

Thames Valley Silent Flyers



LIFT

ISSUE 81

JULY 2016



INDOOR
FUN



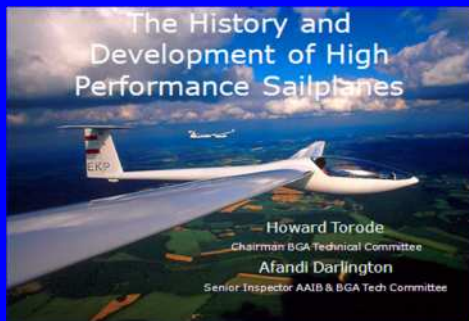
SLOPE SIDE



WALES REPORT

CLUB NIGHT TALKS

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The History and
Development of High
Performance Sailplanes

Howard Torode
Chairman BGA Technical Committee
Afandi Darlington
Senior Inspector AAIB & BGA Tech Committee



LAZER CUTTING

From the Slope

Whitesheet again proved an inspired choice, with a good breeze all day giving excellent flying conditions. Although there was a lot of flying done, the most fun was had flying three Gulps together. Concentration has to be high for this, but with all the laughing that was difficult. My impact with Trev resulted in a about 10 spins, and an inverted landing on the slope - no damage, but I wish I could do the spins without the impact.—*Colin Hutchinson*

Here are some shots.

From the 21/05/2016

Graham flew his Flair K8 with increasing enthusiasm.



Trev campaigned his Fox.



I had a bent-wing day!



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Photo on the rear cover is a Fox
flown by Trevor Hornby.
More often seen inverted



Do you know someone who would like our club newsletter? To order a copy of the next issue (November 2016) send a cheque to Tony Ridler, 109 Pierrefondes Ave, Farnborough, Hants. GU14 8NZ for £3.00 which covers P&P. A few back issues are available @ £2, email Tony for availability. Make cheque's payable to Thames Valley Silent Flyers. Orders must be received by the cut off date. - **19th October 2016 for the November Publication.**

Editorial *By Tony Ridler*



Summer has arrived! Time to get out those creations built over the Winter—just waiting for the rain to stop or the wind to drop.

Just as the weather starts to improve we lose our flying field for a few weeks!.

For those who went to Wales we had flying every day despite driving to CIM in the snow. Slope venues in the morning and garden activities in the afternoon. Those energetic types also did some walking, generally terminating in a pub followed by an afternoon kip. A good time was had by all.

Sadly we have to report the death of one of our members, Ken Glyn. He was a very proficient and prolific builder. At our April club meeting we had an auction of Ken's models and received realistic bids for his excellent aircraft.

I bought an ASW 18 from him several years ago, the picture is of the model at Harting Down taken by Colin Hutchinson. I have converted it to electric now so I have more opportunities to fly.



Our May club night was about full size sailplanes, the history and development of high performance gliders. A number of the latest sailplanes now have the option of electric propulsion for achieving a launch. This significantly reduces the cost of full size gliding as you do not have to rely on a winch or tug to get airborne.

In June, a club member, Mark Pitts gave us a light hearted and amusing talk on his trials and tribulations of Laser cutting. His Chinese Laser cutter leaves a lot to be desired from the health and safety point of view.

Well I guess that's enough from me, enjoy the articles from your club members, if you would like to have an article published, just send me some words and a couple of photo's and I will do the rest. ➔

Safe Flying
Tony



*Paddy was coming through the customs at the airport carrying a large bottle.
"What have you there?" said a suspicious customs officer.
"Tis Lourdes holy water. I am bringing it home with me", said Paddy.
The officer took the bottle and tried some. " Why it's Irish whiskey."
he spluttered.
"Lord bless me."! Said Paddy, "another blooming miracle."*

Chairman's Chat

By Graham Stallard



Hello All,

A year on and we have a field, some of the time. Being asked to stay off just as the season starts is less than ideal. Chris Moynihan approached Mark Osman of the Royal Farms see if they could help in any way. The result somewhat unexpected with a positive no and not for the foreseeable future. Its likely we'll be asked to keep off Big Barn later in the season so while we have access, get on and use it. If any club member has any lead to a field that is not being built on let the committee know.

Following on from Big Barn we have made use of the Syngenta sports field a few times, now the football season is over. We also have a club member who has passed their B test. Well done Spencer. I understand, some are put off by the questions and answers more than the flying. To help with this the stock questions and answers are on the BMFA web site, so think about giving it a go.

A dozen club members made it to Lasham on the 9th June for a visit to the Gliding Heritage centre, Evening air experience flight and evening meal. The sun shone, the wind was light, some vintage gliders were out in the open making for a great start. All members had a flight with one member flying the whole flight, aero tow to landing. The evening meal went down well and all in all a most enjoyable visit.

As many will be aware I now fly 1:1 scale gliders. Some of my adventures will be covered the day you receive the newsletter. For those who will not make the club meeting it is simply the best thing ever. I flew 6 out of 7 days the first week in May at Santa Cilia Northern Spain in the Pyrenees. Flight times were between 5 and 7 hours, flying in some of the roughest air I have ever experienced through to the silky smooth wave lift to 19,500. Fantastic. Then by chance I was in the right place at the right time to go slope soaring on the Southdown's, in the back seat of a DG1000, bank holiday Monday, 30th May. The P1 Merv Saunders flew the first 3½ hours with me flying the 1½ hours from Lewes to Butser then back to Lewes then Parham. Merv landed at Parham, after all its his glider and is sure did not want to break it. To conclude we aero towed into a 30 knot Northerly back to Lasham. Magic, I want more.

The real challenge continues to find a field that we can fly in when we want, especially in the summer season. When the committee next meets we'll try and come up with some alternatives. We need some out of the box suggestions. However, there is a planning notice on Big Barns gate indicating the house building is getting nearer. On the up side we have been flying on temporary fields the whole time I have been in the club. I am still looking for Will. (see last year's Lift)

That's me done. Now to do some flying, don't mind which, 1:1 or models.

Graham



Diary Dates

Date	Day	Item	Contact
5 July	Tuesday	Club Night	
08 July	Friday	Thermal FNL 2 18:00 - 21:00	GJ
10 July	Sunday	Field Xcountry eSoar 10:00 - 14:00	TH
12 July	Tuesday	Mini Glider L 3 18:45 - 21:00	JP
15 July	Friday	Thermal FNL 3 18:00 - 21:00	GJ
17 July	Sunday	Spare Field Xcountry eSoar 10:00 - 14:00	TH
22 July	Friday	Thermal FNL 4 18:00 - 21:00	GJ
23/24 July	Sat/Sun	Aerotow - Ghost Squad' - Middle Wallop	
24 July	Sunday	Field Aerobatics 10:00 - 14:00	CH
29 July	Friday	Thermal FNL 5 18:00 - 21:00	GJ
30 July	Saturday	F3K Open (national league) 08:00 - 17:00	MF
31 July	Sunday	100" Thermal + BBQ 10:00 - 14:00	CM
2 August	Tuesday	Club Night	
05 August	Friday	Thermal FNL 6 18:00 - 21:00	GJ
06 August	Saturday	F3K Open (2) 09:00 - 17:00	MF
07 August	Sunday	Miniglider 4 13:00 - 17:00	JP
12 August	Friday	Thermal FNL Spare 18:00 - 21:00	GJ
14 August	Sunday	TVSF Thermal Open 10:00 - 14:00	GJ
16 August	Tuesday	Spare MGL midweek event 18:45 - 21:00	JP
19 August	Friday	Thermal FNL Spare 18:00 - 21:00	GJ
27/28/29 August	Sat/Sun/Mon	Silent Flights Nats 08:00 - 17:00	GJ
04 September	Sunday	Spare 100"/Thermal Open 10:00 - 14:00	GJ
06 September	Tuesday	Club Night - Photo Comp 20:00 - 22:30	RS
08 September	Thursday	Slope Day Out (2) 8:00 - 17:00	GS
11 September	Sunday	Spare 100"/Thermal Open 10:00 - 14:00	GJ
18 September	Sunday	Mini Glider L 5 13:00 - 17:00	JP
25 September	Sunday	Spare Field Aerobatics 10:00 - 14:00	CH
01 October	Saturday	F3K Open (nat league) RESERVE 08:00 - 17:00	MF
01/08	Sat-Sat	Wales Week	CM
11 October	Tuesday	Club Night 20:00 - 22:30	
16 October	Sunday	Spare Mini Glider L 13:00 - 17:00	JP
23 October	Sunday	Spare Slope Xcountry 09:00 - 15:00	GS
30 October	Sunday	Spare Slope 60" pylon , 2016, 08:00 - 17:00	GS
01 November	Tuesday	Club Night + Bring & Buy 20:00 - 22:30	

Radioglide 2016

A personal view by Graham James

Held on the late May Bank holiday at Edgecott Bucks, I love Radioglide and have been going for so long, I can't actually remember. The weather often lets us down but this year, the Saturday was perfect, Sunday cooler and breezier and Monday windy but eminently flyable.

