How to defy gravity!

PAYLOAD CHALLENGE ▪ **BRUCE CORFE**

The annual British Model Flying Association University and Schools Payload Challenge was battled out in June at the new BMFA National Visitor Centre and Flying Site at Buckminster Lodge in Lincs. Here Bruce Corfe brings the first of his two reports on the event.

Two great opportunities in one presented themselves in June of this year. Firstly, I was asked to review the annual BMFA University and Schools Payload Challenge, which is always one of my favourite weekends of the year. Secondly, the event was to be held, for the first time, at the brand spanking new BMFA National Visitor Centre and Flying Site at Buckminster Lodge in Sewstern near Grantham in Lincs.

Terrific! A chance to see the venue which we've all read so much about and which Manny Williamson and the BMFA team have worked so hard to set up over the past years. And all the thrills and spills of the Payload Challenge too!

I must confess that I did have slightly mixed feelings about the venue change, for selfish reasons – the previous events have all been held at Elvington Airfield near York, which is only half-an-hour down the road from my home – actually it is an awesome venue in its own right, with its 2-mile runway, massive concrete holding area and Air Museum next door.

BUT, I was also desperate to see the new National Visitor Centre so what better opportunity? But where to stay? I ended up spending the two nights, on my own, in my brother-in-law's floating gin palace (aka motor boat) on a marina (aka gravel pit) near Newark, only 20 miles from Sewstern. So that worked very well, apart from the incessant drip drip of a leaking roof-light in the torrential rain on Friday night!!

SO WHAT'S THE NEW VISITOR CENTRE LIKE?

My sat-nav struggled a bit on Saturday morning, e.g. trying to right-turn me off the A1 through a gap blocked by rusty Armco barrier, but once in the lanes near the village of Buckminster, the post-code got me straight to Sewstern and the centre. Set in gorgeous rolling Leicestershire countryside, the ex-equestrian centre is spacious and probably more importantly, isolated from other habitation.

There has obviously been a great deal of work done on the site recently – a big crunchy gravel car park area greets you at the end of the long driveway. Next on view is the very large Event Room (or 'Hangar' as the team's dubbed it) – a big metal-clad space which has been re-roofed and has a large side building attached, with meeting

Teams queue patiently outside the BMFA offices for scrutineering on Saturday a.m.

Uh-oh – Mike Colling detects an undersized ball!

Manny in the brand-new Reception area – frugally furnished.

The big National Centre Event room a.k.a. 'The Hangar'.

Off limits - the stables and outbuildings – plans are afoot to renovate these too.

Scrutineering – Keith Barker inspects W13 – Ningxia Uni (China)'s 'Weight' entry.

BMFA Buckminster's newly renovated Reception area and Office facility.

Team briefing in the Event room on Saturday morning.

rooms and facilities.

The original brick-built house on the site is now the BMFA Reception Area and offices, used for presentations by the competitors on this occasion. Again, a lot of care has gone into the renovations in the building, but care has also been taken with members' money as all the new-looking office furniture is actually from a second-hand office supplier.

Then there are the stables and other outbuildings, not in very good repair and currently off-limits, but Manny and the team have plans for these too, including overnight accommodation for visitors to the centre – bunk beds anyone?

Finally the enormous flying field, which slopes gently away from the centre buildings – the Challenge pilots used a reasonably flat and smooth, shorter runway close to the sheltering hedgerow, with north-facing outlook for flyers (no sun in the eyes) but a much longer strip has been prepared and sown slightly further into the field, which looks as though it will have billiard table-like qualities when useable, in the near future.

Liquid refreshments were provided courtesy of an honesty box, but catering at the meeting, as for nearly every other BMFA event over the past 20 or so years, came in the form of the mobile Burger Van of Roy Wright, who has just been made an Honorary Life Member of the organisation in recognition of services rendered – congrats Roy!

Overall, the centre proved ideal for the Challenge weekend – not the first event held here but probably the biggest so far. The grass strip was tougher on take-offs for the heavily-laden models, but it was much more forgiving on 'arrivals' than Elvington's concrete! The large indoor Event area was a boon for teams' preparations and Manny's meetings. (Actually, Friday night's torrential rain cleared up for the weekend and we were treated to excellent weather and temperatures even if it was a bit windy – but it always is at flying competitions isn't it?)

Verdict: this is an excellent and improving facility for all members' benefit – way more than fit for purpose.

THE THREE CHALLENGES:

Why do I consider the Challenge one of the aeromodelling events of the year? The three contests are a fantastic way for school and university students to demonstrate their design and engineering skills in a variety of areas, by designing a model aircraft which will lift a payload, plus win points for their report, drawings and presentations as well as for the success of their model in the Challenge. So it's a test of students' skills in design, technical knowledge and teamwork. This was the 22nd anniversary of the Challenge, under the aegis of BMFA Development Officer Manny Williamson (University Challenge Co-ordinator) plus volunteers from both the BMFA and local clubs. Club Support Officer Andy Symons was busy at another event on the weekend, plus the development of the Centre has been largely under Manny's watchful eye. Mr BMFA Dart, Mike Colling of the BMFA Education Working Group, who introduced the Challenge, was present to keep an eye on proceedings and organise the scrutineering and scoring.

PAYLOAD CHALLENGE RULES:

Rules are little changed from last year, once again the competition is run in three classes:

1. Payload Challenge 1 (D for Distance). The entry-level class for schools and youth organisations is less rigorous than the existing challenges. Models have to be loaded with and carry an enormous half-kilo balsa block and complete as many laps as possible in 5 minutes.

Beijing Wenhui Middle School students look a bit confused by Life Member Roy Wright's Burger Van menu...

My 'Breakfast of Champions'!

Ningxia Uni students give their Q11 Quantity model's presentation – in English. Impressive performance.

The National Centre flying site – pilots' area in front of the temporary runway in the far distance of the shot.

Reason for the world balsa shortage – Distance models have to carry TWO of these blocks for a total of half a kilogram weight!

Drone shot of The National Centre flying site.

