



Newsletter

June 2020

In this issue you will see that Steve's Avro 504 is coming well towards completion of quite a complex construction. Steve, you've made a brilliant job of both the detailed pictures and the detailed blog.

I can see from the social network pages that you gentlemen are enjoying flying again at the field. I know that the weather has been a bit mixed but at least the 'lockdown' is effectively over but of course, that virus is still lurking. We must just hope and pray that we don't get a second wave in Covid 19 which will bugger things up again.

During this period of enforced hibernation I have been spending lots of my time at the computer working on photography. My wife requires more and more help so I'm always close by when she needs me.

So, I spend many a happy hour reminiscing - looking through a very large library of photos - events we've held at the field, events I've been able to go to at Elvington and Cosford.

The event I most miss has to be Elvington. We would go up the night before and book in to the lovely Primrose Lodge at which we stayed every year. We would enjoy a really good dinner at the Windmill just up the road before heading to the Elvington venue where Dave would run a hilarious quiz. He managed to take the p....s out of pretty well every one in sight at his quiz. Great way to start - by the time he'd finished the whole audience were chuckling into their beer.

So the next morning, off to the show. From our Club, Jason, Dave and Mark would be flying, giving exciting displays up with the best. I so loved taking photographs at those shows but as I said, those mages are still stored on my hard drive so it is a pleasure re-processing them (because the software is constantly being updated).

This is what has kept me reasonably sane during this time of restriction.

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Elvington 2015 LMA Show - Dave Swarbrick flying



Elvington 2015 again - this time it's Jason on a low flypast



Mark's Viperjet just about to touch down

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A VIEW FROM THE HEDGE. (By Will Sparrow)



Thankfully, you've been released from your plague lockdown for a few weeks now and most of you have quickly adapted to the "new normal" although some little rascals in your midst seem to have only a vague idea of just how large a two metre separation is – think of the wing span of a medium-sized glider or one of those lovely F3A pattern models or, as one recently divorced woman was reported as saying "I just imagine my ex. lying on his face with a knife in his back!" There are many ways to ensure that you don't succumb to the plague. If you were all to be carried off by the grim reaper I would have nothing to view, would I? (Thinking of yourself again, Will, as usual – Jim Sparrow).

Late May dished up a good number of excellent flying days and your members turned out in droves in order to take full advantage of the Weather God's bounty. Fine weather, coupled with rusty flying skills, sadly brought a spate of model crashes and incidents. A small and fast glider-type model went in "like a bag of spanners" and will not see the light of day again. Another member did a beautiful landing with his new scale model only to notice that he had not put the undercarriage down. An ARTF warbird stalled on take-off and suffered quite a bit of damage and a large, petrol-powered aerobatic model met its end when "low and slow" and self-confessed pilot error combined. Those little plastic men you trust to fly your models really are having a hard time of it!

Now for a bit of good news: I noticed another of those lovely, big, high-wing ARTFs put in an appearance (by my reckoning this makes three in total). This one eschewed the clean simplicity of electric power and had a twin-cylinder petrol engine installed. The model is jointly owned by a father/son dynamic duo and flew beautifully. I really like these models, even the smelly, noisy ones. Joint ownership can be problematical when maintenance and repairs are needed; I'm sure that, in this case, no repairs will be needed.

As official summer started the weather was model-friendly and the facilities, in tip-top condition by the way, were, once again, being put to good use. Unfortunately, the fun was punctuated with a further spate of crashes. An engine stop on a large petrol-powered model at a fair height over the strip left its pilot



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with a dilemma: do a 360° turn and land on the strip or try and feather it in and land on the strip. What would you do? The pilot made his choice and the model landed heavily in the long grass with a loud cracking sound. The damage proved to be more than anyone would expect; oriental "splinter ply" lived up to its name yet again. Another model, a "super swooper" this time, was living up to its name when a half-roll and pull through from inverted coincided with a seismic heave resulting in the ground moving upwards just as the model tried to pull through. If your club had a graveyard for miniature plastic men it would be filling up at a rare old rate!

One consequence of the high model attrition rate is that member's hangars are becoming a bit depleted and, as a result, old or least-favoured models are to be seen coming out for an airing. One such model, when I viewed it on the ground in the pits, reminded me of a slice of cheese – such were the lines of its fuselage. It looked weird on the ground but strangely charming once in the air. Beauty is always in the eye of the beholder.