With two fields to fly from, provided by a very friendly and co-operative farmer, we are able to run five disciplines in total with four, 100s and F5J on the Saturday and F3J and F3K on the Monday running concurrently and the middle Sunday given over to Multilaunch where Electric, Winch and Hand Launch Gliders compete on a very equitable basis.

I flew 100s on the Saturday. I enjoy the meld of simple three channel gliders with the excitement of the winch launch. Virtually everyone flies a Tracker or Eliminator. In my case a 'Tragidy' a Tracker with Tragi rear end grafted on and formerly owned by Clive Learwood, it flies extremely well. So well that I made the four man fly off, against some well practised opposition. Pretty good considering I haven't flown the plane in competitive anger since our own club 100s last year. Unfortunately I had a bit of an accident in the second slot of fly off and mid-aired with the eventual joint winner. Our models locked for a good few seconds and when they eventually parted, I had lost rudder and my model spiralled into some power lines, damaging the tip. Peter Newett flew on and shared the win with his son Kevin, with Mark DeVall in third place.



*Keeping it in the family Kevin and Peter Newett
100s Winners (photo Graham James)*

F5J was the chosen electric discipline flown in the second field on Saturday. Can't tell you a lot about it other than Colin Boorman won with Dave East and Graham Wicks taking second and third. Obviously their conditions were the same as ours and although we shared the same air and launch and landing approaches somewhat overlapped, there was never a problem.

Sunday was Multilaunch. This class was pioneered by the Aldershot Club (now Alton Silent Fliers) and allows any form of launch method to fly in a slot of 10 minutes timed from the end of a 30 second launch phase, or completion of motor run/line release, whichever comes later. Clubmate Mike Fantham had a go with a DLG, they get 4 launches in the working time with a two second bonus for each launch after the first to give a cumulative time plus a landing bonus. A part of the task which Mike readily admits is not his strong point as it's not



something he has to practice in F3K. I, by the way was CD for this event, so was a little distracted. To ease the workload, I decided to fly electric with my Supra, which has always been a reliable model but not so on this occasion. In first slot the motor wouldn't ramp up, I suspected the battery as it was quite cold early in the day. I changed battery to no avail. Strange, so I ran the motor for 10 seconds to see what happened and it promptly shed the prop. By the time I got it back on and launched I was way behind everyone else who had found lift and although I flew the slot out and got a high landing bonus, I was nowhere in the reckoning. Slot two and again the motor played up, just not getting to full revs. I started it three times and on the third occasion it went to full power but again time was lost. I still don't know the cause but it ran fine for the rest of the day. Interestingly, there was a pretty equal split of winch and electric launch models and with the rules stating 175meter launch height on electric, the competition proved very even, with two electrics and two winchers in the fly off with the final placings: Peter Allen (electric), Kevin Beale (winch), Colin Boorman (winch), Colin Paddon (electric). Mike came twelfth which he was quite happy with and generally enjoyed the experience of 'playing with the big boys' as he put it. He beat me too but I had a bad day and was so busy running the day, honest.



Monday is the F-Class team selection league day, with events for F3J and F3K. Mike Fantam was CD for F3K, he had considered calling the event off because of the impending bad weather but although conditions were breezy, for the morning at least they were flyable. Eight pilots flew 5 rounds of various tasks pre-lunch and started round six but after two slots the wind and resulting turbulence had made flying unpleasant and a halt was called. Richard Swindells took top spot dropping only 6pts to record 4994.

Over on the F3J field, I joined the 17 other competitors for the fun and excitement of quick launches, long searches downwind for the often strong but equally elusive lift that the breezy conditions gave us. We managed four rounds before lunch, the break is required as much to allow the scorer time to update the scores. F3J is a full on event where you are always flying, timing or dogging and although we had the help of Sydney Lennsen as CD, it's

Peter Allen who does all the number crunching. There were plenty of high 9.50 scores and 90+ landings, though not so much me! The familiar Xplorers, Maxas and Tragis dominated the models but Pike Perfects, Shadows and Xperience Pros were also in evidence and still very competitive. Also on show were a couple of the new Optimus machines which look very good and likely to prove popular in the future.

The preliminary rounds saw the top four pilots going onto the fly offs.

Appropriately, Neil Jones with a maximum 5000, Kevin Beale and Mark Devall, who comprise the UK Team for the forthcoming World Championships all made it through along with Colin Paddon who is a helper on the team. Neil didn't have it all his own way, with Kevin winning the first slot but by only 6.3pts. In fly off two however, the roles were reversed and Neil came out on top overall.



Presenting Neil Jones with F3J Trophy (photo Gary Binie)

So Neil Jones took the Humbrol Trophy for F3J.

Additional Radioglide prizes also went to Colin Boorman for the highest place competitor over the whole three Days (Victor Ludorum) and to Jason Bioletti as the Best Newcomer (Lillenthal Trophy).

A full report with more detail and thoughts from Mike can be found on the BARCS homepage <https://www.barcs.co.uk/home/news-and-information/radioglide-news/radioglide-2016-report-and-results/>. ➔



Colin Boorman F5J and RG overall winner (photo Gary Binnie)

Ken Glynn. 1930- 2016

I first met Ken towards the end of the 1970's. At that time Ken, a champion free flighter had been designing and building model free flight gliders since he was a teenager. Ken was in the Reading Club at the time and had already started into radio controlled model gliding, remember proportional radio control was still in its infancy at that time. I believe that Ken during his national service in the RAF had met a certain Al Wisher, who was also a champion free flighter, with many published designs to his credit. Al, who like me was in the Basingstoke club was keen to set up a small team of flyers to take part in new radio controlled model gliding competitions.



These being organised by a new body called British Association of Radio Controlled Soarers or BARCS.----- So Ken was invited to join us in the Basingstoke club, along with a few others to form a team to take on other clubs in Barcs competitions. One of these clubs was in Sussex included the likes of Chris Foss and Ricky Shaw. So Ken, Al, Norman Elliot, Peter Lee and myself came together as a team.

As well as BARCS competitions we started a Friday night gliding league on Basingstoke's new common. Ken, Al, myself and others continued with competitions for many years only giving up after many years while some passed away, others moved on.

Ken will always be remembered for his towing technique; head down, hand held winch over right shoulder and running as fast as he could, no stopping or slowing down. His view was it was the glider pilots responsibility to ensure the plane did not break or come to grief on the tow. Yes, you can guess what occasionally happened

In those days models were all built up of balsa and spruce, GRP models did not exist, some plans where available from the radio modelling magazines as were a few kits and we flew using analogue radio on 35Mhtz. Ken however always designed and built his own planes all aptly called "Freeloader". During the 1980's Ken branched out into researching, drawing and building vintage gliders such as the Minimoa, K8 etc. These all being built to 1/5 and 1/6 scale. Many of his planes can still be seen flying by other club members, some have even been updated to fly in aero tow events.

In later years Ken and a number of us building and flying model gliders joined TVSF to continue flying in a friendlier community.

One of the last things I remember doing with Ken around four of five years ago was to go on a TVSF club holiday to North Wales. Ken loved his slope soaring on local Hampshire and Berkshire hills, however standing near the edge of cliffs in North Wales and flying a model out over the sea Ken found a bit daunting.