2. Challenge 2 (Q for Quantity). The payload is now tennis balls and there is now no wingspan limit. Teams have to load as many balls as feasible, complete a circuit, unload and repeat until the time slot (which has been reduced from 10 to 8 minutes for 2017) is up – well that all sounds straightforward, doesn't it...?
3. Challenge 3 (W for Weight), previously the Heavy Lift Challenge, moved some time ago to an all-electric propulsion system rather than the previous i/c engines, which were the main cause of delays and non-starts in previous years. Teams have to fly a circuit carrying a water payload and the aircraft will be required to perform an additional 360-degree turn in the opposite direction to demonstrate its manoeuvrability. The hemispherical tennis ball 'sensor' was replaced last year with a larger polystyrene sphere, a simulated optical sensor, located inside the fuselage of the aircraft, allowing a clear 60 degree conical view vertically down more representative of a UAV/ UAS camera requirement. A light model will suffer fewer penalties under a payload handicap system.

All classes use a similar power set-up, which means that teams could progress from one Challenge to the next over successive years. Here is an extract from the lengthy rules taken from the BMFA Challenge website:

"The propulsion unit is to consist of one E-Flite Power 10 motor and one E-Flite 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 manufacturer's label with the capacity shown. No modification to the motor, ESC or battery is permitted, however gearboxes and variable pitch propellers are acceptable additions. 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 payload transfer, the "isolator" must be mounted in such a location as to be readily accessible by team members and also easily visible to flight-line marshals".

PRELIMINARIES:

Following Manny's introductory briefing at 10am on Saturday, Chief Judge Andrew White spoke and gave a run-down on desirable design points, which was probably a bit too late for most entrants. Mike Goulette from sponsors the Royal Aeronautical Society spoke as did Aleksey Matyukhin, the representative from sponsors CLA, (Cargo Logic Air) airline cargo experts based at Stansted (who have just added a brand-new example to their existing fleet of two 747s). Thanks are due to all of the sponsors, who have considerably increased the prize money pot for winning teams this year.

In Scrutineering, with Mike Colling, Mr BMFA Dart, in charge, Hebei (China) Institute of Technology's Weight team (W13) had an undersized foam ball problem! (the balls represent an imaginary UAV camera and must have an uninterrupted downward view).This was swiftly remedied with a scrounged ball. Teams queued patiently waiting for their models to be scrutinised. Entrants can win a considerable number of points for their Reports, Drawings and Presentations. I watched Hebei Q11's Quantity presentation to the judges – to say that this was very impressive is an understatement – it was a professional effort, culminating in the team claiming to be World Record breakers in the recent CADC competition in China.

Following scrutineering and presentations there was a lull in proceedings as teams absorbed the process, which was a bit counter-productive as the morning's weather was some of the best/ least windy of the weekend.

No Scottish teams with pilot Alasdair Sutherland this year and with no uber-competitive Airbus-sponsored German team either, the three Chinese teams were the only overseas entrants. But think what a commitment is involved in bringing a team of up to a dozen people and up to half-a-dozen large fragile models more than half-way round the globe for a competition of this sort – respect.

THE TEAMS AND THEIR MODELS:

Challenge 1 - Distance:

D01 West Bridgford School's Distance entry – 'Gavin', the Greatest Aerial Vehicle In Nottingham!

D01 Gavin's greatest moment...

West Bridgford School – the enthusiastic School Aeromodelling Club and their teacher brought a huge luminous yellow balsa-carrying canard model – 'Gavin', the Greatest Aerial Vehicle In Nottingham!

Nail-biting stuff – the 'Aeronauts' team take D01 Distance and Q01 Quantity models to Scrutineering.

D02 – Time & Space Learning 'Aeronauts' sleek swept-wing Distance balsa-block carrier.

Time & Space Learning in Stowmarket is a learning community for students finding difficulties with mainstream education, plus home-educated pupils (previously known as Brockford Barn before a location change, and past winners of this Challenge). Their 'Aeronauts' team fielded a very large and beautifully built yellow/ white swept wing model piloted by teacher Mark Adams.

Beijing Wenhui Middle School students and team leader with their twin-fin D04 Distance entry.

D04 Wenhui School's Distance entry ready to fly, on the apron.

Beijing Wenhui Middle School – yes, these young secondary-age students had come all the way from China with their team managers. Looking very smart in school blazers and ties, their black and yellow twin-fin model looked extremely functional and well constructed.

CHALLENGE 2 - QUANTITY:

Not one, not two, but three Q01 Quantity models in Ningxia University's pit area.

Ningxia University (from near the Chinese city of Xian – think Terracotta Army) were a large team surrounded by huge number of models e.g. three of their Quantity entry in pale blue translucent film over super-light carbon rod and laser-cut former construction.

Ningxia University chose to use the one with the pink nose! Beautifully constructed Q01 Quantity tennis-ball carrier.

A closer look at Q01 Quantity showing some of the carbon and laser-cut construction.

The aircraft were slightly scruffy but of very light build and looked very similar in design to last year's Quantity-winning craft fielded by Beijing's Beihang Uni team, with the same huge 50-ball carrying capacity.

This is Time & Space Learning's 'Aeronauts' Q02 giant delta model in which had a removable central trailing edge ball loading system.

'Aeronauts' Q02 delta takes to the air at the Buckminster field watched by a hard-working marshal.

Time & Space Learning's Aeronauts fielded a giant silver/ yellow delta model in balsa, lite-ply and foam which had a removable central trailing edge to load and unload the tennis ball payload.

Q03 is University of Derby Engineering Dept's small-ish 'Fly Derby' entry.

Q03 'Fly Derby's ball-carrier ready for action on the strip.

University of Derby Engineering Dept's small-ish 'Fly Derby' entry was of blue foam construction with orange trim and had a CNC-routed symmetrical-section wing of odd cross-section – think tall isosceles triangle with a slightly rounded base, on its side...!

This is the University of South Wales' Q05 entry with its hatch cover off. Although computer designed and laser-cut, it is of traditional construction even down to the sewn hinges – note the flaps and complex sprung/ damped u/c.

Pilot Tim commits aviation with Ollie's Q05, full ball load on board.

