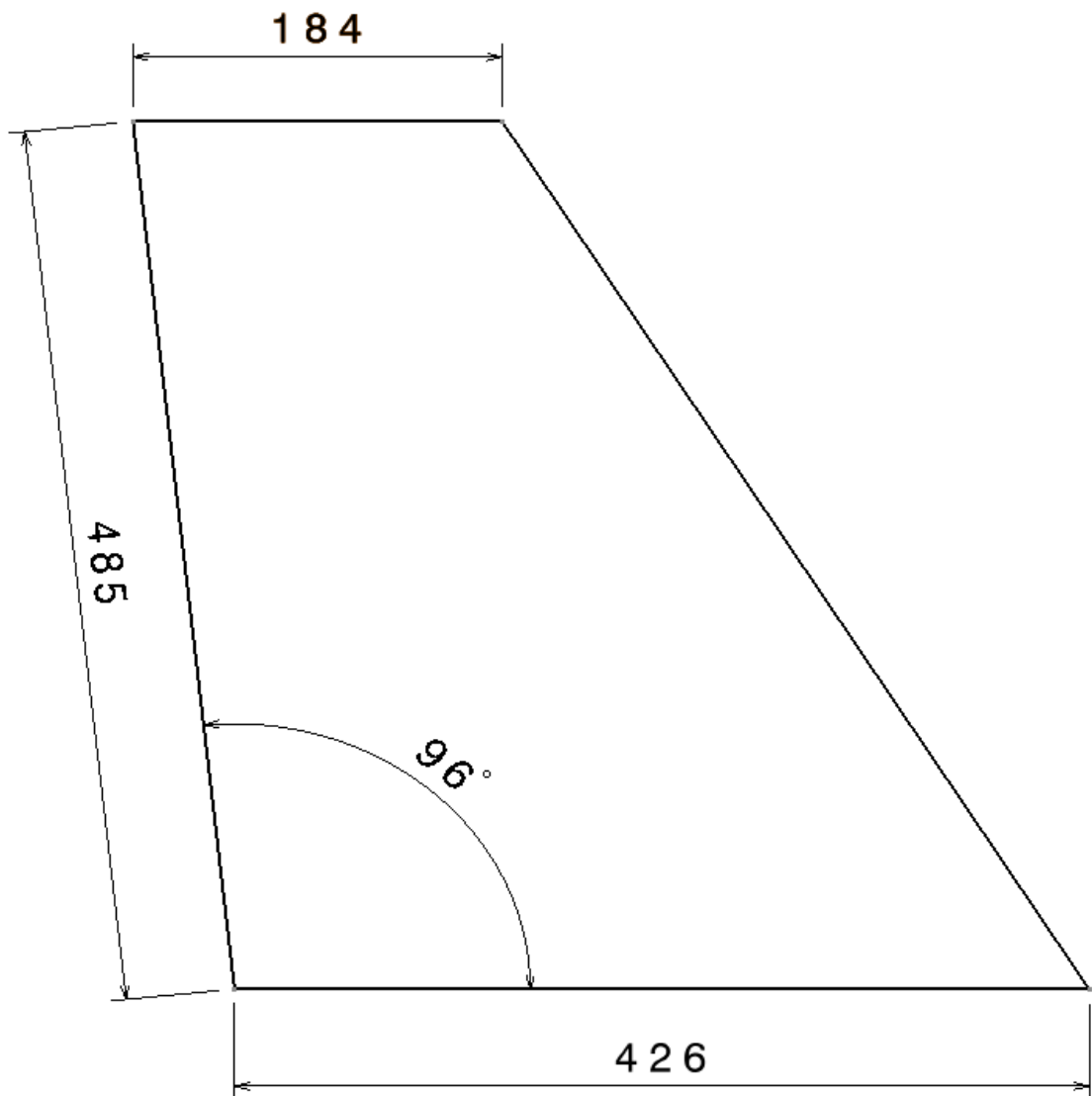
Postage and Packing will be charged at £10.00 per order