Clive Learwood

Wales sketch-a-day

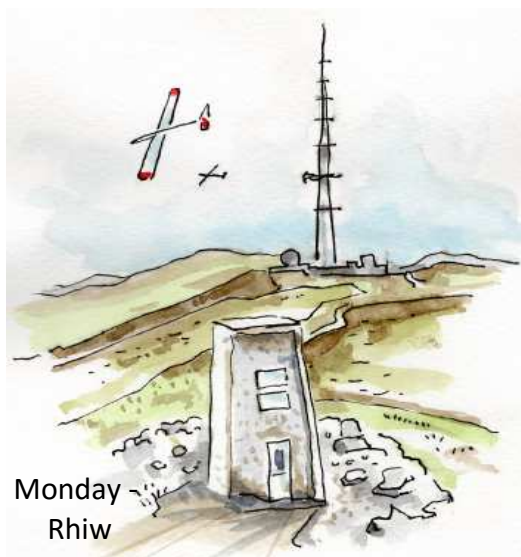
By Paul Vale



Saturday - Nobody thought a repair possible to John's model.



Sunday - Tony R chose the alternative runway to land.



Monday
Rhiw



Tuesday - Garden Flying



Wednesday -
Target shooting
in garden



Thursday - Trev calls international rescue



Friday - Chris throws egg in his lap at breakfast

Winter Indoor Fly

By Phil Hill

The “Indoor Fly” sessions which spread across the 2015/16 Winter period have provided yet another successful round of fun and enjoyment. Like previous years, the TVSF members that get involved are part of a wider union of like-minded enthusiasts that regularly meet up and hone their indoor flying skills during the short Winter Saturdays.



The assortment of RC models are abundant, - fixed wing of all sizes, small helicopters and quadcopters all add up to the mix of flying diversity.

Over the last two seasons the EPP Ramiel Hellfire (see pictures) has proven an excellent aerobatic plane, - but the recent arrival of the RC Factory Click NG slow flyer has now gathered



popularity too. Both planes demonstrate just how far this technology has evolved in making mass produced, lightweight and affordable indoor planes that fly so well.

As you might expect the integration among the 15 or so regulars that take flight at Garth College sports hall is well cemented by virtue of flying skills, technical interest and a good

old natter. (mostly CBA accredited)

Flying in confined spaces may not be for everyone and inevitably there will always be mishaps. But for those that do find the thrills of challenge in this discipline to be their enjoyment, - then this could be for you!



Taxiing down the tarmac, the jetliner abruptly stopped, turned around and returned to the gate.

After an hour-long wait, it finally took off.

A concerned passenger asked the flight attendant, "What was the problem?"

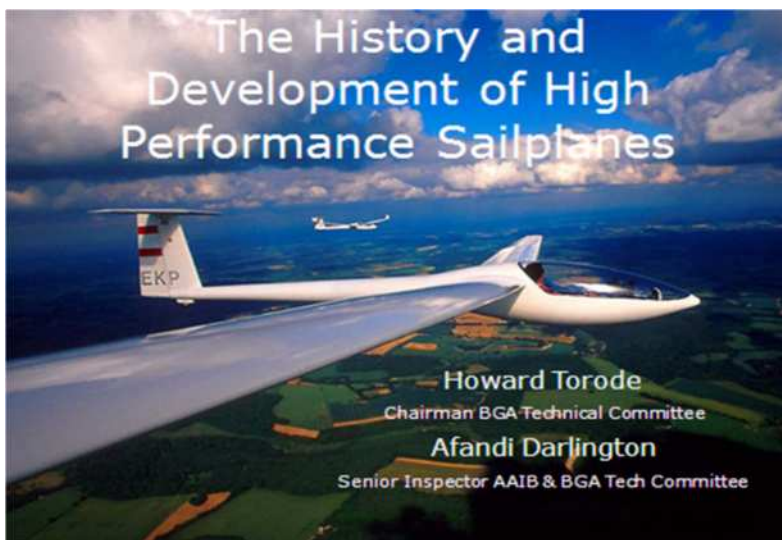
"The pilot was bothered by a noise he heard in the engine," explained the Flight Attendant, "and it took us a while to find a new pilot."

An airliner was having engine trouble, and the pilot instructed the cabin crew to have the passengers take their seats and get prepared for an emergency landing.

A few minutes later, the pilot asked the flight attendants if everyone was buckled in and ready.

"All set back here, Captain," came the reply, "except the lawyers are still going around passing out business cards."

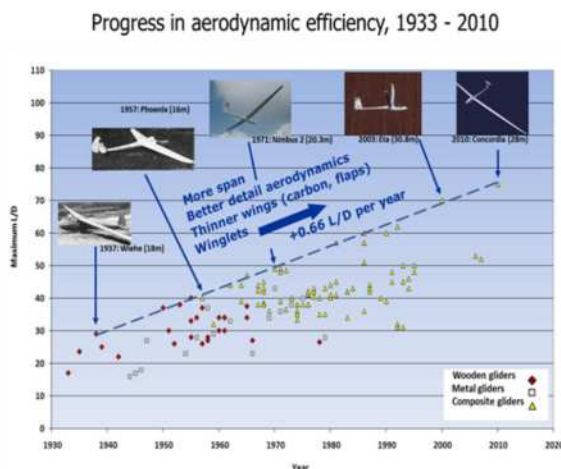
March Club night



This overview summarizes the key themes with illustrative examples

1. **Sailplane design is based on a duty cycle of climb in narrow, localized thermals combined with an efficient glide at an airspeed chosen from a wide range by the pilot as optimum for the conditions.** Deterministic analysis is not often possible because of varying meteorological condition during flights.

- With no motive power sailplanes need to minimise ALL aspect of aerodynamic drag
- Low profile drag and skin friction is needed over a wide speed range for shallow high speed glides. Wing section design is the key.
- Efficient lift generation particularly at high lift, utilizing high aspect ratio
- Good manoeuvrability at high lift, to seek localised lift phenomena.
- Good handling and a high standard of airworthiness



2. **Aerodynamic efficiency has improved at roughly the same pace over nearly a century.** This belies a series of developments some slow, some breakthroughs. Most of these aerodynamic improvements required an enabling technology to deliver them:
 - Structural advances to enable high aspect ratio designs and stiffness to avoid flutter
 - GRP and advance materials to ensure appropriate surface finish for laminar flow aerofoils
 - Sophisticated analysis tools to support detailed aerodynamic design of junctions and winglets
 - Good production techniques for advanced shapes and fine detailed design
 - Sophisticates systems and machining needed for future suction technologies.

3. **Design evolution can be a slow process, and is vulnerable to being overtaken by breakthrough technologies.** Restricted classes tend to encourage this kind of approach. Patient development of aircraft series, but can lead to development stagnation such as occurred with:
 - DFS Reiher, Weihe, Olympia (1930's),
 - Slingsby Skylark series (1950's)
 - Schleicher 'K' series (1960's).

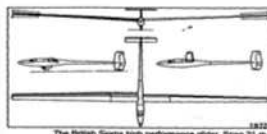
4. **Revolutionary approaches have resulted in performance breakthroughs.** In other cases they have proved expensive mistakes. Typically several design iterations are required to perfect a radically new approach. There are few examples of 'right first time'.
 - GRP structural development in late 1950's: Phoenix, D-36, Libelle (success)
 - Variable geometry projects in the 1970's (failure): Sigma, SB-11
 - Large 2-seat sailplane designs of the 1970/80's (success): SB-10, Janus, ASH25

D36 V1 at South Cerney
1965

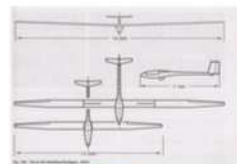
Friess, Waibel, Lemke & Holighaus



Variable geometry – span or chord?



Special tuned section for
climb & cruise



High aspect ratio at low
speed -when you need it

5. **When aerodynamic technology reaches a plateau, designers often turn to producing larger airframes, as this often eases design compromises:**
 - Late pre-war period, with DFS Austria, Darmstadt D30 and Horton IV.
 - Development of larger GRP sailplanes in 1970's: Nimbus, and Eta gliders
 - Recent design of Concordia in US
6. **At today's level of preparation, with L/D ratios over 60, even small details can provide an improvement 'edge'**
 - Specialised wing section designs, including camber flaps optimized for low drag, and tolerant to contamination with water & insects
 - Overall planform shape optimization with winglets.
 - Fuselage contours and wing junction design
 - Details such as : Sealing, turbulators, surface finish.
 - Pilot techniques in operating at higher wing loadings
 -



Technologies can often be 'spun in' from wider scientific areas

- Laminar aerofoils – although these are now specifically developed by the sailplane industry
- Computational fluid dynamics, finite element and aeroelastic modelling computer techniques
- Advanced fibre composite materials, superceding high alloy structures which lack the balance of qualities for sailplane purposes
- Advanced manufacture processes including moulding of complex shapes and post curing.
- Special industrial process required for future technologies such suction membranes
- Battery and electric propulsion (or jet) technology for future propulsion systems

7. Future developments must adhere to strict cost guidelines if the sport is to flourish:

- Old fleet of ageing (but good) gliders depress the club market
- Small number of new very high performance gliders at high cost with limited production prospects
- Emergence of cheaper self-launching electrically powered motorgliders
- Autonomous operation
- Low operating costs
- Suited to group ownership
- FUN!