University of South Wales. Designer/builder Ollie Harris's 2017 entry was a joy to behold. Of traditional construction but CAD-drawn, the yellow translucent film-covered model had a vaguely 'Cardinal' wing and 'Cub' tail (like USW's 2016 entry), then Ollie went mad with the CAD. This was the only model I saw with separate flaps. Its sprung undercarriage had difficult-to-source long-travel RC buggy dampers and springs and the whole set-up looked purposeful.

Detail of Manchester University's Q07 quirky entry in the Quantity class.

Marshal Matt Hoyland steadies Manchester Uni's Q07 in a take-off attempt.

My old alma mater, Manchester University's School of Mechanical, Aerospace and Civil Engineering brought a small boxy pink/ blue/ white model with upswept wingtips reminiscent of (or taken from?) an HK Bixler or similar. The model failed scrutineering several times but eventually fought its way through.

Computer printed folding wing mechanism on City University of London's 'Ball Boys' team Q08 entry. Plus Lego Hans Moleman pilot clutching a void Driving Licence...

'Ball Boys' Q08 waiting for its slot on the landing strip.

City University of London's 'Ball Boys' team produced a small cream and turquoise craft with folding wings and a folding prop. The model was adapted from the rules of another competition as per Q09 below. The model lost its undercarriage in testing on Friday but was repaired for the contest.

Q09 City University of London 'Lady Killerz' model was designed for the American AIEE competition – for the US competition the model has to fit in the tube behind.

Loaded and ready for take-off – Q09 City University of London folding 'Lady Killerz'

City University of London 'Lady Killerz' team's small cream and blue model also had a folding prop. Designed for the American AIEE competition, which entails a hand launch and a weight payload, in this case eight hockey pucks, but this only translated to 3 tennis balls when modified for the Quantity comp. For the US competition the model has to fit in a tube – and it still does! The tiny model has the look of a 1930s racer and was never going to win the ball-carrying contest but full marks for entering into the spirit of the comp. and in the event the model provided some of the best entertainment of the weekend!

Hebei (China) Institute of Technology team's extremely large and light Q11 Quantity model.

Close-up of the business end of Hebei's Q11 Quantity entry.

Slow and stately in take-off - fully-laden (64 balls...) Q11 Quantity entry for Hebei.

Hebei (China) Institute of Technology's team had spare yellow/ red models in both Quantity and Weight classes. The extremely large and light Q11 model had a potential carrying capacity of 64 tennis balls! The oval cross-section fuselage had been designed to give an aerodynamic advantage, we learned in the team's presentation. Beautifully constructed of carbon, balsa and lite-ply with a geared motor, this would be one to watch.

The 'Comet' team's Q12 on approach after a very successful first-round ball-carrying flight.

Repaired for Saturday – University of Hertfordshire 'Comet' team's Q12 wide-bodied twin boom Quantity entry.

University of Hertfordshire 'Comet' team's wide-bodied black/ red twin boom entry had crashed in testing on Friday and lost its undercarriage but this had been mended after the enthusiastic team worked through the night.

CHALLENGE 3 - WEIGHT:

Ningxia University's small, lightly built W01 Weight entry ready for take-off.

W01 from Ningxia Uni on its unladen proving flight.

Ningxia University's pale blue translucent film-covered Weight entry was small, lightly built and looked very purposeful. Lots of carbon and lightening holes in evidence, with tapered wings plus a direct-drive prop.

Loughborough's W06 approaches the strip after a successful second-round payload carrying flight.

W06 – Loughborough University's only Weight entry this year.

This was Loughborough Uni's only entry to arrive at the contest this year – three other teams had hoped to attend but loss of workshop facilities meant they didn't enter a model. W06 was a nicely constructed long-bodied and wide-span entry which looked business-like.

W08 is the University of Liverpool 'Liverbird' team's large nicely-constructed twin-boom twin-fin model.

'Liverbird's W08 makes a successful proving-flight take-off.

University of Liverpool 'Liverbird' team's large purple/ black twin-boom twin-fin model looked nicely (and lightly) constructed, with laser-cut lite-ply and blue foam tail feathers.

Business end of Ningxia's W13 water-carrier – note simple gearbox in the carbon nose-structure.

Ningxia's W13 Weight entrant looks entirely functional & efficient in the air.

Ningxia students look preoccupied as they prepare W13 (foreground) and Q11.

Hebei Institute of Technology's yellow (with red and blue trim) water-carrier had the only geared motor in the class. It seemed to be mainly made of air! It had more lightening holes and carbon than you could shake a stick at. Not elegant but highly purposeful-looking..

W14 Coventry Uni's Engineering Dept 'Phoenix 1' team's large slender craft was made of blue foam, balsa and black electrician's tape.

Successful proving-flight with empty water bottles by W14 'Phoenix 1'.

Coventry Uni's Engineering Dept 'Phoenix 1' team had a large slender craft made of blue foam, balsa and black electrician's tape. With tapered wings and a large carbon undercarriage, the model looked like a contender.

W15 Phoenix 2, Coventry Uni's long-nosed model had crashed in testing on Friday.

BMFA designated pilot, marshal and flight-line judge Graham Stanley discovered that all the servos were reversed on Coventry's W15 'Phoenix 2' and it was back to the hangar.

Phoenix 2, Coventry Uni's long-nosed red and white model had crashed in testing on Friday. Fixed for Saturday, it had an immensely long fuselage and a very long wheelbase (forward-positioned front u/c), which looked to me as though it might cause some problems with rotation at take-off.

W16 'Phoenix 3', also from Coventry, was constructed of blue foam with clear covered open-structure balsa wings and a functional-looking undercarriage.

Coventry's W16 'Phoenix 3' looked stable in the air on its proving flight.

Phoenix 3, again from Coventry, was also largely of blue foam with clear covered open-structure balsa wings. It too had a very long fuselage but a more functional-looking undercarriage – time would tell.

IN CONCLUSION

As usual, the Payload Challenge delivered in spades. The new National Centre proved to be a great facility for this type of event and I'm sure it will prove to be a resounding success. Manny's team had the organisation off to a tee, and the behaviour and conduct of all participants was exemplary.