Motors and speed controllers also available directly from 4-max

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

Tel: 01256 782 512

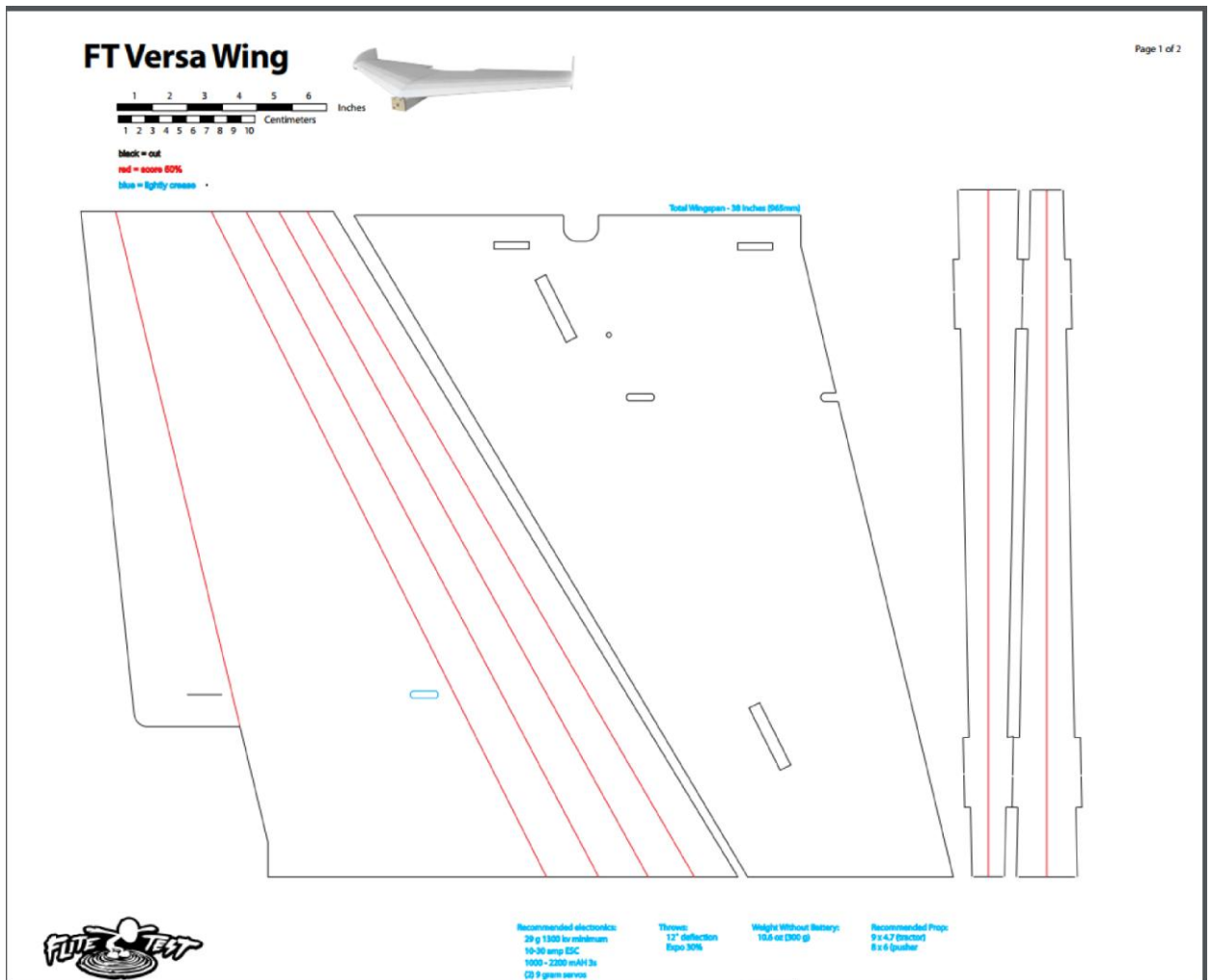
E12. Specified Wing Planform:



The wing is to be made within a tolerance of +/- 10mm and +/- 1degree from these dimensions.