April Club Night

Our April club night was an Auction of Ken Glyn's aeromodelling equipment and models.

All Ken's models were a work of art featuring fully built up construction with all linkages to his own design. Although all models were different, they all featured the same construction technique's and were finished with the same painstaking attention to detail.

The covering was almost always light yellow solartex and the painted surfaces were Nissan Red 465.



Several Models found their way to Wales in April and were flown from St Tudwals.



Also at the May slope day we were treated to the flight of another of Ken's models purchased by Richard Docketty of Meon Valley Soaring Association. This Picture shows Terry Pelling launching. →



May Club Night

Our speaker this month was Mark Pitts and his experiences with his home made LASER cutter. This is a summary of his talk taken from his Power Point presentation.

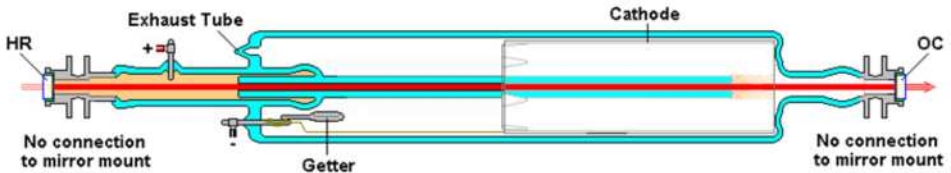
8 Months with a LASER cutter

When did LASERs appear?

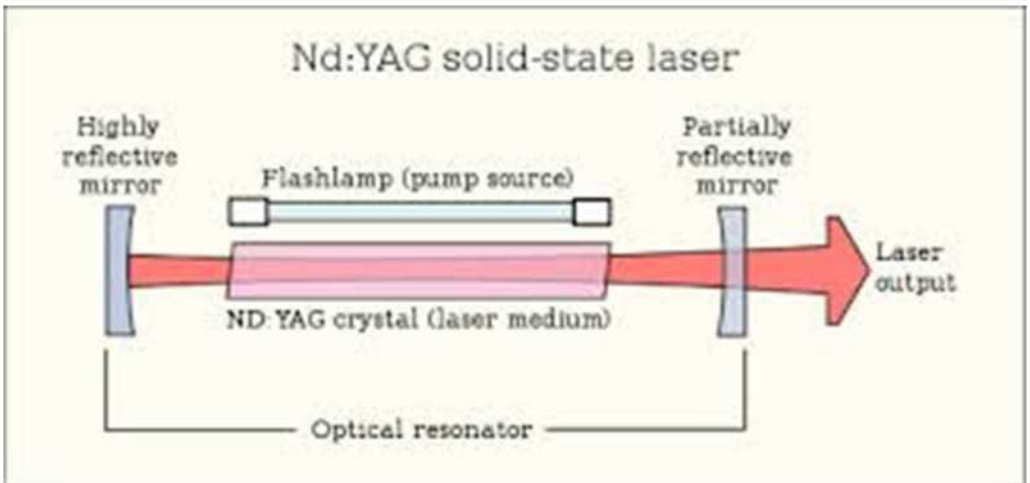
- Albert Einstein proposed Stimulated Emission in 1917.
- It was the same paper that lead Shrodinger to lock his cat in a box.
- The first LASER was a ruby rod, with a coiled flash lamp round it. Developed in 1960, It produced a single high-power pulse.
- The gas discharge LASER came in 1962

What is a LASER ?

- Light Amplification by the Stimulated Emission of Radiation.



NEC Style HeNe Laser Tube



How

- Note the connections , and metal tubes in the glass envelope.
- It is just a large 'neon' sign, with extras



Lasers come in a variety of sizes and powers

- Eye safe
- LASER pointers are ~1 mW
- My He-Ne is ~ 20 mW

Not eye safe

- CD-ROM / DVD readers are ~50 mW
- My CO2 is 40 WATTS. All the radiant heat of light-bulb into a needle point, and its invisible.
- CO2 LASERs produce heat. IT IS INVISIBLE

Safety (No, I expect you to die Mr. Bond)

Experience

- Balsa cuts fantastically well as it is so low density. Very little to turn to gas.
- 1/8" ply cuts fine, so long as the glue between layers is compatible with LASER cutting.
- IF the glue is wrong then the results will be horrible. The resulting gas from vaporisation will ignite, and burn everything around it. PS it is poisonous.



LASER Cutting

- How do LASERS cut (wood)?
- LASERS do not cut by burning (although that can happen). They producing a dot of heat that is so intense that it causes the target to sublime. That is, it goes from solid to gas in one hit. Residual heat can still char the edges.

My Setup

- Chinese K40 A4 LASER cutter.
- 4Gallon tank of deionised water plus a drop of antifreeze.
- Aquarium pump for cooling circulation.
- Extractor hood repurposed for fume removal.
- Pub beer chiller for water cooling (and beer).
- False window for extractor and silent compressor for air assist
- Hoover
- **LASER SAFETY GLASSES**

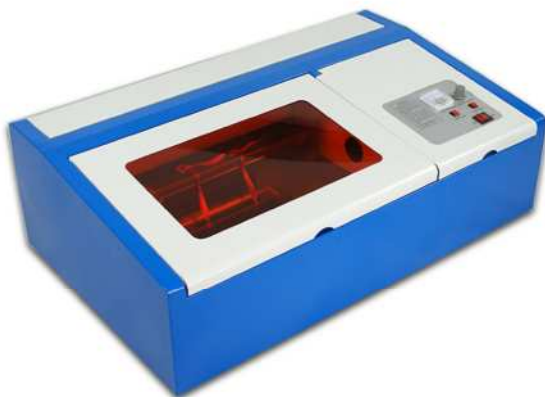
My Toy is a Chinese K40 LASER engraver.

Experience (1)

- The extractor is rubbish.
- The extractor pipe is packaging.
- You need really good ventilation. The by-products of cutting are nasty.

It comes with this rubbish

- Keep the software, and water pump.....



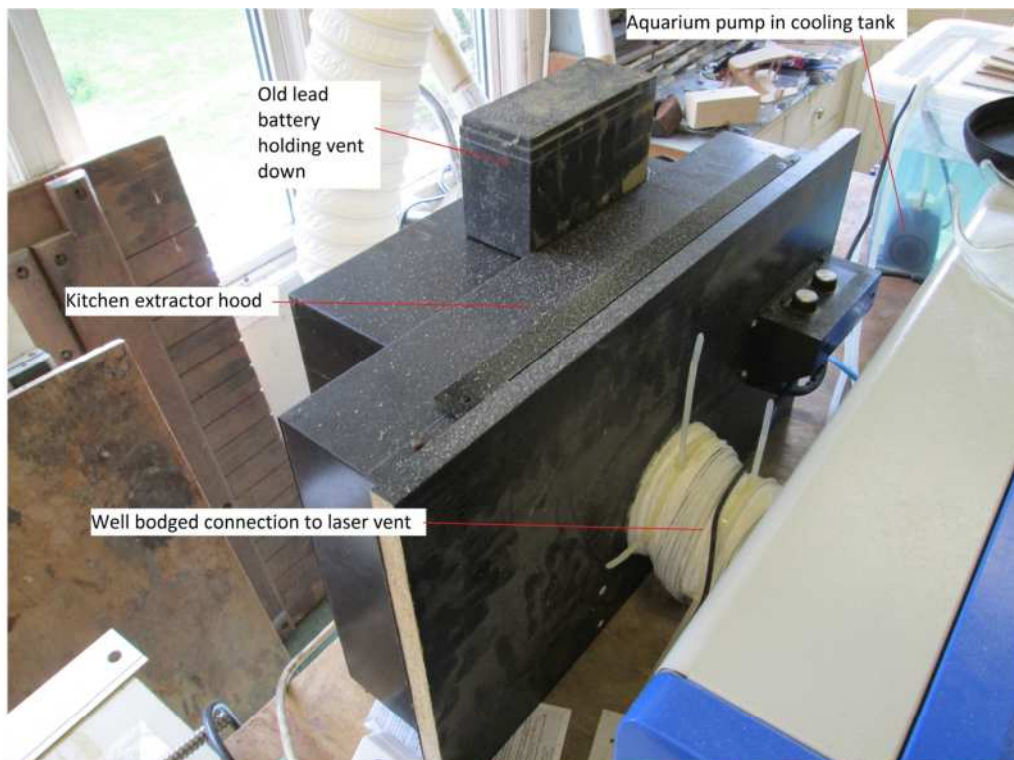
CO2 LASER ENGRAVING MACHINE
12x8INCH
USB PORT BMP/JPG/JPEG/PLT/EMF/WMF
40W