Even the weather smiled on us, not a drop of rain and just a bit of a blow to contend with, unlike the following day and week when it absolutely chucked it down non-stop. The Ed. has allowed me to spread this report over the next two issues as there was so much material and so many photos, but if you are desperate to see how the teams got on, see the links below. Spoiler alert – you won't need a fortune cookie to figure out some of the teams that fared well!!

LINKS:

Full results: Facebook – BMFA Payload Challenge

More photos: http://tinyurl.com/ElvingtonChallenge

Rogues' Gallery – crashes: http://tinyurl.com/RoguesG

The European Model Flying Union – EMFU

Following the ongoing negotiations with the European Aviation Safety Agency (EASA) over the last couple of years led by the BMFA's Dave Phipps (as Technical Officer to Europe Air Sports) on behalf of model flyers throughout Europe, representatives from Model Flying Associations from across Northern Europe met in Friedrichshafen, Germany in October 2016 to discuss the possibility of creating a pan-European 'Union' to help support and represent the interests of model flying at the European level, in respect of all relevant regulatory matters.

A further meeting took place in Vienna, Austria in February 2017 to progress the matter and agree the way in which the EMFU would be constituted.

The EMFU was 'officially formed' at the first General Assembly which took place in Wesel, Germany on the 20/21 May 2017. This meeting elected the Executive Board with Dave Phipps (BMFA) as President, Bruno Delor (FFAM) as Vice-President, Frank Tofahrn (DAeC) as General Secretary and Haagen Valanes (NLF) as Treasurer.

The EMFU is now supported by model flying associations from 12 countries. The UK is represented by both the BMFA and the Large Model Association.

The newly formed EMFU got straight to work by organising a workshop (in partnership with Europe Air Sports) in Cologne on June 15 to discuss the impact of the European Aviation Safety Agency (EASA) proposals for unmanned aircraft and to agree a collective EMFU response.

The workshop was also attended by two key members of the EASA team responsible for the regulations (Yves Morier and Natale Di Rubbo), both of whom had given up their time to attend on what was actually a public holiday in Cologne.

The EASA team spent the entire morning explaining their proposed rules in detail and dealing with any questions and queries.

Following detailed discussion in the afternoon session, the consensus of the meeting was that all of the Associations present could continue to operate as they do today within the framework of EASA's proposed regulations.

Several Associations also commented that they thought that the EASA regulations may even provide them with an opportunity to improve the situation for model flyers within their country.

BMFA CEO and EMFU President Dave Phipps commented:

"Participation in the EMFU is essential for the BMFA at a time when there is an unprecedented level of interest in model flying at a political and regulatory level throughout Europe, especially at a time when the UK has much less direct influence.

"The EASA regulations are by no means the end of the story and there are still significant challenges ahead, including defending the rights of model flyers from any potential negative impact of the proposed U-Space (a scheme within the Single European Sky to facilitate the wider integration of unmanned aircraft into the air space)".

Thrills, spills and non-stop action

PAYLOAD CHALLENGE ■ **BRUCE CORFE**

Bruce Corfe returns with his second report from the BMFA Payload Challenge, this time bringing you all the action and excitement of the three challenges – distance, quantity and weight.

British Match For Asians? BMFA Payload Challenge Part 2

How to defy gravity - the story so far: This is part 2 of our coverage of the annual BMFA University and Schools Payload Challenge, which in June 2017 took place at the new National Visitor Centre and Flying Site at Buckminster Lodge in Sewstern, Leicestershire, near Grantham, under the aegis of BMFA Development Officer Manny Williamson (Challenge Co-ordinator).

The centre proved to be an ideal site for the competition with excellent facilities and a great flying area, off grass – all in all, a brilliant venue for this challenging annual event. In the last issue we looked at the teams, their models and the preliminaries, plus an overview of the new centre. This time it's down to the action from the two days' competitive flying. If you want to see pretty pictures of smiling teams and their models, check out the last instalment – this time its thrills, spills and action all the way!

Oops! D01 West Bridgford School's 'Gavin', the Greatest Aerial Vehicle In Nottingham, bites the dust!

West Bridgford School recovers a stricken 'Gavin'.

RIP Gavin 1 - West Bridgford's scrutineering sticker, post-comp.

Ningxia University's beautifully constructed carbon and laser-cut Q01 Quantity tennis-ball carrier on take-off.

Manic but effective blanket unload system by Hebei in Quantity.

Incoming! This is Beihang Wenhui Middle School's ill-fated D04 Distance entry.

> West Bridgford School – their luminous yellow canard model was christened 'Gavin', the Greatest Aerial Vehicle In Nottingham!

The Three Challenges:

The flying reports are arranged in progressive order of Distance, Quantity and Weight Challenges. A quick reminder that the Distance Challenge (for schools and colleges) involves models having to carry a half-kilo balsa block and completing as many laps as possible in 5 minutes; in Quantity teams have to load as many tennis balls as possible, complete a circuit, unload and repeat until the 8 minute time slot is up; and in Weight, teams have to fly circuits carrying increasing water payloads and the model is required to perform an additional 360-degree turn in the opposite direction to demonstrate its manoeuvrability. Here is the report from both days' flying, most of which took place on the Saturday – this time the teams are arranged in scoring order, winning teams first, with the final scores following each entry:

West Bridgford School's 'Gavin 2' makes a 3 point landing!

Challenge 1 – Distance:

D02 Time & Space Learning Aeronauts' very large yellow/white swept-wing balsa-block carrier piloted by teacher Mark Adams made a good take-off although it was a bit ponderous in flight. The model stayed

Hebei (China) Institute of Technology's team. Their extremely large and light Q11 model, fully-laden with 64 balls(!) outclassed even Ningxia Uni to win Quantity.

high which was difficult in the increasing wind but completed four successful laps.