I overheard, just the other day, that your permission to fly over 7kg models above 400ft had been renewed. (All models are restricted to a maximum of 400ft, but BMFA members are permitted to fly models under 7kg above this height). Personally, I get vertigo if I climb to over 50ft and my nose starts to bleed as I approach 100ft. I'll leave the high flying to you lot with jets, gliders and glider tugs!

Just as June was getting into her stride, we were treated to a longish spell of rain and wind. Have you ever noticed the heady scent that prevails just after rain has fallen after a prolonged dry spell? The Wise Old Owl chipped in as I was savouring the smell. "It's called "petrichor", you know (I didn't). As the raindrops hit the soil the petrichor is released. A key component of the petrichor is an organic chemical called geosmin, which lingers in the soil and gives many root vegetables their distinctive flavour.... the bacteria which make up the geosmin.... have a relationship with insects called springtails....." On and on he went, but my brain had seized up and shut down. I do love the old boy and where he gets all this stuff from is a mystery to me, but sometimes I'm relieved when I see him waddle off to his perch at the end of our hedge!

WS

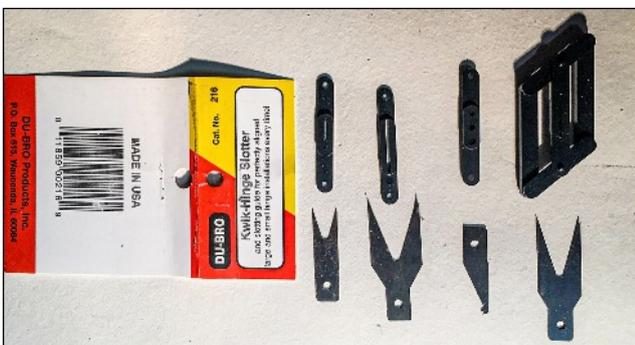
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Avro 504N Part 3 – Hinges and Under-Carriage

PIC 35 – Illustrates the completed ailerons to be used on the lower wing only.



PIC 36 – Cutting slots for Mylar hinges is not my favourite task so in an effort to make the job a little easier for the Ailerons I decided to purchase a Dubro Kwik-Hinge Slotter Cat. No. 2 off E-Bay.



The Dubro Kwik Hinge Slotter comes with an assortment 3 of blades and 3

plastic guides with alignment jig to accommodate the various blade widths. There is also a hole-centring guide supplied which allows drilling of holes for hinges and aileron wire.

I found two snags with the kit, firstly the blades were too thick to be accommodated in my X-ACTO knife handle the instructions specified them to fit a No.2 X-ACTO. Secondly the blades were too thick (0.8mm) for the Mylar hinge material (0.3mm) I intended using.

PIC 37 - The most useful accessory turned out to be the alignment jig, which can accommodate a wide range of trailing edge stock sizes(1mm – 20mm) and allows you to position the slot accurately in the centre of the trailing edges.



PIC 38 - The only problem was using a thinner blade meant there was a certain amount of freedom when cutting with a thin blade with the jig which is meant for a blade of 0.8mm however, it was a lot easier than having no guide and the slots cut in the wing trailing edge aligned a lot more

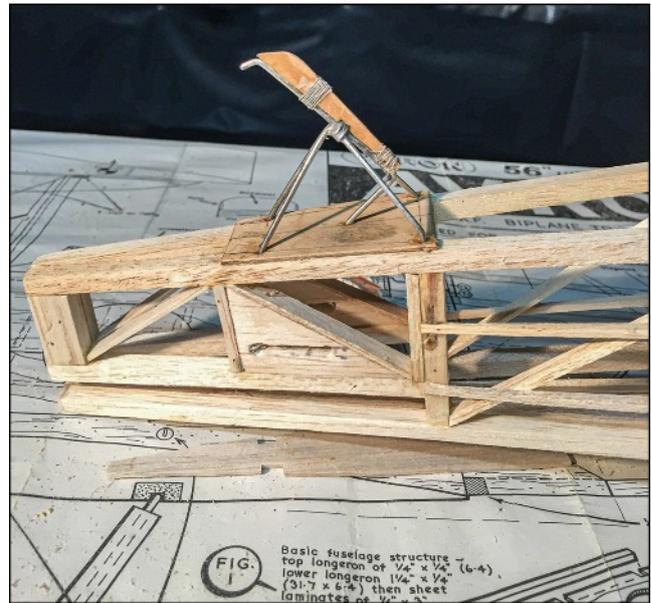
Avro 504n Part 3 continued..