Extractor Fan
Water Pump
Software
Extractor Pipe

100% SATISFACTION GUARANTEED
2 YEARS WARRANTY ✓
CE

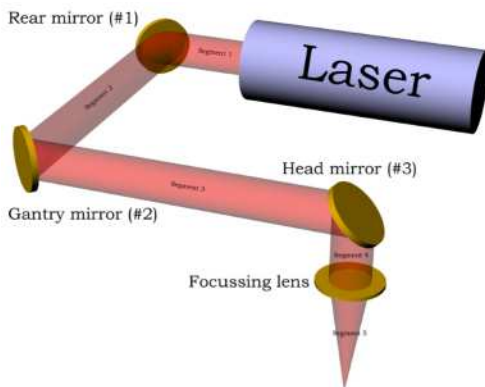
NEW





Notes on the K40 (and clones)

- It is lethal. It has no interlocks or safety switches. It runs at 15,000 V, 20mA.
- It has no cooling monitoring.
- It arrives 'slapped together' in a very poor state (spring washers? clean optics?).
- It took a week of evenings to get it set-up near enough.
- The tube is fragile, and I fail to understand how it ever got here in one piece

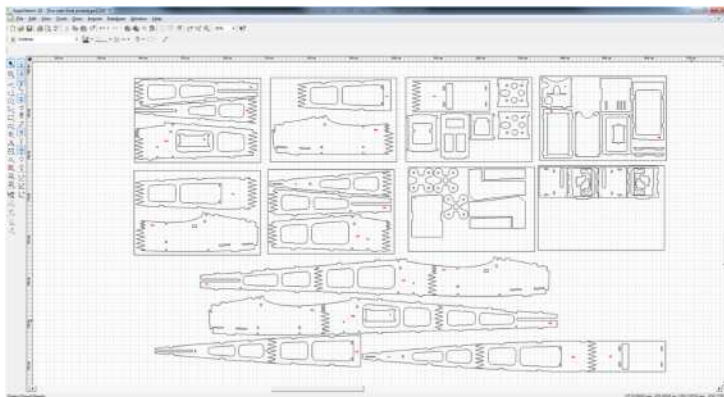


Software

- The box comes with what I presume is a hookey copy of Corel Draw.
- There is an add on / plug in for Corel Draw that controls the LASER.
- I use AutoDesk AutoSketch 2D software.
- You can use any software that can save in DXF or other format that Corel can import.

How I work

The drawing is arranged in parts that are A4 and edges stitched together to form a fuselage side for example.



Modifications and the future

Mods so far

Added the 'air assist' nozzle, which

- A) Keeps the lens clean and protects it
- B) Blows the smoke and CO2 away from the cut

Replaced the bed with a section of BMW aircon radiator.



For the Future

- Bigger bed.
- Longer focus.
- More power.
- Rotary attachment for glass engraving

Middle Wallop Aerotow May 8, 2016

By Colin Hutchinson



Yet another fabulous day, where the thermals grew in size and power in a direct correlation to the strength of the winds.

Still you don't want to read another boring report about how I enjoyed myself, so here is a picture to ponder instead. The questions are, "Did the model survive, and how did the model get into this situation?"

The answer is obvious really if you think about it, as most TVSF members would get this excited if they had just jumped off a dolly in pursuit of a pair of black lacy knickers!!!!

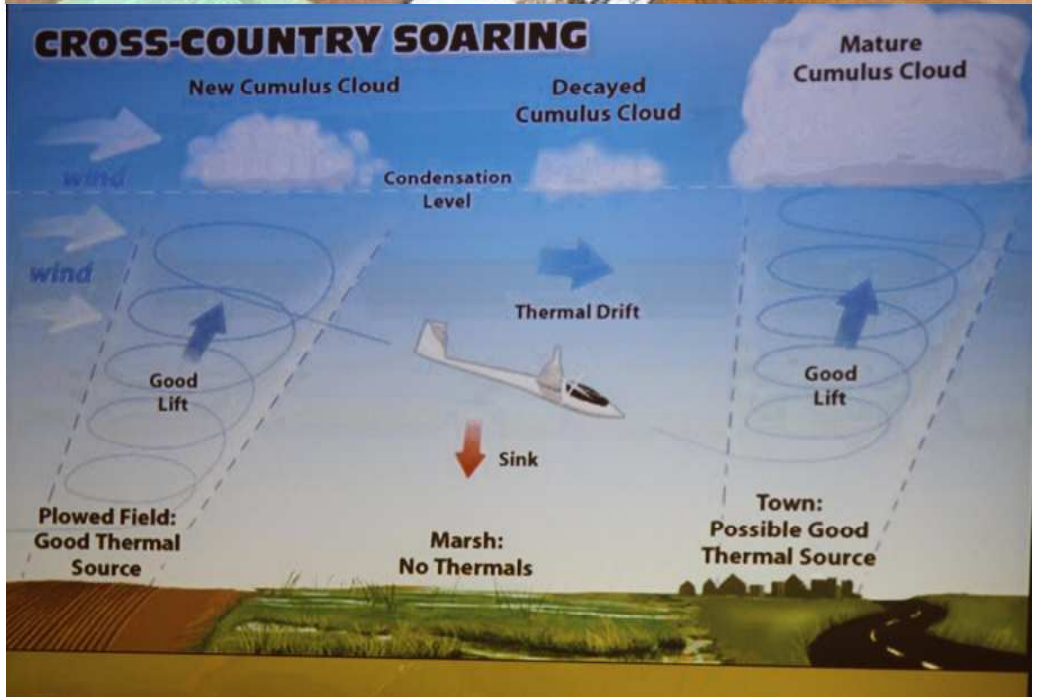
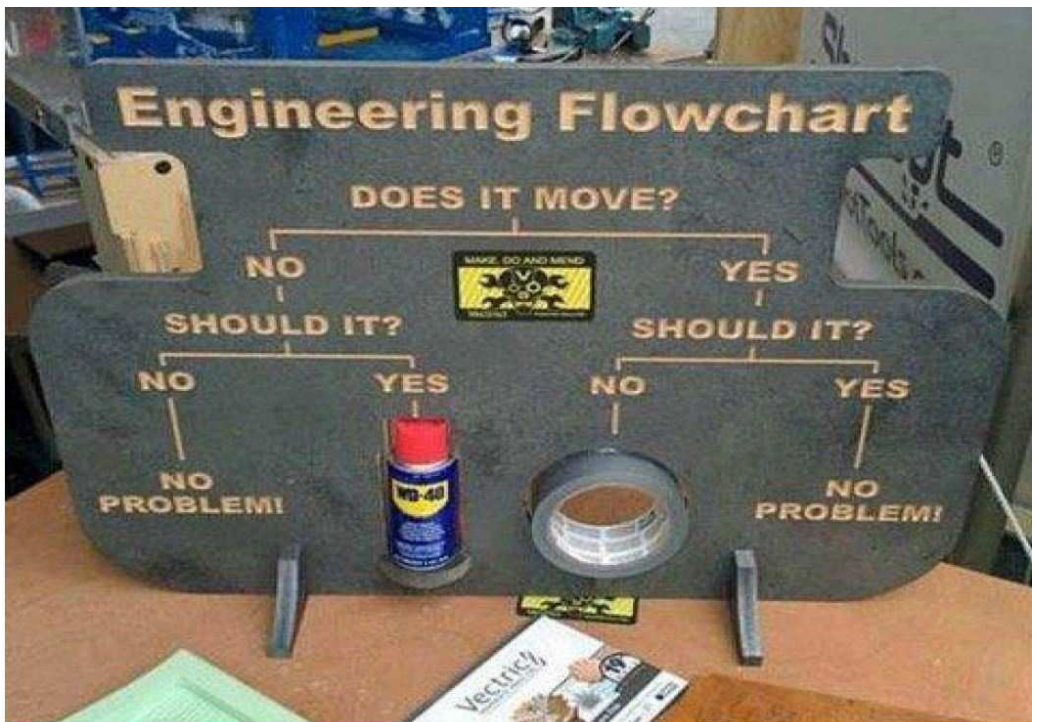
Oh, and yes, the model did survive!