In Round 2 with a larger, 11x6" prop fitted, the model fared better, completing 7 laps before the battery ran out and the model glided safely home with 4min 45sec on the clock. Its third attempt was flown very high and the model was slow into the high wind. The battery cut on the 8th circuit but Mark was able to glide the aircraft home for a brilliant 8 laps completed. 136 points and the class win - job done.

D01 West Bridgford School – their luminous yellow canard model was christened 'Gavin', the Greatest Aerial Vehicle In Nottingham! In Round 1, after an impressive launch, the team suffered two take-offs and two crashes, the second removing the motor and a wingtip, nil points. The team had a solution, however - Gavin 2! Last year's shocking pink model had been converted to a sport flyer by removing the payload module, and then converted back into a Distance competitor with a new, bright yellow module and tractor motor (unlike last year's pusher set-up). Manny decided that the team could fly the replacement model in the remaining rounds but that there could be no marks for flying, just for Gavin 1's drawing and presentation. The 1-metre V-tail model was fast and stable, flying almost in knife-edge after a LH turn (due to a combination of torque and aerodynamic effects, caused by the massive box on top, according to West Bridgford MFC team leader/ teacher Steve Green) but ran out of go before the round ended. Steve is planning to retire this year although the school are trying to persuade him to continue with the Flying Club.

The model made a fast, short second round take-off run and completed six good laps. Pilot Steve baled out of the last attempted lap in order to get the landing score. In Round 3 the Mark 2 model completed 8 excellent, fast laps using 80% throttle, unfortunately these scores wouldn't count. 41 points.

> The flying sessions ended with some electric sport flying by some team members, plus an awe-inspiring F3A practise demo by top aerobatic pilot Matt Hoyland.

D04 Wenhui & BeiHang Middle School – the smart Chinese students and team had brought a well-built black and yellow twin-fin model. In fact though, at the first round take-off attempt, the model veered sharply left (observed by yours truly through the camera viewfinder – I was forced to do a standing high-jump as the model careened under my feet!) A further attempt saw a violent veer to the left in the air and a crash which badly damaged a wing. Onlookers wondered if a rearward c.o.g. might have been the culprit.

Day 2 saw the model miraculously restored to pristine condition. But following more ground-looping and a collapsed nose-wheel the attempt resulted in a Did Not Fly. Sadly its Round 3 attempt fared no better. Again a violent turn to the left was followed by a cart-wheel and a non-flight. I felt extremely sorry for this well-organised team who had travelled half-way round the world with a very business-like model only to have launch problems preclude any flying score at all. Their only consolation was an excellent Drawing score and top marks in class for their Presentation. 39 points.

Challenge 2 - Quantity:

Q11 Hebei (China) Institute of Technology – their extremely large and light model, with under-cambered wings, had a potential carrying capacity of 64 tennis balls! It was marginal on take-off in the wind but made a good first circuit and an accurate landing. The team's funnel-and-tube loading system plus blanket un-loader were crude (by comparison to Ningxia for e.g.) but highly effective, five flights giving an amazing total of 300 balls in Round 1!

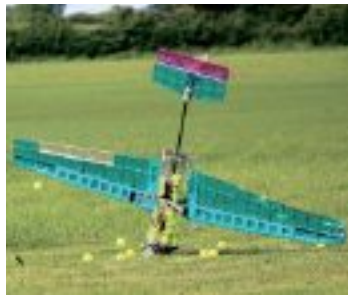
In Round 2, the model tipped up on landing after its first flight and lost most of its balls on the strip, causing (or because of) a 90-degree twist in the nose-wheel, but this round counted, for a smaller single flight total of 64. Perhaps because of this the team were on a mission for Round 3, their pilot flying very low and level and making a hugely impressive 5 successful load-carrying fights, plus a sixth with a smaller payload after fumbled

This is Time & Space Learning's 'Aeronauts' Q02 giant delta model which had a removable central trailing edge ball loading system.

Ningxia 's W13 Weight model was unable to carry 4kg - it completed half a lap before cart-wheeling in on the final round. An excellent 2nd place was their reward.

This might not end well! University of Derby Engineering Dept's small-ish Q03 'Fly Derby' entry.

Q09 City University of London 'Lady Killerz' folding model was designed for the American AIEE competition - for the US competition the model has to fit in a tube.



Balls! Ningxia's Q01 Quantity entry sheds it's load on a windy 5th flight in their otherwise brilliant 3rd round.

Pilot Tim Rowe lands Q05, the University of South Wales' traditionally -constructed, Cub-inspired model.

University of Hertfordshire 'Comet' team's Q12 wide-bodied twin boom Quantity entry on a dicey approach.

Ningxia 's ill-fated W13 Weight entrant looked entirely functional & efficient in the air. Big prop on a geared motor.

loading, but the team ran out of time 5 seconds before landing. The negative g of a hurried

Disappointed Ningxia students remove the damaged W13 craft.

W05 Loughborough Team 2's purple canard - on its first unladen attempt, the nose-wheel collapsed and the craft exploded in a shower of bits - the wings are out of shot!

W14 Coventry Uni's Engineering Dept 'Phoenix 1' team's large slender craft was made of blue foam, balsa and black electrician's tape. This was the result of trying to carry 3kg on Sunday.

approach saw the hatch open and most of the balls pop out of the top! An awesome 320 ball total for Round 3 which was a new Quantity Challenge Record. 161 points and class win.

Q01 Ningxia University from Xian fielded one of their three very light Quantity entries, finished in pale blue translucent film. Round one saw the team invoke their superb 2-stage ball loading system of 5 pre-loaded vertical tubes dropping into a clever 5-slot right-angle transfer system and thence into the model. All done in a split second! The team very nearly completed 5 laps for an amazing total of 200 balls.

Round 2 saw the team very nearly succeeding in completing 5 laps

W16 'Phoenix 3' from Coventry, constructed from blue foam with clear covered open-structure balsa wings, lost its u/c on one of several crashes.

Sad end for W16 'Phoenix 3'.

which would have given a total of 250 but they had to settle for 200 again. However their running total after two rounds was now 400 compared to Q11 Hebei's 364 - this one could have been close! The third attempt saw a slight problem on loading the fourth load after three good flights (but with the simple gearbox sounding noisier each flight), then a crash in the wind on the 5th approach for what would have been the team's best round. Another massive score of 200. 111 points.