Competition Wing Specification

Teams may choose to build an open source wing such as this to meet the wing criteria

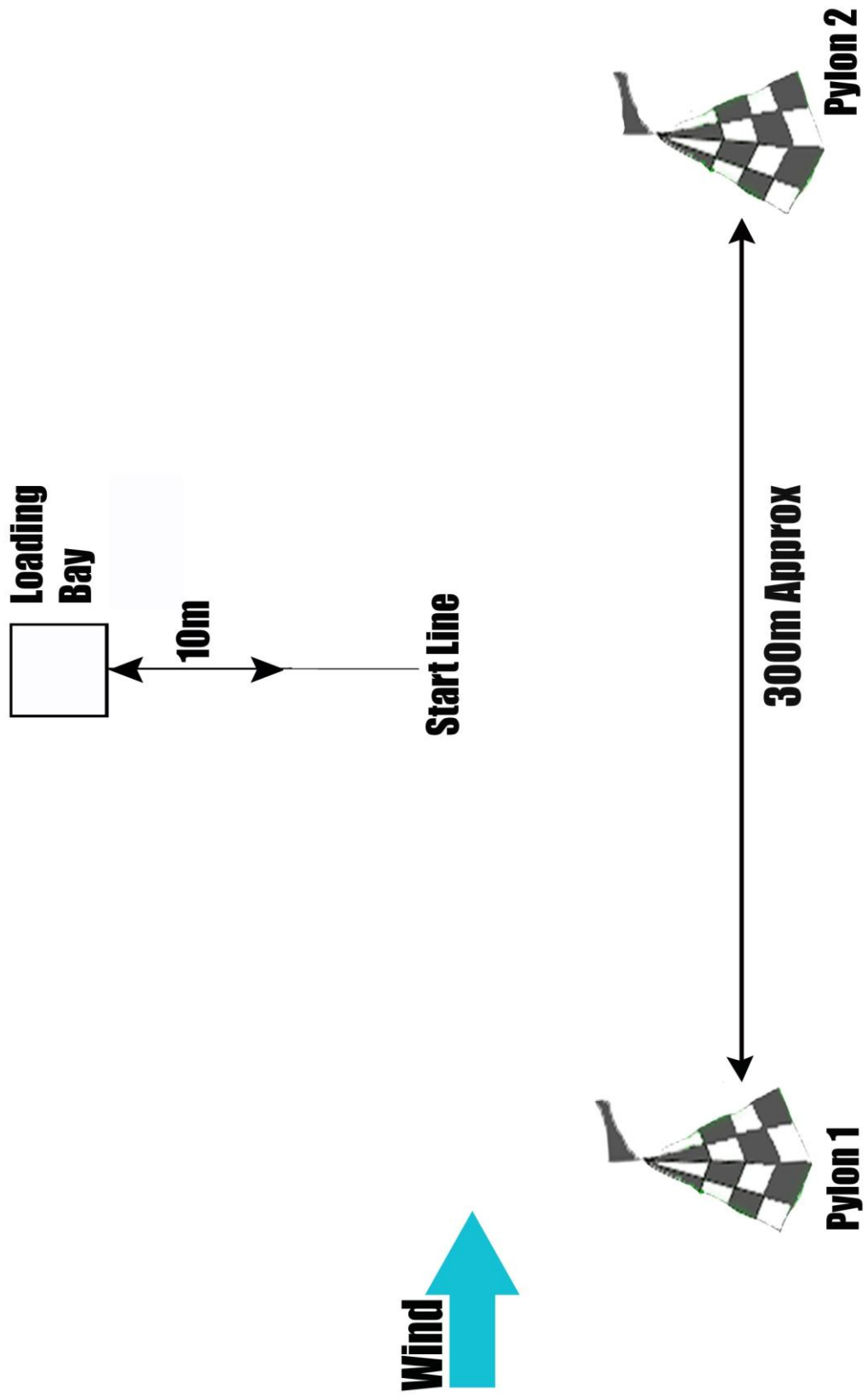


Do not scale this drawing. It may be downloaded from FT website

<https://www.flitetest.com/articles/ft-versa-wing-build>

BMFA is not responsible for content of this website

Flight Pattern Subject To Wind Direction



Entry form for 2018 Flight Lift Challenge 1

Egg Lift

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

Forms to be received by 1st February 2018

<p>Name of University, School, youth group or organisation:</p> <p>_____</p> <p>Name of Tutor/Teacher responsible for entry: _____</p> <p>Team Name: _____</p>
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<p>Names of 5 Team Members:</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p>5. _____</p> <p>Pilot: _____</p>

<p>Name and Address of Team Manager</p> <p>Name: _____</p> <p>Address: _____</p> <p>_____</p> <p>_____</p> <p>Contact Number: _____</p> <p>Email: _____</p>

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 £25.00 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

Flight Challenge Co-Ordinator
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: _____