As migration approached, two elderly vultures doubted they could make the trip south, so they decided to go by airplane.

When they checked their baggage, the attendant noticed that they were carrying two dead raccoons. "Do you wish to check the raccoons through as luggage?" she asked.

"No, thanks," replied the vultures. "They're carrion."



Wales 16 April, 2016



Saturday

We had a bad start to the week when on the journey it started to rain, the M40 was blocked so we took a diversion up the M1, (not my favourite motorway). On the way up the M1 it began to sleet, and rain heavily. The diversion did not add much to the journey, but the sleet made the hills to the left of the M54 very pretty. The rain and sleet soon gave way to sunshine, which lasted all the way to Cim, and for the rest of the evening.

Unpacked quickly, as usual, and rushed off to the right-hand edge of Annies, where we found several locals, mostly flying foamies. Alan Butterworth, myself, Trevor, Graham's Stallard, and James joined in the fun.

After the locals departed we started a round of touch-and-goes with the Gulpes. There were many mishaps, many touch-and-goes, and much laughter.

We packed up to head off to an excellent curry at East Meets West, which was surprisingly quiet.

Sunday

Heavy showers in the morning produced a fabulous double rainbow whilst we were preparing breakfast. The strong NW wind meant a visit to Rhiw Mountain, where all day the thermals were epic and the downdraft in between was also epic!! No one managed to land at the bottom of the huge slope, but several had a good try! No names here, but Mr 74 saved at least three models from a long-distance landing – he must be good!



Dinner was eaten at the Lion at Tudweliog, where I had roast duck – delicious.

Monday

The forecast 12-15 mph turned out to be 20-25 mph, just a little south of a direct hit on Annies. So flying was excellent, the lift being very smooth. Along with the cries of "Hooligan!" could be heard the cries of the Chough, Peregrin and Raven.

Tuesday

In contrast to the first three days, Tuesday dawned bright with very light winds. To start with they were easterly, and the lift over Tudwalls was good enough to slope the Moaning Mini. The wind eased in the afternoon and we managed a few hand-tow launches, some exciting light bungee launches, which helped to liven things up a bit. There were some good thermals to soar.



Wednesday

A more northerly breeze on Wed soon eased to almost nothing, and there was little if any lift from the slope. More launches from the mini bungee of my Zulu and Alan's Zagi. I hand-towed Graham S's Nixx, and Roger did the same with my Scout, but most of the day was spent chatting, and watching the dolphins fishing. A dozen or so of the beautiful animals entertained us in the morning, sometimes leaping clear of the water. Alan spent some time taking many photos, and managed to photograph several of the dolphin out of the water.



In the evening I assisted TVSF's mystery chef, Graham (poached-egg) Stallard, in preparing a dinner-in for 16 hungry slopers. Chicken breast wrapped with Parma Ham, with tagliatelli, carbonara sauce, and steamed carrots. Followed by jam roly polly with custard and ice-cream. It was an excellent meal, and I was full, full. FULL!!!

Thursday

A good start to the day, with enough wind to keep most planes in the air, but it faded to very light after two hours or so. Thus, the late-comers were disappointed. In the late afternoon Graham Stallard and I climbed up Garn Fadryn, just (as the saying goes) because it was there. Remarkably, there was almost no wind at the top, the late afternoon sun made it feel very warm, and of course the views were breath-taking.



Friday

An odd day, that had two three different flying conditions, but you had to be there and ready to take advantage of them, as some found out later.

The ENE breeze provided good lift for two hours, then began to ease and drift into the south. At this point I managed to launch my new Schweitzer TG2, and it soared up to a great height. Roger was so inspired he started to get his monster (5m) Reiher out, but by the time it was fully rigged the wind had eased even more, and gone so far south there was no lift on the slope. His closed-loop rudder linkage was broken anyway. A shame as the mighty machine is one of the most beautiful gull-winged gliders ever designed.

Whilst we packed up, Graham James went around to Cerriad, where the wind had gone, and had some excellent sloping, before heading back to Cim to join us all in packing.

Conclusion

Another good week, well organised, great food in the morning care of our excellent Quarter-Master, Mr Terry Pelling, a good evening meal, almost exclusively dry weather, a variety of slopes, and good beer.

Who could ask for more? →

Colin



CIM from the back garden

Not all activities took place on the slope, due to the lack of wind a lot of flying took place in the back garden. The grass had been cut short so even small models could take off and land satisfactory.

It was amazing to see Richard flying his drone at such high speed. What was more amazing was the very large FPV helicopter that took all of Richard's attention.



A few more photos of fun in the back garden.



Seen at the slope! - No wind, CBA Club



How-To: Parallel Charging

By TJin Tech

Warning: Attempt at own risk. A lack of knowledge or improper equipment can result in both the loss of equipment and a fire. Only attempt if you fully understand how to properly construct and use multiple battery charging setups and accept the risks of doing so. I am not responsible for accidents that may occur when using these charging methods.

What is parallel charging?

In a nutshell parallel charging allows for multiple same cell count batteries to be connected in parallel to create a single larger logical battery that can then be charged.

What does this mean to you?

Say you have (3) 3s 2200 packs that you run in your 450 sized heli. You take all 3 packs, wire them in parallel, set the charger to charge a 3s 6600mAh pack and poof you will have 3 packs done in an hour. This is assuming a few things of course but that is the basic idea and it is a good one to say the least.

How does it work you ask?

It's actually pretty simple. When you place all the packs in parallel, they all become the same voltage. I am not speaking in metaphors here, they really all do become the same voltage. Not the average of the packs either. Current actually flows between the packs and they actually all adjust voltage until they all perfectly match each other. The charger only "sees" one larger pack and charges it as if it were a single pack.

But if the charger only sees one pack, how does it balance all the packs?

All the individual packs will be balanced by the charger if a parallel balance adapter used. Using this also ties all the like cells of all the packs together (first cell in all the packs are tied together, second cell in all the packs are tied together and so on). Then not only do the packs all become the same voltage but each set of cells does also. The charger then balances all the packs as if it was charging a single pack.

Is parallel charging for me?

Anyone can do parallel charging on any charger with any batteries, so it is always an option but there are always trade-offs. Read through the "Potential Drawbacks" section for more information.

What are some specific uses of parallel charging?

450 sized heli:

Many times people start with a 450 sized heli and in the beginning they can not get enough flight time. This is what we call the "Welcome to your new addiction" stage. Parallel charging can be a great aid to the new pilot. For example with a 350W charger a 6x parallel lead set, a new pilot could charge 6 450 packs in 30min.