Q05 University of South Wales had a two-man team. Ollie Harris' traditionally-built yellow model had flaps and a 'Sprung High Intensity Transfer System' for loading... Pilot Tim Rowe forgot the flaps on the first flight and had wheel problems but carried a creditable 88 balls in 4 circuits. In the second round the model showed great form with high-speed circuits and accurate landings with flaps deployed. The tail skid was lost on one landing but was recovered (actually the increased angle of attack gave a shorter take-off run!) The fifth flight was completed in 7mins 58sec i.e. 2 seconds to go, and at approx. 26 balls per lap, gave a very creditable total of 104. Top job!! (The only other team to complete 5 laps in 8mins were Q11 Hebei when I checked).

In the third round, with a 12x6 prop added, 4 good flights were made, then the speed controller burned out on approach to the landing strip! However a fifth landing and emptying was

> The 'BMFA' bit of the Payload Challenge title should stand for 'British Match For Asians', which is now apparently a standing joke in Chinese aeromodelling circles!

successfully completed with 10 seconds to spare, for a new British 8-minute Record of 103 balls! (Strathclyde managed 104 balls in 10 minutes in 2016's contest). 94 points.

Q12 University of Hertfordshire 'Comet' team's black/red twin boom model had crashed in testing. In Round 1 it made a near-vertical take-off and looked very sensitive in pitch but made an impressive total score of 54 with 3 laps completed at 18 balls capacity.

Round 2 saw two good flights completed but then loading problems struck, followed by a collapsed nose-wheel after several hard landings, total 28 balls. Sunday's 3rd Round effort resulted in one good payload-carrying flight but then on the second attempt the model ballooned on approach and

Coventry's team leader was allowed to try an unofficial hand-launch with W16 after the u/c failed, but the flight didn't end well.

W15 Phoenix 2, Coventry Uni's long-nosed model, crashed in testing on Friday and again, here, on Sunday.

After the comp, we were treated to an awe-inspiring practise demo by top aerobatic pilot Matt Hoyland. Matt's very large electric-powered Oxai Galaktica, with a big contra-rotating prop set-up, performed some huge manoeuvres practising his F3A competition schedule, with father Ashley calling.

stalled in, breaking the prop and motor mount. One flight, 18 balls carried. 72 points.

Q02 Time & Space Learning Aeronauts' silver/ yellow delta had a removable trailing edge to load and unload but was only able to carry 6 tennis balls per flight even though it had a potential capacity of 40 balls. in Round 1 it ran out of juice after 11/2 laps and christened Manny's newly-seeded main runway in an off-piste landing! 1 lap and 6 balls scored. In Round 2 the delta completed 1 flight carrying 6 balls but then ran out of battery and landed in the outfield again, with no damage. The final round saw a repeat of this pattern, with one good lap completed then a forced landing in the outfield after running out of electrons - another 6 balls added to the total. Aeronauts were the only school-age team in the Quantity Challenge - 56 points.

Q09 City University of London 'Lady Killerz' entry was designed to fit in a tube for the American AIEE competition, which entails a hand launch and a weight payload, in this case eight hockey pucks, but this only translated to 3 tennis balls when modified for the Quantity comp. The tiny model has the look of a 1930s racer and was never going to win the ball-carrying contest but full marks for entering into the spirit of the comp. and in the event, the model provided some of the best entertainment of the weekend! In round 1, with top F3A flyer Matt Hoyland piloting, 2 successful flights and 6 balls were carried before the u/c (not required in the US comp.) was knocked off.

Round 2 saw a fast take off and a good lap but then a serious cart-wheel on landing resulted in (only!) a broken prop. The model was first in the air on Sunday. Matt made a lightning-fast circuit, then on retrieval the teams two fetchers got in a tangle and runner Santosh tripped and fell at full pelt - cue much screaming from partner Alex - it looked as though he was going to land on the model but he managed to hurl it away as he went flying - miraculously, it survived! The model had a habit of cart-wheeling on landing without help from the runners too, but it completed 3 good flights before just running out of time for a total of 9 balls, and this year's Comedy Running award to Santosh! See it all on the BMFA Facebook page and Rogues Gallery! 3 good flights and 9 balls total carried. 53 points.

Q03 University of Derby Engineering Dept. 'Fly Derby's blue foam entry had problems. The first flying attempt started with the team having to rectify an aileron adjustment problem. The model made a short flight but crashed and this was followed by several more unsuccessful attempts to get airborne. 48 points.

Q08 City University of London's 'Ball Boys' team's small cream and turquoise model with folding wings and prop was also designed to compete in the US AIEE competition. In the first round, under the supervision of team leader Chris Atkin, Professor of Aeronautical Engineering at C.U., the model would not take off and lost its undercarriage. In the afternoon the model got off the ground and flew well, inspiring massive celebrations from the team, but, sadly half a lap in it dived straight into the ground from 100ft, sustaining what proved to be terminal damage. An elevator failure was posited as a possible culprit. 45 points.

Q07 Manchester University's School of Mechanical, Aerospace and Civil Engineering's compact model had upswept wingtips taken from a commercial foamy. The model failed scrutineering several times and on its initial flight trial, kept tipping over at start on the grass. Much duct tape was applied to the wobbly u/c but the result was a Did Not Fly. 39 points.

Challenge 3 - Weight

W01 Ningxia University. The Ningxia Weight entry used a pull-pull rudder control system and had a steer-able nose-wheel incorporated in a carbon fibre motor mount. On its first (unladen) attempt the team had a problem arming the motor and retired for a re-think. The second flight attempt saw a practically vertical take-off! The craft then struggled in the wind as it was very twitchy unladen, but a successful flight was completed. The 2nd Round saw the model make another twitchy take-off but a successful payload of 1.1kg was carried. On it's 3rd Round flight, carrying a nearly 3kg payload, the model struggled in the air but completed a successful flight and landing giving the team the highest successful payload score of the year's competition, 2920gm when measured, the highest payload score of this year's competition. Cue much celebration and hugs all round from the team leader! Class winners - 430 points.