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Article by Steve Warburton

accurately with the mating slots produced in the ailerons.

angles to ensure the completed



PIC 39 – The Kwik-Hinge alignment jig worked equally well on the thinner materials used in the Tail plane and all moving rudder/fin.

assembly would align with the 5 locating holes drilled in the plywood plate and fuselage longerons took a bit of doing as the pre soldered assembly was very unstable even when the parts had been wired together however, once soldered the resulting assembly proved to be very rigid. A plywood tailskid embellishment was wired and glued to the wire part of the tail skid prior to epoxying the completed assembly to the rear fuselage.



PIC 40 – Illustrates the Tail-skid which comprises of 3, 20SWG wire parts bent to suit in accordance with the side view provided on the plan. Achieving the correct bend

PIC 41 – The under-carriage is to be located crosswise in three slotted hardwood guides one at the forward position in the fuselage and the mid and aft braces in the corresponding

Avro 504n Part 3 continued..

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Article by Steve Warburton

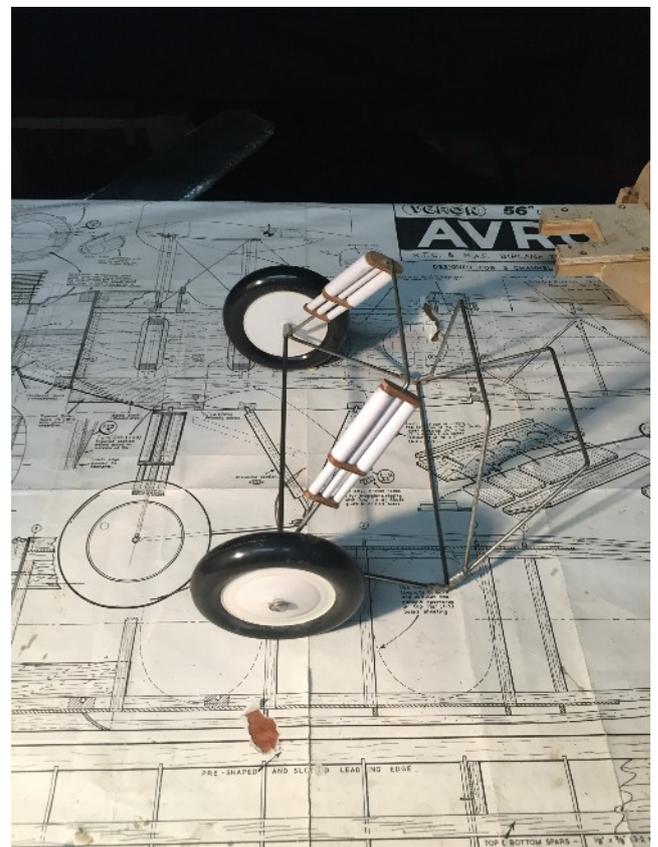
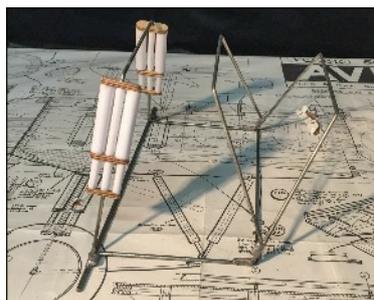
slots in hardwood cross pieces let into the wing centre section. It was assembled from 5 pre-formed 12SWG wire parts. Due to my experience with the tailskid I decided the only way forward was to devise a simple jig shown in the picture as an aid for positioning, wiring and soldering. The final soldered

PIC 42 – This picture illustrates the side view of the undercarriage complete with oleo structure. The oleo strut tubes were made by rolling self adhesive paper strips over plastic tubing until the required diameter was achieved.



PIC 43 – Illustrates the undercarriage complete with wheels, which were secured using wire circlips made from 30amp fuse wire and steel washers, soldered to the axle. I used a thick tin foil baking tray to act as a heat shield to protect the plastic wheel hubs from the

assembly is illustrated in the picture along with the tubing and plywood oleo parts, which needed to be added prior to soldering, but I had to almost straighten the two lower bends in order to feed the plywood and plastic tubes prior to soldering.



Avro 504n Part 3 continued..