700 sized heli:

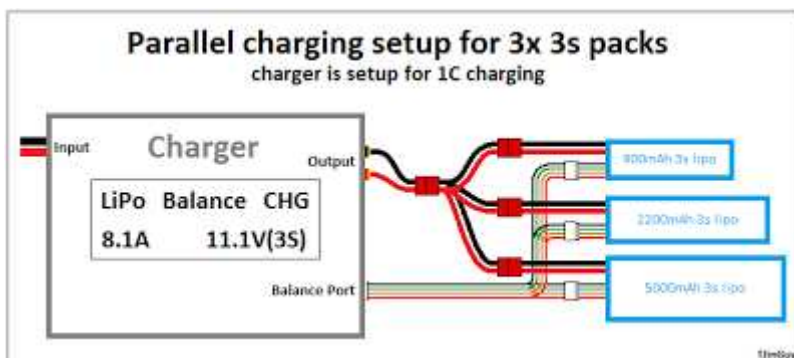
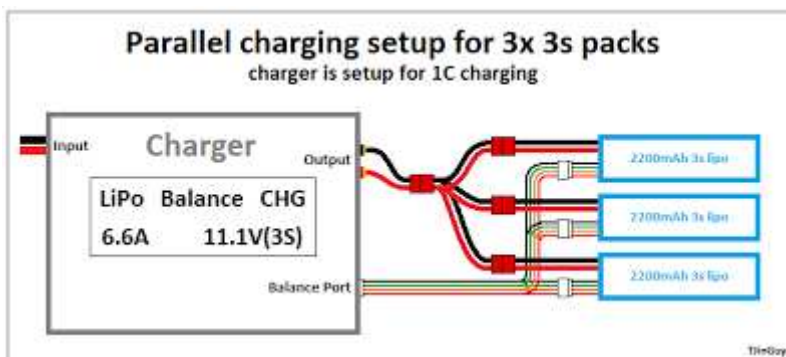
Larger electric helis are becoming very popular and they come with large needs in terms of power. A common battery pack for a 700 is a 12s 5000mAh made up of (2) 6s 5000mAh packs wired in series. Due to the lack of 12s chargers available, a need for charging pairs of large 6s packs has arisen. Of course you could use 2 chargers, or a dual port charger, but there is another solution, a solution that really brings out the best on the new powerful chargers offering 1000W or more of output. By using one of these new 1000W chargers and parallel charging, you can charge a pair of 6s 5000mAh packs in 25min or less.

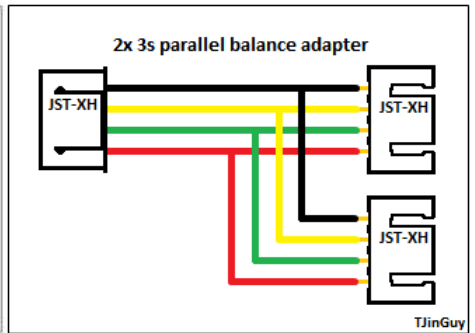
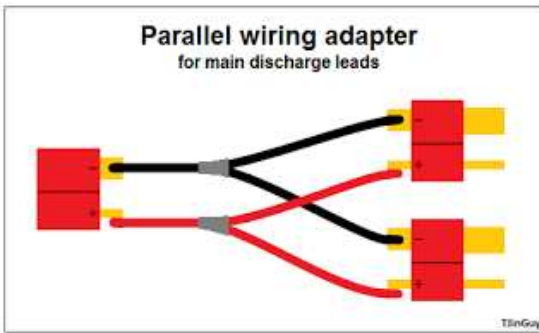
Sparky-sparky (warning)

If the packs being charged are used in with a series connector like a large helicopter running 12s using 2x 6s packs in series, make sure you remove the series adapter before you connect the balance leads in parallel to charge. Failure to do so will result in a direct short and a toasted balance lead or board. Always connecting the main leads before the balance leads solves this potential problem.

Parallel charging diagrams and adapters

Below are several diagrams of a typical parallel charging setups and adapters. As you can see, parallel balance charging requires 2 adapters, one for the main discharge leads and one for the balance leads. The adapters simply wire all the battery leads in parallel (i.e. all the red wires are tied together, all the black wires are tied together, etc).

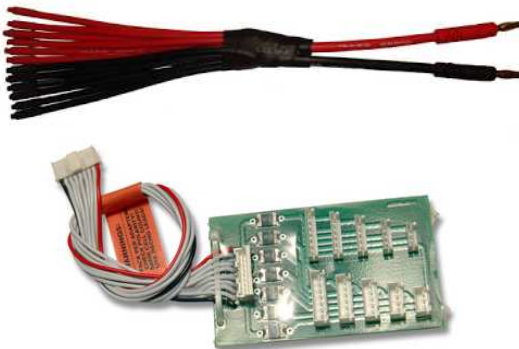
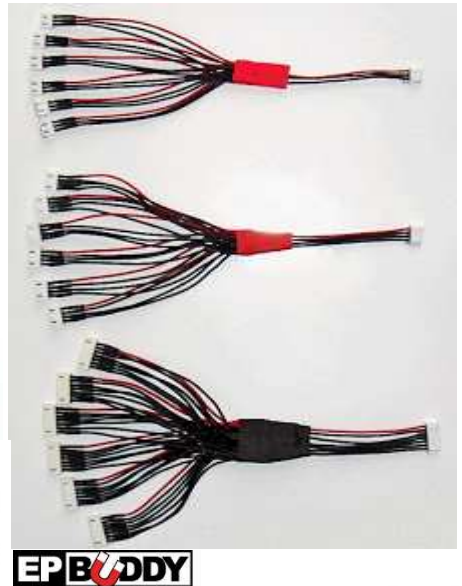




A few notes on commercially available parallel adapters

When I first started parallel charging there were no commercially available parallel adapter cables. But how times change. Parallel charging is now common place and there are a variety of pre-made adapter cables available. Even charger companies have come on-board and are now offering "Safe" parallel adapters that include polyfuses that help protect users from battery connection mistakes.

Below are a few of the options out there.



Additional info/discussion

This section is where I will address other concerns with parallel charging as they arise.

High current flow concern when connecting packs at different voltages together for parallel charging

Many people are greatly concerned that when charging multiple packs in parallel, that they be very near in voltage when you connect them, or the current that flows between them will be very great and could harm the lipos or cause greater problems. It is true that large currents can flow but the size of these currents are often greatly over-calculated. Here is some math to show a worst case scenario, connecting 2 high performance 6s 5000mAh packs, one fully charged and the other discharged.

The voltage of the charged pack is 25.2V, the voltage of the discharged pack is 22.2V, and so the voltage difference is 3.0V. The internal resistance of each pack is .018 ohms (3mohm per cell) for a total of .036 ohms.

$\text{Volts} = \text{Amps} * \text{Resistance}$ or $\text{Amps} = \text{Volts} / \text{Resistance} = 3.0\text{V} / .036\text{ohms} = 83.3\text{A}$

If we only do this simple math and go no further, we find the initial current flow to be 83.3A or nearly 17C. That looks bad on paper but in reality it is nowhere near that high because of a simple concept that the straight math fails to take into account and that is the voltages of both packs will change under load. Basically the more you load (discharge) a battery, the greater voltage drop. This means that the charged pack is no longer at 25.2V when it is loaded. In fact a 6s 5000mAh lipo will likely drop to more like 22V under that high of a load. Notice that is actually lower than the discharged lipo. Likewise the discharged lipo's voltage will rise under the charging load. The actual initial current flow is not easy to pin down without testing it in real life and will change with different packs, at different voltages, and so on.

Basically it is never a good idea to connect a to packs in parallel that are at vastly different voltages but in this case the likely end result will be nothing other than 2 packs will end up half charged.

There is one concern that is still very real though and that is if the pack's balance wires are connected first, this high current could damage the balance wires and/or the balance adapter. As such the main leads should always be connected first.

Testing data

In the interest of backing up the concepts above, I have done several tests. The first was to cover the voltage differences in normal use. I choose .2V per cell as the greatest possible difference between 2 packs for this test. And in the interest of making it as harsh as possible, I used a charged pack and a pack .2V per cell lower instead of a drained pack and one .2V higher. The packs used were Hyperion VX 2600mAh 35C 6s packs. These packs represent some of the higher capable packs available.

Here are the numbers for the test

I used my G.T. Power watt meter to measure the current flow between the packs. I do not have the capability to log the results on a computer, so I watched the numbers closely and mentally noted them. The peak current was recorded by the watt meter. The results were

	Pack 1	Pack 2
Cell Size	2600mAh	2600mAh
Cell count	6s	6s
Internal R per cell	4-5mohm	3-4mohm
Pack voltage	24.96V	23.73V
Initial Cell voltages	4.16V	3.96V

Initial current (peak)	18.7A
Current @ .5sec	~15A
Current @ 1sec	~12A
Current @ 2sec	~10A
Current @ 5sec	~8A
Current @ 10sec	~6A
Current @ 20sec	~5A

These results are approximately what I expected, maybe a little higher though. The initial (peak) current represents a rate of just over 7C and within 2sec it was below 4C. These numbers are child's play for the VX packs in terms of discharge rates and only the first second of current flow exceeded the charge rating of the packs.