W13 Hebei Institute of Technology (China)'s yellow water-carrier's first unladen flight was exciting! I'll swear it took off vertically with no taxi-run! Whilst in the air there was some linguistic confusion regarding the circuit requirements but a successful flight was completed. Its 2nd Round flight was uneventful but marked the first successful flight of the weekend with a 2kg load. Sunday's 3rd Round effort carrying 4kg was less successful - after a very long take-off run the model completed

D02 - Time & Space Learning 'Aeronauts' sleek class-winning swept-wing balsa-block carrier won the Distance class.

All smiles! 64 tennis balls carried in their best flight - awesome achievement.

This is the Ningxia University team receiving their prize for winning the top-level Weight class from Aleksey, 130+ points clear of their nearest rivals Hebei.

Despite the fact that it says 'Quantity' on the trophy (last year's winners having failed to return theirs as yet), this is Ningxia Uni receiving their prize for winning the Weight class.

Loughborough rep. John Newton accepts the Jetex Cup, awarded for very high Drawing and Presentation marks, on behalf of Yusuf Karim, in absentia.

half a lap before cart-wheeling in and sustaining damage, for a disappointing no-score. 293 points.

W08 University of Liverpool 'Liverbird' team's large twin-boom twin-fin model was nicely (and lightly) constructed. In round 1 carrying 2 litres/ kilos of water struggled with the grass runway but then made a successful flight, losing one bottle on landing but luckily that still counted towards the score of 2000 pts. In the second round the team loaded up with 4kg but were unsuccessful in getting into the air, ditto with 3kg. The round ended with a broken undercarriage and a DNF. Its Round 3 attempt, again with 4litres/ kg payload, saw a slightly ponderous take-off but the craft then landed at the end of the strip - no score, unfortunately. 243 points.

W06 Loughborough Team 5 Unladen, the model wouldn't r.o.g. so a longer take-off run was attempted but the model suffered a nose-wheel failure. Its third attempt was unfortunately no more successful. These attempts were discounted as the ESC was playing up so another attempt saw a successful unladen flight. Carrying 1kg on Sunday the team made a good scoring flight and landing. Following an aileron issue on this flight the team did well to carry 1.3kg on their 3rd Round attempt and landed successfully on one aileron with the covering having blown off the other mid-flight. 167 points.

W14 Coventry Uni's Engineering Dept 'Phoenix 1'. In the afternoon the team had strange radio problems with servos not working, including a non-functional rudder. Pilot Steve Hunt and the students overcame these issues and the team made a successful if twitchy and tail-heavy flight, carrying 1kg of water. On Sunday, carrying a 3kg payload, the motor ran in reverse then when corrected, the model just took off but, sadly, crashed. 146 points.

W16 Phoenix 3, also from Coventry, was also largely constructed of blue foam with clear covered open-structure balsa wings. It had a very long fuselage but a more functional-looking undercarriage - time would tell. The spindly-looking craft was ready to roll when Matt discovered that the Tx was configured to Mode 2 and Matt flies Mode 1 (Mode of Champions!), so the tranny was handed over to flight-line judge Graham Stanley. Graham discovered that all the servos were reversed and it was back to the hangar for a DNF.

By the afternoon the servo issues had been rectified. With Steve Hunt piloting, the aircraft made a very short take of run followed by a successful unladen flight. On it's first payload-carrying attempt, with 1.1kg aboard and Graham wielding the Tx, the model made a good take-off and flew well although the u/c collapsed on landing. Round 3 went less well - with 2kg on-board the model attempted a 100ft take-off run before the undercarriage collapsed again. Following an unofficial hand launch the model staggered in the air and crashed fairly terminally. 120 points.

W15 Phoenix 2, Coventry Uni's long-nosed red and white model also crashed on test but was repaired. Unladen, it lacked rudder control and made a wobbly first flight with a hard landing, but it had flown! Sunday's effort, carrying a 1kg payload, saw the crudely-constructed machine, composed by now mainly of gaffer-tape, suffer a disconnected rudder. On its third attempt with Graham S piloting it did briefly become airborne but then pirouetted rather less than gracefully into the ground, failing to post a score. 102 points.

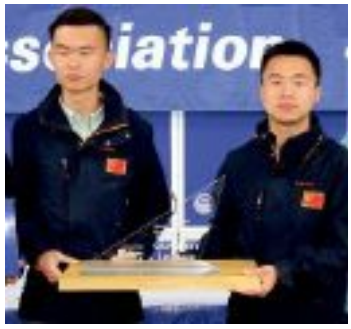
W05 Loughborough Team 2's purple canard - on its first unladen attempt, the craft made a high-speed take-off run, but then the nose-wheel collapsed and the unwieldy-looking craft exploded in a shower of bits, unfortunately. A second-round attempt saw the nose-wheel collapse and come adrift, then, despite the fuse being removed, the motor continued to judder and eventually all the magic smoke came out of it... It turned out that the team had inserted the fuse in one of the motor wires, so that the controls would continue to work if it was removed, but this burned out the motor through the two remaining live wires. Game over. 81 points.

The flying sessions ended with some electric sport flying by some team members, plus an awe-inspiring F3A practise demo by top aerobatic pilot Matt Hoyland. Matt's very large electric-powered Oxai Galaktica, with a big contra-rotating prop set-up, performed some huge manoeuvres practising his F3A competition schedule, with father Ashley calling. Awesome indeed, though equally inspiring was the small foam delta pusher model, constructed the night before by one of the West Bridgford lads, after returning home late following Saturday's competition - top effort.

Winners – and losers...

Scores, under the aegis of Mike Colling, had been posted throughout the weekend – teams rushing backwards and forwards with their score slips following each round. Scoring each of the events is not as straightforward as one might be forgiven for thinking. In Distance, each team's best round counts. In Quantity, it's the best individual round and in Weight, all 3 rounds are included in the final score including a score for a successful unladen Round

'Aeronauts' with their winnings, including a model of one of sponsor CargoLogic Air's 747s - CLA's Aleksey Matyukhin is on the right.