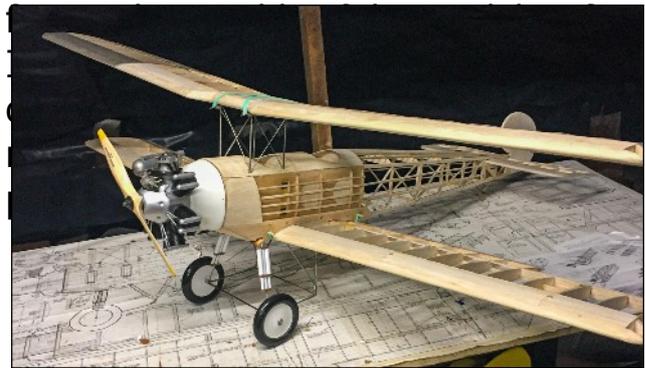
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heat of the soldering torch, this worked well on the first wheel but some melting occurred on the second wheel which had to be sanded out.

PIC 44 – Illustrates the undercarriage assembly located in the forward hardwood slotted cross member. Carpet thread binding was used with Epoxy to secure the undercarriage in the forward hardwood crosspiece and once set the adhesive was cracked to

PIC 45 – I couldn't resist doing this the



allow the undercarriage to be hinged to allow access and fitting of the wing. The elastic bands used to secure the wing also secures the undercarriage in slotted hardwood cross pieces in the wing.



Adhesives

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Article by Brian Holdsworth

There is a considerable range of two-part products which may be divided into several categories.

Polyester resin became popular for use with fibreglass cloth, tissue and mat for repairs, reinforcement and moulding parts. This was marketed as fibre glass resin. An inert powder can be added producing a filler in the form of a paste used to fill dents etc. and capable of being sanded to a very smooth finish - useful for car body repairs etc. A catalytic reaction is used where a tiny amount of a substance is mixed into the resin when a vigorous reaction is triggered so that the mixture sets hard within a few minutes. The reaction is exothermic meaning that considerable heat is generated. Insufficient catalyst results in incomplete setting while too much generates a lot of heat, perhaps enough to produce a fire, especially for large quantities.

The resin is reasonably benign to handle but the catalyst is often corrosive or poisonous. To simplify usage, the catalyst is considerably diluted with an inert carrier reducing its harmful effects and simplifying mixing in the appropriate ratio. At room temperature, the mixture starts to set after a few minutes, becoming hard after 20 minutes or so. This setting time is sensitive to temperature where too low may never set properly and too high can set too quickly, possibly before mixing is complete - typically 10 to 30 degrees centigrade is manageable. Early examples such as "Bondaglass" used a liquid catalyst which was difficult to handle without spilling.

A widely available consumer product is "David's Isopon" which packages the catalyst in the form of a coloured paste in a squeezable tube making it easier to measure the required amount and mix thoroughly so that no streaks are evident. This produces a brown colour which may be inconvenient. Larger-scale usages with tight control over mixing and application would use a clear liquid for the catalyst allowing large structures such as boat hulls to be moulded in one piece; considerable ventilation is needed to dissipate the generated heat.

Epoxy resins are supplied in two containers where one is identified as the hardener, often containing formaldehyde which can be somewhat unpleasant in usage. Frequently, a suitable carrier is added to one part so that equal portions are mixed for simplicity in use. Thorough mixing is needed prior to use with a short period



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Adhesives Continued...

Article by Brian Holdsworth

for application before it starts to set. Full hardening usually takes about 24 hours with some formulations setting reasonably hard after a few minutes though with reduced final strength. Hardness is generally less than that of polyester resin, but this can be advantageous to allow some flexing in use.

They generally set better at high temperatures (120 degrees centigrade or more). High-strength usages cook the joined parts through a carefully-controlled temperature sequence in an oven. Consumer products generally produce reasonable results at normal temperatures, but all struggle at low temperatures (below about 10 degrees centigrade).

Products intended for gluing are supplied in the form of viscous fluids so that the glue does not flow away from the joint. The setting process becomes rubbery before eventually setting hard. After a few hours, the glue is firm enough to hold the parts, but soft enough to be cut with a knife which can be convenient for trimming any excess squeezed out of the joint.

An early consumer product was "Araldite" supplied as two tubes for mixing in equal quantities, taking up to 24 hours to set. It was widely used for modelling purposes and could even be used for joining silencer parts if the assembled item was warmed under the grill of a domestic oven to improve its setting performance - care was needed since the glue becomes very fluid at the required temperature and so likely to run down the side to become bonded to the grill pan. Later products are often labelled as "5 minute", "10 minute" etc. indicating their claimed (optimistic!) setting times, and are widely used though their performance is inferior to the 24 hour types, tending to remain rubbery rather than setting hard.