All-in-all I think this shows that normal voltage differences (up to .2V per cell) between discharged packs are not problematic as long as the main leads are connected before the balance leads. Also the size and performance of the packs used are not important, as large-

er, higher end packs will have cause higher currents to flow between the packs but they are better suited to handle them. In other words the current is proportional to the pack capabilities and it works on both sides, charging and discharging.

The next test will be with the same packs but using a fully charged and fully discharged packs.

The bulk of mankind is as well equipped for flying as thinking.

- Jonathon Swift

If God had meant man to fly, He would never have given us the steam railway locomotive.

- A Great Aviation Quotes reader's late great aunt.

If God wanted us to fly, He would have given us tickets.

- Mel Brooks

If God had really intended men to fly, He'd make it easier to get to the airport.

- George Winters

A Day at South Harting

By Colin Hutchinson



Harting Down proved a good choice, with at least as much wind as forecast, if not more. However, on the way there the weather was so dull, and damp that I had my doubts about flying at all, but after leaving the A3 the roads dried up and a bit of brightness showed through the clag!

Then standing in the car park and looking up the hill to the slope made me feel even less like flying, as there was a constant mist forming in the bowl being blown across the path to the top of the hill. An interesting phenomenon that continued all day. Was the bowl causing a change in air pressure that made the water vapour in the air condense as it was forced upwards by the hill?

One for Graham Stallard there, I think?

With all that breeze the flying was spirited, to say the least, but the highlight of the day was the first flight, under Peter's ownership, of the beautiful Ken Glyn K8. I was worried about flying it in such a strong wind, but I need not have as it flew like a dream. Magic. The size of Peter's grin said it all! ➔



Slope Cross country 20 March 2016



A very dull and dreary start to the day meant that spirits were not very high as we walked across the downs to Coombe Hole. However, once the course was laid out along the ridge we soon got started. There was one flag not on the ridge, but some way up the fence on the west edge of the green on your left as you start walking to the slope. This was to prove much more difficult than it looked because of the wind direction.

First round saw Peter and I taking it in turns to spin around the flags for extra points, but that chivalry soon disappeared as the competition hotted up. On one turn-point we managed to arrange it so Peter flew clock-wise and I flew anti-clockwise. Amazingly the gliders managed to pass each other in opposing directions without crashing into each other, several times!

The flag at the top of the field, as I mentioned earlier, was in poor lift. This was to be expected, but the route back to the slope was what proved to be the tricky part of the course. The wind was coming over the knob, and getting muddled even more by the trees in the first bowl. A low exit from the flag at the top of the field meant a very turbulent route back over the knob to the strong lift. I only just scrapped back after my first round series of turns,



nearly losing sight of the model more than once.

However, the same flag made itself very unpopular with Graham, as he entered the bowl when the wind was at its weakest, and the sink and turbulence at its worst. The result was a long walk to the bottom of the first bowl to retrieve his Starlight. On the plus side he had plenty of exercise, and the landing he made was an absolute greaser – not bad at 500 foot distance, and no sun to help with the landing! (Are you reading this Trev???)

The second round was a fly-off between the winners of the first rounds, myself and Roger. I should point out the Roger was flying my old blue Pike Perfect, and as the comp went on, I questioned myself several times as to the wisdom of the sale. He would not sell it back to me though!!

The second round was flown in brighter conditions, with a generous breeze that meant when we approached the dreaded flag at the top of the field the route back could be flown at a greater altitude, thus avoiding all the turbulence created by the knob and the increasingly tall trees.

All competitors managed to complete the course safely.

The day was improved further by several slopers arriving during the morning and early afternoon. One rather curmudgeonly chap started chatting to Graham, and as it emerged during the conversation he was a regular at Lasham, working behind the scenes in the workshop. There was also a group of chaps flying combat, and the last to arrive were Byron and his brother.

Oh, I should add that I said hello to Clare Balding!

Colin Hutchinson	953	988	1000	923	882	1000	5747	882	4865	1
Roger Critchley	1000	1000	888	1000	933	892	5713	888	4825	2
Trevor Hornby	852	932	819	941	1000	933	5477	819	4658	3
Graham Stallard	890	919	831	925	938	958	5461	831	4630	4
Peter Williams	837	907	828	979	898	851	5300	828	4472	5

Colin

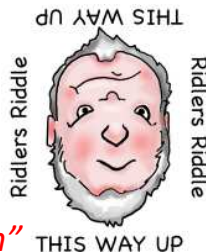
(or if that chap from Lasham is reading this, my real name is Fred Green). ➔

I went to the cemetery yesterday to lay some flowers on a grave. As I was standing there I noticed 4 grave diggers walking about with a coffin, 3 hours later and they're still walking about with it. I thought to myself, they've lost the plot!!

I was at a cash point yesterday when a little old lady asked if I could check her balance, so I pushed her over.

TVSF Puzzle Corner

Model Aviation Quiz last issue - Answers



Last issue teaser "Famous Aircraft in anagram form"

- | | |
|------------------------|---------------------|
| 1. a valid philandered | DE HAVILLAND RAPIDE |
| 2. a meth cowslip | SOPWITH CAMEL |
| 3. wise fads horrify | FAIREY SWORDFISH |
| 4. rarer haiku wench | HAWKER HURRICANE |
| 5. reds halts don run | SHORT SUNDERLAND |

This issue has "Select the correct alternative which describes the statement."

- What does FAA stand for?
 - A. Federal Avionics Administration _____
 - B. Federal Aviation Administration _____
 - C. Fedex Aircraft Administration _____
- What are the four forces of flight?
 - A. Air law, trust, drag, heavy _____
 - B. Crew, aircraft, luggage, passengers _____
 - C. Lift, thrust, drag, weight _____
- Which of the following are PPL training aircraft?
 - A. C172, B737, DA-20 _____
 - B. B757, B767, A330 _____
 - C. C172, C152, DA-20 _____
- Altitude in aviation is measured in?
 - A. Feet _____
 - B. Meters _____
 - C. Kilometers _____
- At what age can you receive your PPL?
 - A. 15 _____
 - B. 14 _____
 - C. 17 _____

Musings from my anonymous friend.

Many seek to uncover his true identity but only the editor knows, it is believed he is the wise man of Moss End.

An Engineer dies and goes to Hell. Dissatisfied with the level of comfort, he starts designing and building improvements. After a while, Hell has air conditioning, flush toilets and escalators. The engineer is a pretty popular guy.

One day God calls and asks Satan, "So, how's it going down there?" Satan says, "Hey things are going great. We've got air conditioning and flush toilets and escalators, and there's no telling what this engineer is going to come up with next."

God is horrified. "What? You've got an engineer? That's a mistake - he should never have gone down there! You know all engineers go to Heaven. Send him up here!

Satan says, "No way. I like having an engineer on the staff. I'm keeping him.

God says, "Send him back up here or I'll sue."

"Yeah, right," Satan laughs, "and where are you going to get a lawyer?"

One day on the golf course, a golfer accidentally overturned his golf cart.

A very attractive woman, who lived in a villa on the golf course, heard the noise, came out onto her balcony and called out to him, "Hey, are you okay?"

"I'm fine, thanks," he replied.

"You look frazzled", the woman said, "Come up to my villa for a drink and I will help you get the cart up afterwards."

"That's mighty nice of you," he answered, "But I don't think my wife would like that."

"Oh, come on," the woman, a gorgeous brunette in a sexy bikini, insisted. "I can see you've cut your head. It could be serious. Let me take care of that right away. I'm a nurse."

She was very persuasive....and he was weak.

"Well okay," he agreed, but added, "But my wife won't like it."

After she bandaged his wound, she gave him a most welcome brandy. They talked a little about golf and he discovered she was an avid golfer with a four handicap.

When he confessed to a weakness in his putting, she gave him a putting lesson holding him close and intimately as she did so.

Finally he confessed, "I feel a lot better now, but I had better get going. I know my wife is going to be really upset with me being here with you."

"Don't be silly!", the woman said with a smile. "She won't know anything. By the way, where is she?"

"Under the cart," he replied.

That's all for this issue of LIFT, to be sure to get your articles to me early for the next issue.