Hebei proudly display their Quantity trophy.

Manny W. launches the Award Ceremony on Sunday afternoon.

Chief Judge Andrew White (left) presents Hebei Institute of Technology's team with their winning trophy for Quantity.

1 flight, although in this case a formula is applied which depends on the unladen weight of the model, meaning a light model will suffer fewer penalties under the payload handicap system.

However, all scores for all three Classes are then subjected to a 'Normalisation' process, using an arcane formula which Mike has transferred from computer to computer since some time in the last century! Basically the top team's score in each Class is used as a benchmark and all other scores are 'normalised' as a percentage of that winning score.

Anyway, at the presentation ceremony in the big Events Room, With Chief Judge Andrew White, sponsor from CargoLogic Air Aleksey Matyukhin and Manny doing the honours, the attractive wood and glass trophies went to:

1. Distance Challenge - Winners were Team D02 Time & Space Learning 'Aeronauts' with 136.5 points. Runners up despite having their flight scores disallowed (replacement model) were West Bridgford School and 3rd place went to Beihang Middle School who nearly got second place, with good Drawing and Presentation marks.

2. Quantity Challenge - Team Q11 Hebei (China) Institute of Technology won with 161.25 points. Their best flight score of 320 balls was unsurpassable and as Andrew White pointed out, we are approaching the stage where a total of 1000 balls carried in three rounds is distinctly possible, even though the time limit per round has been reduced from 10 to 8 minutes! Second place went to Q01 Ningxia University (China) with 111 points and in a creditable 3rd place plus top Drawing and Presentation marks, was the University of South Wales' two-man team of Ollie Harris and Tim Rowe on 94.75 points.

3. Weight Challenge - Top scorers were Team W01 Ningxia University on 430.97 points. Their 1kg and 3kg payloads were unbeaten (though Hebei would surely have won this Challenge as well had they not been unsuccessful in attempting

> Their extremely large and light model, with under-cambered wings, had a potential carrying capacity of 64 tennis balls!

to lift 4kg in Sunday's last round. They ended second on 293.42 points). A close third went to W08 Liverbirds with 243 points then W06 Loughborough Team 5 with 167.

4. In addition, Team W02 Loughborough 'Tearlinators' were awarded the Jetex Cup for overall effort by Manny even though the team didn't arrive at Buckminster! The Loughborough teams had all suffered through the loss of workshop facilities during the year, hence the no-show. Loughborough rep. John Newton accepted the Cup, awarded for very high Drawing and Presentation marks, on behalf of Yusuf Karim, in absentia.

Conclusions:

Once again Manny and his teams of volunteers have succeeded in running a highly successful event, showcasing design and engineering talent in our younger generation, from around the world (well England, Wales and China anyway). The new Buckminster Lodge National Centre and Flying Site proved its worth instantly, the venue being ideal for a medium-sized event like this. Even the weather smiled upon us.

My Chinese email contact, Ruichen, from last year's Quantity Challenge-winning Behei University team, made me laugh when I sent him this year's results. Apart from noting that the 2nd-placed Ningxia team's Quantity entry this year looked exactly like his team's winning model last year(!) even down to payload capacity, Ruichen said that henceforth the 'BMFA' bit of the Payload Challenge title should stand for 'British Match For Asians', which is now apparently a standing joke in Chinese aeromodelling circles!

Once more we had a riveting 2-days worth of thrilling competition, with as many spills as thrills. Teams behaved impeccably and organisation was super-efficient. Manny and the crew even organised the weather which was ideal. Chinese teams won both of the senior Challenges this year, a return to form in the absence of the German teams (from memory China has taken home two, then one, then one pot again over the previous three years' contests) and once again some of the UK teams struggled to perform. Some teams felt that it would be nice if all rounds counted towards the final score in Quantity, rather than just the best score – it would certainly have given us a new leader after Round 2, although the final result would not have altered.

Whilst the Weight Challenge is seen as the 'Formula 1' of the contest, in my view the technical innovation and teamwork involved in Quantity have now made it the most competitive class, with a potential total of nearly 1,000 tennis balls being carried by Hebei over three rounds this year, despite a reduced time-slot.

The Weight class is still challenging, with success going to teams who can build a super-light sub-1kg model still capable of flying whilst carrying 3 or even 4 kilos of water – indeed, Chinese teams cornered this market too, with only one British team (Liverbirds, with the lightest UK model) managing to carry 2kg of payload; one (Chinese) team carrying 3kg and nobody succeeding in carrying 4kg. So let's conclude with:

Uncle Bruce's Tips For Would-Be Challenge Winners in 2018:

1. Involve an experienced model builder and flyer from the outset.

2. Design an orthodox-looking tractor-prop model – pushers and tailless models (and Ekranoplans!) fare less well.

3. Your Report, Drawings, and Presentation scores count for up to 130 points.

4. Points are greater for homework (as above) which is handed in on time!

5. Keep the overall WEIGHT DOWN!

6. Gearboxes and larger props are the Way To Go!

7. In Quantity, you need to be looking at 50-60+ ball capacity to equal winners from the last two years.

8. Also in Quantity, your loading and unloading teamwork and systems are paramount – PRACTISE!

9. In Weight, you need a sub-1kg model which will fly and land safely with a 2, 3, or 4kg payload.

10. Finally, whilst bribery and corruption are frowned upon, anything is worth a try ;o)

Corrections Dept:

Apologies for referring to Wenhui & BeiHang Middle School as 'Wenhui & Beijing' in the previous article.

The photos of Hebei's W13 weight-carrier were incorrectly labelled as Ningxia's model.

My Photobucket account with the extra images has turned into an advert-laden scam site so the new links below should improve matters for anyone who wishes to see more photos of the event.

Links:

Full results are available on the BMFA's website and Facebook page.

Many more photos: http://tinyurl.com/BMFAChallenges

Rogues' Gallery – crashes: https://tinyurl.com/RoguesGall

Check out this awesome Chinese CADC comp. Video:

https://www.youtube.com/watch?v=iXMxMLMuT1Q