Less viscous formulations are used instead of polyester resins for bonding glass fibre and, increasingly, carbon fibre, Kevlar etc. producing items with a considerably higher strength-weight ratio than steel. As above, an inert powder can be added producing a filler in the form of a paste. A common modelling usage covers sheeted structures with lightweight fibreglass cloth bonded by resin squeegee'd through the cloth to saturate it, removing any surplus, to produce a tough finish for little added weight. For this purpose, some products are available



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Adhesives Continued...

Article by Brian Holdsworth

in two forms for initial bonding and a final finishing coat where the latter includes wax to achieve a smooth finish; that wax can cause adhesion problems for any subsequent coats.

They can be temperamental in usage and often have a short shelf life before deterioration. Unopened from the manufacturer, they only store for a few years; some commercial products are repackaged before sale shortening their life. Even if carefully sealed after opening, they can deteriorate within months, tending to thicken and becoming reluctant to set. Storage in a domestic refrigerator (not the freezer compartment!) can extend storage life.

The mixing ratio can be critical. It was common for the printed label on a product to specify a ratio of hardener to resin with a hand-written change or separate note specifying a higher ratio; practical experience often suggested an even higher ratio. If insufficient or deteriorated, it can fail to set, remaining tacky to the touch, with remedial action very difficult - frustrating on a newly finished model!

Adding coloured pigments produces paint which is hard-wearing with resistance to chemical attack including fuel residues. Low viscosity using a suitable thinner produces a reasonably high surface tension so tending to self-level and not drip. They are generally better sprayed than brushed. Some are supplied ready for spraying after mixing, but any thinner used must match that specified since there are several incompatible formulations. Spray guns need to be thoroughly cleaned and brushes are generally discarded after a single use.

The adhesion of any subsequent layers can be problematic and mechanical roughening of the surface with sandpaper etc can be helpful to provide a mechanical key, but mixing of polyester and epoxy types is unlikely to be effective. Paints usually benefit from the prior application of a suitable primer.

There is a group of two-part glues which are supplied in a single container where the required catalyst is supplied by ambient conditions, particularly moisture.



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Adhesives Continued...

Article by Brian Holdsworth

Isocyanate glues are widely used providing near-instantaneous bonding, but they can be reluctant to set properly under some conditions; the use of a "kicker" can help by improving the moisture content. The fumes given off during setting can produce hayfever-like symptoms (itchy/streaming nose and eyes) so ventilation may be essential, particularly for large areas; those affected may find some brands are less troublesome than others. The resultant joint is rather brittle and dependent on the porosity of the surfaces to be joined. Thicker types would be more appropriate for balsa wood etc, since a thin glue would soak into this porous material leaving an inadequate quantity of glue at the junction. Usages such as gluing "furry" hinges into control surfaces would need multiple applications of thin cyano into the join to penetrate the wood and still leave sufficient glue at the junction with the hinge.

Polyurethane glues such as "Gorilla" glue also use moisture as the required catalyst. A fine spray of water over one surface with glue applied to the other is recommended by the instructions. The glue takes several minutes to set and expands considerably during the process which can be a problem, generally requiring parts to be clamped together.

Thick acrylic or silicone-based pastes are marketed as frame sealants, generally supplied in the form of a disposable plastic cartridge with the contents squeezed out of a nozzle using a dedicated lever-action gun to provide the considerable pressure required. They are often somewhat acidic, making them unsuitable for use with metal due to the corrosion potential. After opening, they may dry out within a few weeks even if carefully resealed. As the name suggests, they are intended for sealing the gaps around door and window frames while helping to secure them in position. A few hours after application, they develop a firm surface skin with the interior hardening over a few weeks. A variation with faster setting is marketed as "No Nails" for usages such as fitting skirting boards onto interior house walls without, as the name suggests, needing any other fixing such as nails. However, performance can be limited so that a long length may benefit from some fixings at the ends to resist the considerable forces pulling away from the wall if the wood should warp.

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Club Instructors

Jason Reid, Mark Conlin, John Higgins, Brian Holdsworth, Chris Vernon, Andy Harrison, Jim Sheldon, Paul Cusworth, Justin Goldstone, John Prothero.

In Conclusion

Well guys, time to say farewell for this month. Thank you to Will, Brian and Steve for your kind contributions to this newsletter. Enjoy your flying and keep safe.



Final shot from the 2015 Elvington LMA is this large scale Klemm powered by a 5 cylinder radial engine - it looked and sounded beautiful.